

**FINAL REPORT for APN PROJECT**  
**Project Reference: CBA2010-09NSY-Okayama**



**- Making a Difference –**

Scientific Capacity Building & Enhancement for Sustainable Development in Developing Countries

***Scientific Capacity Development of the Trainers  
and Policy Makers for Climate Change  
Adaptation Planning in Asia and the Pacific***

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**Scientific Capacity Development of the Trainers and Policy Makers for Climate Change  
Adaptation Planning in Asia and the Pacific**

**Project Reference Number: CBA2010-09NSY-Okayama  
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# OVERVIEW OF PROJECT WORK AND OUTCOMES

## Non-technical summary

The project entitled “Scientific Capacity Development of the Trainers and Policy Makers for Climate Change Adaptation Planning in Asia and the Pacific”, funded by the Asia Pacific Network for Global Change Research (APN) under the ‘CAPaBLE’ programme, was implemented as a part of Asia Pacific Adaptation Network (APAN) activities that aimed at enhancing the capacity of national and regional institutions to support adaptation actions. Under this project, three workshops were conducted in January, March and August 2011 with the participation of all project collaborators representing different training institutes, universities, and ministries of agriculture in five project-targeted countries (Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal). While the first and second workshops (meetings) focused on training needs assessment, the last workshop was focused on the drafting the training modules for their respective countries which were then finalized and submitted as the final country reports. The project received the technical expertise from Institute for Global Environmental Strategies (IGES), Asia Institute of Technology (AIT) and AIT-UNEP Regional Resource Center for Asia and the Pacific (RRC.AP).

## Objectives

The overall objective of the project was to strengthen the trainers’ skills and knowledge in imparting training in agriculture and water sectors in the project countries of the Asia-Pacific region.

The specific objectives were:

- (i) to undertake appraisal of training needs in terms of knowledge and skill areas for effective adaptation; and
- (ii) to design training modules for imparting knowledge and skills for effective adaptation.

## Amount received and number years supported

The Grant awarded to this project was US\$ 30,000 for 2010-2011

## Activity undertaken at Project level

1. Workshop 1 (1<sup>st</sup> Training Needs Assessment meeting): Kick-off workshop on January 31, 2011
2. Workshop 2 (2<sup>nd</sup> Training Needs Assessment meeting): Review workshop on March 11, 2011
3. Workshop 3: Training module design workshop on August 10-12, 2011

Please refer to Appendix 1 for the proceedings of these three workshops.

## Activities taken up at country level

The following activities were taken up in all project countries:

- Desk review of existing training modules implemented by various government and non-government agencies in the field of climate change adaptation for agriculture sector: Reviewing these programs has provided important information on the duration of existing training programs, subject matters covered, relative weight of knowledge and skill areas, nature of knowledge and skill areas, target audience, and organizations involved in conducting these training programs.
- Conducted consultation meetings to identify priority subject areas for training: Consultation meetings were conducted with the participation of subject matter specialists, departmental officials and trainers to identify priority subject areas for training, to identify institutional limitations and if there is a need to change the job profile of important functionaries in agriculture department to take forward the agenda of climate change adaptation.
- Questionnaire surveys to identify existing skill and knowledge areas and possible changes in the job functions of staff for handling climate change adaptation related work. The questionnaires consist of four forms to list various functionaries working in agriculture at various levels, their current job responsibilities, to identify institutional and infrastructure limitations for training and to assess their knowledge and skill areas in climate change adaptation in agriculture sector.

## Results

Several aspects related to capacity building for climate change adaptation have become clearer in this project. Most importantly, all the project countries are at a nascent stage of capacity building for climate change adaptation with Bangladesh and Nepal at an advanced stage in terms of number of existing training programs and capacity to implement capacity building programs on climate change adaptation. A range of obstacles were identified that limit the introduction and expansion of training programs on climate change adaptation. Some of these limitations include lack of sufficient funds for training, lack of critical mass of trainers, lack of knowledge on what constitutes adaptation and how it is different from usual developmental planning, lack of specified mandate for many government officers to undertake project on climate change adaptation. In all the countries, the national level policy setting plays an important role in furthering the agenda of climate change adaptation. Documents such as National Adaptation Plan of Action are still the important source of information to identifying priority areas for capacity building. Hence, there is every need to make these assessments accurate possible since all the national interventions are going to be aligned based on these documents.

All country partners have developed training modules for entry level, mid-level and senior-level (policy makers) for induction and in-service training. For entry level staff, the focus was on introducing principles and operational aspects of climate change adaptation. For the mid-level staff, more technical aspects were introduced with high proportion of content on vulnerability and effectiveness assessment tools. For the senior staff at the policy level, the modules were focused mostly on policy areas, decision support tools, existing policies for climate change adaptation and on climate change negotiation skills.

In addition to above, the following broad conclusions can be made from this project:

1. Climate change adaptation is also an issue of capacity building and hence capacity building of key stakeholders is of paramount importance for promoting climate change adaptation in some of the most vulnerable sectors and countries in the Asia-Pacific region. Awareness generation and capacity building of policy makers is the key since they are crucial to bring change in various government related processes and in the society at large.
2. There have already been several initiatives by various international and national agencies for training and capacity building of key stakeholders. Training and capacity building of various government staff and trainers in the region have been facilitated by both formalized systems consisting of induction and on-the job training programs and ad-hoc training programs that are conducted from time to time when resources are available. However, they are too few and inadequate in terms of their design and implementation.
3. The project has revealed the presence of training and capacity needs assessments for adaptation for priority sectors in some of the project countries. However, the nature and details of these training and capacity needs are not entirely related to climate change adaptation since many times the content related to disaster risk reduction are interchangeably used for that of climate change adaptation.
4. Formulation of draft training modules and pilot programs shouldn't be seen as an end but only as a beginning for creating enabling environment for engagement of different stakeholders. Active and coordinated engagement of national and local governments and other stakeholders is crucial to regularize training and capacity building programs in the Asia-Pacific region.

The Asia-Pacific Adaptation Network is well placed to play an important role as a facilitator to bring various stakeholders together and to initiate training needs assessment and formulation of draft training modules and pilot training programs for the most vulnerable sectors in the Asia-Pacific region. However, piloting and scaling up of these initiatives require proactive participation of various stakeholders including the support from governments, NGOs, national and local institutions and donor agencies.

## **Relevance to the APN Goals and Science Agenda, Scientific Capacity Development and Sustainable Development**

### **Self evaluation**

The project has done exceedingly well beyond the initial expectations considering the different levels of expertise and experience of national collaborators on this topic. The success could be attributed to development of methodology that was uniformly adopted by all partners with little modifications at the national level, frequent meetings that facilitated in exchanging intermittent outputs and more importantly the focus of the national partners in achieving the results. All the project countries are able to identify gaps in the existing training programs, identify training needs in terms of knowledge, skill and institutional infrastructure areas.

### **Potential for further work**

The training modules developed in this project need to be tested through conducting pilot training



programs in the project countries. Upon testing these modules, a national framework need to be developed in consultation with the national governments to provide policy level support for continued use of these training modules in terms of integrating these modules into the existing induction and in-service training programs. New training programs need to be developed where there are no induction or in-service training programs exist in the agriculture sector. The project countries still lack comprehensive policy and roadmap for capacity building in climate change adaptation at the national level cutting across all sectors and sub-regions. The national human resource development plans in these countries need to be reviewed and revised to incorporate necessary elements related to climate change adaptation. There are several other sectors that need specific attention including urban planning, disaster risk reduction, and coastal areas that are most vulnerable to climate change after agriculture.

## **Publications (please write the complete citation)**

Prabhakar, S.V.R.K. 2010/10. Technical capacity development for climate change adaptation planning in the Asia-Pacific region. In UNFCCC: Action on the ground: A synthesis of activities in the areas of education, training and awareness-raising for adaptation, edited by UNFCCC. 30-31. Bonn, Germany. UNFCCC.

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# TECHNICAL REPORT

# PREFACE

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This project is a part of Asia Pacific Adaptation Network (APAN) activities that aimed at enhancing the capacity of national and regional institutions to support adaptation actions. In response to the absolute necessity to develop capacity of training institutes and policy-makers for science-based adaptation planning and informed investments, while addressing climate change adaptation issues by the countries that are most vulnerable to the impacts of climate change, this project titled “ Scientific Capacity Development of the Trainers and Policy Makers for Climate Change Adaptation Planning in Asia and the Pacific” was envisaged under the ‘CAPaBLE’ programme of the Asia Pacific Network for Global Change Research (APN). The report presents training needs assessment methodology adopted in the project, results in terms of training modules developed by individual project countries, and future directions.

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# 1. INTRODUCTION

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Research has indicated that institutional capacity forms one of the determinants of adaptive capacity and vulnerability to climate change (Brooks et al., 2005). It is well-known that institutional capacity is also determined by the human resources that make institutions function (START and UNESCO, 2009). One of the most important considerations for enhanced adaptive capacity has been provision of required finances for helping developing countries implement adaptation actions. However, even if required finances are made available, the lack of necessary human resource capacity could limit the effective utilisation of provided funds. Recognising this fact, the Japan International Cooperation Agency (JICA) has identified human resource development as a core component of its external assistance program (JICA, 2007). The BAP has identified that the adaptive capacity of developing countries be enhanced through international cooperation between developed and developing nations. Further, BAP has identified specific areas where such cooperation is possible, including vulnerability assessments, prioritization of adaptation actions, incentivizing adaptation, implementing capacity building programs for better response strategies, and promoting climate resilient development (UNFCCC, 2007). The NWP has identified critical capacity gaps among developing countries falling into nine work areas, which include methods and tools, data and observations, climate modeling, climate related risks and extreme events, socio-economic information, adaptation planning and practices, research, technologies for adaptation and economic diversification.

Adaptive capacity varies across Asia and the Pacific, based on social system, economic capacity and the level of environmental disruptions. The Nairobi Work Program (NWP), several National Communications, and National Adaptation Plan of Action (NAPAs) have indicated the need for additional human resource capacity to help adapt to climate change impacts. Recognizing the need for building capacity to adapt to climate change, the Government of Japan has initiated special ODA support to developing countries in adapting to climate change through JICA training courses on disaster risk reduction, water resource management, forest resource management, and river and land management. Though there is no regional level research carried out on the availability of human resource capacity for adaptation, the country level research indicate that there is a need to build the human resource capacity for adaptation. The Institute for Global Environmental Strategies (IGES) in Japan held consultations on the post-2012 regime which indicated a significant human resource gap in the region in terms of understanding and implementing climate change adaptation plans and participating in negotiations under the UNFCCC. In addition, major gaps in adaptive capacity were identified at the Asian regional workshop on adaptation organized by the United Nations Framework Convention on Climate Change (UNFCCC) in Beijing in 2007 which included lack of technical expertise for the application of methods and tools for specific circumstances and lack of technical capacity to assess, plan and integrated adaptation needs into sectoral development plans and policy.

To satisfy such needs United Nations Environment Programme (UNEP), in partnership with key UN and other international organizations, governments, foundations and research institutions, is facilitating the development of the Global Climate Change Adaptation Network (GAN). Under GAN, the Asia Pacific Adaptation Network (APAN) was established in October 2009. The Regional Hub for APAN is co-hosted by Asian Institute of Technology - UNEP Regional Resource Centre for Asia and the Pacific (AIT-UNEP RRC.AP) and the Institute for Global Environment Strategies (IGES). This project is a part of activities under APAN.

Capacity needs assessment of trainers is the first step for implementing any well-structured capacity building program. Although there are general assumptions and agreement over the need for

capacity building, there are no detailed assessments on exactly what specific areas or subjects of adaptation the capacity is lacking, whose capacity needs to be enhanced, and how the capacity enhancement mechanism can be effectively integrated into the ongoing capacity building programs.

In addition to the technical skills needed for better adaptation decision-making, the change in attitudes of stakeholders on various aspects of adaptation is also important. This project contributes to improved decision making by transferring the knowledge and skill available with the scientific communities to various stakeholders including trainers, policy-makers, developmental practitioners, etc.

This project is most relevant for objectives one and three, while having close relationship with others, of the CAPaBLE program i.e. “Improvement of informed decision-making in developing countries by dissemination of the outcomes of research activities to policy-makers and civil society”. Informed decision-making by policy-makers, developmental practitioners and other stakeholders for better adaptation requires better understanding of principles and practices of adaptation in terms of knowledge and skill. These could include conducting vulnerability assessments, understanding long-term climate projections, converting impacts information into policy, etc. The project was implemented in Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal in close collaboration with different regional and national institutions. The project had technical inputs from the members of the Steering Committee of the Network which include Australia, China, India, Japan, Republic of Korea, Kazakhstan, Philippines, Turkmenistan and The Pacific islands who are also involved in conducting the sub-regional activities of the Network. United Nations Environment Programme (UNEP) was also involved to facilitate overall activities at the regional, sub-regional and national levels.

Through this project experiences and expertise from developed countries (e.g. Japan and Australia) were shared and transmitted to developing countries on matters related to effective adaptation decision-making (subject matter of the capacity building) and know-how on conducting TNA which is related to Parts 107 and 110 of The Johannesburg Plan of Implementation (JPOI) (building capacity to access a larger share of multilateral and global research and development programmes and capacity development through international cooperation) and section c (i) and (ii) of Bali Action Plan (BAP).

## 2. METHODOLOGY

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The overall methodology followed is discussed below:

**Questionnaire surveys:** Training needs assessment (TNA) was carried out using the questionnaires and methodology developed by the Institute for Global Environmental Strategies (IGES) where the capacities of personnel from agriculture and water department of the local governments to carry out their expected role in taking adaptation decisions in the climatically stressed administrative divisions of the project countries were assessed. The TNA questionnaire forms were to be filled by the representatives of the department or the employee/interviewee themselves in order to help the interviewer assess the training needs in knowledge and skill areas. These forms also included questions related to capacity of the faculty and training environment in terms of infrastructure etc. As a part of this TNA, the following information was obtained from the interviewees (Please refer to Appendix 2a for complete forms used for TNA).

- Line of command or the structure of decision making authority within the department/organization being assessed (in this case the aim is to assess training needs in agriculture sector including water for agriculture) (Form I)
- TOR or job description of each personnel (including any expected change in the role to be assigned for an effective adaptation decision making within the department) (Form II)
- A questionnaire that assess the training facilities available in each country or geographical area of the respondent (Form III)
- A questionnaire to be answered by the employee to assess his knowledge, skill and environmental areas (Form IV)

**Desk review of existing training programs and modules:** In addition to the TNA, the existing training modules being implemented by various government and non-government agencies were reviewed. The results of this review are tabulated by individual country reports in the annexure. Please refer to Appendix 2b for formats used for evaluating existing training program

**Identifying the ideal knowledge and skill area for climate change adaptation:** After identifying the existing knowledge and skill areas through questionnaire surveys, efforts were made to prepare ideal knowledge and skill profile for carrying out satisfactory performance by various target government functionaries. For identifying this profile, country partners have reviewed the existing climate change impact and adaptation literature, and national adaptation plan of actions that outline the priority projects to be implemented at the national level. This information was compared with the existing level of knowledge and skill areas (from questionnaire surveys) and gaps were identified that formed the training content for intervention at induction and in-service training programs. Please refer to Annexure XX for the two-stage process used for identifying ideal knowledge and skill areas for climate change adaptation.

**Drafting training modules:** The gaps identified in the TNA phase were addressed in a transparent and inclusive training modules preparation workshop involving inter-disciplinary teams of experts covering the domains of adaptation, capacity building and national policy processes.

During this period of project the focal point and key personnel from concerned departments were deployed to enrich their knowledge and skills on training and development as well as on course module development. Workshops on training design, methodologies and course module development were organized in order to standardize the process in training design. During the

workshop, a team of three experts i.e. training expert, departmental expert, and expert on climate change adaptation in agriculture sector from each project country have discussed the TNA outcomes and converted the gaps into learning and session objectives which further helped in identifying training content, duration, mode of delivery etc. The module development workshops were participatory in nature and using learning-by-doing approach. The workshops addressed key important elements in module design such as principle of adult learning, formulating learning objectives, selection and organization of training contents and identifying effective training methodologies. Standard format for module development was provided and used as a guideline for the personnel to prepare course curriculum framework. After the completion of the design phase, the course modules from each country were presented and submitted to module development experts to review and give feedbacks.

The ultimate outcome of this project was development of training modules if implemented would lead to developing a critical mass of trainers who can impart training programs to end users in the region on subjects identified. The capacity building programs were developed in a comprehensive manner to ensure urgent implementation of adaptation actions through identification of measures of for prioritizing adaptation actions, capacity building & response strategies, integration of adaptation into sectoral & national planning, and identification of means to incentivize adaptation by various stakeholders. The project identified gaps in the existing capacity of various stakeholders and training programs imparted in different project countries. As an initial step, gaps were identified at the national level and efforts were made to help national governments to conduct similar TNAs at sub-national level using their resources and hence building the ownership in the initiative and spreading the benefits of the project beyond the project proposed activities.



## 3. RESULTS & DISCUSSION

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The contributions and inputs of all project collaborators, five country reports submitted by the country collaborators (Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal), to the project are presented in this section.

## 3.1 BANGLADESH

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# BANGLADESH PART I: TRAINING NEEDS ASSESSMENT (TNA) ON CLIMATE CHANGE ADAPTATION IN AGRICULTURE SECTOR

## a. Introduction

In the Asia and Pacific region, climate change has been observed in the form of extreme events with intense rains and floods, droughts and cyclones/typhoons etc. Many parts of Asia has suffered decreasing trends in food production due to reduced water availability, increased temperature, decreasing number of total rain fall days, recurrent flood, drought, salinity etc. In Bangladesh, changes in rainfall, sea level and temperature are the major impacts of climate change. The vulnerability to climate change in Bangladesh is due to poor progress in development, high population density, and high dependency of large proportion of population on climate-related sectors such as agriculture that is directly impacted by changes in climate and weather.

The availability of many local fish species has declined with the silting of river beds, changes in temperature, and early flooding. Communities are coping with these changes by working as labour, migrating to other places and borrowing money from money lenders. Coastal zones have suffered loss of mangroves due to salt water intrusion in Bangladesh. Droughts and lower precipitation have also contributed to the loss of wetlands and the severe degradation of ecosystems. The incidence of diarrhea diseases and other infectious diseases such as cholera, hepatitis, malaria and dengue fever increases during severe floods, rainfall and droughts in combination with poverty, poor access to safe water and poor sanitation. High temperatures and poor hygiene contribute to health impacts.

Climate change adaptation (CCA) is a problem of capacity too. Though Bangladesh has robust system of agricultural research and training, the initiatives on capacity building for climate change in agriculture sector are still at nascent stages and needs a phillip. Efforts are required for building realistic programmes for key stakeholder such as trainers, academicians, researchers, policy makers, development practitioners, extension providers etc. in the Asia-Pacific region in order to streamline the CCA principles and practices into development planning. Keeping this in view, a collaborative project was implemented with the UNEP Asia Pacific Adaptation Network (APAN) and Institute for Global Environmental Strategies (IGES) which is funded by the Asia Pacific Network for Global Change Research (APN) through the project No CBA2009-FP15-Okayama entitled 'Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in the Asia and Pacific'.

## b. Overall objectives and methodology

### b.1 Overall Objectives

- To conduct training needs assessment surveys using the questionnaires developed for all project countries
- To conduct desk review of existing training programs in the field of climate change adaptation in agriculture and related development activities in Bangladesh
- To identify training gaps
- To draft training modules by attending the module design workshop
- To provide broad policy suggestions for improving policy environment for capacity building in Bangladesh

## b.2 Methodology

### Activities

Training Needs Assessment in Bangladesh was conducted by a three-step process listed below:

- **Conducting questionnaire survey with the help of a pre-designed questionnaire:** A set of questionnaires developed by the Institute for Global Environmental Strategies was used for conducting field surveys. Data was collected from key informants such as Deputy Directors (DD), District Training Officers (DTO), Crop Production Specialists (CPS), Plant Protection Specialists (PPS), Horticulture Specialists (HS), Irrigation Specialists (IS), Upazila Agriculture Officers (UAO) and Sub-Assistant Agriculture Officers (SAAO) of the Department of Agricultural Extension (DAE).
- **Reviewing of existing materials:** Reviewed training modules, schedules, programs, materials and documents, reports, etc. related to different training and extension providing organizations in Bangladesh to identify existing approaches and find gaps for improvement.
- **Organizing workshop:** After completing survey and review of related existing literature and training modules in Bangladesh, a workshop was organized at Bangladesh Agricultural Research Council Training hall to finalize the draft training module on CCA. This workshop has considered the survey findings and existing training programs in the country and has identified gaps that could be addressed by the interventions taken up as a part of this project. The findings from the workshop has helped in identifying ideal skill and knowledge requirements of various government functionaries and trainers in agriculture sector and to draft a generic training module which was later tailored to suit to different specific target groups within the agriculture department.

### Selection of survey Area

Keeping in view various natural disasters occurring in Bangladesh, 25 districts were selected through selective random sampling from salinity, flood and water logging (locally known as hoar) and drought (locally known as Borendra) prone areas. Fifty (50) Sub-districts (locally known as Upazilla) were then selected from these selected 25 districts for the study by taking two upazillas from each district. One hundred (100) Blocks were then further randomly selected from these selected 50 upazillas by taking two Blocks from each upazilla. For better understanding, maps of Bangladesh showing various natural disaster prone areas are shown in Fig.1 to Fig.3.

### Sample

One Deputy Director, one District Training Officer (DTO) and one Crop Production Specialist (CPS), one Plant Protection Specialists (PPS), one Horticulture Specialists (HS), one Irrigation Specialists (IS) in each district were interviewed in the study. Seventy five (75) district level Officers were interviewed that include 25 DDs, 25 DTOs and 25 CPS/PPS/HS/ISs from 25 districts. There is one Upazilla Agriculture Officer (UAO) in each Upazilla (Sub-district). Thus, 50 Upazilla level Officers were interviewed from 50 selected Upazillas. There are 15-60 block level Sub-Assistant Agriculture Officers (SAAO) in each Upazilla. Two SAAOs were randomly selected from each Upazilla. Thus, a total of 100 SAAOs were interviewed for the study (two from each Upazilla) (Table 1).

Table 1: Sample strength (number of respondents) at various administrative levels for questionnaire surveys in the study.

S.N	Level	Designation of the respondent	Population size (In Number)	Sample size (In Number)
	District	Deputy Director	25	25
1.		District Training Officers	25	25
2.		CPS/PPS/HS/IS	100	25

S.N	Level	Designation of the respondent	Population size (In Number)	Sample size (In Number)
3.	Upazilla	Upazilla Agriculture Officer	50	50
4.	Block	Sub-Assistant Agriculture Officers	1310	100
Total			1510	225

National level Officers were not included in the questionnaire survey. However, consultations were made with them. Review materials were also collected from them. Workshop participants were selected from upazilla to national level officials. Selected district and upazillas for questionnaire survey are listed in Table 2.

Table 2: Selected district and upazillas for questionnaire survey

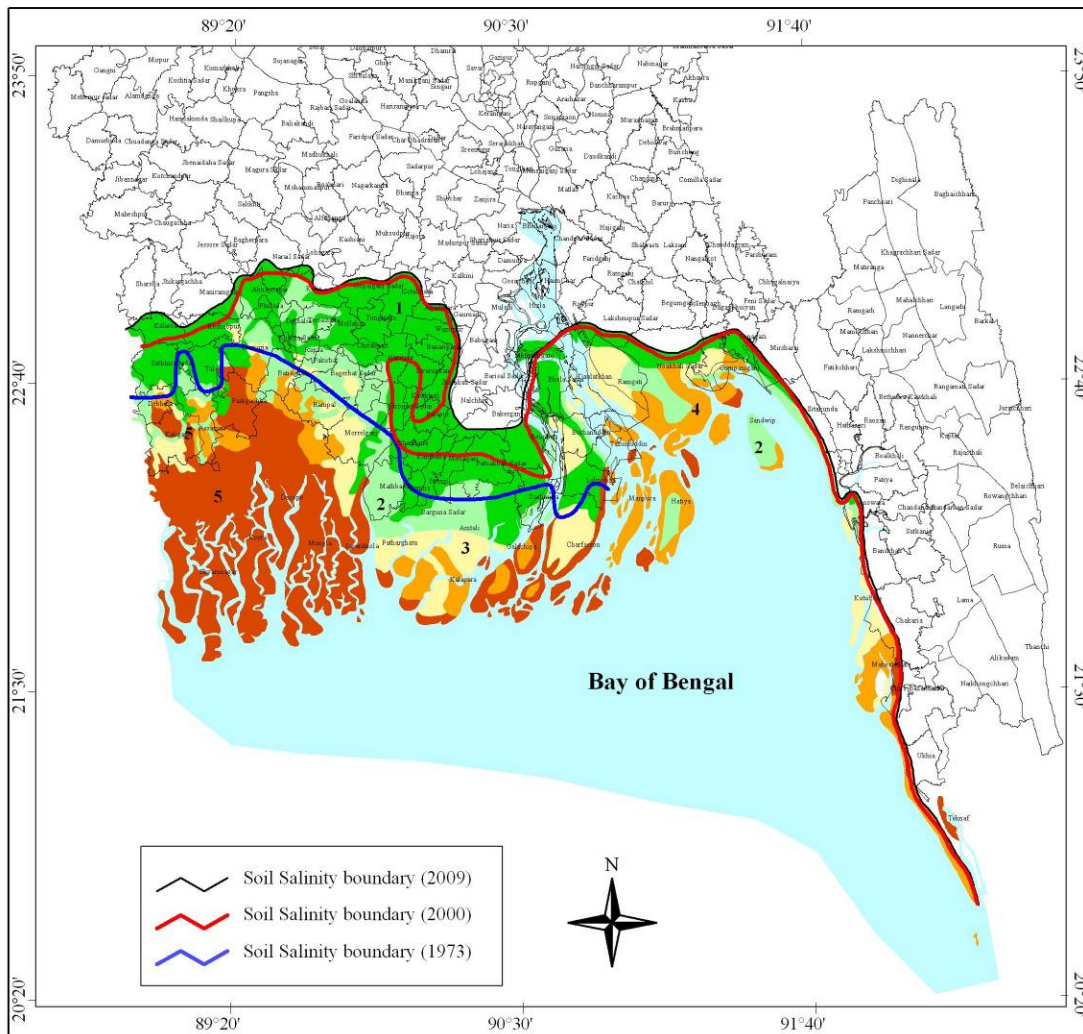
S.N.	Districts	Upazillas
1.	Khulna	Dakope, Terokhda
2.	Satkhira	Shyamnagar, Ashashuni
3.	Bagerhat	Morolganj, Saraonkhola
4.	Borguna	Sadar, Amtoli
5.	Patuakhali	Dashmina, Mirzaganj
6.	Bhola	Daulatkhan, Charfashan
7.	Bandarban	Roma, Thanchi
8.	Rangamati	Barkol, Bilaichhari
9.	Khagrachhari	Manikchhari, Matiranga
10.	Sunamgnj	Bishwambarpur, Taherpur
11.	Hobigabj	Lakhai, Baniachang
12.	Kishoreganj	Mithamain, Tarail
13.	Rajshahi	Tanor, Godagari
14.	Chapainababganj	Nachal, Gomastapur
15.	Nawgaon	Patnitola, Sapahar
16.	Joypurhat	Khetlal, Akkelpur
17.	Bogra	Kahaloo, Shibganj
18.	Gaibanda	Fulchhari, Saghata
19.	Kurigram	Chilmari, Nagershawri
20.	Jamalpur	Islampur, Dewanganj
21.	Faridpur	Madhukhali, Charbhadrasan
22.	Madaripur	Kalkeni, Shibchar
23.	Dhaka	Dhamrai, Savar
24.	Gazipur	Kapasias, Shreepur
25.	Mymanshingh	Haluaghat, Muktagchha



# Soil Salinity Bangladesh

2009

30 0 30 60 Kilometers



### Legend

- 1 Non saline with some very slightly saline
- 2 Very slightly saline with some slightly saline
- 3 Slightly saline with some moderately saline
- 4 Moderately saline with some strongly saline
- 5 Strongly saline with some very strongly saline


  
 Prepared by  
 DPS Section, SRDI  
 9 February, 2010

Fig. 2: Map of Bangladesh showing salinity prone areas (SRDI, 2010)

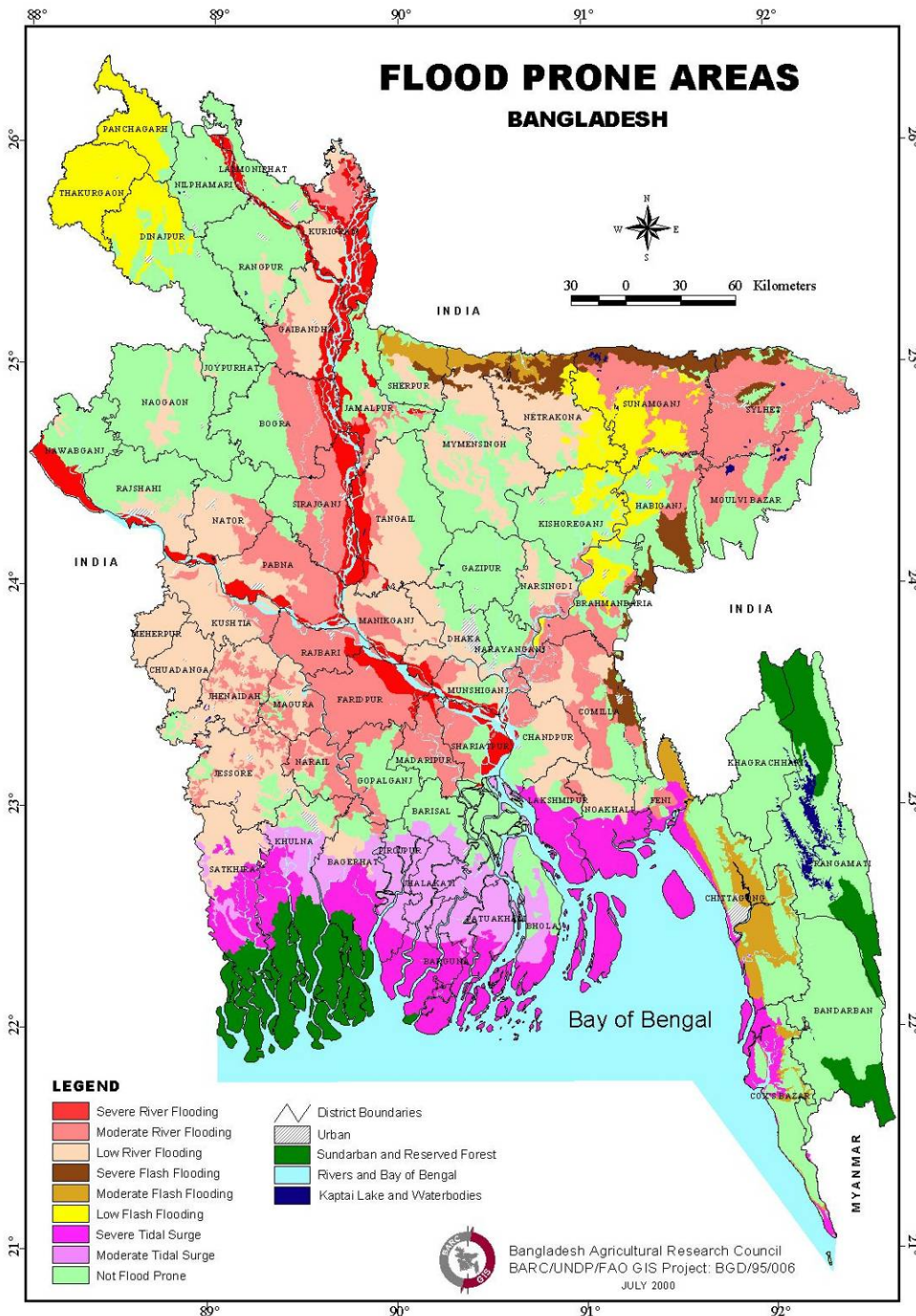


Fig. 3: Map of Bangladesh showing flood prone areas (BARC, 2000)



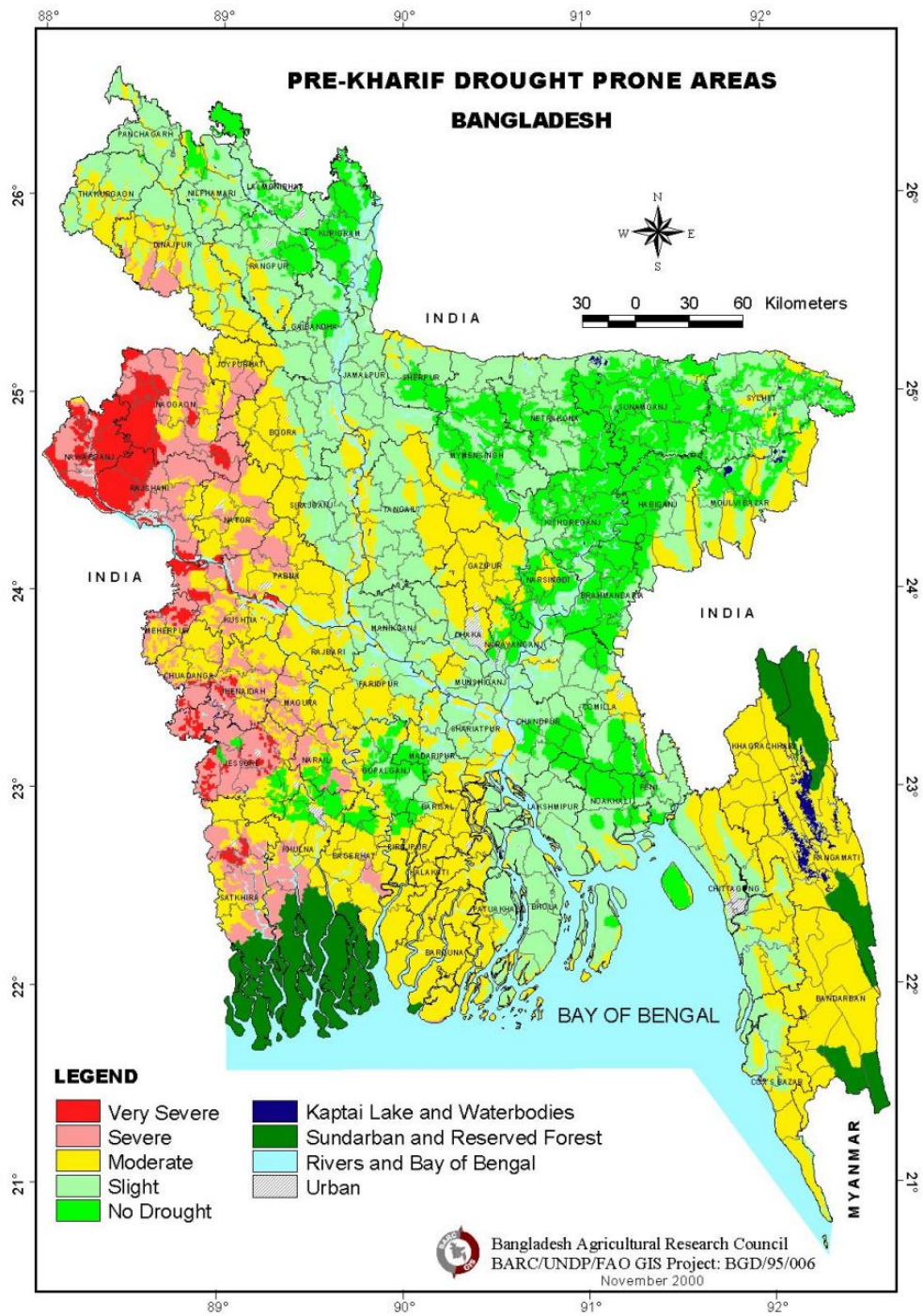


Fig. 4: Map of Bangladesh showing drought prone areas (BARC, 2000)

### **b.3 Data Collection**

Questionnaire survey was done with above mentioned respondents with the help of a pre-designed questionnaire developed by the Institute for Global Environmental Strategies (IGES). Data were collected from the sample respondents by the Research Assistant through face to face interview method. Existing training modules, materials and documents were also collected from different training and extension organizations for desk review. Collected data were coded, categorized and analyzed in accordance with the objectives of the study.

## **C. Institutional arrangements and policy setup for training and capacity building**

### **C.1 National level**

There are different national training institutes in Bangladesh which provide training courses to the officials of different organizations. Some of the important national training organizations are listed below:

Department of Agricultural Extension (DAE)

i) Central Extension Resources Development Institute (CERDI) located at Gazipur district. Trainings are providing from this institute to the personnel of DAE of different level as well as farmers on various aspects of agriculture.

ii) Mushroom Development and Training Center at Savar, Dhaka

- Directorate of Livestock Services, Dhaka
- Directorate of Fisheries
- Bangladesh Agricultural Research Council
- Ten Agricultural Research Organizations under National Agricultural Research System (NARS)
- Graduate Training Institute, at Bangladesh Agricultural University, Mymensingh
- Sher-e-Bangla Agricultural University, Dhaka
- Bangladesh Academy for Rural Development, Comilla
- Rural Development Academy, Bogra
- Bangladesh Rural Development Board, Dhaka
- Department of Youth Development, Dhaka

Besides the above Government Organizations, some NGOs and private organizations provide various types of training for various types of target trainees on different issues in agriculture sector. The list of training programs offered in agriculture sector in Bangladesh is listed in Annexure I.

### **C.2 Sub-national level**

In Bangladesh, district, Upazilla (sub-district) and block levels are treated as sub-national level. Most of the national level organizations have sub-national level training centers. Sub-national level officers and staffs take training from national level and they provide training as to their sub-ordinates as well as rural peoples on different subjects. Sub-national Level Training Centers of important Departments in Bangladesh are listed below:

- Department of Agricultural Extension (DAE): 15 Agricultural Training Institutes (ATI), 14 Horticulture Training Centers and 64 district training halls
- Directorate of Livestock Services (DLS): 3 Veterinary Training Institutes (VTI), 3 Livestock Training Institutes (LTI), 64 district training halls
- Directorate of Fisheries (DOF): 5 Fisheries Training Institutes (FTI), 64 district training halls

At upazilla (sub-district) level, there is a common training center for all government departments in each of 490 upazillas. DAE has separate training center in 200 upazillas. Besides these government organizations, some NGOs and private organizations have training centers at upazilla level for providing various types of training to their target audience.

## d. Training needs assessment for agriculture sector

### d.1. Evaluation of training programs (curriculum)

Three induction and six in-service training programs were evaluated for this study. General lessons and CCA content of these training programs are presented below in Table 3. Detailed list of training programs is provided in Annexure I.

Table 3: List of induction and in-service trainings being conducted in Bangladesh

#### Induction training

S.N.	Name of the training	Organizing Institute	Training content	Climate change adaptation content
	Foundation training for university teachers	Graduate Training Institute, Bangladesh Agricultural University, Mymensingh	Teaching methods and techniques, Project cycle & research management, Scientific report writing, Administration & Office management, Health & development, Computer literacy & ICT, Statistical methods & data analysis, Physical conditioning & car driving, Study tour & Co-curricular activities	Disaster preparedness issues, disaster risk reduction strategies, disaster policy framework in Bangladesh, Academic activities related to disaster management in different universities of Bangladesh.
	Foundation training course for NARS Scientists Provided by BARC	Bangladesh Academy for Rural Development (BARD)	Introducing Bangladesh, Public policies, Government system, leadership behavior, changing public sector, Human resources & Office management, Important laws, financial management, economic theory, Social research methods, poverty reduction &	Disasters, definition, types, impact & management.

S.N.	Name of the training	Organizing Institute	Training content	Climate change adaptation content
			development planning, English language skill, globalization, Environment management and sustainable development, gender issues, Quantitative analysis, information & communication technology, car driving, field report writing, book reviewing, computer literacy	
	Induction Training course for the newly recruited Scientific Officers of BARI	Bangladesh Agricultural Research Institute (BARI)	Research program development, BARI service rules, development of human resources & technology transfer, budget preparation, procurement rules & regulations, project planning, labour management, Experimental design, field plot technique, data collecting procedure and data processing, scientific paper writing and presentation	No content related to climate change adaptation

### In-service training

S.N.	Name of the training	Organizing Institute	Training content	Climate change adaptation content
1.	Training course on climate change & challenges in agriculture sector	Central Extension Resources Development Institute	Introduction to CERDI training norms	Disaster & disaster management-an over view, Flood & flood management, Drought, drought management & its classification, Hazards & Forecasting, Cropping pattern in flood & drought prone areas of Bangladesh, Pre-disaster management at grass root level, Flood forecasting & its application in agriculture, Modern cultivation techniques of different crops in flood & draught prone area, Year-round homestead vegetables production in flood & drought prone area, Vegetables production techniques in flood prone areas (Heap process), Field crops & vegetable production techniques in drought prone areas, Vegetables production

S.N.	Name of the training	Organizing Institute	Training content	Climate change adaptation content
				techniques in drought prone areas, Advance rice production technology, Community seed bed preparation in drought prone area, Floating seed bed preparation in flood prone area
2.	Training courses on disaster management	Central Extension Resources Development Institute		<p>Concepts of disaster risk management in agricultural sector and Disaster risk situation in Bangladesh and global scenarios, Regulatory framework of Bangladesh disaster management system and Institutional framework of Bangladesh disaster management system, Disaster mitigation strategies, hazard identification and vulnerability analysis, Physical and Socio-economic impacts of disaster, animals in disaster, emotional impacts of disasters, trauma and counseling, Media and disaster management, the role of media in disaster management, types of media, impact of the media, advantages and challenges, Meteorology and public awareness for disaster management, Implication of agro-meteorology for agricultural disaster management, Meteorology and early warning for disaster management in Bangladesh, Duties and responsibilities of national and local disaster Managers, community based action plan, advantages and disadvantages of the community based approach, Plan of action of DAE in disaster and climate risk management in Bangladesh, Standing orders on disasters and roles of DMC(s) Comprehensive Disaster Management Programme (CDMP) approach, The role of technology in disaster management, emergency management system, EMS and the disaster management cycle, Water resource development in Bangladesh, National water policy, water</p>

S.N.	Name of the training	Organizing Institute	Training content	Climate change adaptation content
				<p>development plan, flood management strategy, infrastructure development and impact in agriculture, Vulnerabilities to disaster, development programs to decrease vulnerability, disaster and development policy, Disaster mitigation and infrastructure disaster management cycle, disaster mitigation, Wetland management, Livelihood adaptation to climate change in agriculture, Disaster and hazardous materials, ways of storing and safty handling hazardous materials, coping with exposure to hazardous materials, Geographic Information System (GIS) and disaster management, GIS application, GIS and emergency shelters, GIS and distribution of relief, GIS and data gathering, advantages and challenges of using GIS in disaster management, Global Positioning System (GPS) and disaster management, application of GPS to disaster management, remote sensing and disaster management, Disaster preparedness, disaster risk reduction techniques and bottom-up planning, Emergency healthy services in disasters, infrastructure and procedure in assessing emergency situations, risk factors contributing to the spread of communicable diseases and outbreaks, prevention and control of communicable diseases, Vulnerable group in disasters, people with disabilities, elderly people, internally displaced people and refugees, women and children, Drought management and agricultural rehabilitation for disaster management</p>
3.	Training module on draught and flood pre-	Practical Action – Bangladesh Department of Agriculture		<p>Concepts of disaster (flood and drought) management, Forecasting procedure and weather forecast, Gender and disaster, Institutional management – Role of different</p>



S.N.	Name of the training	Organizing Institute	Training content	Climate change adaptation content
	management & risk reduction in agriculture sector	Extension		stakeholder and disaster management committees and its principles, Technology dissemination strategies, community based disaster preparedness, Field visit to flood and drought affected families, Agriculture technologies for flood and drought prone areas, Fisheries technologies for flood and drought prone areas, Livestock technologies for flood and drought prone areas
4.	Training module-2 (Drought): Disaster pre-management & risk reduction in agricultural sector	Support to strengthening of the disaster preparedness in agricultural sector (SSDP)		Disaster, drought and drought management, Risk, vulnerabilities and forecasting of disaster, Gender and drought, Root level preparedness in drought prone areas, Irrigation management and drought resistance cropping pattern, Fisheries technologies in drought prone areas, Livestock management in drought prone areas, Alternative ways for the livelihood in the drought prone areas, Village level preparation for drought prone areas and field visit, Preparation of Plan
5	Drought risk management and preparedness in Agricultural Sector	DAE and FAO		Understanding disaster and drought vulnerability, hazard, warning system, gender issues in drought, Community participation and planning in drought, preparedness, Seed and seedling raising, irrigation management, homestead gardening, livestock, poultry, fisheries management in drought affected areas, pond fish culture and drought, preparedness action planning, monitoring and follow up
6	Flood risk management and preparedness in Agricultural Sector	DAE and FAO		Understanding disaster and flood, vulnerability, hazard, warning system, gender issues in flood, Community participation and planning in flood, preparedness, Seed and seedling raising, irrigation management, homestead gardening, livestock, poultry, fisheries management in flood affected areas, pond fish culture and flood, preparedness action planning, monitoring and follow up

From the above tables, it can be concluded that the content on CCA in induction training is

limited to disaster risk reduction and no content directly touching on the principles and practices of CCA could be found. In case of in-service training, the content of climate change and adaptation can be rated as 'moderate' and can still be improved. In order to do so, the duration of these induction and in-service training programs should be either increased or some of the existing content should be reduced to accommodate the additional content on CCA.

## d.2. Evaluation of training facilities

Attempt was made to collect information from 225 officers of the Department of Agricultural Extension (DAE) using the questionnaires developed by IGES. Collected data were coded, categorized, analyzed and presented in this section.

### Availability of human resource development plan or policy in DAE

Respondents were asked if there was any human resource development plan or policy in their organization that stipulates certain training activities to be carried out at regular intervals. From the findings, it was revealed that more than half (53.8%) of the respondents responded as 'yes', compared to 35.1% 'no' and rest 11.1% 'no opinion' (Fig.4.). Actually DAE has human resource development plan that stipulates certain training activities.

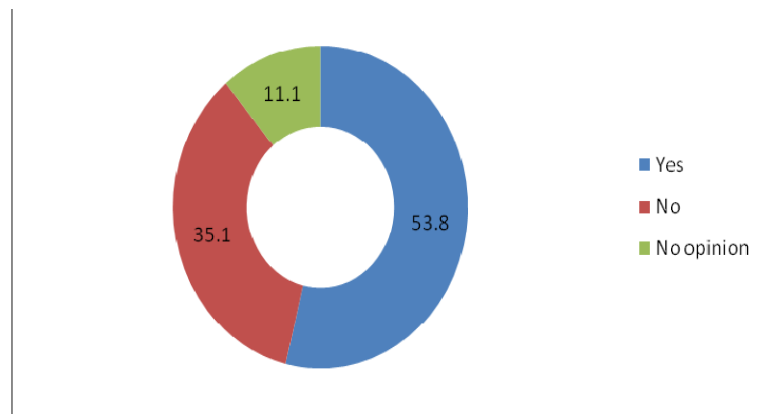


Fig. 4: Opinion of respondents (%) on presence of Human Resource Development plan of DAE

### Funds for Training in DAE

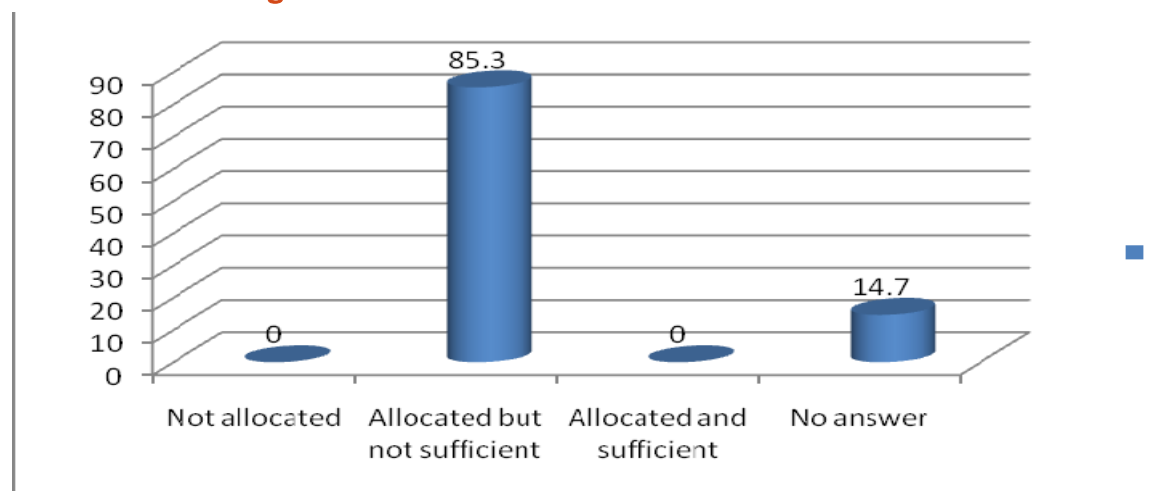


Fig. 5: Opinion of respondents (%) on fund availability for training

Overwhelming majority (85.3%) of respondents opined that funds are allocated for training in DAE but it was not sufficient. Rest of 14.7% respondents did not respond to this question

(Fig. 5.). Information from the head Office of DAE indicates that there is a Training Wing in DAE and funds are limited for implementing training programs.

### **Kinds of training being implemented**

Based on respondents' responses and documents of DAE, it was revealed that DAE organized one day orientation training at the joining day of Sub Assistant Agriculture Officers (SAAO) and Agriculture Extension Officers (AEO). Within two months of their joining, they got 5 day duration induction training. Within joining year AEOs got 4 months foundation training. In the induction training, only knowledge areas are included without any skill areas. DAE organized in-service training for their Officers of Different levels. About two-third (64.6%) of the respondent opined that this in-service trainings are regularly occurred but the rest one-third (35.4%) opined it as sporadic. Both knowledge and skill areas are covered in in-service trainings. Durations of in-service trainings are varied based on types, content and nature of training.

### **Training implementing institutes for DAE personnel**

Training wing is responsible for organizing training for the DAE personnel. It has in house training facilities for organizing orientation and induction training. Foundation trainings are arranged in Public Administration Training Institute (PATC). Other in-service trainings are organized in different nation research institutes and DAE. Findings revealed that 54.6% trainings for the Officials of DAE are offered by its own facilities, 41% trainings are arranged from dedicated training organizations and only 4.4% are from Graduate Training Institute of Bangladesh Agricultural Univesity, Mymensingh (Fig. 6.).

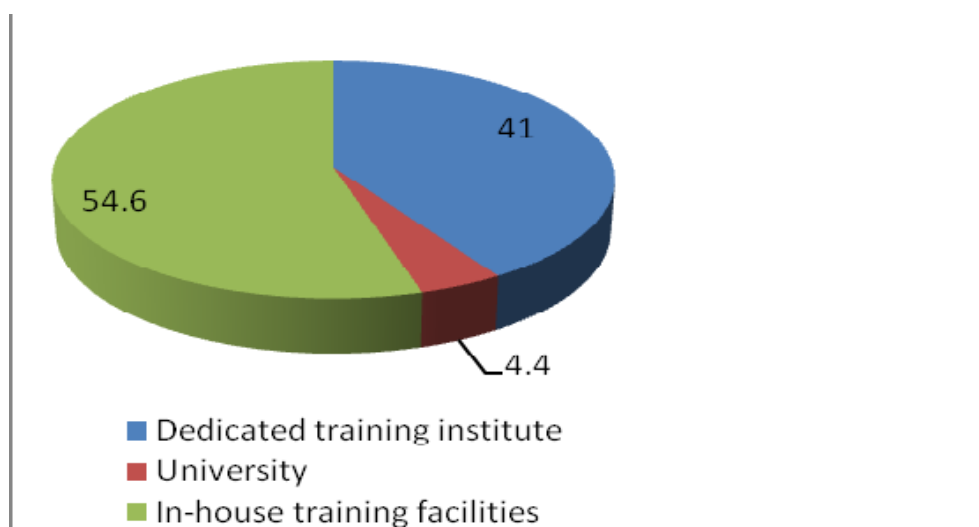


Fig. 6: Implementing institutes for training DAE personnel

### **Overall assessment of training facilities**

Figure 7 revealed that most (70.2%) of the respondents opined that overall training facilities of DAE were average compared to 9.8%, 18.7% and 1.3% opined as poor, good and very good respectively. Nobody opined as bad.

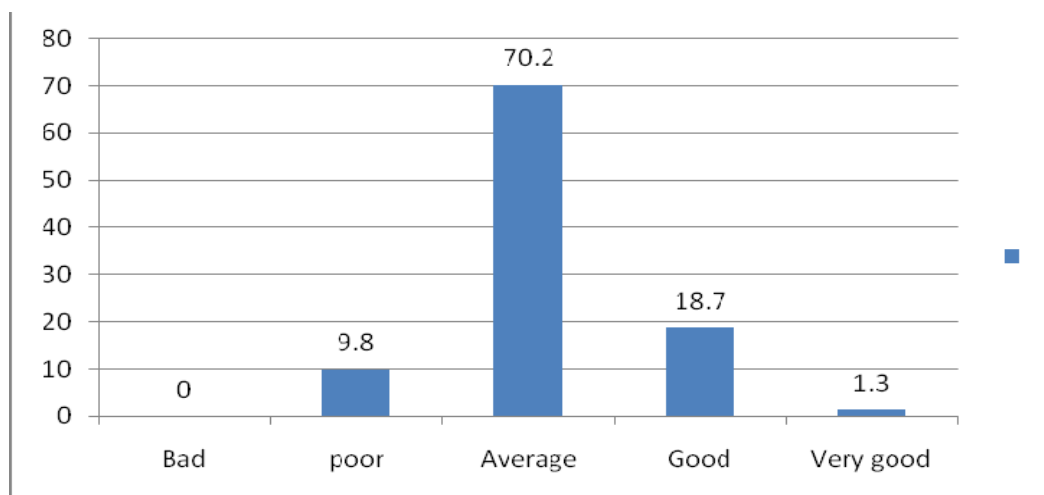


Fig.7: Overall assessment of training facilities (% responses)

### Specific training facilities need to be improved for CCA related training

Based on the citation rank of the respondents, specific training facilities need to be improved for effective implementation of climate change adaptation (CCA) related trainings are listed below:

- Inclusion of CCA courses specially for agricultural sector
- Increase of training materials like multimedia projectors with screen, laptop computers, digital camera, CCA related poster, leaflet, booklet, etc.
- Increase fund for CCA training
- Improvement of CCA related trainers
- Arranging meteorological instrument for training
- Improvement of residential facilities in training centers

### Overall assessment of trainers

More than half (56%) of the trainers were average compared to 8.4%, 33.8% and 1.8% poor, good and very good respectively as perceived by the respondent DAE personnel. Nobody was bad as perceived by them (Fig. 8.).

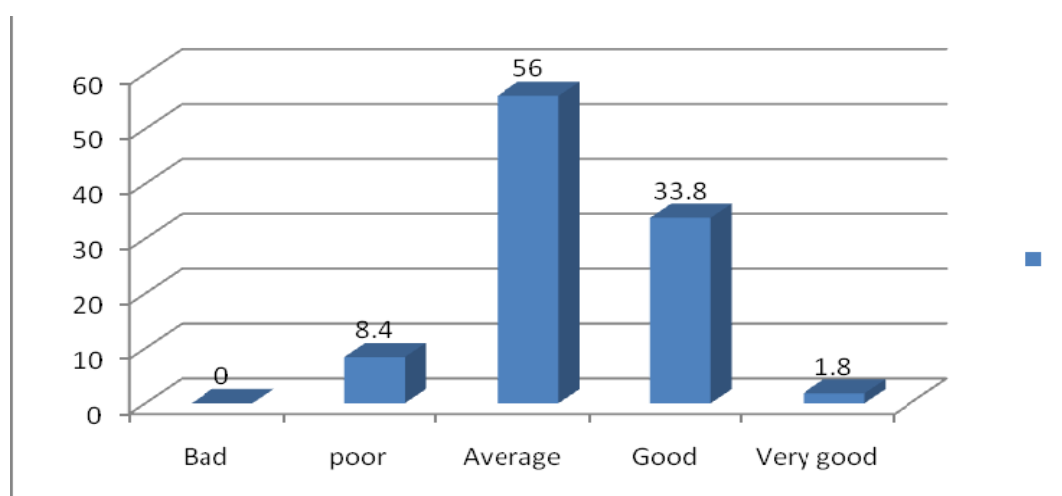


Fig.8: Overall assessment of trainers (% responses)

### Number of Trainers

About half (49.4%) of the respondents reported that the number of trainers was average, compared to 21.3% and 29.3% poor and good respectively (Fig.9.). Nobody of the respondent DAE personnel perceived that the number of trainers was bad or very good. Actually, every DAE personnel receive training from their higher authorities and everybody has to act as trainer for providing training to their sub-ordinate or farmers. As a result, it can be said that DAE has a good number of trainers.

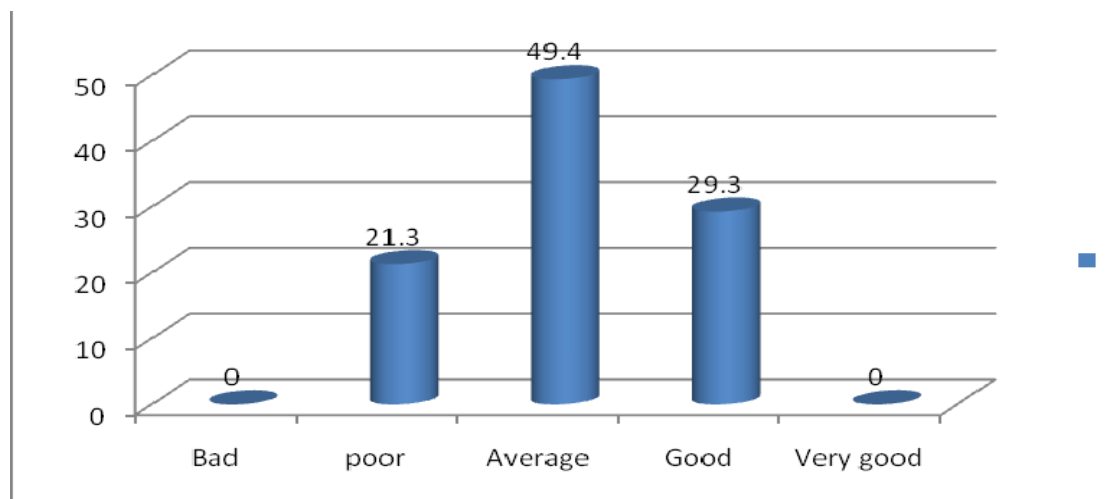


Fig.9: Sufficiency of number of trainers (% responses)

### Trainers Training Skill

Majority (61.8%) of the respondents DAE personnel perceived that the trainers had average training skill, compared to 4.9%, 32% and 1.3% respondents perceived that the trainers had poor, good and very good training skill respectively. Nobody perceived that the trainers had bad training skill (Fig.10.).

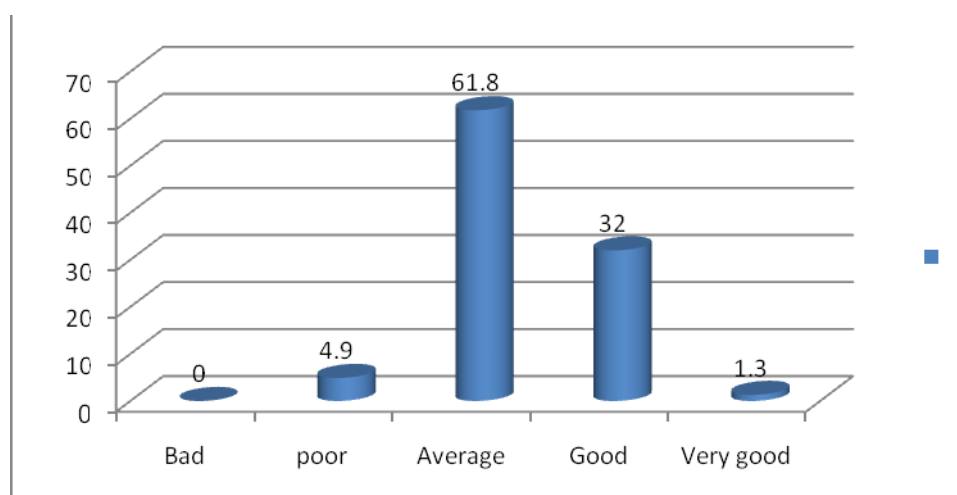


Fig.10. Trainers training skills (% responses)

### Trainers' knowledge to impart training

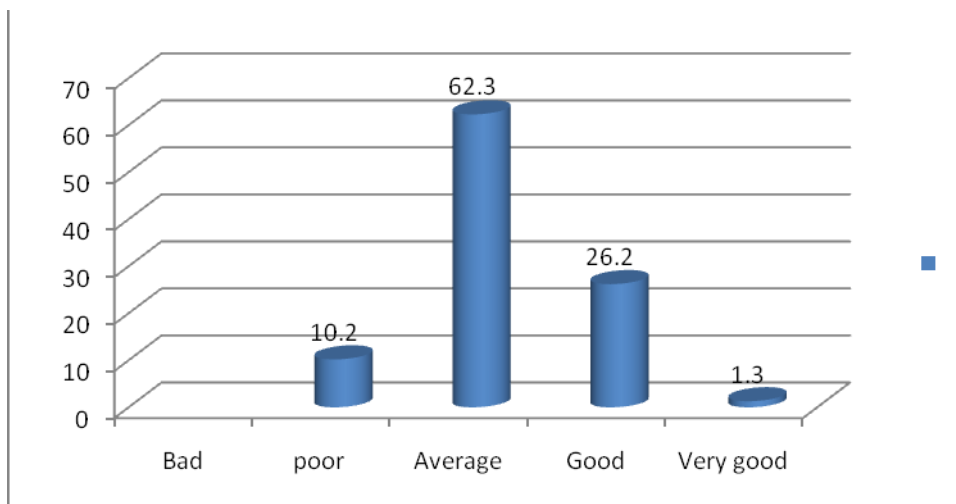


Fig.11: Trainers' knowledge to impart training (% responses)

Majority (62.3%) of the respondents DAE personnel perceived that the trainers had average knowledge to train, compared to 10.2%, 26.2% and 1.3% respondents perceived that the trainers had poor, good and very good knowledge to train respectively. Nobody perceived that the trainers had bad knowledge to train (Fig.11.).

### Evaluation of post training performance of trained staff

About three-fourth (74.2%) of the respondents reported that post training evaluation is done in DAE (Fig.12.). Improvement of job performance after training was observed by overwhelming majority (91.6%) of the respondents (Fig.13.). In general, most training programs have enabled the trained to perform well in his/her job. However, some training programs may have failed to achieve this objective due to various reasons such as movement of staff, improper selection of trainees for a particular training and limited resources for conducting training in a way that is required for most trainees. The training for DAE staff has always been good due to the nature of institutions involved in their training.

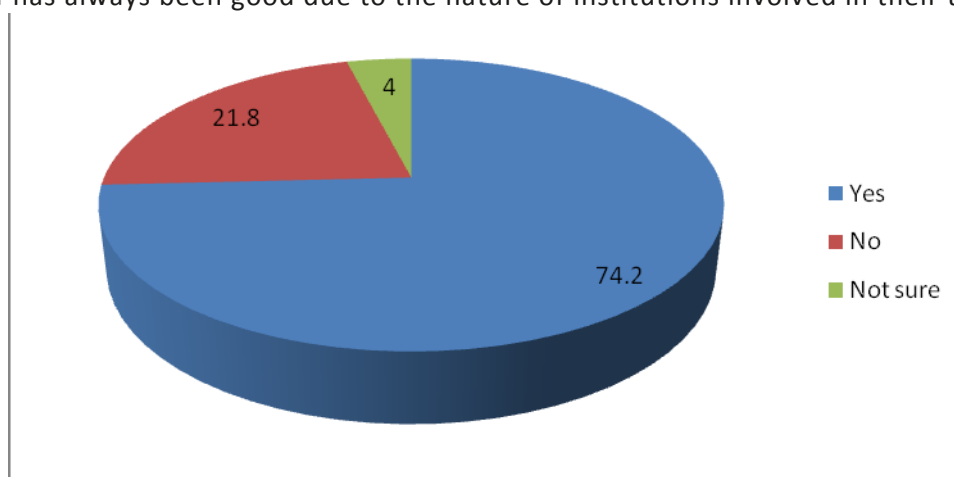


Fig.12: Conduction of post training evaluation (% responses)

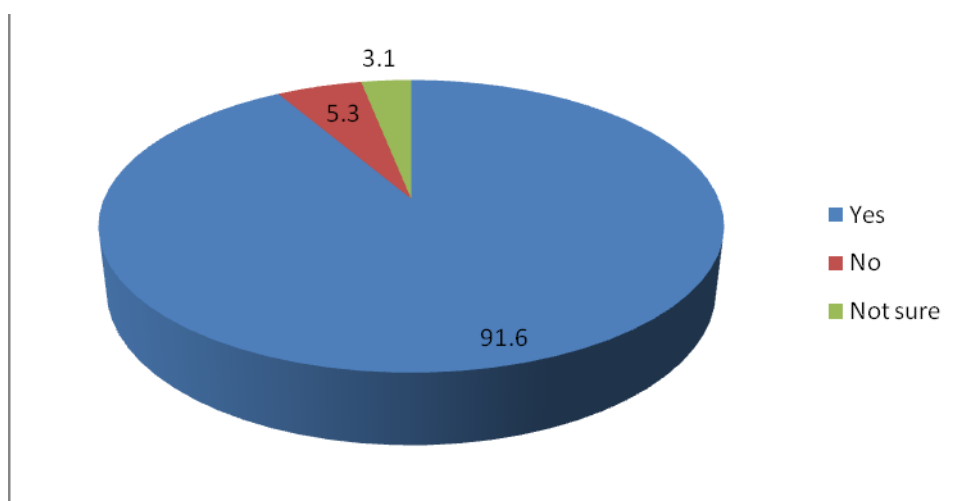


Fig.13: Observation on improvement after in-service training (% responses)

### d.3. Evaluation of trainers and trainees

#### Educational Qualification

Basic qualification for entry into the Job as Sub-Assistant Agriculture Officer (SAAO) is four-years Agricultural Diploma from Agricultural Training Institute (ATI) after passing 10 years schooling certificate. This officer works at the block level. Agricultural Extension Officer (AEO) AEOs are posted at Upazilla level and they need four (4) years university degree in agriculture [B.Sc.Ag.(Hons,)] after passing 12 years schooling certificate. Educational qualifications of respondents in the study are shown in Table 4. Based on experience and further qualification the AEOs are promoted as show in Figure 14.

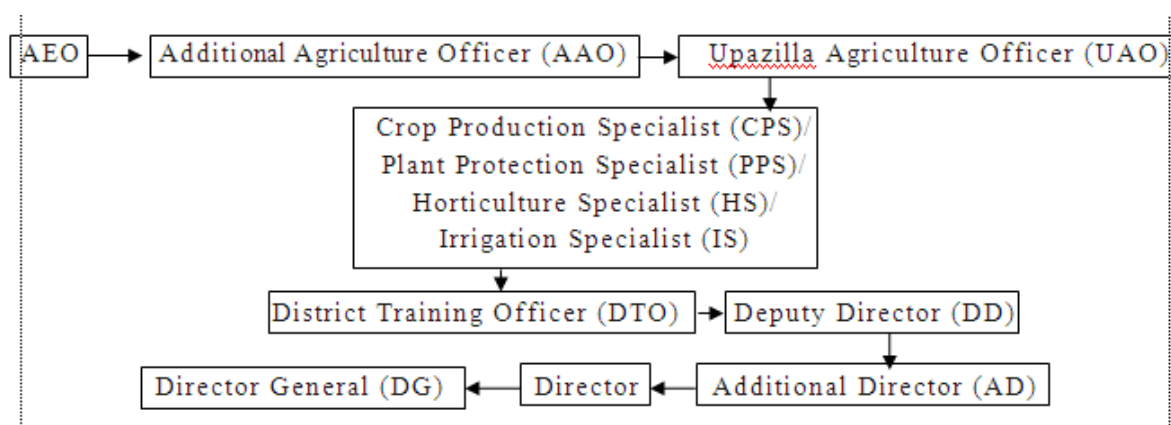


Figure 14: Hierarchy of promotions within DAE

Table 4: Educational qualifications of respondents in the study

Respondents' post	Number	Educational qualification (% of respondents)
SAAO	100	Agricultural Diploma -100%
UAO	50	B.Sc.Ag. (Hons.) – 100%
CPS/PPS/HS/IS	25	B.Sc.Ag. (Hons.) – 92%, MS – 8%
DTO	25	B.Sc.Ag. (Hons.) – 92%, MS - 4%, PhD - 4%
DD	25	B.Sc.Ag. (Hons.) – 92%, MS - 4%, PhD - 4%

Respondents' post	Number	Educational qualification (% of respondents)
<b>Total</b>	<b>225</b>	Agricultural Diploma - 44.4% B.Sc.Ag. (Hons.) – 52.9% MS – 1.8% PhD – 0.9%

### Experience

The observed range of service experiences of the SAAOs was 1 to 32 years. Only 20% of the SAAOs could be promoted as AEO. This might be the reason for having 32 years of experience as SAAO. After entering as AEO, one cannot be promoted as UAO without putting an experience of 8 years and promotion is usually delayed in DAE of Bangladesh. As a result, the observed range of service experience of UAOs was 8 to 30 years. An entry level officer cannot be posted as CPS/PPS/HS/IS without putting an experience of 20 years. As a result, the observed range of experience of the CPS/PPS/HS/IS was found to be 20 to 31 years. Only very few CPS/PPS/HS/IS could be promoted as DTO or DD. For this reason, the range of service experience for DTO and DD was observed from 24 to 37 years (Table 5).

Table 5: Reported range of experiences of officers among respondents

Respondents' post	Service Experience (in years) from starting job
SAAO	1- 32
UAO	8 – 30
CPS/PPS/HS/IS	20 – 31
DTO	24 -32
DD	28 -37

### Curriculum on climate, climate change and addressing climate change in education

Most (60.4%) of the respondents responded that there was curriculum on climate, climate change and addressing climate change in their B.Sc. Ag. (Hons.) and Agricultural Diploma course (Figure 15.). Actually, there is very little content on CCA in Agricultural University and ATI courses of Bangladesh.

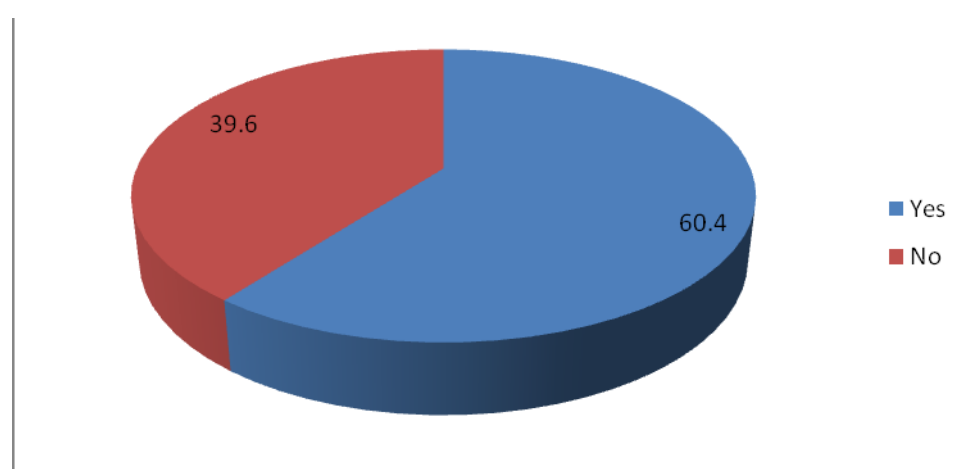


Fig. 15: Responses (%) on presence of climate, climate change and related curriculum in their education



### Handled Project/program/activities

Survey findings have revealed that overwhelming majority of the respondents have not handled project/program/activities in CCA relevant areas in agriculture (82.2%) and water (95.1%) sector. Only 17.8% respondents handled CCA relevant activities in agriculture sector and 4.9% in water sector (Table 6.). Actually, DAE had very few project activities relevant to climate change adaption collaboration with other organizations. The SAAOs, AEOs, AAOs and UAOs under the jurisdiction of the project area were involved with such types of activities. This might be the reasons for the above findings.

Table 6: Handled Project/program/activities by the respondents

Area	Yes/No	Number of respondents	% of respondents
Agriculture Sector	Yes	40	17.8
	No	185	82.2
	<b>Total</b>	<b>225</b>	<b>100</b>
Water Sector	Yes	11	4.9
	No	225	95.1
	<b>Total</b>	<b>225</b>	<b>100</b>

### Received formal training on CCA

Findings revealed that none of the respondents received any induction training on CCA. Only 22.7% of the respondents received in-service training on CCA, but rest 77.3% of the respondents did not received any in-service training on CCA (Table 7.)

Table 7: Number and Percentage of Respondents received formal training on CCA

Types of training	Number of Respondents		% of respondents	
	Received training	Not received training on CCA	Received training	Not received training on CCA
Induction	0	225	0	100
In-service	51	174	22.7	77.3

### Brief list of subjects and duration

Out of 225 respondents, only 51 (22.7%) received CCA relevant training of 3 to 5 days. Main subjects of these training are listed in Table 8. It can be noted that the content (both skill and knowledge areas) are mostly disaster risk reduction (DRR) related and are not directly related to the CCA. It indicates that the opinion of the respondents on DRR as equivalent to CCA.

Table 8: List of CCA-related content (knowledge and skill areas) included in training received by the respondents

Knowledge areas	Skill areas
<ul style="list-style-type: none"> <li>• Concept of disaster, its management and regulatory framework</li> <li>• Flood, drought and salinity management and agricultural rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>• Modern cultivation techniques of different crops in flood, drought and salinity prone area</li> <li>• Field crop and Vegetables (especially year round homestead vegetables) production in</li> </ul>

Knowledge areas	Skill areas
<ul style="list-style-type: none"> <li>• Cropping pattern in flood, salinity &amp; drought prone areas of Bangladesh</li> <li>• Pre-disaster management at grass root level</li> <li>• Media and disaster management</li> <li>• Meteorology and public awareness for disaster management</li> <li>• Hazards &amp; Forecasting</li> <li>• Duties and responsibilities of national and local disaster Managers</li> <li>• Geographic Information System (GIS) and disaster management</li> <li>• Gender and disaster</li> <li>• Role of different stakeholder and disaster management committees</li> <li>• Procedure in assessing emergency situations</li> <li>• Disaster risk reduction techniques and bottom-up planning</li> </ul>	flood, drought and salinity prone area <ul style="list-style-type: none"> <li>• Advance rice production technology</li> <li>• Community seed bed preparation in drought prone area</li> <li>• Floating seed bed preparation in flood prone area</li> <li>• Livelihood adaptation to climate change in agriculture</li> <li>• Ways of storing and safety handling of hazardous materials</li> <li>• Coping with exposure to hazardous materials</li> <li>• Emergency health services in disaster</li> <li>• Risk factors contributing to the spread of communicable diseases and outbreaks, prevention and control of communicable diseases</li> <li>• Visit to flood, drought and salinity affected areas</li> <li>• Fisheries and livestock technologies for flood, drought and salinity prone areas</li> </ul>

### Usefulness of training

Most (62.7%) of the respondents who received the training opined that the trainings were useful in helping the DAE personnel and farmers in addressing the climate change related issues. But 37.3% of them perceived that the trainings were not useful (Table 9).

Table 9: Opinion of the Respondents on Usefulness of Training

Opinion of respondents	Number of Respondents	% of respondents
Useful	32	62.7
Not useful	19	37.3
<b>Total</b>	<b>51</b>	<b>100</b>

### Evaluation after receiving training

Most (70.6%) the respondents who received the training have reported that the performance of trainees was evaluated after receiving training compared (Table 10.).

Table 10: Opinion of the Respondents on Evaluation after Receiving Training

Opinion of respondents on evaluation	Number of Respondents	% of respondents
Evaluated	15	29.4
Not evaluated	36	70.6

<b>Total</b>	<b>51</b>	<b>100</b>
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**b. On the job functions (Current duties and expected changes in roles for CCA)**

**Supervisory role:** All the respondents in the study opined that all of them have supervisory role of one or other kind.

**Staff supervised:** Staffs supervised by the respondents are listed below with their position:

Post of respondents	Staff supervised
SAAO	All the farmers of the Block: 1200-2000 Farm Families
UAO	All the SAAOs of the Upazilla including AAO and AEO (15- 50 Officers)
CPS/PPS/HS/IS	All the SAAOs of the district including AEOs (125 – 325 Officers)
DTO	All the SAAOs of the district including AEOs (125 – 325 Officers)
DD	All the SAAOs, AEOs, AAOs, UAOs of the district including CPS/PPS/HS/IS and DTO (125 – 325 Officers)

The job descriptions of respondents from DAE were assessed by reviewing the Agricultural Extension Manual (1999) and by consulting National Level Officials and the findings are presented below:

**Level of authority in DAE**

Department of Agricultural Extension (DAE) has following 5 levels of authority:

- i) National level: There is one Director General (DG) at the top of the Organization. There are 7 wings under DG at Nation level. Each wing is headed by a Director.
- ii) Region level: There are 10 regions of DAE in Bangladesh under the Field Service wing. Each region is headed by an Additional Director (AD).
- iii) District level: There are 64 districts under 10 regions of DAE. Each district is headed by a Deputy Director (DD)
- iv) Upazilla (Sub-district) Level: There are 490 upazillas under 64 districts. Each upazilla is headed by an Upazilla Agriculture Officer (UAO)
- v) Block Level: There are 12832 Blocks under 490 Upazillas of DAE in Bangladesh. There is one Sub-Assistant Agriculture Officer (SAAO) in each Block.

For Better understanding an organogram of DAE is presented in Fig. 16.

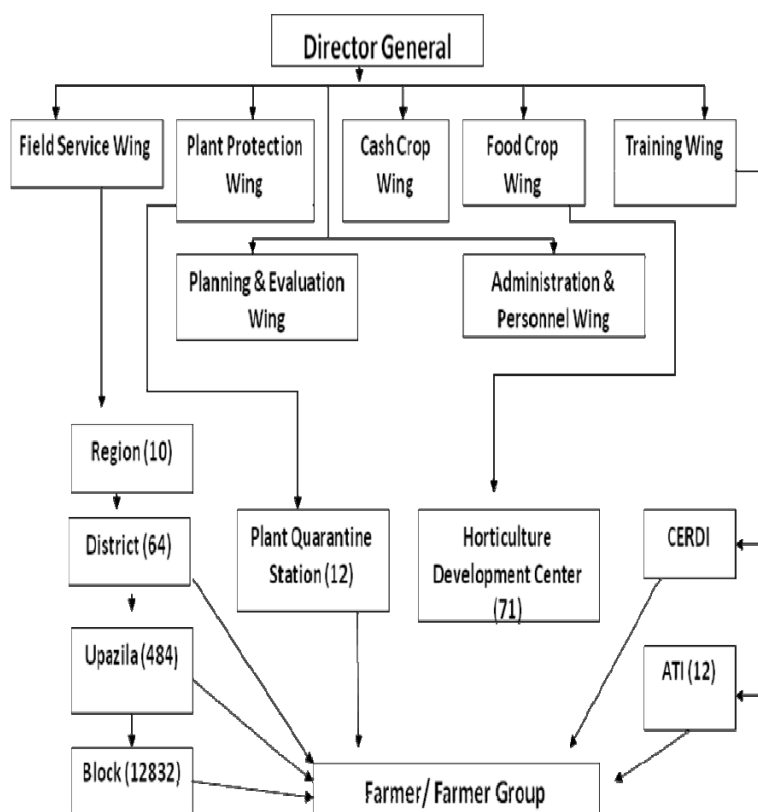


Fig.16: Organogram of DAE

Among 225 respondents of this study, 44.4% were SAAO of Block level, 22.2% were UAO of Upazilla Level and 33.3% were district level officers like Deputy Director, District Training Officer, Crop Production Specialist/Plant Protection Specialist/Horticulture Specialist/irrigation Specialist (Fig. 17.).

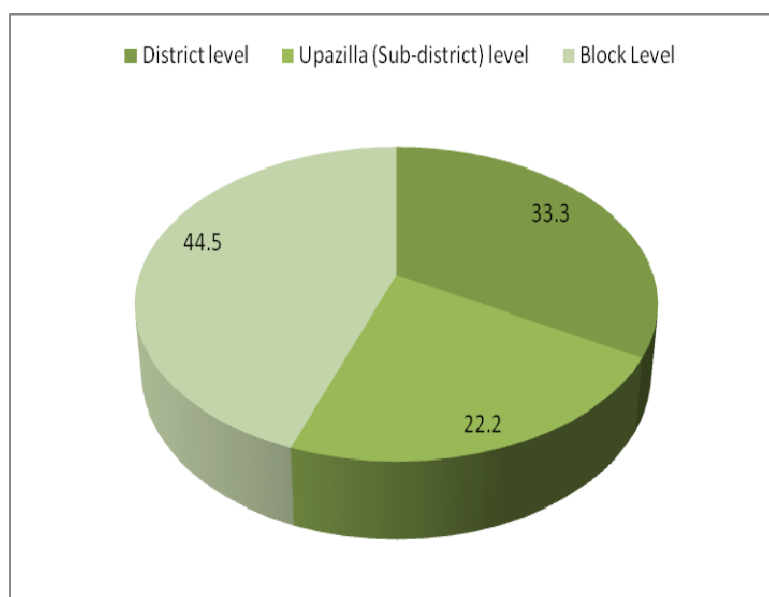


Fig.17: Level of Authority of the Respondents

Designation of the immediate Supervisors of the respondents are listed below:

Level of respondents	Designation of Respondents	Level of immediate Supervisor	Designation of immediate Supervisor
Block	SAAO	Upazilla	UAO
Upazilla	UAO	District	DD
District	CPS/PPS/HS/IS	District	DD
District	DTO	District	DD
District	DD	Region	AD

### Current duties of the respondents

The current duties of the respondents are listed below based on Agricultural Extension Manual (1999) of DAE and their responses:

#### Sub-Assistant Agriculture Officer (SAAO)

##### Technical:

- Assisting farmers to identify their problems and possible solutions to them
- Implementing extension events within the block based on local needs
- Providing ideas for suitable extension activities for farmers during the Upazilla planning workshop
- Assisting farmers to obtain information and other assistance from other extension partners
- Collecting and recording information about the block on natural resources, population, areas of different crops, under cultivation, crop input requirements, marketing systems for locally produced crops, numbers and extension of farmers adapting, testing and adopting technologies

##### Administrative:

- Maintaining a diary to record day to day progress, plan future activities and record farmer information needs and responses
- Identifying active farmers group, including those working with NGOs
- Agreeing a fortnightly work program within the block in accordance with the annual extension plan
- attending and contributing to upazilla meetings and training days
- monitoring the implementation of extension events in the block using the Seasonal Extension Monitoring System (SEMS) and the registration systems used by DAE.

#### Upazilla Agriculture Officer (UAO)

##### Technical:

- Ensuring effective FINA within the Upazilla
- Preparing high quality extension plan
- Preparing training materials for farmers and technical staff
- Raising farmers' problem, which cannot be resolved by Block level by DAE, with other extension partners during the UAEC, or with district specialists
- Liaising with farmers associations and other related agencies at Upazilla level
- Providing high quality advice to SAAOs on a range of agricultural subjects
- Assisting SAAOs to organize field events (e.g. farmers' rallies, field days, motivational

tours, etc.)

- Planning and implementing Upazilla level extension activities (e.g. upazilla fairs, farmers training etc.)

**Administrative:**

- Maintaining links and coordinating activities with other extension providers through the Upazilla Agricultural Extension Coordination Committee (UAECC)
- Organizing and conducting Upazilla planning workshops
- Assessing and responding to staff training needs
- Planning and organizing fortnightly Upazilla training days
- Ensuring monitoring the performance of all SAAOs through fortnightly work programming assessment meeting and field visits
- Managing and coordinating Seasonal Extension Monitoring System (SEMS) and Knowledge, Attitude and Practices (KAP) at Upazilla level
- Ensuring attending monthly meeting and training workshops held at district office including District Extension Planning Committee (DEPC) of a senior member of Upazilla staff
- Ensuring the management of the Upazilla budget and the timely production accounts
- Collecting information including ad hoc information on emergencies from SAAOs and reporting to Districts, Regions or Headquarters to an agreed format

**Subject Matter Specialist (CPS/PPS/HS/IS)**

**Technical:**

- Helping DD to prepare district extension plan
- Helping in preparation of monthly district bulletin for all technical staff within the district
- Preparing training materials for effective training of Upazilla and Block level officers related to his/her subject
- Participating at Agricultural Technical Committee (ATC) meeting and maintaining direct links with research institutes for the purpose of facilitating the free flow of information on adaptive research, field trials and new technologies
- Conducting training courses at district and upazilla level as Subject Matter Specialist

**Administrative:**

- Participating District Extension Planning Committee (DEPC) meeting to review seasonal activities and annual extension plans
- Helping DD to ensure the effective management of human resources in the district and the Assessment of performance and management of their work
- Providing guidance to UAO and AAO/AEOs on the detail of which extension message, methods and packages are available for their consideration when compiling their Upazilla extension plan
- Maintaining liaison with research institutes and agencies under the coordination of DD

**District Training Officer (DTO)**

**Technical:**

- Preparing training materials for effective training of Upazilla and Block level officers
- Determining areas and types of specific and general training required for staffs
- Determining options for local skill development
- Identifying sources of local technical expertise
- Defining mechanism for utilizing local technical expertise in staff training
- Integrating staff training into local work plan

**Administrative:**

- Attending District Extension Planning Committee (DEPC) meeting to review seasonal activities and annual extension plans
- Supervising the assessment of training needs for all staff and drawing up proposals for training wings within the district
- Assisting Upazilla level training
- Maintaining a training record for all district staff and Upazilla Officers
- Helping DD for authorizing staff to travel outside the district for special training purposes as planned by training wing

**Deputy Director (DD)****Technical:**

- Reviewing and checking Upazilla plans to ensure technically soundness, quality and reflection of Farmers' Information Need Assessment (FINA)
- Preparing district extension plan
- Preparing and circulating monthly district bulletin for all technical staff within the district
- Ensuring Upazilla Officers' adequacy of technical knowledge in current extension messages and assessing them to adjust messages so that they reflect local circumstances
- Implementing Knowledge, Attitude and Practices (KAP) surveys within the district
- Preparing training materials for effective training of Upazilla officers
- Participating at Agricultural Technical Committee (ATC) meeting and maintaining direct links with research institutes for the purpose of facilitating the free flow of information on adaptive research, field trials and new technologies
- Providing the main link between field officers and technical Wing Directors, passing information to them and receiving advice and programmes of extension messages and methods available for use in the field

**Administrative:**

- Organizing and conducting District Extension Planning Committee (DEPC) meeting to review seasonal activities and annual extension plans
- Submitting all Upazilla and District plans to the Region level Additional Director for technical validation at the Agricultural Technical Committee (ATC)
- Supervising the implementation of all Upazilla plans in the District
- Supervising the assessment of training needs for all staff and drawing up proposals for training wings within the District
- Assisting Upazilla level training
- Managing monthly meetings at the District for all UAOs to discuss problems, solutions, progress and extension activities
- Maintaining a training record for all district staff and Upazilla Officers
- Maintain up to date staff records stationed in the district
- Authorizing staff to travel outside the district for special training purposes as planned by training wing
- Monitoring DAE/NGO partnership within the district and promoting joint DAE/NGO activities among District and Upazilla staff
- Coordinating and consolidating Seasonal Extension Monitoring System (SEMS)
- Ensuring the effective management of human resources in the District and the Assessment of performance and management of their work
- Controlling District expenditure within approved budget callings and ensuring timely submission of monthly accounts to Administrative and Planning Wing in Headquarter.

### Expected changes in roles for CCA

Opinions were collected on expected change in role for CCA from block to District level personnel of DAE. Based on the frequency of citation of opinions, some important expected changes in the role for CCA are listed below (please note that these are generally felt needed changes across the respondents and specific role changes may vary from designation to designation):

- Attending CCA training
- Keeping regular climate & agriculture forecasting records
- Develop knowledge and skill dissemination capacity related to climate change issue
- Develop knowledge and skill on weather equipments
- Collaboration with local and national level climate committee
- Keeping regular contact with advising center by establishing permanent climate change advice center
- Develop capacity to operate CCA fund
- Develop independent field visit and monitoring capacity
- Capacity building for development of knowledge and skill on disaster management
- Extension program development for adaptation to climate change
- Develop capacity to prevent undue bureaucratic and political interference
- Strengthening relationship among extension providers, researchers and farmers
- Develop favorable working environment at block level
- Conduction of bottom-up planning for CCA
- Develop ability to take quick decision at the time of emergency
- Provision of recognition from higher authorities for active participation in CCA activities

### d.4. Evaluation of skill and knowledge areas

Data was collected from 225 block to national level personnel of DAE on the extent of their skill and knowledge in CCA. Twenty five respondents did not respond on this issue and the, results of 200 respondents are presented in Fig. 18. Findings revealed that more than half of the respondents had average skill (59%) and knowledge (57%) on CCA and one-third of them had poor skill (29.5%) and knowledge (34%) levels. Only 11.5% and 9% had good skill and knowledge respectively on CCA. It is notable that nobody claimed bad or very good skill and knowledge on CCA. These results could be overemphasized and the results could be different if these ratings are obtained from their supervisors or by conducting skill and knowledge test, the result might be more unsatisfactory.

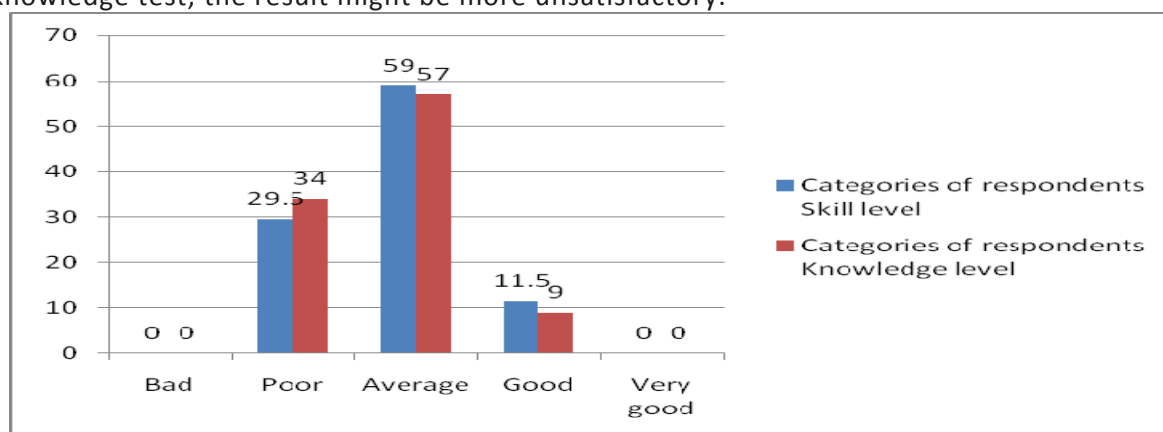


Fig.18: Categories and percentage of respondents based on skill and knowledge level on climate change adaptation



### Training areas needed for better job performance

Based on the opinion of the respondents, needed knowledge and skill areas of training are listed in Table 11.

Table 11: Knowledge and skill areas needed for better performance for CCA as indicated by respondents.

Knowledge areas	Skill areas
Concept of climate change and its present global status specially in the Asia & Pacific Region	Modern cultivation techniques of different crops in saline, flood and drought prone areas
Types of climate change vulnerabilities in Bangladesh and its regulatory framework	Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production
Physical, socio-economic and emotional impacts of climate change	Advance rice production technology for vulnerable areas of Bangladesh
Effects of climate change on agriculture, fisheries and livestock sector in Bangladesh	Special agricultural activities for hilly areas
Implication of agro-meteorology and agricultural forecasting on agricultural production	Management of saline soil for crop production
Public awareness and role of media for CCA	Livelihood adaptation to climate change in agriculture
Duties and responsibilities of community based local, upazilla, district and national level CCA managers	Livestock management in water logging, flood, salinity and drought prone areas
Gender discrimination in climate change shocks	Fisheries management in water logging, flood, salinity and drought prone areas
Water resource management in Bangladesh due to climate change	Special agricultural activities after at the time of emergency due to climate change
Bottom-up planning for disaster preparedness to reduce risk	Community seed bed preparation in draught prone areas and floating seed be preparation in flood prone areas
	Cropping pattern in flood, saline & drought prone areas of Bangladesh

### Self-evaluation of working environment

Attempt has been made to collect data from 225 Block and District level personnel of DAE on self- evaluation of working environment. Fifty five (55) respondents did not respond on this issue; hence results of the 170 respondents are presented in Fig. 19.

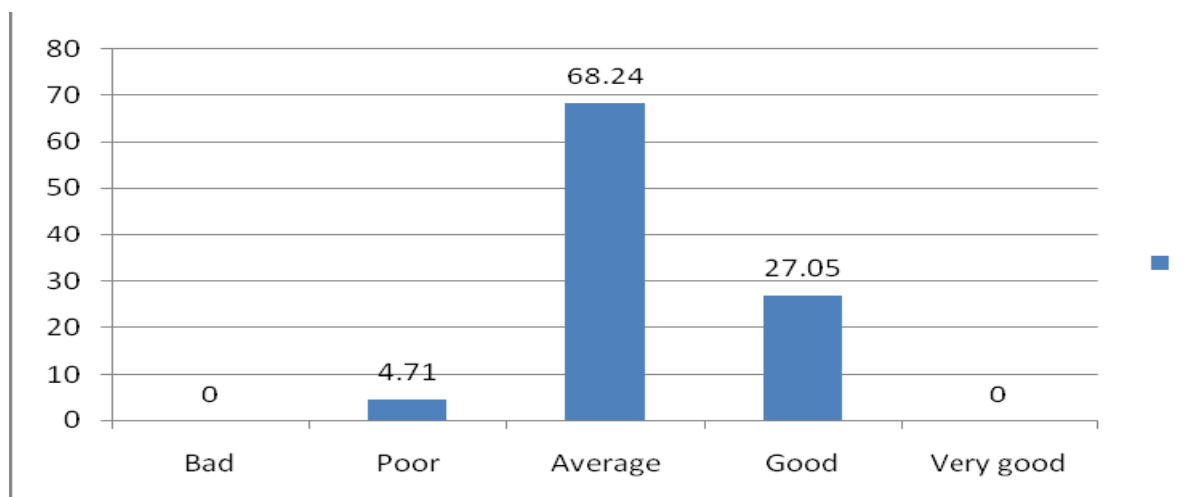


Fig. 19: Self-evaluation (% of responses) of working environment for better performance in their job

More than two-third (68.24%) of respondents reported average working environment, 27.05% good and 4.71% poor working environment. None have reported bad or very good working conditions. It may be concluded that necessary interventions are needed by DAE to create favorable working environment especially for the block level workers to perform their duties properly by reducing bureaucratic behavior of the higher authorities of the organization.

**Reasons for average working environment:** The staff at upzilla and district levels can share their ideas in various meetings. They can solve their problems by the suggestions from higher authorities. In these considerations, the working environment was average. On the other hand, there is bureaucratic nature in higher authorities. Regarding this bureaucratic nature of authorities, no respondent of this study opined that there is very good working environment in DAE.

## e. Knowledge and Skills Areas for Climate Change Adaptation in Agriculture Sector

A set of knowledge and skill areas are identified by reviewing the NAPA strategies, consultations with CCA experts and departmental experts, and referring to the job description of the staff (presented in the previous section). The results of this analysis are presented as 'ideal scenario of knowledge and skill areas for climate change adaptation in agriculture sector' in this section. The training gaps can be arrived by comparing this ideal scenario with the skill and knowledge that the staff already possess (assessed from the TNA survey exercise for which results are presented in the previous section).

A 3-step-process for arriving at an ideal capacity profile of staff was performed as explained in this section. In Step I, current duties of various target staff are enumerated. In the step II, an ideal profile of staff was constructed after analyzing the NAPA documents, CCA literature, and consultations with CCA experts in the country. This ideal profile of staff is compared with the current job profile of staff and the knowledge and skill levels they have (refer to results from TNA surveys).

### e.1. Step 1: Current duties

The current duties of the respondents are listed below based on Agricultural Extension Manual (1999) of DAE and their responses:

### **Sub-Assistant Agriculture Officer (SAAO)**

#### **Technical:**

- Assisting farmers to identify their problems and possible solutions to them
- Implementing extension events within the block based on local needs
- Providing ideas for suitable extension activities for farmers during the Upazilla planning workshop
- Assisting farmers to obtain information and other assistance from other extension partners
- Collecting and recording information about the block on natural resources, population, areas of different crops, under cultivation, crop input requirements, marketing systems for locally produced crops, numbers and extension of farmers adapting, testing and adopting technologies

#### **Administrative:**

- Maintaining a diary to record day to day progress, plan future activities and record farmer information needs and responses
- Identifying active farmers group, including those working with NGOs
- Agreeing a fortnightly work program within the block in accordance with the annual extension plan
- attending and contributing to upazilla meetings and training days
- Monitoring the implementation of extension events in the block using the Seasonal Extension Monitoring System (SEMS) and the registration systems used by DAE.

### **Upazilla Agriculture Officer (UAO)**

#### **Technical:**

- Ensuring effective FINA within the Upazilla
- Preparing high quality extension plan
- Preparing training materials for farmers and technical staff
- Raising farmers' problem, which cannot be resolved by Block level by DAE, with other extension partners during the UAECC, or with District Specialists
- Liaising with farmers associations and other related agencies at Upazilla level
- Providing high quality advice to SAAOs on a range of agricultural subjects
- Assisting SAAOs to organize field events (e.g. farmers' rallies, field days, motivational tours, etc.)
- Planning and implementing Upazilla level extension activities (e.g. upazilla fairs, farmers training etc.)

#### **Administrative:**

- Maintaining links and coordinating activities with other extension providers through the Upazilla Agricultural Extension Coordination Committee (UAECC)
- Organizing and conducting Upazilla planning workshops
- Assessing and responding to staff training needs
- Planning and organizing fortnightly Upazilla training days
- Ensuring monitoring the performance of all SAAOs through fortnightly work programming assessment meeting and field visits
- Managing and coordinating Seasonal Extension Monitoring System (SEMS) and Knowledge, Attitude and Practices (KAP) at Upazilla level
- Ensuring attending monthly meeting and training workshops held at District office including District Extension Planning Committee (DEPC) of a senior member of Upazilla staff
- Ensuring the management of the Upazilla budget and the timely production accounts
- Collecting information including ad hoc information on emergencies from SAAOs and

reporting to Districts, Regions or Headquarters to an agreed format

### **Subject Matter Specialist (CPS/PPS/HS/IS)**

#### **Technical:**

- Helping DD to prepare district extension plan
- Helping in preparation of monthly district bulletin for all technical staff within the district
- Preparing training materials for effective training of Upazilla and Block level officers related to his/her subject
- Participating at Agricultural Technical Committee (ATC) meeting and maintaining direct links with research institutes for the purpose of facilitating the free flow of information on adaptive research, field trials and new technologies
- Conducting training courses at district and upazilla level as Subject Matter Specialist

#### **Administrative:**

- Participating District Extension Planning Committee (DEPC) meeting to review seasonal activities and annual extension plans
- Helping DD to ensure the effective management of human resources in the district and the Assessment of performance and management of their work
- Providing guidance to UAO and AAO/AEOs on the detail of which extension message, methods and packages are available for their consideration when compiling their Upazilla extension plan
- Maintaining liaison with research institutes and agencies under the coordination of DD

### **District Training Officer (DTO)**

#### **Technical:**

- Preparing training materials for effective training of Upazilla and Block level officers
- Determining areas and types of specific and general training required for staffs
- Determining options for local skill development
- Identifying sources of local technical expertise
- Defining mechanism for utilizing local technical expertise in staff training
- Integrating staff training into local work plan

#### **Administrative:**

- Attending District Extension Planning Committee (DEPC) meeting to review seasonal activities and annual extension plans
- Supervising the assessment of training needs for all staff and drawing up proposals for training wings within the district
- Assisting Upazilla level training
- Maintaining a training record for all district staff and Upazilla Officers
- Helping DD for authorizing staff to travel outside the district for special training purposes as planned by training wing

### **Deputy Director (DD)**

#### **Technical:**

- Reviewing and checking Upazilla plans to ensure technical soundness, quality and reflection of Farmers' Information Need Assessment (FINA)
- Preparing district extension plan
- Preparing and circulating monthly district bulletin for all technical staff within the district
- Ensuring Upazilla Officers' adequacy of technical knowledge in current extension messages and assessing them to adjust messages so that they reflect local circumstances

- Implementing Knowledge, Attitude and Practices (KAP) surveys within the district
- Preparing training materials for effective training of Upazilla officers
- Participating at Agricultural Technical Committee (ATC) meeting and maintaining direct links with research institutes for the purpose of facilitating the free flow of information on adaptive research, field trials and new technologies
- Providing the main link between field officers and technical Wing Directors, passing information to them and receiving advice and programmes of extension messages and methods available for use in the field

#### **Administrative:**

- Organizing and conducting District Extension Planning Committee (DEPC) meeting to review seasonal activities and annual extension plans
- Submitting all Upazilla and District plans to the Region level Additional Director for technical validation at the Agricultural Technical Committee (ATC)
- Supervising the implementation of all Upazilla plans in the District
- Supervising the assessment of training needs for all staff and drawing up proposals for training wings within the District
- Assisting Upazilla level training
- Managing monthly meetings at the District for all UAOs to discuss problems, solutions, progress and extension activities
- Maintaining a training record for all district staff and Upazilla Officers
- Maintain up to date staff records stationed in the district
- Authorizing staff to travel outside the district for special training purposes as planned by training wing
- Monitoring DAE/NGO partnership within the district and promoting joint DAE/NGO activities among District and Upazilla staff
- Coordinating and consolidating Seasonal Extension Monitoring System (SEMS)
- Ensuring the effective management of human resources in the District and the Assessment of performance and management of their work
- Controlling District expenditure within approved budget callings and ensuring timely submission of monthly accounts to Administrative and Planning Wing in Headquarter.

### **e.2 Expected changes in roles for CCA**

Opinions were collected on expected change in role for CCA from block to District level personnel of DAE. Based on their frequencies of citation of opinions some important expected changes in role for CCA are listed below:

- Attending CCA training
- Keeping regular climate & agriculture forecasting records
- Develop knowledge and skill dissemination capacity related to climate change issue
- Develop knowledge and skill on weather equipments
- Collaboration with local and national level climate committee
- Keeping regular contact with advising center by establishing permanent climate change advice center
- Develop capacity to operate CCA fund
- Develop independent field visit and monitoring capacity
- Capacity building for development of knowledge and skill on disaster management
- Extension program development for adaptation to climate change
- Develop capacity to prevent undue bureaucratic and political interference
- Strengthening relationship among extension providers, researchers and farmers
- Develop favorable working environment at block level

- Conduction of bottom-up planning for CCA
- Develop ability to take quick decision at the time of emergency
- Provision of recognition from higher authorities for active participation in CCA activities

Sub-Assistant Agriculture Officer (SAAO) is responsible for the provision of day to day extension services in the block. Current daily duties and responsibilities of SAAOs are listed below:

- Assisting farmers to identify their problems and possible solutions to them
- Implementing extension events within the block based on local needs
- Providing ideas for suitable extension activities for farmers to the higher authority
- Assisting farmers to obtain information and other assistance from other extension partners
- Collecting and recording information about the block on natural resources, population, areas of different crops, under cultivation, crop input requirements, marketing systems for locally produced crops, numbers and extension of farmers adapting, testing and adopting technologies
- Maintaining a diary to record day to day progress, plan future activities and record farmer information needs and responses
- Identifying active farmers group, including those working with NGOs
- Monitoring the implementation of extension events in the block using the Seasonal Extension Monitoring System (SEMS) and the registration systems used by DAE.

#### **Needed changes to be made in their job profile**

- Keeping regular climate & agriculture forecasting records
- Develop knowledge and skill dissemination capacity related to climate change issue
- Develop knowledge and skill on weather equipment
- Collaboration with local and national level climate committee
- Keeping regular contact with advising center by establishing permanent climate change advice center
- Develop capacity to operate CCA fund
- Develop independent field visit and monitoring capacity
- Capacity building for development of knowledge and skill on disaster management
- Extension program development for adaptation to climate change
- Develop capacity to prevent undue bureaucratic and political interference
- Strengthening relationship among extension providers, researchers and farmers
- Develop favorable working environment at block level
- Conduction of Bottom-up planning for CCA
- Develop ability to take quick decision at the time of emergency
- Provision of recognition from higher authorities for active participation in CCA activities.

### **e.3 Assessment of requirements from national level initiatives**

The National Adaptation Programme of Action (NAPA) is prepared by the Ministry of Environment and Forest (MOEF), Government of the People's Republic of Bangladesh as a response to the decision of the Seventh Session of the Conference of the Parties (COP7) of the United Nations Framework Convention on Climate Change (UNFCCC). NAPA (2005) suggested future adaptation strategies listed below:

1. Reduction of climate change hazards through coastal afforestation with community participation
2. Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise

3. Capacity building for integrating climate change in planning, designing of infrastructure, conflict management and land-water zoning for water management institutions
4. Climate change and adaptation information dissemination to vulnerable community for emergency preparedness measures and awareness rising on enhanced climatic disasters
5. Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains
6. Mainstreaming adaptation to climate change into policies and programmes in different sectors (focusing on disaster management, water, agriculture, health and industry)
7. Inclusion of climate change issues in curriculum at secondary and tertiary educational institution
8. Enhancing resilience of urban infrastructure and industries to impacts of climate change
9. Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change
10. Promotion of research on drought, flood and saline tolerant varieties of crops to facilitate adaptation in future
11. Promoting adaptation to coastal crop agriculture to combat increased salinity
12. Adaptation to agriculture systems in areas prone to enhanced flash flooding in North East and Central Region
13. Adaptation to fisheries in areas prone to enhanced flooding in North East and Central Region through adaptive and diversified fish culture practices
14. Promoting adaptation to coastal fisheries through culture of salt tolerant fish special in coastal areas of Bangladesh
15. Exploring options for insurance and other emergency preparedness measures to cope with enhanced climatic disasters

#### e.4. Step 2: Construction of ideal profile

As a part of step 2, information was obtained from consultations conducted with CCA experts and other stakeholders on ideal knowledge and skills required for satisfactory performance of job by various officers at national, district and village levels. The results are presented in Table 12.

Table 12: List of CCA knowledge and skills needed to perform each job to a satisfactory level

Level of Staff/Trainers	Knowledge areas	Skill areas
<ul style="list-style-type: none"> <li>• Policy level Officers (Additional Directors and Directors of DAE; Chief Scientific Officers of agricultural research organizations; Agricultural University Professors and National CCA experts)</li> </ul>	<ul style="list-style-type: none"> <li>• Bangladesh Government's policy in relation to CCA</li> <li>• International obligations and commitments related to CCA</li> <li>• Types of climate change vulnerabilities in Bangladesh and its regulatory framework</li> <li>• Impact of climate change in Bangladesh agriculture</li> <li>• Role of media in CCA</li> <li>• Duties and responsibilities of community based Local, Upazilla, district and national level CCA managers</li> </ul>	<ul style="list-style-type: none"> <li>• Program planning, budgeting and management on CCA</li> <li>• Preparation of CCA related training materials for Mid level Officers of DAE</li> </ul>



Level of Staff/Trainers	Knowledge areas	Skill areas
<ul style="list-style-type: none"> <li>• Mid level Officers of DAE (Deputy Directors; District Training Officers; Subject matter specialists like CPS/PPS/HS/IS; Upazilla Agriculture Officers; Additional Agriculture Officers and Agriculture Extension Officers)</li> </ul>	<ul style="list-style-type: none"> <li>• Bangladesh Government policy and strategy in relation to CCA</li> <li>• Types of climate change vulnerabilities in Bangladesh and its regulatory framework</li> <li>• Causes and consequences of climate change in Bangladesh agriculture</li> <li>• Duties and responsibilities of community based Local, Upazilla and District level CCA managers</li> <li>• Preparing district CCA plan</li> <li>• Reviewing of upazilla CCA plan to ensure its technically soundness and quality</li> <li>• Ensuring effective Farmers' Information Need Assessment (FINA)</li> <li>• Raising farmers' problems, with other extension partners, and district specialist which cannot be resolved at block level</li> <li>• Liaising with farmers associations and other related agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Climate change vulnerability assessment</li> <li>• Design appropriate demonstrations for flood, drought and flood prone areas</li> <li>• Program planning and management on CCA</li> <li>• Preparation of CCA related training materials for Block/root level Officers (SAAO) of DAE</li> <li>• Preparing and circulate monthly district CCA bulletin for all technical staff within the district</li> <li>• Implementing knowledge, attitude and practice (KAP) survey within the district related to CCA</li> <li>• Preparing training materials for upzaila and block level Officers</li> <li>• Preparing training materials for Sub-Assistant Agriculture Officers and farmers</li> <li>• Assisting Sub-Assistant Agriculture Officers to organized field events like farmers' rallies, field days, motivational campaigning</li> </ul>



Level of Staff/Trainers	Knowledge areas	Skill areas
<ul style="list-style-type: none"> <li>Block/root level extension Officers (Sub-Assistant Agriculture Officers)</li> </ul>	<ul style="list-style-type: none"> <li>Types of climate change vulnerabilities in Bangladesh</li> <li>Causes and consequences of climate change in Bangladesh agriculture</li> <li>Water management technologies for flood, drought and salinity prone areas</li> <li>Integrated Plants Nutrient Management practices</li> <li>Integrated Pest Management practices</li> <li>Implication of agro-meteorology, agricultural forecasting and public awareness</li> <li>Gender discrimination in climate change shocks</li> <li>Livelihood adaptation to climate change in agriculture</li> <li>Cropping pattern in flood, saline &amp; drought prone areas of Bangladesh</li> <li>Water resource management in Bangladesh due to climate change</li> <li>Management of saline soil for crop production</li> <li>Collaboration with local and national level climate committee</li> <li>Strengthening relationship among extension providers, researchers and farmers</li> </ul>	<ul style="list-style-type: none"> <li>Setting up demonstration for various aspects of CCA</li> <li>Different crop production practices for CCA</li> <li>Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production</li> <li>Advance rice production technology for vulnerable areas of Bangladesh</li> <li>Community seed bed preparation in draught prone areas and floating seed be preparation in flood prone areas</li> <li>Special agricultural activities for hilly areas</li> <li>Livestock and fisheries management practices for technologies for flood, drought and salinity prone areas</li> <li>Special agricultural activities after cyclone and at the time of emergency</li> <li>Bottom-up planning for CCA to reduce risk</li> <li>Preparation of CCA related training materials for vulnerable people</li> <li>Keeping regular climate &amp; agriculture forecasting records</li> <li>Ability to take quick decision at the time of emergency</li> </ul>

### e.5 Identified priorities for training

#### Basic knowledge and skill that need to be imparted to all the staff/trainers

Block level workers of DAE have Diploma in agricultural and Agriculture Officers have at least Bachelor degree in Agriculture. So, it is assumed that all the agriculture officers of DAE have basic agricultural knowledge. However, they lack knowledge and skill on climate change and related issues. Hence, it is very important to impart knowledge and skill to all the staff/trainers of DAE as shown in Table 13.

Table 13: Generic knowledge and skill areas identified for DAE personnel.

Knowledge area	Skill area
<ul style="list-style-type: none"> <li>• Concept of climate change and its present global status specially in the Asia &amp; Pacific Region</li> <li>• Types of climate change vulnerabilities in Bangladesh and its regulatory framework</li> <li>• Physical, socio-economic and emotional impacts of climate change</li> <li>• Effects of climate change on agriculture, fisheries and livestock sector in Bangladesh</li> <li>• Implication of agro-meteorology, agricultural forecasting and public awareness</li> <li>• Role of media in CCA</li> <li>• Duties and responsibilities of community based local (block), upazilla, district and national level CCA managers</li> <li>• Gender discrimination in climate change shocks</li> <li>• Cropping pattern in flood, saline &amp; drought prone areas of Bangladesh</li> <li>• Water resource management in Bangladesh due to climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Modern cultivation techniques of different crops in saline, flood and drought prone areas</li> <li>• Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production</li> <li>• Advance rice production technology for vulnerable areas of Bangladesh</li> <li>• Community seed bed preparation in draught prone areas</li> <li>• Floating seed be preparation in flood prone areas</li> <li>• Special agricultural activities for hilly areas</li> <li>• Management of saline soil for crop production</li> <li>• Livelihood adaptation to climate change in agriculture</li> <li>• Livestock management in water logging, flood, salinity and drought prone areas</li> <li>• Fisheries management in water logging, flood, salinity and drought prone areas</li> <li>• Special agricultural activities after cyclone and at the time of emergency</li> <li>• Bottom-up planning for CCA to reduce risk</li> </ul>

### Specific knowledge and skill areas need to be imparted to specific staff/trainers

SAAOs are the root/block level officers responsible for disseminating innovations in agriculture to the farmers. SAAOs will get training from district level officials. District level officials will get training from national level experts. Specific knowledge and skill areas need to be imparted to specific staffs/trainers are listed below based on analysis of information from TNA surveys, review of existing materials, job descriptions, and group discussion in a workshop at Bangladesh Agricultural Research Council (Table 14.).

Table 14: Knowledge and skill areas identified for national, mid and block level officers

Level of Staff/Trainers	Knowledge areas	Skill areas
National/Policy level Officers (Additional Directors and Directors of DAE; Chief Scientific Officers of agricultural research organizations;	<ul style="list-style-type: none"> <li>• Bangladesh Government's policy in relation to CCA</li> <li>• International obligations and commitments related to CCA</li> <li>• Types of climate change vulnerabilities in Bangladesh and its regulatory framework</li> <li>• Impact of climate change in Bangladesh agriculture</li> <li>• Role of media in CCA</li> <li>• Duties and responsibilities of community</li> </ul>	<p>Program planning, budgeting and management on CCA</p> <p>Preparation of CCA related training materials for Mid level Officers of DAE</p>

Level of Staff/Trainers	Knowledge areas	Skill areas
Agricultural University Professors and National CCA experts)	based local (village and block), upazilla, district and national level CCA managers	
Mid level Officers of DAE (Deputy Directors; District Training Officers; Subject matter specialists like CPS/PPS/HS/IS; Upazilla Agriculture Officers; Additional Agriculture Officers and Agriculture Extension Officers)	<ul style="list-style-type: none"> <li>• Bangladesh Government policy and strategy in relation to CCA</li> <li>• Types of climate change vulnerabilities in Bangladesh and its regulatory framework</li> <li>• Causes and consequences of climate change in Bangladesh agriculture</li> <li>• Duties and responsibilities of community based local(village and block), upazilla and district level CCA managers</li> <li>• Preparing district CCA plan</li> <li>• Reviewing of upazilla CCA plan to ensure its technically soundness and quality</li> <li>• Ensuring effective Farmers' Information Need Assessment (FINA)</li> <li>• Raising farmers' problems, with other extension partners, and district specialist which cannot be resolved at block level</li> <li>• Raising with farmers associations and other related agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Climate change vulnerability assessment</li> <li>• Design appropriate demonstrations for flood, drought and flood prone areas</li> <li>• Program planning and management on CCA</li> <li>• Preparation of CCA related training materials for Block/root level Officers (SAAO) of DAE</li> <li>• Preparing and circulate monthly district CCA bulletin for all technical staff within the district</li> <li>• Implementing knowledge, attitude and practice (KAP) survey within the district related to CCA</li> <li>• Preparing training materials for upzaila and block level Officers</li> <li>• Preparing training materials for Sub-Assistant Agriculture Officers and farmers</li> <li>• Assisting Sub-Assistant Agriculture Officers to organized field events like farmers' rallies, field days, motivational campaigning</li> </ul>
Block/root level extension Officers (Sub-Assistant Agriculture Officers)	<ul style="list-style-type: none"> <li>• Cropping pattern in flood, saline &amp; drought prone areas of Bangladesh</li> <li>• Causes and consequences of climate change in Bangladesh agriculture</li> <li>• Collaboration with local (village and block) and national level climate committee</li> <li>• Cropping pattern in flood, saline &amp; drought prone areas of Bangladesh</li> <li>• Gender discrimination in climate change shocks</li> <li>• Implication of agro-meteorology, agricultural forecasting and public awareness</li> <li>• Integrated pest management practices</li> <li>• Integrated plant nutrient management practices</li> <li>• Livelihood adaptation to climate change in agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to take quick decision at the time of emergency</li> <li>• Advance rice production technology for vulnerable areas of Bangladesh</li> <li>• Bottom-up planning for CCA to reduce risk</li> <li>• Community seed bed preparation in draught prone areas and floating seed be preparation in flood prone areas</li> <li>• Different crop production practices for CCA</li> <li>• Keeping regular climate &amp; agriculture forecasting records</li> <li>• Livestock and fisheries management practices for technologies for flood, drought and salinity prone areas</li> <li>• Preparation of CCA related training materials for vulnerable people</li> </ul>

Level of Staff/Trainers	Knowledge areas	Skill areas
	<ul style="list-style-type: none"> <li>• Management of saline soils for crop production</li> <li>• Strengthening relationship among extension providers, researchers and farmers</li> <li>• Types of climate change vulnerabilities in Bangladesh</li> <li>• Water management technologies for flood, drought and salinity prone areas</li> <li>• Water resource management in Bangladesh for climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Setting up demonstration for various aspects of CCA</li> <li>• Special agricultural activities after cyclone and at the time of emergency</li> <li>• Special agricultural activities for hilly areas</li> <li>• Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production</li> </ul>

### e.6 Infrastructure needs

Capable CCA experts are to be identified from different agricultural universities, research and other relevant organizations for providing training to the staff of DAE and other policy level officials. After receiving CCA related training, the national level Officials will act as facilitators for providing training to the mid level Officers. After receiving CCA related training, the mid level officials will act as facilitators for providing training to the block level Sub-Assistant Agriculture Officers (SAAOs). Policy level training will be held at Giasuddin Milky Auditorium located near to DAE Head Office. Mid level Officers training will be arranged at Central Extension Resources Development Institute (CERDI) at Gazipur. Block/root level officers training may be arranged at different Agricultural Training Institute (ATI), Horticulture Centers and Districts training Halls located at different places of the country. Facilities needed for these training centers are listed in Table 15.

Table 15: Facilities required for imparting training in various training institutions in Bangladesh

Level	Facilities needed
<b>National</b>	
Giasuddin Milky Auditorium	<ul style="list-style-type: none"> <li>• Multimedia projector with laptop and fixed screen, UPS, sound system, etc.</li> <li>• Adequate funds for training</li> <li>• Printing and scanning facilities</li> </ul>
CERDI of DAE	<ul style="list-style-type: none"> <li>• Multimedia projector with laptop and fixed screen, UPS, sound system, etc.</li> <li>• Adequate funds for training</li> <li>• Printing and scanning facilities Establishment of meteorological instruments</li> <li>•</li> </ul>
ATI, Horticulture centers, District Training Hall of DAE	<ul style="list-style-type: none"> <li>•Infrastructure for arranging training with residential hostel and district training hall</li> <li>• Multimedia projector with laptop and fixed screen, UPS, sound system, etc.</li> <li>• Adequate funds for training</li> <li>•Printing and scanning facilities</li> </ul>

## **f. Policy Suggestions and Road Map for Bangladesh**

The following policy suggestions emerge from this project for Bangladesh.

1. Awareness building and dissemination plays an important role at different levels from the common people, farmers, and governments, non-governmental agencies, scientists, policy makers, and planners. In Bangladesh, some organizations are involved in various studies on climate change. However, information about climate change related issues is scattered, incomplete and sometimes difficult to access. A national awareness building program should coordinate for dissemination of knowledge about the effects of climate change and possibilities for adaptation.
2. Physical adaptations like riverbank training, dredging and bank protection have long been practiced in Bangladesh. Evaluation of these adaptations is needed, focusing on feedback for policy making and planning. The people of Bangladesh have developed many ways to address climate variations over the centuries. These adaptations may be useful in coping with climate change. Documentation, dissemination and support are essential.
3. Central Extension Resources Development Institute (CERDI) is the largest training center of DAE. There is another training center at Savar, Dhaka under DAE named as Mushroom Development and Training Center. These two training centers have moderate infra-structure and equipment facilities for training. Facilities of these centers should be increased to conduct more training sessions. Sometimes, national policy level training, conference, seminar, workshop etc. are arranged at Giasuddin Milky Auditorium located at the Head Office of DAE. This auditorium also has limited facilities for arranging training with limiter residential facility.
4. There are small facilities of training at district level training centers of DAE. There is a lack of residential and equipment facilities in these District level training centers. There are 15 Agricultural Training Institutes (ATI) under DAE at different locations of Bangladesh. Training can also be arranged in 14 Horticulture Centers of DAE at different places of the country. Multimedia projectors with laptop computer, hand microphone, room microphone and necessary logistics should be provided to each of 64 District level training centers, ATIs and Horticulture Centers of DAE as opined by most of the respondents.
5. At Sub-district (Upazilla) level, there is a common training center which is used by all government departments. Only a few Upazillas have separate training center under DAE. For CCA training, there should be a separate training center under DAE in each of 490 Upazillas of Bangladesh. Necessary equipments should be provided to these centers.
6. Bangladesh Agricultural Research Council (BARC) is the apex body of the National Agricultural Research Organizations of Bangladesh. Under National Agricultural Research System (NARS), there are 10 agricultural research organizations in Bangladesh which are coordinated by BARC. Each research organizations of Bangladesh including BARC have moderate training facilities. For coordination among agricultural education, research and extension, there should be training center at Sher-e-Bangla Agricultural University (SAU), which is situated in Dhaka city at the center of the country. Necessary, infra-structural

development and supply of modern equipments are necessary at NARS organizations, BARC and SAU.

7. Detailed course content and delivery procedure of these training modules will be developed by high quality national level experts from DAE, different universities, research organizations under NARS and other relevant organizations. With these detailed course content and delivery procedure, initially training will be conducted for national policy level personnel of DAE, BARC, NARS organizations and universities. They will then act as facilitators for the training of Mid level officials of DAE. These mid level Officers will then conduct training for entry level SAAOs. Number of trainees and trainers are listed below:

Sl. No.	Name of training	No. of trainees /batch	No. of Batch	Total No. of trainees	No. of trainers /batch
1	In-service Training Module on Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh	30	5	150	20
2	Induction Training Module on Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh	30	5	150	10
3	In-service Training Module on Climate Change Adaptation for District and Upazilla (Sub-District) level Agriculture Officers of the Department of Agricultural Extension of Bangladesh	30	5	150	20
4	Induction Training Module on Climate Change Adaptation for Agriculture Extension Officers (AEO) of the Department of Agricultural Extension of Bangladesh	30	5	150	10
5	In-service Training Module on Climate Change Adaptation for Policy Makers of Bangladesh	30	1	30	20
6	Induction Training Module on Climate Change Adaptation for Policy Makers of Bangladesh	30	1	30	10

### **Implication/linkages in terms of education curriculum for developing expert base**

For developing detailed course content and delivery procedure of the content, national experts need to be selected from Bangladesh Agricultural Research council (BARC), Sher-e-Bangla Agricultural University (SAU) and Department of Agricultural Extension (DAE). Evaluation of the training courses will be done by the National TNA Team. The team can consist of:

Convener	:	Director, Training Wing, DAE
Member-Secretary	:	Dr. Md. Sekender Ali, Professor, Department of Agricultural Extension & Information System, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh
Member	:	Dr. Abul Kalam Azad, Chief Scientific Officer, Bangladesh Agricultural Research Council, Dhaka, Bangladesh
Consultant	:	KBD. Mr. Md. Fazlul Karim, Retired Director, of Training Wing, Department of Agricultural Extension, Dhaka, Bangladesh

For the above consideration, a linkage will be needed among BARC, SAU and DAE.

### Activity Schedule

Piloting of the training will be done in one year. The active schedule is presented below:

S.N.	Activities	Months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Selection of nation experts and preparation of detailed course content and delivery procedure by them	→											
2	In-service Training Module on Climate Change Adaptation for Policy Makers of Bangladesh		→										
3	Induction Training Module on Climate Change Adaptation for Policy Makers of Bangladesh			→									
4	In-service Training Module on Climate Change Adaptation for District and Upazilla (Sub-District) level Agriculture Officers of the Department of Agricultural Extension of Bangladesh				→								
5	Induction Training Module on Climate Change Adaptation for Agriculture Extension Officers (AEO) of the Department of Agricultural Extension of Bangladesh					→							
6	Induction Training Module on Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh						→						
7	In-service Training Module on Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh									→			
8	Reporting												→

The arrow (→) indicates the start (tail) and completion date (head) of each activity.



### Budget for implementation

Sl. No.	Items of Expenditure	Amount (BDT)
1.	In-service Training Module on Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh	12,50,000.00
2.	Induction Training Module on Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh	6,50,000.00
3.	In-service Training Module on Climate Change Adaptation for District and Upazilla (Sub-District) level Agriculture Officers of the Department of Agricultural Extension of Bangladesh	16,75,000.00
4.	Induction Training Module on Climate Change Adaptation for Agriculture Extension Officers (AEO) of the Department of Agricultural Extension of Bangladesh	8,25,000.00
5.	In-service Training Module on Climate Change Adaptation for Policy Makers of Bangladesh	3,35,000.00
6.	Induction Training Module on Climate Change Adaptation for Policy Makers of Bangladesh	1,65,000.00
7.	Honorarium for TNA Country Team: @ 100,000.00 Per Month X 12 Months X 4 Members	48,00,000.00 0
8.	Car hiring for Country TNA Team: @ 50,000.00 Per Month X 12 Months	6,00,000.00
9.	Salary for TNA Team Secretary: @ 30,000.00 Per Month X 12 Months	3,60,000.00
Total:		106,60,000.00 0

BDT. 106,60,000.00 = US\$ 144,837.00 ( US\$ One Hundred Forty Four Thousands Eight Hundred Thirty Seven Only)

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## BANGLADESH PART II: TRAINING MODULES

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**In-service training modules:** 3 modules for:

- i. Sub-Assistant Agriculture Officers (DAE)
- ii. District and Upazilla (Sub-District) level Agriculture Officers
- iii. Policy Makers

**Induction training modules:** 3 modules for:

- iv. Sub-Assistant Agriculture Officers (SAAO)
- v. Agriculture Extension Officers (AEO)
- vi. Policy Makers

### **i. In-service Training Module for Sub-Assistant Agriculture Officers of DAE**

#### **1. INTRODUCTION**

Department of Agricultural Extension (DAE) is the largest extension provider for the agricultural farming community in Bangladesh. Sub-Assistant Agriculture Officers (SAAOs) are the root level (locally known as Block Level) workers of DAE. They work for the betterment of farmers. Rural farmers of Bangladesh are very much affected by various types of climate change. Farmers of Bangladesh are generally faced water logging, flood, drought, salinity, etc. for their farming activities. As a result, agricultural productivity is reduced.

SAAOs are responsible to disseminate agricultural innovations to the farmers to reduce the losses of agricultural productivity. For this reasons, it is necessary to provide training to the SAAOs so that they make themselves able to help the farmers to reduce their agricultural losses. SAAOs can further provide training to the farmers as facilitators. On these considerations, “Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific” project has taken an initiative to prepare training module for developing capacity of Trainers like SAAOs of Bangladesh.

This module can facilitate to provide training to the SAAOs at root level aiming to introduce them with the concepts of climate change, its impacts on agricultural farming communities and the existing institutional and community based mechanisms for CCA.

#### **2. TARGET GROUP**

Sub-Assistant Agricultural Officers (SAAOs) of DAE: SAAOs are the Block (root) level frontline extension workers of DAE.

#### **3. ENTRY BEHAVIOUR**

**Age:** 25-55 years

**Educational Background:** 4 years Agricultural Diploma from Agricultural Training Institute (ATA) after passing 10 years Secondary School Certificate examination

**Level of knowledge and skill on the training module being conducted:** The SAAOs have little knowledge and skill on CCA and have good knowledge and skill on agriculture in general.

**Expected skill and knowledge levels of the trainer/trainees before entering into the module:** SAAOs of DAE will be the main trainers to provide training to the farmers. First, the SAAOs should be trained by the Upazilla (Sub-district) and District Level Officials having at least Bachelor of Agricultural Science (B.Sc.Ag.) degree. At this stage, SAAOs having working experience of at least 5 years should be selected. When the SAAOs will act as trainers to train the farmers, the module should be translated into Bengali.

#### **4. GOAL AND LEARNING OBJECTIVES**

**Goal:** capacity building for saaos as trainers for climate change adaptation planning

**Learning Objectives:** After receiving training, the SAAOs will be able to:

- Explain various concepts of climate change adaptation (CCA)
- Identify new coping practices for CCA
- Create awareness among the farmers to minimize their agricultural losses
- Create awareness among the rural poor on CCA planning
- Provide training to the rural poor on CCA

#### **5. IMPLEMENTATION MODALITIES**

Number of Batch for training: 5 Batches for piloting

**Trainers:** District Training Officer (DTO) will be Course Coordinator for the training. For each batch of training 20 trainers will be required. Deputy Directors (DD), District Training Officers (DTO), Crop Production Specialists (CPS), Plant Protection Specialists (PPS), Horticulture Specialists (HS), Irrigation Specialists (IS), Upazilla (Sub-District) Upazilla Agriculture Officers (UAO), Additional Agricultural Officers (AAO), Agricultural Extension Officers (AEO) will be the trainer.

**Trainees:** Thirty (30) SAAOs will be the trainees for each batch, i.e. 150 SAAOs for 5 batches

**Duration of training:** 5 days

**Collaboration with other organization:** Five (5) batches will be held at 5 selected District Training Hall. For accommodation facilities, training may be arranged at nearer ATI of the district. Facilitators may be selected from nearer stations of agricultural research institutes and universities, Directorate of Livestock Services (DLS), Directorate of Fisheries (DOF), Meteorological Departments etc. for special cases.

#### **Facilities required:**

Funds for TA, DA and Honorarium for Trainers, Trainees, Evaluators and Course Coordinator

Funds for training materials and field visit

Training equipments like multimedia projectors with laptop computer, screen, UPS, high capacity sound system, digital camera, printer, scanner etc.

## **6. EXPECTED OUTCOMES**

After receiving training, the trainees will be able to:

Explain CCA and related issues

Identify new coping practices for CCA

Identify the ways of minimizing agricultural losses

Plan for CCA

Acquire skills and knowledge to be a CCA trainer

## **7. EVALUATION**

Pre-test and post-test of the trainees on training contents for each training batch will be conducted by the evaluation team. Mean difference obtained by paired t-test may be the basis of initial evaluation. Internal evaluation through a self-rated scale and external evaluation through their job performance after the training may be done in three-six months interval. Evaluation team will be composed of four members of country TNA team.

## 8. Session Details

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1	Participants will be able to explain the present status of climate change in Bangladesh	Present status of climate change in Bangladesh	Lecturing, showing video maps and data table followed by discussion	60 min	Maps, data table, DVD, multimedia projector, handout, whiteboard, marker, microphone, etc.	By feedback discussion	Facilitator will explain the present status of climate change in Bangladesh by showing related documents in video, maps and climate related data with the help of a multimedia. Then he will discuss the matter with the participants.
2	Participants will be able to assess the extent of damage due to climate change on agriculture, fisheries and livestock in Bangladesh	Effects of climate change on agriculture, fisheries and livestock in Bangladesh	Lecturing, video show, data presentation and discussion	60 min	Multimedia projector, DVD, handout, microphone, poster and flash cards	By feedback discussion	The trainer will overview on the effects of climate change on agriculture, fisheries and livestock in Bangladesh by showing video documents and previous data.
3	Participants will be able to explain about meteorology and its implication for agricultural forecasting	Implication of meteorology for agricultural forecasting	Lecturing, observation, video show followed practicing forecasting	60 min	Meteorological instruments, leaflet, handout, microphone, Multimedia projector etc.	By feedback discussion	The trainer will overview on meteorological implication for agricultural forecasting followed by showing forecasting tools.
4	Participants will be able	Livelihood adaptation to	Lecturing, case	60	Microphone,	Feedback	The trainer will overview

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	to review and familiarize on livelihood adaptation to climate change in agriculture	climate change in agriculture	study presentation, discussion and sharing of ideas	minutes	handout, whiteboard, marker, Multimedia	discussion	on livelihood adaptation to climate change in agriculture. After presentation and discuss he will arrange brainstorming for livelihood adaptation to climate change in agriculture.
5	The trainees will be able to describe water resource management in Bangladesh due to climate change	Water resource management in Bangladesh due to climate change	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, marker, whiteboard, Multimedia projector etc.	Feedback discussion	The trainer will discuss water resource management in Bangladesh due to climate change with sharing previous experiences.
6	Participants will be able to demonstrate the management of saline soil for crop production.	Management of saline soil for crop production	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview on management of saline soil for crop production. After presentation and discuss he will arrange brainstorming among the participants on the related issue.

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
7	The trainees will be able to review and discuss the cropping pattern in flood, saline & drought prone areas of Bangladesh	Cropping pattern in flood, saline & drought prone areas of Bangladesh	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, Multimedia projector etc.	Feedback discussion	The trainer will explain the cropping pattern in flood, saline & drought prone areas of Bangladesh.
8	Participants will be able to explain about modern cultivation techniques of different crops in saline, flood and drought prone areas	Modern cultivation techniques of different crops in saline, flood and drought prone areas	Presentation, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview the modern cultivation techniques of different crops in saline, flood and drought prone areas. After presentation and discuss he will arrange sharing of ideas with the trainees.
9	Participants will be able to share experience and explain about advanced rice production Technology for vulnerable areas of Bangladesh	Advanced rice production technology for vulnerable areas of Bangladesh	Presentation, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain advanced rice production technology for vulnerable areas of Bangladesh followed by discussion and sharing of ideas.
10	Participants will be able to explain and select the techniques of community seed bed (floating seed bed) preparation in flood	Community seed bed preparation techniques in flood prone areas	Presentation, visual demonstration, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia	Feedback discussion	The trainer will explain the importance of floating seed bed preparation in flood prone areas followed by visual demonstration,

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	prone areas				projector etc.		discussion and sharing of ideas.
11	Participants will be able to explain the techniques of community seed bed preparation in draught prone areas	Community seed bed preparation techniques in drought prone areas	Presentation, visual demonstration, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain the importance of community seed bed preparation in draught prone areas followed by visual demonstration, discussion and sharing of ideas.
12	Participants will be able to describe the techniques of vegetable, specially year-round vegetable production in saline, flood, drought prone areas	Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will demonstrate the techniques of vegetable, especially year-round vegetable production in saline, flood, and drought prone areas by using multimedia.
13	Participants will be able to discuss about the special activities for hilly areas	Special agricultural activities for hilly areas	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain the special activities for hilly areas including some case studies. After presentation and discuss he will arrange brainstorming for the agricultural activities in the hilly areas
14	The trainees will be able	Eco-friendly plant	Pictorial	60	Multimedia	Feedback	The trainer will conduct



SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	to update knowledge about the merits and demerits of traditional chemical and eco-friendly plant nutrient practices.	nutrient management practices for flood, salinity and drought prone areas	presentation, discussion, brainstorming and sharing of ideas	minutes	projector, DVD, Microphone, handout, whiteboard, marker, etc.	discussion	pictorial presentation about merits and demerits of traditional chemical and eco-friendly plant nutrient practices followed by organic manure preparation
15	The trainees will be able to update knowledge about the merits and demerits of traditional chemical and eco-friendly pest management practices.	Eco-friendly pest management practices for crop production	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, Microphone, handout, whiteboard, marker, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits and demerits of traditional chemical and eco-friendly pest management practices and preparation of some those practices.
16	The trainees will be able to update knowledge on the merits of afforestation and the procedures of tree plantation	Afforestation to mitigate climate change risk	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, Microphone, handout, whiteboard, marker, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits of afforestation and procedure of tree plantation.
17	Participants will be able to review approach on livestock management in water logged, salinity and drought prone areas.	Livestock management in water logged, salinity and drought prone areas	Discussion, presentation of case study report and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia	Feedback discussion	The trainer will overview on livestock management in water logging, flood, salinity and drought prone areas including some case

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
					projector etc.		studies.
18	Participants will be able to explain fisheries management in water logged, salinity and drought prone areas.	Fisheries management in water logged, salinity and drought prone areas	Discussion, presentation of case study report and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview on fisheries management in water logging, flood, salinity and drought prone areas including some case studies.
19	Trainees will be able to apply rapid CCA at the time of emergency	Rapid CCA at the time of emergency	Lecturing, presentation of case study results, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain rapid CCA at the time of emergency with case studies results followed by sharing of ideas.
20	Participants will be able to prepare production plan to reduce climate change losses	Bottom-up planning for CCA to reduce losses	Group work, group presentation followed by combined discussion	60 minutes	Microphone, poster paper, sign pen, whiteboard, marker, etc.	Observing plan	The facilitators will help the trainees to prepare future production plan to reduce climate change losses. Prepared plan will be present by group leaders. Combined plan will then be prepared.

## 9. LIST OF TRAINING MATERIALS

Following materials are required for trainers and trainees for implementing the training:

Multimedia projector, projection screen, laptop computers, laser printers, scanner, digital camera, training module, poster papers, sign pens, white boards, white board markers, offset paper, printing leaflet, booklet, handout etc., microphone, books and literature related to climate change impacts and adaptation in Bangladesh.

## 10. FEEDBACK FORM

The feedback form in Annexure II may be used for getting feedback from the trainees.

## 11. SCHEDULE OF TRAINING PROGRAM

### OFFICE OF THE DEPUTY DIRECTOR

(Name of the District), Bangladesh

In-service Training Schedule on

Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh

**Trainees:** Thirty (30) Sub-Assistant Agriculture Officers of the District

**Course Coordinator:** District Training Officer, (Name of the District)

**Place:** District Training Hall, (Name of the District) / ATI, (Place)

**Duration:** 5 days (From ..... to .....)

Day	Time	Topics	Facilitators
Previous day of starting training	16.00-19.00	Arrival, registration & room allotment	Representatives of the Course Coordinator
	19.00-20.00	Dinner	
	20.00-21.00	Norms, rules and disciplines of Training	Deputy Director District Training Officer
1 <sup>st</sup>	07.30-8.15	Morning preparation for training	
	08.15-09.00	Breakfast	
	09.00-09.30	Pre-test	Monitoring Team
	09.30-10.30	Inaugural session	Deputy Director with Chief and Special Guests
	10.30-11.00	Tea Break	
	11.00-12.00	Present status of climate change in Bangladesh	*
	12.00-13.00	Effects of climate change on agriculture, fisheries and livestock in Bangladesh	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15-30	Implication of meteorology for	*

Day	Time	Topics	Facilitators
		agricultural forecasting	
	15.30-16.00	Tea Break	
	16.00-17.00	Livelihood adaptation to climate change in agriculture	*
	19.00-20.00	Dinner	
2 <sup>nd</sup>	06.30-07.30	Morning Practical Work	
	07.30-8.15	Morning preparation for training	
	08.15-09.00	Breakfast	
	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Water resource management in Bangladesh due to climate change	*
	10.30-11.00	Tea Break	
	11.00-12.00	Management of saline soil for crop production	*
	12.00-13.00	Cropping pattern in flood, saline & drought prone areas of Bangladesh	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Modern cultivation techniques of different crops in saline, flood and drought prone areas	*
	15.30-16.00	Tea Break	
	16.00-17.00	Advanced rice production technology for vulnerable areas of Bangladesh	*
	19.00-20.00	Dinner	
3 <sup>rd</sup>	06.30-07.30	Morning Practical Work	
	07.30-8.15	Morning preparation for training	
	08.15-09.00	Breakfast	
	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Community seed bed preparation techniques in flood prone areas	*
	10.30-11.00	Tea Break	
	11.00-12.00	Community seed bed preparation techniques in drought prone areas	*
	12.00-13.00	Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Special agricultural activities for hilly areas	*
	15.30-16.00	Tea Break	
	16.00-17.00	Eco-friendly plant nutrient management practices for flood, salinity and drought	*

Day	Time	Topics	Facilitators
		prone areas	
	19.00-20.00	Dinner	
4 <sup>th</sup>	06.30-07.30	Morning Practical Work	
	07.30-8.15	Morning preparation for training	
	08.15-09.00	Breakfast	
	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Eco-friendly pest management practices for crop production	*
	10.30-11.00	Tea Break	
	11.00-12.00	Afforestation to mitigate climate change risk	*
	12.00-13.00	Livestock management in water logged, salinity and drought prone areas	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Fisheries management in water logged, salinity and drought prone areas	*
	15.30-16.00	Tea Break	
	16.00-17.00	Rapid climate change adaptation at the time of emergency	*
	19.00-21.00	Cultural Function	
	21.00-22.00	Dinner	
5 <sup>th</sup>	06.30-07.30	Morning Practical Work	
	07.30-8.15	Morning preparation for training	
	08.15-09.00	Breakfast	
	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Bottom-up planning for climate change adaptation to reduce losses	*
	10.30-11.00	Tea Break	
	11.00-11.30	Post-test	Monitoring Team
	11.30-13.00	Planning Session	DD, DTO. CPS, PPS, IS, HS etc.
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Concluding Remarks	Deputy Director District Training Officer
	15.30-16.00	Tea Break	
	16.00-17.00	Closing session with certificate distribution ceremony	Deputy Director with Chief and Special Guests
	17.00	Departure from the Training Place	

\*Facilitators to be selected at the time of planning training schedule

### Implementation of the training module

Twenty knowledge and skill areas are proposed for the 5-day training in this module. Detailed course content and delivery procedure will be developed by national level experts from DAE, different universities, research organizations under NARS and other relevant organizations. With these detailed course content and delivery procedure, initially training will be conducted for national policy level personnel of DAE, BARC, NARS organizations and universities. They will then act as facilitators for the training of Mid level officials of DAE. These mid level Officers will then conduct training for entry level SAAOs.

There are 12832 SAAOs in 64 districts in Bangladesh. Out of 64 districts, 5 districts will be selected purposively based on severity of climate change vulnerability. One batch of 30 SAAOs are to be trained in each of 5 selected Districts. Therefore, a total of 150 SAAOs will receive these in-service training at piloting phase.

### Cost estimation for this training

Items of Expenditure	Amount (BDT)
For each batch:	
i. Allowances for 30 trainees @ 1000 per day X 5 days X 30 persons	1,50,000.00
ii. Allowances for trainers @ 1000 per lecture X 20	20,000.00
iii. Logistics @ 500 x 30	15,000.00
iv. TA for 30 trainees @ 500 X 30	15,000.00
v. Allowances for 4 evaluators @ 3000 X 4	12,000.00
vi. Allowances for Course Coordinator @ 3000 X 1	3,000.00
vii. Allowances for Co-Course Coordinator @ 3000 X 1	3,000.00
viii. Materials, field visit and administrative cost	32,000.00
Total for each batch	2,50,000.00
Total for 5 batches @ 2,15,000.00 X 5	12,50,000.00

## ii. Induction Training Module for Sub-Assistant Agriculture Officers of DAE

### 1. INTRODUCTION

Department of Agricultural Extension (DAE) is the largest extension provider for the agricultural farming community in Bangladesh. Sub-Assistant Agriculture Officers (SAAOs) are the root level (locally known as Block Level) workers of DAE. They work for the betterment of farmers. Rural farmers of Bangladesh are very much shocked by various types of climate change. Farmers of Bangladesh are generally faced water logging, flood, drought, salinity, etc. for their farming activities. As a result, agricultural productivity is reduced.

SAAOs are responsible to disseminate agricultural innovations to the farmers to reduce the losses of agricultural productivity. For this reasons, it is necessary to provide training to the SAAOs so that

they make themselves able to help the farmers to reduce their agricultural losses. SAAOs can further provide training to the farmers as facilitators. On these considerations, “Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific” project has taken an initiative to prepare training module for developing capacity of Trainers like SAAOs of Bangladesh.

This module can facilitate to provide 2-day training courses to the SAAOs at root level in addition with normal induction training aiming to introduce them with the concepts of climate change, its impacts on agricultural farming communities and the existing institutional and community based mechanisms for climate change adaptation.

## **2. TARGET GROUP**

Sub-Assistant Agricultural Officers (SAAOs) of DAE: SAAOs are the Block (root) level frontline extension workers of DAE.

## **3. ENTRY BEHAVIOUR**

**Age:** 22-32 years

**Educational Background:** 4 years Agricultural Diploma from Agricultural Training Institute (ATA) after passing 10 years Secondary School Certificate examination

**Level of knowledge and skill on the training module being conducted:** Though the SAAOs have little knowledge and skill on climate change adaptation, they have knowledge and skill on agricultural farming activity.

**Expected skill and knowledge levels of the trainer/trainees before entering into the module:** SAAOs of DAE will be the main trainers to provide training to the farmers. But at first the SAAOs should be trained by the Upazilla (Sub-district) and District Level Officials having at least Bachelor of Agricultural Science (B.Sc.Ag.) Degree. In this phase, newly recruited SAAOs are to be selected as trainees.

## **4. GOAL AND LEARNING OBJECTIVES**

**GOAL:** Capacity building for SAAOs as Trainers for climate change adaptation planning

**LEARNING OBJECTIVES:** After receiving training, the SAAOs will be able to:

Update their knowledge on climate change adaptation

Identify new coping practices for climate change adaptation

Create awareness among the farmers to minimize their agricultural losses

Create awareness among the rural poor on climate change adaptation planning

Provide training to the rural poor on climate change adaptation

## **5. IMPLEMENTATION MODALITIES**

Number of Batch for training: 5 Batches for piloting

**Trainers:** District Training Officer (DTO) will be Course Coordinator for the training. For each batch of training 20 trainers will be required. Deputy Directors (DD), District Training Officers (DTO), Crop Production Specialists (CPS), Plant Protection Specialists (PPS), Horticulture Specialists (HS), Irrigation Specialists (IS), Upazilla (Sub-District) Upazilla Agriculture Officers (UAO), Additional Agricultural Officers (AAO), Agricultural Extension Officers (AEO) will be the trainer.

**Trainees:** Thirty (30) SAAOs will be the trainees for each batch, i.e. 150 newly recruited SAAOs for 5 batches

Duration of training: 5 days

**Collaboration with other organization:** Five (5) batches will be held at 5 selected District Training Hall. For accommodation facilities, training may be arranged at nearer ATI of the district. Facilitators may be selected from nearer stations of agricultural research institutes and universities, Directorate of Livestock Services (DLS), Directorate of Fisheries (DOF), and Meteorological Departments etc. for special cases.

**Facilities required:**

Fund for TA, DA and Honorarium for Trainers, Trainees, Evaluators and Course Coordinator

Fund for training materials and field visit

Training equipments like multimedia projectors with laptop computer, screen, UPS, high capacity sound system, digital camera, printer, scanner etc.

## 6. EXPECTED OUTCOMES

After receiving training, the trainees will be able to:

Explain climate change adaptation and related issues

Identify new coping practices for climate change adaptation

Identify the ways of minimizing agricultural losses

Plan for climate change adaptation

Prepare themselves as a climate change adaptation trainers

## 7. EVALUATION

Pre-test and post-test of the trainees on training contents for each training batch will be conducted by evaluation team. Mean difference obtained by paired t-test may be the basis of initial evaluation. Internal evaluation through a self-rated scale and external evaluation through their job performance after the training may be done in three-six months interval.



## 8. Session Details

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1.	Participants will be able to review and explain the present status of climate change in Bangladesh	Present status of climate change in Bangladesh	Lecturing, showing video maps and data table followed by discussion	60 min	Maps, data table, DVD, multimedia projector, handout, whiteboard, marker, microphone, etc.	By feedback discussion	Facilitator will explain the present status of climate change in Bangladesh by showing related documents in video, maps and climate related data with the help of a multimedia. Then he will discuss the matter with the participants.
2.	Participants will be able to assess the extent of damage due to climate change on agriculture, fisheries and livestock in Bangladesh	Effects of climate change on agriculture, fisheries and livestock in Bangladesh	Lecturing, video show, data presentation and discussion	60 min	Multimedia projector, handout, marker with whiteboard, microphone, poster and flash cards	By feedback discussion	The trainer will overview on the effects of climate change on agriculture, fisheries and livestock in Bangladesh by showing video documents and previous data.
3.	Participants will be able to explain about meteorology and its implication for agricultural forecasting	Implication of meteorology for agricultural forecasting	Lecturing, observation, video show followed practicing forecasting	60 min	Meteorological instruments, microphone, handout, marker,	By feedback discussion	The trainer will overview on meteorological implication for agricultural forecasting followed by showing forecasting tools.

					whiteboard, Multimedia projector etc.		
4	Participants will be able to review and familiarize on livelihood adaptation to climate change in agriculture	Livelihood adaptation to climate change in agriculture	Lecturing, case study presentation, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia	Feedback discussion	The trainer will overview on livelihood adaptation to climate change in agriculture. After presentation and discuss he will arrange brainstorming for livelihood adaptation to climate change in agriculture.
5.	The trainees will be able to explain and discuss on advantage and disadvantage of various cropping pattern in flood, saline & drought prone areas of Bangladesh	Cropping pattern in flood, saline & drought prone areas of Bangladesh	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain the cropping pattern in flood, saline & drought prone areas of Bangladesh
6.	Participants will be able to review and explain modern cultivation techniques of different crops in saline, flood and drought prone areas	Modern cultivation techniques of different crops in saline, flood and drought prone areas	Presentation, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, Multimedia projector etc.	Feedback discussion	The trainer will overview the modern cultivation techniques of different crops in saline, flood and drought prone areas followed by sharing of ideas.
7.	The trainees will be able	Integrated Crop	Pictorial	60	Multimedia	Feedback	The trainer will conduct

	to update their knowledge about Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas	Management and eco-friendly agricultural practices for flood, salinity and drought prone areas	presentation, discussion, brainstorming and sharing of ideas	minutes	projector, DVD, Microphone, handout, whiteboard, marker, etc.	discussion	pictorial presentation about merits and demerits of Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas followed by organic manure preparation.
8.	The trainees will be able to update his knowledge on the merits of afforestation and the procedures of tree plantation	Afforestation to mitigate climate change risk	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, Microphone, handout, whiteboard, marker, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits of afforestation and procedure of tree plantation.
9.	Trainees will be able to describe and apply rapid climate change adaptation at the time of emergency	Rapid climate change adaptation at the time of emergency	Lecturing, presentation of case study results, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain rapid climate change adaptation at the time of emergency with case studies results followed by sharing of ideas.
10.	Participants will be able to identify guideline to prepare production plan to reduce climate change losses	Bottom-up planning for climate change adaptation to reduce losses	Group work, group presentation followed by combined discussion	60 minutes	Microphone, poster paper, sign pen, whiteboard, marker, etc.	Observing plan	The facilitators will help the trainees to prepare future production plan to reduce climate change losses. Prepared plan will be present by group leaders. Combined plan will then be prepared.

## 9. LIST OF TRAINING MATERIALS

Following materials are required for trainers and trainees for implementing the training:

Multimedia projector, projection screen, laptop computers, laser printers, scanner, digital camera, training module, poster papers, sign pens, white boards, white board markers, offset paper, printing leaflet, booklet, handout etc., microphone, books and literature related to climate change impacts and adaptation in Bangladesh.

## 10. FEEDBACK FORM

The feedback form in Annexure II of this report may be used for getting feedback from the trainees.

## 11. SCHEDULE OF TRAINING PROGRAM

### OFFICE OF THE DEPUTY DIRECTOR

(Name of the District), Bangladesh

### Induction Training Schedule on

### Climate Change Adaptation for Sub-Assistant Agriculture Officers of the Department of Agricultural Extension of Bangladesh

**Trainees:** Thirty (30) newly recruited Sub-Assistant Agriculture Officers of the District

**Course Coordinator:** District Training Officer, (Name of the District)

**Place:** District Training Hall, (Name of the District) / ATI, (Place)

**Duration:** 2 days (From ..... to .....)

Day	Time	Topics	Facilitators
1 <sup>st</sup>	09.00–09.30	Registration	
	09.30-10.00	Pre-test	Monitoring Team
	10.00-11.00	Present status of climate change in Bangladesh	*
	11.00-11.30	Tea Break	
	11.30-12.30	Effects of climate change on agriculture, fisheries and livestock in Bangladesh	*
	12,30-13.30	Implication of meteorology for agricultural forecasting	*
	13.30-14.30	Lunch and Prayer Break	
	14.30-15-30	Livelihood adaptation to climate change in agriculture	*
	15.30-16.00	Tea Break	
	16.00-17.00	Cropping pattern in flood, saline & drought prone areas of Bangladesh	*
	09.00-10.00	Modern cultivation techniques of different crops in saline, flood and drought prone	*

2 <sup>nd</sup>		areas	
	10.00-11.00	Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas	*
	11.00-11.30	Tea Break	
	11.30-12.30	Afforestation to mitigate climate change risk	*
	12.30-13.30	Rapid climate change adaptation at the time of emergency	*
	13.30-14.30	Lunch and Prayer Break	
	14.30-15.30	Bottom-up planning for climate change adaptation to reduce losses	*
	15.30-15.50	Post-test	Monitoring Team
	15.50-16.10	Tea Break	
	16.10-17.00	Concluding Remarks & Closing session	DD, DTO

\*Facilitators to be selected at the time of planning training schedule

### Implementation of the training module

Ten knowledge and skill areas are proposed for the 2-day induction training in this module. Detailed course content and delivery procedure will be developed by national level experts from DAE, different universities, research organizations under NARS and other relevant organizations. With these detailed course content and delivery procedure, initially training will be conducted for national policy level personnel of DAE, BARC, NARS organizations and universities. They will then act as facilitators for the training of Mid level officials of DAE. These mid level Officers will then conduct training for entry level SAAOs.

At present, there are 12832 SAAOs in 64 districts in Bangladesh. In each year, 400-800 SAAOs are newly recruited. Out of 64 districts, 5 districts will be selected purposively based on severity of climate change vulnerability. One batch of 30 newly recruited SAAOs are to be trained in each of 5 selected Districts. If there is shortage of newly recruited SAAOs in the selected District, selection will be done from nearer District within the Region. Therefore, a total of 150 newly recruited SAAOs will receive these induction training at piloting phase.

### Cost estimation for this training

Items of Expenditure	Amount (BDT)
For each batch:	
i. Allowances for 30 trainees @ 1000 per day X 2 days X 30 persons	60,000.00
ii. Allowances for trainers @ 1000 per lecture X 10	10,000.00
iii. Logistics @ 500 x 30	15,000.00
iv. TA for 30 trainees @ 500 X 30	15,000.00
v. Allowances for 4 Evaluators @ 3000 X 4	12,000.00
vi. Allowances for Course Coordinator @ 3000 X 1	3,000.00
vii. Allowances for Co-Course Coordinator @ 3000 X 1	3,000.00
viii. Materials and administrative cost	12,000.00

Total for each batch	1,30,000.00
Total for 5 batches @ 1,30,000.00 X 5	6,50,000.00

### iii. In-service Training Module for District and Upazilla (Sub-District) level Agriculture Officers of DAE

#### 1. INTRODUCTION

Department of Agricultural Extension (DAE) is the largest extension provider for the agricultural farming community in Bangladesh. Sub-Assistant Agriculture Officers (SAAOs) are the root level (locally known as Block Level) workers of DAE. They work for the betterment of farmers. Rural farmers of Bangladesh are very much shocked by various types of climate change. Farmers of Bangladesh are generally faced water logging, flood, drought, salinity, etc. for their farming activities. As a result, agricultural productivity is reduced. SAAOs are responsible to disseminate agricultural innovations to the farmers to reduce the losses of agricultural productivity. These SAAOs receive training from District and Upazilla (Sub-District) level Officers of DAE.

For the above reasons, it is necessary to provide training to the District and Upazilla (Sub-District) level Officers of DAE so that they can provide training to the SAAOs. On these considerations, “Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific” project has taken an initiative to prepare training module for developing capacity of Trainers like District and Upazilla (Sub-District) level Officers of DAE of Bangladesh.

This module can facilitate to train the mid-level (District and Upazilla) Officials like DD, DTO, CPS, PPS, HS, IS, UAO, AAO and AEOs aiming to introduce them with the concepts of climate change, its impacts on agricultural farming communities and the existing institutional and community based mechanisms for climate change adaptation.

#### 2. TARGET GROUP

Deputy Director (DD), District Training Officer (DTO), Crop Production Specialist (CPS), Plant Protection Specialist (PPS), Horticulture Specialist (HS) and Irrigation Specialist (IS) of District Level and Upazilla Agriculture Officer (UAO), Additional Agriculture Officer (AAO) and Agriculture Extension Officer (AEO) of Upazilla (Sub-District) level of DAE.

#### 3. ENTRY BEHAVIOUR

**Age:** 30-57 years

**Educational Background:** 4 years B. Sc. Ag. (Hons.) Degree from any Agricultural University

**Level of knowledge and skill on the training module being conducted:** There are limited meteorological courses in B. Sc. Ag. (Hons.) degree in the Agricultural Universities of Bangladesh. So, Upazilla and District level Agricultural Officers of DAE have little knowledge and skill on climate change adaptation, but they have knowledge and skill on agricultural farming activity.

**Expected skill and knowledge levels of the trainer/trainees before entering into the module:** In this phase, District and Upazilla level Officials of DAE having at least 5 years working experience should be selected. National policy level Officials of DAE, research organizations and universities and relevant experts will act as facilitators/Trainers for this training.

#### **4. GOAL AND LEARNING OBJECTIVES**

**Goal:** Capacity building for District and Upazilla level Officers of DAE as Trainers for climate change adaptation planning

**Learning Objectives:** After receiving training, the trainees will be able to:

Update their knowledge on climate change adaptation

Identify new coping practices for climate change adaptation

Create awareness among the SAAOs to minimize agricultural losses

Create awareness among the SAAOs on climate change adaptation planning

Provide training to the SAAOs on climate change adaptation

#### **5. IMPLEMENTATION MODALITIES**

Number of Batch for training: 5 Batches for piloting

**Trainers:** These training will be held at Central Extension Resources Development Institute (CERDI) at Gazipur. Executive Director, CERDI will be Course Coordinator for the training. National policy level Officials of DAE, research organizations and universities and relevant experts will act as facilitators/Trainers for this training.

**Trainees:** Thirty (30) District and Upazilla level Officers of DAE will be the trainees for each batch, i.e. 150 Officers for 5 batches

**Duration of training:** 5 days

**Collaboration with other organization:** Five (5) batches will be held at CERDI, Gazipur. Facilitators may be selected from national agricultural research institutes, universities meteorological departments etc. for special cases.

#### **Facilities required:**

Fund for TA, DA and Honorarium for Trainers, Trainees, Evaluators and Course Coordinator

Fund for training materials and field visit

Training equipments like multimedia projectors with laptop computer, screen, UPS, high capacity sound system, digital camera, printer, scanner etc.

#### **6 EXPECTED OUTCOMES**

After receiving training, the trainees will be able to:

Explain climate change adaptation and related issues

Identify new coping practices for climate change adaptation

Identify the ways of minimizing agricultural losses

Plan for climate change adaptation

Prepare themselves as a climate change adaptation trainers

## **7. EVALUATION**

Pre-test and post-test of the trainees on training contents for each training batch will be conducted by evaluation team. Mean difference obtained by paired t-test may be the basis of initial evaluation. Internal evaluation through a self-rated scale and external evaluation through their job performance after the training may be done in three-six months interval. Evaluation team will be composed of three members of country TNA team.



## 8. Session Details

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1.	Participants will be able to review and discuss the present status of climate change in Bangladesh	Concept of climate change and its present status in Bangladesh	Lecturing, showing video, maps and data table followed by discussion	60 min	Maps, data table, DVD, multimedia projector, handout, whiteboard, marker, microphone, etc.	By feedback discussion	Facilitator will explain the present status of climate change in Bangladesh by showing related documents in video, maps and climate related data with the help of a multimedia. Then he will discuss the matter with the participants.
2.	Participants will be able to state the types of vulnerabilities due to climate change and its regulatory framework in Bangladesh	Types of climate change vulnerabilities and its regulatory framework in Bangladesh	Lecturing, showing video, maps and data table followed by discussion	60 min	Microphone, handout, whiteboard, marker, Multimedia projector etc.	By feedback discussion	Facilitator will present the types of climate change vulnerabilities and its regulatory framework in Bangladesh with the help of a multimedia. After presentation he will discuss among the participants

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
3.	Participants will be able to discuss physical, socio-economic and emotional impacts of different types of climate change	Physical, socio-economic and emotional impacts of climate change	Pictorial Presentation followed by discussion	60 min	DVD, Multimedia projector, Microphone, handout, whiteboard, marker, etc.	By feedback discussion	The trainer will show physical, socio-economic and emotional impacts of different climate change hazards by pictorial presentation. He will then overview and discuss about the matter.
4.	Participants will be able to assess the extent of damage due to climate change on agriculture, fisheries and livestock in Bangladesh	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	Lecturing, video show, data presentation and discussion	60 min	Multimedia projector, DVD, handout, whiteboard with marker, microphone, poster and flash cards	By feedback discussion	The trainer will overview on the effects of climate change on agriculture, fisheries and livestock in Bangladesh by showing video documents and previous data.
5.	Participants will be able to explain about meteorology and its implication for agricultural forecasting	Implication of meteorology for agricultural forecasting	Lecturing, observation, video show followed practicing forecasting	60 min	Meteorological instruments, leaflet, handout, microphone, Multimedia projector etc.	By feedback discussion	The trainer will overview on meteorological implication for agricultural forecasting followed by showing forecasting tools.
6.	Participants will be able to get acquainted on livelihood adaptation to climate change in	Livelihood adaptation to climate change in agriculture	Lecturing, case study presentation, discussion and	60 min	Microphone, handout, whiteboard, marker,	Feedback discussion	The trainer will overview on livelihood adaptation to climate change in agriculture. After

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	agriculture		sharing of ideas		Multimedia		presentation and discuss he will arrange brainstorming for livelihood adaptation to climate change in agriculture.
7.	Trainees will be able to discriminate vulnerabilities of male and female due to climate change shocks.	Gender discrimination in climate change shocks	Lecturing, case study presentation, discussion and sharing of ideas	60 min	Microphone, handout, marker, whiteboard, Multimedia projector etc.	Feedback discussion	The trainer will show discriminating vulnerabilities by sex due to climate change shocks including some case studies.
8.	Participants will be able to define duties and responsibilities of community based local, Upazilla, District and national level Officials climate change adaptation.	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	Lecturing followed by discussion and sharing of ideas	60 min	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview on duties and responsibilities of community based local, Upazilla, district and national level disaster managers After presentation and discuss he will arrange to sharing of ideas with the trainees.
9.	Participants will be able to define duties and responsibilities of community based local,	Water resource management in Bangladesh due to climate change	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker,	Feedback discussion	The trainer will discuss water resource management in Bangladesh due to climate

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	Upazilla, District and national level Officials climate change adaptation.				Multimedia projector etc.		change with sharing previous experiences.
10.	Participants will be able to prepare guideline for management of saline soil for crop production.	Management of saline soil for crop production	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview on management of saline soil for crop production. After presentation and discuss he will arrange brainstorming among the participants on the related issue.
11.	The trainees will be able to discuss the suitable cropping pattern in flood, saline & drought prone areas of Bangladesh	Suitable cropping pattern in flood, saline & drought prone areas of Bangladesh	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, marker, whiteboard, Multimedia projector etc.	Feedback discussion	The trainer will explain the suitable cropping pattern in flood, saline & drought prone areas of Bangladesh
12.	Participants will be able to explain about modern cultivation techniques of different crops in saline, flood and drought prone areas	Modern cultivation techniques of different crops in saline, flood and drought prone areas	Presentation, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview the modern cultivation techniques of different crops in saline, flood and drought prone areas. After presentation and discuss he will arrange sharing of ideas with the trainees.

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
13.	Participants will be able to explain the techniques of community seed bed preparation in draught prone areas and floating seed be preparation in flood prone areas	Community seed bed preparation techniques in drought and flood prone areas	Presentation, visual demonstration, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain the importance of community seed bed preparation in draught prone areas and floating seed bed preparation in flood prone areas followed by visual demonstration, discussion and sharing of ideas.
14.	Participants will be able to describe the techniques of vegetable, specially year-round vegetable production in saline, flood, drought prone areas	Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will demonstrate the techniques of vegetable production, especially year-round vegetable production in saline, flood, and drought prone areas by using multimedia.
15.	Participants will be able to discuss about the special activities for hilly areas	Special agricultural activities for hilly areas	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain the special activities for hilly areas including some case studies. After presentation and discuss he will arrange brainstorming for the agricultural activities in the hilly areas
16.	The trainees will be able	Eco-friendly plant	Pictorial	60 minutes	Multimedia	Feedback	The trainer will conduct

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	to update knowledge about the merits and demerits of traditional chemical and eco-friendly plant nutrient practices.	nutrient management practices for flood, salinity and drought prone areas	presentation, discussion, brainstorming and sharing of ideas		projector, DVD, Microphone, handout, whiteboard, marker, etc.	discussion	pictorial presentation about merits and demerits of traditional chemical and eco-friendly plant nutrient practices followed by organic manure preparation
17.	The trainees will be able to update knowledge about the merits and demerits of traditional chemical and eco-friendly pest management practices.	Eco-friendly pest management practices for crop production	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, Microphone, handout, whiteboard, marker, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits and demerits of traditional chemical and eco-friendly pest management practices and preparation of some those practices.
18.	The trainees will be able to update knowledge on the merits of afforestation and the procedures of tree plantation	Afforestation to mitigate climate change risk	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, Microphone, handout, whiteboard, marker, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits of afforestation and procedure of tree plantation.
19.	Trainees will be able to describe rapid climate change adaptation at the time of emergency	Rapid climate change adaptation at the time of emergency	Lecturing, presentation of case study results, discussion and sharing of ideas	60 minutes	Microphone, handout, marker, whiteboard, Multimedia	Feedback discussion	The trainer will explain rapid climate change adaptation at the time of emergency with case studies results followed by

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
					projector etc.		sharing of ideas.
20.	Participants will be able to prepare production plan to reduce climate change losses	Planning for climate change adaptation to reduce losses	Group work, group presentation followed by combined discussion	60 minutes	Microphone, poster paper, sign pen, whiteboard, marker, etc.	Observing plan	The facilitators will help the trainees to prepare future production plan to reduce climate change losses. After preparing the plan by groups, those will be present by group leaders to prepare combined plan.

## 9. LIST OF TRAINING MATERIALS

Following materials are required for trainers and trainees for implementing the training:

Multimedia projector, projection screen, laptop computers, laser printers, scanner, digital camera, training module, poster papers, sign pens, white boards, white board markers, offset paper, printing leaflet, booklet, handout etc., microphone, books and literature related to climate change impacts and adaptation in Bangladesh.

## 10. FEEDBACK FORM

The feedback form in Annexure II of this report may be used for getting feedback from the trainees.

## 11. SCHEDULE OF TRAINING PROGRAM

CENTRAL EXTENSION RESOURCES DEVELOPMENT INSTITUTE

GAZIPUR, BANGLADESH

In-service Training Schedule on

Climate Change Adaptation for District and Upazilla (Sub-District) level Agriculture Officers of the Department of Agricultural Extension of Bangladesh

**Trainees:** Thirty (30) District and Upazilla (Sub-District) level Agriculture Officers of the DAE

**Course Coordinator:** Executive Director, CERDI

**Place:** CERDI, Gazipur

**Duration:** 5 days (From ..... to .....)

Day	Time	Topics	Facilitators
1 <sup>st</sup>	08.30-09.00	Registration	
	09.00-09.30	Pre-test	Monitoring Team
	09.30-10.30	Inaugural session	Executive Director, CERDI with Chief and Special Guests
	10.30-11.00	Tea Break	
	11.00-12.00	Concept of climate change and its present status in Bangladesh	*
	12.00-13.00	Types of climate change vulnerabilities and its regulatory framework in Bangladesh	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Physical, socio-economic and emotional impacts of climate change	*
	15.30-16.00	Tea Break	
	16.00-17.00	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	*
	09.00-09.30	Recapitulate of last day activities	



Day	Time	Topics	Facilitators
2 <sup>nd</sup>	09.30-10.30	Implication of meteorology for agricultural forecasting	*
	10.30-11.00	Tea Break	
	11.00-12.00	Livelihood adaptation to climate change in agriculture	*
	12.00-13.00	Gender discrimination in climate change shocks	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	*
	15.30-16.00	Tea Break	
	16.00-17.00	Water resource management in Bangladesh due to climate change	*
3 <sup>rd</sup>	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Management of saline soil for crop production	*
	10.30-11.00	Tea Break	
	11.00-12.00	Suitable cropping pattern in flood, saline & drought prone areas of Bangladesh	*
	12.00-13.00	Modern cultivation techniques of different crops in saline, flood and drought prone areas	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Community seed bed preparation techniques in drought and flood prone areas	*
	15.30-16.00	Tea Break	
	16.00-17.00	Vegetable production techniques in saline, flood, drought prone areas with special emphasis on year-round vegetable production	*
4 <sup>th</sup>	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Special agricultural activities for hilly areas	*
	10.30-11.00	Tea Break	
	11.00-12.00	Eco-friendly plant nutrient management practices for flood, salinity and drought prone areas	*
	12.00-13.00	Eco-friendly pest management practices for crop production	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Afforestation to mitigate climate change	*

Day	Time	Topics	Facilitators
		risk	
	15.30-16.00	Tea Break	
	16.00-17.00	Rapid climate change adaptation at the time of emergency	*
5 <sup>th</sup>	08.00-10.30	Field Visit	*
	10.30-11.00	Tea Break	
	11.00-11.30	Post-test	Monitoring Team
	11.30-13.00	Planning for climate change adaptation to reduce losses	Director, Field Service Wing, DAE
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Concluding Remarks	Director, Training Wing, DAE
	15.30-16.00	Tea Break	
	16.00-17.00	Closing session with certificate distribution ceremony	Director, CERDI with Chief and Special Guests
	17.00	Departure from the Training Place	

\*Facilitators to be selected at the time of planning training schedule

### Implementation of the training module

Twenty knowledge and skill areas are proposed for the 5-day training in this module. Detailed course content and delivery procedure will be developed by national level experts from DAE, different universities, research organizations under NARS and other relevant organizations. With these detailed course content and delivery procedure, initially training will be conducted for national policy level personnel of DAE, BARC, NARS organizations and universities. They will then act as facilitators for the training of Mid level (District and Upazilla) officers of DAE.

There are 1772 District and Upazilla level Officers of DAE in 64 districts in Bangladesh. Out of these 1772 Officers, 150 Officers will be selected from purposively selected 15 Districts based on severity of climate change vulnerability by taking 10 from each District. These 150 selected Officers will be trained in 5 batches by taking 30 in each batch.

### Cost estimation for this training

Items of Expenditure	Amount (BDT)
For each batch:	
i. Allowances for 30 trainees @ 1500 per day X 5 days X 30 persons	2,25,000.00
ii. Allowances for trainers @ 1500 per lecture X 20	30,000.00
iii. Logistics @ 500 x 30	15,000.00
iv. TA for 30 trainees @ 500 X 30	15,000.00
v. Allowances for 4 Evaluators @ 3000 X 4	12,000.00
vi. Allowances for Course Coordinator @ 3000 X 1	3,000.00
vii. Allowances for Co-Course Coordinator @ 3000 X 1	3,000.00
viii. Materials and administrative cost	32,000.00

Total for each batch	3,35,000.00
Total for 5 batches @ 3,35,000.00 X 5	16,75,000.00

## iv. Induction Training Module for Agriculture Extension Officers (AEO) of DAE

### 1. INTRODUCTION

Several types of vulnerabilities are caused by climate change in Bangladesh as well as in the Asia and the Pacific Region. Vulnerabilities like flood, drought, salinity, etc. occur in Bangladesh due to climate change. Agricultural farming communities, i.e. farmers are mostly affected by the climate change. Besides agriculture, poultry, livestock and fisheries sectors are also affected by the consequences of climate change.

Department of Agricultural Extension (DAE) is the largest extension provider for the agricultural farming community in Bangladesh. Sub-Assistant Agriculture Officers (SAAOs) are the root level (locally known as Block Level) workers of DAE. They work for the betterment of farmers. Rural farmers of Bangladesh are very much shocked by various types of climate change. Farmers of Bangladesh are generally faced water logging, flood, drought, salinity, etc. for their farming activities. As a result, agricultural productivity is reduced. SAAOs are responsible to disseminate agricultural innovations to the farmers to reduce the losses of agricultural productivity. These SAAOs are directly supervised by Agricultural Extension Officers (AEO) of Upazilla (Sub-District) level of DAE.

For the above reasons, it is necessary to provide training to the newly recruited AEOs of DAE so that they can provide training to the SAAOs and supervise them properly. On these considerations, “Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific” project has taken an initiative to prepare induction training module for developing capacity of Trainers like AEO of DAE of Bangladesh.

This induction courses will be added with normal induction training of the AEOs. In case of non-arrangement of normal induction training for AEOs, this training can be arranged separately for them. This module can facilitate to provide induction training to the AEOs aiming to introduce them with the concepts of climate change, its impacts on agricultural farming communities and the existing institutional and community based mechanisms for climate change adaptation.

### 2. TARGET GROUP

Newly recruited Agriculture Extension Officer (AEO) of Upazilla level of DAE

### 3. ENTRY BEHAVIOUR

**Age:** 28-33 years

**Educational Background:** 4 years B. Sc. Ag. (Hons.) Degree from any Agricultural University

**Level of knowledge and skill on the training module being conducted:** There are limited meteorological courses in B. Sc. Ag. (Hons.) degree in the Agricultural Universities of Bangladesh. So,

AEOs have little knowledge and skill on climate change adaptation, but they have knowledge and skill on agricultural farming activity.

**Expected skill and knowledge levels of the trainer/trainees before entering into the module:** In this phase, newly recruited Upazilla level AEOs of DAE will be selected. National policy level Officials of DAE, research organizations and universities and relevant experts will act as facilitators/Trainers for this training.

#### **4. GOAL AND LEARNING OBJECTIVES**

**Goal:** capacity building for upazilla level aeos of dae as trainers for climate change adaptation planning

**Learning Objectives:** After receiving training, the trainees will be able to:

Update their knowledge on climate change adaptation

Identify new coping practices for climate change adaptation

Create awareness among the SAAOs to minimize agricultural losses

Create awareness among the SAAOs on climate change adaptation planning

Provide training to the SAAOs on climate change adaptation

#### **5. IMPLEMENTATION MODALITIES**

Number of Batch for training: 5 Batches for piloting

**Trainers:** These training will be held at Central Extension Resources Development Institute (CERDI) at Gazipur. Executive Director, CERDI will be Course Coordinator for the training. National policy level Officials of DAE, research organizations and universities and relevant experts will act as Facilitators/Trainers for this training.

**Trainees:** Newly recruited 30 AEOs of Upazilla level of DAE in each batch, i.e. 150 AEOs in 5 batches

**Duration of training:** 2 days

**Collaboration with other organization:** Five (5) batches will be held at CERDI, Gazipur. Facilitators may be selected from national agricultural research institutes, universities meteorological departments etc. for special cases.

#### **Facilities required:**

Fund for TA, DA and Honorarium for Trainers, Trainees, Evaluators and Course Coordinator

Fund for training materials and field visit

Training equipment like multimedia projectors with laptop computer, screen, UPS, high capacity sound system, digital camera, printer, scanner etc.

#### **6. EXPECTED OUTCOMES**

After receiving training, the trainees will be able to:

Explain climate change adaptation and related issues

Identify new coping practices for climate change adaptation

Identify the ways of minimizing agricultural losses

Plan for climate change adaptation

Prepare themselves as a climate change adaptation trainers

## **7. EVALUATION**

Pre-test and post-test of the trainees on training contents for each training batch will be conducted by evaluation team. Mean difference obtained by paired t-test may be the basis of initial evaluation. Internal evaluation through a self-rated scale and external evaluation through their job performance after the training may be done in three-six months interval.

## 8. Session Details

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1.	Participants will be able to review and explain different types of climate change vulnerabilities in Bangladesh and its regulatory framework	Extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	Lecturing, showing video, maps and data table followed by discussion	60 min	Maps, data table, DVD, multimedia projector, handout, whiteboard, marker, microphone, etc.	By feedback discussion	Facilitator will explain different types of climate change vulnerabilities in Bangladesh and its regulatory framework by showing related documents in video, maps and climate related data with the help of a multimedia.
2.	Participants will be able to assess the extent of damage due to climate change on agriculture, fisheries and livestock in Bangladesh	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	Lecturing, video show, data presentation and discussion	60 min	Multimedia projector, DVD, handout, whiteboard with marker, microphone,	By feedback discussion	The trainer will overview on the effects of climate change on agriculture, fisheries and livestock in Bangladesh by showing video documents and previous data.
3.	Participants will be able to explain about meteorology and its implication for agricultural forecasting	Implication of meteorology for agricultural forecasting	Lecturing, observation, video show followed practicing forecasting	60 min	Meteorological instruments, handout, Multimedia projector etc.	By feedback discussion	The trainer will overview on meteorological implication for agricultural forecasting followed by showing forecasting tools.

4.	Participants will be able to state duties and responsibilities of community based local, Upazilla, District and national level Officials climate change adaptation.	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	Lecturing followed by discussion and sharing of ideas	60 min	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview on duties and responsibilities of local, Upazilla, district and national level CCA managers followed by sharing of ideas.
5.	The trainees will be able to describe soil and water management in Bangladesh due to climate change	Soil and water management in Bangladesh due to climate change	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, marker, whiteboard, Multimedia projector etc.	Feedback discussion	The trainer will discuss soil and water management in Bangladesh due to climate change with sharing previous experiences.
6.	The trainees will be able to discuss the cropping pattern and modern cultivation techniques of different crops in flood, saline & drought prone areas of Bangladesh	Cropping pattern and modern cultivation techniques of different crops in flood, saline & drought prone areas of Bangladesh	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain the cropping pattern and modern cultivation techniques of different crops in flood, saline & drought prone areas of Bangladesh
7.	The trainees will be able to update their knowledge about Integrated Crop Management and eco-friendly agricultural practices for flood,	Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, Microphone, handout, whiteboard, marker, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits and demerits of Integrated Crop Management and eco-friendly agricultural practices for flood, salinity

	salinity and drought prone areas						and drought prone areas followed by organic manure preparation.
8.	The trainees will be able to update his knowledge on the merits of afforestation and the procedures of tree plantation	Afforestation to mitigate climate change risk	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, Microphone, handout, whiteboard, marker, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits of afforestation and procedure of tree plantation.
9.	Trainees will be able to describe and apply rapid climate change adaptation at the time of emergency	Rapid climate change adaptation at the time of emergency	Lecturing, presentation of case study results, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain rapid climate change adaptation at the time of emergency with case studies results followed by sharing of ideas.
10.	Participants will be able to review guideline to prepare production plan to reduce climate change losses	Planning for climate change adaptation to reduce losses	Group work, group presentation followed by combined discussion	60 minutes	Microphone, poster paper, sign pen, whiteboard, marker, etc.	Observing plan	The facilitators will help the trainees to prepare future plan to reduce climate change losses. After preparing the plan by groups, those will be present by group leaders. At last combined plan will be prepared.



## 9. LIST OF TRAINING MATERIALS

Following materials are required for trainers and trainees for implementing the training:

Multimedia projector, projection screen, laptop computers, laser printers, scanner, digital camera, training module, poster papers, sign pens, white boards, white board markers, offset paper, printing leaflet, booklet, handout etc., microphone, books and literature related to climate change impacts and adaptation in Bangladesh.

## 10. FEEDBACK FORM

The feedback form in Annexure II of this report may be used for getting feedback from the trainees.

## 11. SCHEDULE OF TRAINING PROGRAM

### CENTRAL EXTENSION RESOURCES DEVELOPMENT INSTITUTE

Gazipur, Bangladesh

### Induction Training Schedule on

### Climate Change Adaptation for Agriculture Extension Officers (AEO) of the Department of Agricultural Extension of Bangladesh

**Trainees:** Newly recruited 30 Upazilla level Agriculture Extension Officers of DAE

**Course Coordinator:** Executive Director, CERDI

**Place:** CERDI, Gazipur

**Duration:** 2 days (From ..... to .....)

Day	Time	Topics	Facilitators
1 <sup>st</sup>	09.00–09.30	Registration	
	09.30-10.00	Pre-test	Monitoring Team
	10.00-11.00	Extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	*
	11.00-11.30	Tea Break	
	11.30-12.30	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	*
	12,30-13.30	Implication of meteorology for agricultural forecasting	*
	13.30-14.30	Lunch and Prayer Break	
	14.30-15-30	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	*

	15.30-16.00	Tea Break	
	16.00-17.00	Soil and water management in Bangladesh due to climate change	*
2 <sup>nd</sup>	09.00-10.00	Cropping pattern and modern cultivation techniques of different crops in flood, saline & drought prone areas of Bangladesh	*
	10.00-11.00	Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas	*
	11.00-11.30	Tea Break	
	11.30-12.30	Afforestation to mitigate climate change risk	*
	12.30-13.30	Rapid climate change adaptation at the time of emergency	*
	13.30-14.30	Lunch and Prayer Break	
	14.30-15.30	Planning for climate change adaptation to reduce losses	*
	15.30-15.50	Post-test	Monitoring Team
	15.50-16.10	Tea Break	
	16.10-17.00	Concluding Remarks & Closing session	Executive Director, CERDI

\*Facilitators to be selected at the time of planning training schedule

### Implementation of the training module

Ten knowledge and skill areas are proposed for the 2-day induction training in this module. Detailed course content and delivery procedure will be developed by national level experts from DAE, different universities, research organizations under NARS and other relevant organizations. With these detailed course content and delivery procedure, initially training will be conducted for national policy level personnel of DAE, BARC, NARS organizations and universities. They will then act as facilitators for the induction training of Upazilla level AEOs of DAE.

At present there are 484 AEOs of DAE in 64 districts in Bangladesh. Recruitment of AEOs are going on almost every year. Based on severity of climate change vulnerability areas, 150 AEOs will be selected. These 150 selected AEOs will be trained in 5 batches by taking 30 in each batch.

### Cost estimation for this training

Items of Expenditure	Amount (BDT)
For each batch:	
i. Allowances for 30 trainees @ 1500 per day X 2 days X 30 persons	90,000.00
ii. Allowances for trainers @ 1500 per lecture X 10	15,000.00
iii. Logistics @ 500 x 30	15,000.00
iv. TA for 30 trainees @ 500 X 30	15,000.00
v. Allowances for 4 Evaluators @ 3000 X 4	12,000.00
vi. Allowances for Course Coordinator @ 3000 X 1	3,000.00

vii. Allowances for Co-Course Coordinator @ 3000 X 1	3,000.00
viii. Materials and administrative cost	12,000.00
Total for each batch	1,65,000.00
Total for 5 batches @ 1,65,000.00 X 5	8,25,000.00

## **v. In-service Training Module on Climate Change Adaptation for Policy Makers of DAE, Agricultural Research Organizations and Universities**

### **1. INTRODUCTION**

Department of Agricultural Extension (DAE) is the largest extension provider for the agricultural farming community in Bangladesh. Sub-Assistant Agriculture Officers (SAAOs) are the block level workers of DAE. They work for the betterment of farmers. Rural farmers of Bangladesh are very much shocked by various types of climate change. Farmers of Bangladesh are generally faced water logging, flood, drought, salinity, etc. for their farming activities. As a result, agricultural productivity is reduced. SAAOs are responsible to disseminate agricultural innovations to the farmers to reduce the losses of agricultural productivity. These SAAOs receive training from District and Upazilla (Sub-District) level Officers of DAE. Again, District and Upazilla level Officers of DAE receive training from national experts of relevant subjects.

For the above reasons, it is necessary to develop national experts on climate change adaptation issue for providing training to the District and Upazilla (Sub-District) level Officers of DAE. On these considerations, “Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific” project has taken an initiative to prepare training module for developing capacity of Policy-Makers of Bangladesh.

This module can facilitate to provide training to the Policy-Makers of Bangladesh aiming to develop their capacity to act as trainers on climate change adaptation for mid level Officers’ training.

### **2. TARGET GROUP**

Regional level Additional Director (AD) and National level Directors of DAE, Chief Scientific Officers (CSO) of Agricultural Research Organizations and Professors of Agricultural Universities

### **3. ENTRY BEHAVIOUR**

**Age:** 40-60 years

**Educational Background:** At least B. Sc. Ag. (Hons.) Degree from any Agricultural University with special emphasis to Masters and PhD Degree

**Level of knowledge and skill on the training module being conducted:** There are limited meteorological courses in B. Sc. Ag. (Hons.) degree in the Agricultural Universities of Bangladesh. The target group of this training generally participate in various types of seminar, symposium, workshop, dialogue, training of national burning issues. As climate change adaptation is a present burning issue,

the selected target group of this training have moderate to high knowledge and skill on climate change adaptation and they have adequate knowledge and skill on agricultural farming activities.

**Expected skill and knowledge levels of the trainer/trainees before entering into the module:** Ten (10) Additional Directors of Regional level and six (6) Wing Directors of DAE, Seven (7) CSOs of Agricultural Research Organizations and Seven (7) Professors of Agricultural Universities, i.e. a total of 30 high officials will be the participants of this training. Highest level experts of relevant topics will be the facilitators. Individual participant of the training may also be act as facilitator of specific topic of this training.

#### **4. GOAL AND LEARNING OBJECTIVES**

**Goal:** Capacity building for Policy-Makers for climate change adaptation planning

**Learning Objectives:** After receiving training, the participants will be able to:

Update their knowledge on climate change adaptation

Identify new coping practices for climate change adaptation

Create awareness among the agricultural extension personnel to minimize agricultural losses

Create awareness among the national to root level Officials on CCA planning

Provide training to the Mid level Officers on climate change adaptation

#### **5. IMPLEMENTATION MODALITIES**

Number of Batch for training: One (1) Batch for piloting

**Trainers:** This training will be held at Giasuddin Milky Auditorium located near the Head Office of DAE. Director General of DAE will be Course Coordinator for the training. Highest level experts of relevant topics will be the facilitators of this training. Individual participant of this training may also be act as facilitator of specific topic of this training.

**Trainees:** Ten (10) Additional Directors of Regional level and six (6) Wing Directors of DAE, Seven (7) CSOs of Agricultural Research Organizations and Seven (7) Professors of Agricultural Universities, i.e. a total of 30 high officials will be the participants of this training.

**Duration of training:** 4 days

**Collaboration with other organization:** One (1) batch of training will be held at Giasuddin Milky Auditorium, Dhaka. Facilitators may be selected from national agricultural research institutes, universities, meteorological departments etc. for special cases.

#### **Facilities required:**

Fund for TA, DA and Honorarium for Trainers, Trainees, Evaluators and Course Coordinator

Fund for training materials

Training equipments like multimedia projectors with laptop computer, screen, UPS, high capacity sound system, digital camera, printer, scanner etc.

## **6. EXPECTED OUTCOMES**

After receiving training, the participants will be able to:

Explain climate change adaptation and related issues

Identify new coping practices for climate change adaptation

Identify the ways of minimizing agricultural losses

Plan for climate change adaptation

Prepare themselves as a climate change adaptation planner and trainers

## **7. EVALUATION**

Pre-test and post-test of the participants on training contents will be conducted by the evaluation team.

## 8. Session Details

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1.	Participants will be able to explain about the extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	Extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	Lecturing, showing video, maps and data table followed by discussion	60 min	Maps, data table, DVD, multimedia projector, handout, whiteboard, marker, microphone, etc.	By feedback discussion	Facilitator will explain different types of climate change vulnerabilities in Bangladesh and its regulatory framework by showing related documents in video, maps and climate related data with the help of a multimedia followed by discussion.
2.	Participants will be able to assess the extent of damage due to climate change on agriculture, fisheries and livestock in Bangladesh	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	Lecturing, video show, data presentation and discussion	60 min	Multimedia projector, handout, marker, whiteboard microphone	By feedback discussion	The trainer will overview on the effects of climate change on agriculture, fisheries and livestock in Bangladesh by showing video documents and previous data.

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
3.	Participants will be able to discuss physical, socio-economic and emotional impacts of different types of climate change	Physical, socio-economic and emotional impacts of climate change	Pictorial Presentation followed by discussion	60 min	DVD, Multimedia projector, Microphone, handout, whiteboard, marker, etc.	By feedback discussion	The trainer will show physical, socio-economic and emotional impacts of different climate change hazards by pictorial presentation. He will then overview and discuss about the matter.
4.	Participants will be able to explain about the role of media for CCA	Role of media for CCA	Lecturing followed by discussion	60 min	Multimedia projector, handout, etc.	By feedback discussion	The trainer will overview the role of media for CCA followed by discussion.
5.	Participants will be able to familiarize with livelihood adaptation to climate change in agriculture	Livelihood adaptation to climate change in agriculture	Lecturing, case study presentation, discussion and sharing of ideas	60 min	Microphone, handout, whiteboard, marker, Multimedia	Feedback discussion	The trainer will overview on livelihood adaptation to climate change in agriculture. After presentation and discuss he will arrange brainstorming for livelihood adaptation to climate change in agriculture.
6.	Trainees will be able to discriminate vulnerabilities of male and female due to climate change shocks.	Gender discrimination in climate change shocks	Lecturing, case study presentation, discussion and sharing of ideas	60 min	Microphone, handout, marker, whiteboard, Multimedia	Feedback discussion	The trainer will show discriminating vulnerabilities by sex due to climate change shocks including some case

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
					projector etc.		studies.
7.	Participants will be able to define duties and responsibilities of community based local, Upazilla, District and national level Officials climate change adaptation.	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	Lecturing followed by discussion and sharing of ideas	60 min	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview on duties and responsibilities of community based local, Upazilla, district and national level disaster managers After presentation and discuss he will arrange to sharing of ideas with the trainees.
8.	The trainees will be able to describe about soil and water management in Bangladesh due to climate change	Soil and Water management in Bangladesh due to climate change	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will discuss about soil and water resource management in Bangladesh due to climate change with sharing previous experiences.
9.	The trainees will be able to discuss the cropping pattern in flood, saline & drought prone areas of Bangladesh	Cropping pattern in flood, saline & drought prone areas of Bangladesh	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, marker, whiteboard, Multimedia projector etc.	Feedback discussion	The trainer will explain the cropping pattern in flood, saline & drought prone areas of Bangladesh
10.	The trainees will be able to update their	Integrated Crop Management and eco-	Pictorial presentation,	60 minutes	Multimedia projector,	Feedback discussion	The trainer will conduct pictorial presentation



SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	knowledge about Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas	friendly agricultural practices for flood, salinity and drought prone areas	discussion, brainstorming and sharing of ideas		DVD, Microphone, handout, whiteboard, marker, etc.		about merits and demerits of Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas followed by organic manure preparation.
11.	The trainees will be able to update his knowledge on the merits of afforestation and the procedures of tree plantation	Afforestation to mitigate climate change risk	Pictorial presentation, discussion, brainstorming and sharing of ideas	60 minutes	Multimedia projector, DVD, handout, Microphone, marker, whiteboard, etc.	Feedback discussion	The trainer will conduct pictorial presentation about merits of afforestation and procedure of tree plantation.
12.	Trainees will be able to describe implications of disaster risk reduction for climate change adaptation	Implications of disaster risk reduction to CCA	Lecturing, presentation of case study results, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain implications of disaster risk reduction to CCA with case studies results followed by sharing of ideas.
13.	Participants will be able to enumerate procedure for involvement of national political and	Role of National political and social leaders and policy-makers in CCA	Group Discussion followed by combined discussion	60 minutes	Microphone, poster paper, sign pen, whiteboard,	Feedback discussion	The facilitator will make facilities for make groupm discussion on the way to involvement of more

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	social leaders and policy-makers in CCA				marker, etc.		national political and social leaders and policy-makers in CCA.
14.	Participants will be able to prepare CCA related training materials for Mid level Officers of DAE	Preparation of CCA related training materials for Mid level Officers of DAE	Individual work followed by combined discussion	120 minutes	Microphone, poster paper, sign pen, whiteboard, marker, etc.	Observing training materials	The facilitators will distribute individual topic to individual participant to prepare CCA related training materials for Mid level Officers of DAE. After preparation at night those will be then present next day by him for finalization.
15.	Participants will be able to prepare plan and budget to manage CCA	Program planning, budgeting and management of CCA	Group work, group presentation followed by combined discussion	60 minutes	Microphone, poster paper, sign pen, whiteboard, marker, etc.	Observing plan	The facilitators will help the trainees to prepare future plan with budget to manage CCA, those will be then present by group leaders to prepare combined plan.

## 9. LIST OF TRAINING MATERIALS

Following materials are required for trainers and trainees for implementing the training:

Multimedia projector, projection screen, laptop computers, laser printers, scanner, digital camera, training module, poster papers, sign pens, white boards, white board markers, offset paper, printing leaflet, booklet, handout etc., microphone, books and literature related to climate change impacts and adaptation in Bangladesh.

## 10. FEEDBACK

The feedback form in Annexure II of this report may be used for getting feedback from the trainees.

## 11. SCHEDULE OF TRAINING PROGRAM

### DEPARTMENT OF AGRICULTURAL EXTENSION

Dhaka, Bangladesh

### In-service Training Schedule on

### Climate Change Adaptation for Policy Makers of Bangladesh

**Trainees:** Ten (10) Additional Directors of Regional level and six (6) Wing Directors of DAE, Seven (7) CSOs of Agricultural Research Organizations and Seven (7) Professors of Agricultural Universities, i.e. a total of 30 high officials

**Course Coordinator:** Director General, DAE

**Place:** Giasuddin Milky Auditorium, Dhaka

**Duration:** 4 days (From ..... to .....)

Day	Time	Topics	Facilitators
1 <sup>st</sup>	08.30-09.00	Registration	
	09.00-09.30	Pre-test	Monitoring Team
	09.30-10.30	Inaugural session	DG, DAE; EC, BARC; VC, SAU
	10.30-11.00	Tea Break	
	11.00-12.00	Extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	*
	12.00-13.00	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Physical, socio-economic and emotional impacts of climate change	*
	15.30-16.00	Tea Break	
	16.00-17.00	Role of media for CCA	*

2 <sup>nd</sup>	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Livelihood adaptation to climate change in agriculture	*
	10.30-11.00	Tea Break	
	11.00-12.00	Gender discrimination in climate change shocks	*
	12.00-13.00	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Soil and Water management in Bangladesh due to climate change	*
	15.30-16.00	Tea Break	
	16.00-17.00	Cropping pattern in flood, saline & drought prone areas of Bangladesh	*
3 <sup>rd</sup>	09.00-09.30	Recapitulate of last day activities	
	09.30-10.30	Integrated Crop Management and eco-friendly agricultural practices for flood, salinity and drought prone areas	*
	10.30-11.00	Tea Break	
	11.00-12.00	Afforestation to mitigate climate change risk	*
	12.00-13.00	Implications of disaster risk reduction to CCA	*
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Role of National political and social leaders and policy-makers in CCA	*
	15.30-16.00	Tea Break	
	16.00-17.00	Preparation of CCA related training materials for Mid level Officers of DAE	*
4 <sup>th</sup>	09.00-10.30	Presentation CCA related training materials for Mid level Officers of DAE	*
	10.30-11.00	Tea Break	
	11.00-11.30	Post-test	Monitoring Team
	11.30-13.00	Program planning, budgeting and management of CCA	All participants
	13.00-14.30	Lunch and Prayer Break	
	14.30-15.30	Concluding Remarks	DG, DAE
	15.30-16.00	Tea Break	
	16.00-17.00	Closing session with certificate distribution ceremony	DG, DAE; EC, BARC; VC, SAU
	17.00	Departure from the Training Place	

\*Facilitators to be selected at the time of planning training schedule

### Implementation of the training module

Fifteen knowledge and skill areas are proposed for the 4-day training in this module. Detailed course content and delivery procedure will be developed by high quality national level experts from DAE, different universities, research organizations under NARS and other relevant organizations. With these detailed course content and delivery procedure, training will be conducted for national policy level personnel of DAE, BARC, NARS organizations and universities. In this case an individual trainee can act as a facilitator for specific course. One batch of training will be conducted for 30 Trainees for piloting phase.

### Cost estimation for this one (1) batch of training

Items of Expenditure	Amount (BDT)
i. Allowances for 30 trainees @ 1500 per day X 5 days X 30 persons	2,25,000.00
ii. Allowances for trainers @ 1500 per lecture X 15	22,500.00
iii. Logistics @ 750 x 30	22,500.00
iv. TA for 30 trainees @ 500 X 30	15,000.00
v. Allowances for 4 Evaluators @ 3000 X 4	12,000.00
vi. Allowances for Course Coordinator @ 3000 X 1	3,000.00
vii. Allowances for Co-Course Coordinator @ 3000 X 1	3,000.00
viii. Materials and administrative cost	32,000.00
Total	3,35,000.00

## vi. Induction Training Module on Climate Change Adaptation for Policy Makers of DAE, Agricultural Research Organizations and Universities

### 1. INTRODUCTION

Department of Agricultural Extension (DAE) is the largest extension provider for the agricultural farming community in Bangladesh. Sub-Assistant Agriculture Officers (SAAOs) are the root level (locally known as Block Level) workers of DAE. They work for the betterment of farmers. Rural farmers of Bangladesh are very much shocked by various types of climate change. Farmers of Bangladesh are generally faced water logging, flood, drought, salinity, etc. for their farming activities. As a result, agricultural productivity is reduced. SAAOs are responsible to disseminate agricultural innovations to the farmers to reduce the losses of agricultural productivity. These SAAOs receive training from District and Upazilla (Sub-District) level Officers of DAE. Again, District and Upazilla level Officers of DAE receive training from national experts of relevant subjects.

For the above reasons, it is necessary to develop national experts on climate change adaptation issue for providing training to the District and Upazilla (Sub-District) level Officers of DAE. On these considerations, "Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific" project has taken an initiative to prepare induction training module for developing capacity of Policy-Makers of Bangladesh.

There is no induction training system for the senior administrative officers such as Additional Directors, Chief Scientific Officers (policy makers) in DAE, Bangladesh. This module can facilitate providing induction training to the Policy-Makers of Bangladesh aiming to develop their capacity to act as trainers on climate change adaptation for mid level Officers' training.

## 2. TARGET GROUP

Additional Directors (AD) of DAE, Chief Scientific Officers (CSO) of Agricultural Research Organizations and Professors of Agricultural Universities

## 3. ENTRY BEHAVIOUR

**Age:** 40-50 years

**Educational Background:** At least B. Sc. Ag. (Hons.) Degree from any Agricultural University with special emphasis to Masters and PhD Degree

**Level of knowledge and skill on the training module being conducted:** There are limited meteorological courses in B. Sc. Ag. (Hons.) degree in the Agricultural Universities of Bangladesh. Generally, the target group of this induction training participates in various types of seminar, symposium, workshop, dialogue, training of national burning issues. As climate change adaptation is a present burning issue, the selected target group of this training have moderate to high knowledge and skill on climate change adaptation and they have adequate knowledge and skill on agricultural farming activities.

**Expected skill and knowledge levels of the trainer/trainees before entering into the module:** Sixteen (16) Additional Directors of DAE, Seven (7) CSOs of Agricultural Research Organizations and Seven (7) Professors of Agricultural Universities, i.e. a total of 30 high officials will be the participants of this training. Highest level experts of relevant topics will be the facilitators.

## 4. GOAL AND LEARNING OBJECTIVES

**GOAL:** Capacity building for Policy-Makers for climate change adaptation planning

**LEARNING OBJECTIVES:** After receiving training, the participants will be able to:

Update their knowledge on climate change adaptation

Identify new coping practices for climate change adaptation

Create awareness among the agricultural extension personnel to minimize agricultural losses

Create awareness among the national to block level Officials on CCA planning

Provide training to the Mid level Officers on climate change adaptation

## 5. IMPLEMENTATION MODALITIES

**Number of Batch for training:** One (1) Batch for piloting

**Trainers:** This training will be held at Giasuddin Milky Auditorium located near the Head Office of DAE. Director, Training Wing of DAE will be Course Coordinator for the training. Highest level experts of relevant topics will be the facilitators of this training.

**Trainees:** Sixteen (16) Additional Directors of DAE, Seven (7) CSOs of Agricultural Research Organizations and Seven (7) Professors of Agricultural Universities, i.e. a total of 30 high officials will be the participants of this training.

**Duration of training:** 2 days

**Collaboration with other organization:** One (1) batch of training will be held at Giasuddin Milky Auditorium, Dhaka. Facilitators may be selected from national agricultural research institutes, universities, meteorological departments etc. for special cases.

**Facilities required:**

Fund for TA, DA and Honorarium for Trainers, Trainees, Evaluators and Course Coordinator

Fund for training materials

Training equipments like multimedia projectors with laptop computer, screen, UPS, high capacity sound system, digital camera, printer, scanner etc.

**6. EXPECTED OUTCOMES**

After receiving training, the participants will be able to:

Explain climate change adaptation and related issues

Identify new coping practices for climate change adaptation

Identify the ways of minimizing agricultural losses

Plan for climate change adaptation

Prepare themselves as a climate change adaptation planner and trainers

**7. EVALUATION**

Pre-test and post-test of the participants on training contents will be conducted by evaluation team. Mean difference obtained by paired t-test may be the basis of evaluation.

## 8. Session Details

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1.	Participants will be able to review and explain about the extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	Extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	Lecturing, showing video, maps and data table followed by discussion	60 min	Maps, data table, DVD, multimedia projector, handout, whiteboard, marker, microphone, etc.	By feedback discussion	Facilitator will explain different types of climate change vulnerabilities in Bangladesh and its regulatory framework by showing related documents in video, maps and climate related data with the help of a multimedia followed by discussion.
2.	Participants will be able to assess the extent of damage due to climate change on agriculture, fisheries and livestock in Bangladesh	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	Lecturing, video show, data presentation and discussion	60 min	Multimedia projector, handout, marker, whiteboard microphone	By feedback discussion	The trainer will overview on the effects of climate change on agriculture, fisheries and livestock in Bangladesh by showing video documents and previous data.
3.	Participants will be able to explain about meteorology and its implication for agricultural forecasting	Implication of meteorology for agricultural forecasting	Lecturing, observation, video show followed practicing forecasting	60 min	Meteorological instruments, handout, marker, whiteboard,	By feedback discussion	The trainer will overview on meteorological implication for agricultural forecasting followed by showing forecasting tools.



					Multimedia projector etc.		
4.	Participants will be able to explain about the role of media for CCA	Role of media for CCA	Lecturing followed by discussion	60 min	Multimedia projector, handout, etc.	By feedback discussion	The trainer will overview the role of media for CCA followed by discussion.
5.	Participants will be able to familiarize with livelihood adaptation to climate change in agriculture	Livelihood adaptation to climate change in agriculture	Lecturing, case study presentation, discussion and sharing of ideas	60 min	Microphone, handout, whiteboard, marker, Multimedia	Feedback discussion	The trainer will overview on livelihood adaptation to climate change in agriculture. After presentation and discuss he will arrange brainstorming for livelihood adaptation to climate change in agriculture.
6.	Trainees will be able to discriminate vulnerabilities of male and female due to climate change shocks.	Gender discrimination in climate change shocks	Lecturing, case study presentation, discussion and sharing of ideas	60 min	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will show discriminating vulnerabilities by sex due to climate change shocks including some case studies.
7.	Participants will be able to define duties and responsibilities of community based local, Upazilla, District and national level Officials for climate change adaptation.	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	Simulation and scenario building	60 min	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will overview on duties and responsibilities of community based local, Upazilla, district and national level disaster managers. After presentation and discuss

							he will arrange to sharing of ideas with the trainees.
8.	The trainees will be able to describe about soil and water management practices for climate change adaptation in Bangladesh	Soil and Water management for climate change	Presentation, discussion, brainstorming and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will discuss about soil and water resource management in Bangladesh due to climate change with sharing previous experiences.
9.	Trainees will be able to describe implications of disaster risk reduction for climate change adaptation	Implications of disaster risk reduction to CCA	Lecturing, presentation of case study results, discussion and sharing of ideas	60 minutes	Microphone, handout, whiteboard, marker, Multimedia projector etc.	Feedback discussion	The trainer will explain implications of disaster risk reduction to CCA with case studies results followed by sharing of ideas.
10.	Participants will be able to prepare plan and budget to manage CCA	Program planning, budgeting and management of CCA	Group work, group presentation followed by combined discussion	60 minutes	Microphone, poster paper, sign pen, whiteboard, marker, etc.	Observing plan	The facilitators will help the trainees to prepare future plan with budget to manage CCA, those will be then present by group leaders to prepare combined plan.

## 9. LIST OF TRAINING MATERIALS

Following materials are required for trainers and trainees for implementing the training:

Multimedia projector, projection screen, laptop computers, laser printers, scanner, digital camera, training module, poster papers, sign pens, white boards, white board markers, offset paper, printing leaflet, booklet, handout etc., microphone, books and literature related to climate change impacts and adaptation in Bangladesh.

## 10. FEEDBACK FORM

The feedback form in Annexure II of this report may be used for getting feedback from the trainees.

## 11. SCHEDULE OF TRAINING PROGRAM

### DEPARTMENT OF AGRICULTURAL EXTENSION

Dhaka, Bangladesh

### Induction Training Schedule on

### Climate Change Adaptation for Policy Makers of Bangladesh

**Trainees:** Sixteen (16) Additional Directors of DAE, Seven (7) CSOs of Agricultural Research Organizations and Seven (7) Professors of Agricultural Universities, i.e. a total of 30 high officials

**Course Coordinator:** Director, Training Wing, DAE

**Place:** Giasuddin Milky Auditorium, Dhaka

**Duration:** 2 days (From ..... to .....)

Day	Time	Topics	Facilitators
1 <sup>st</sup>	08.45–09.00	Registration	
	09.00-09.45	Inaugural Session	DG, DAE; EC, BARC; VC, SAU
	09.45-10.15	Tea Break	
	10.15.-10.30	Pre-test	Monitoring Team
	10.30-11.30	Extent of different types of climate change vulnerabilities in Bangladesh and its regulatory framework	*
	11.30-12.30	Causes and consequences of climate change on agriculture, fisheries and livestock in Bangladesh	*
	12,30-13.30	Implication of meteorology for agricultural forecasting	*
	13.30-14.30	Lunch and Prayer Break	
	14.30-15-30	Role of media for CCA	*
	15.30-16.00	Tea Break	
16.00-17.00	Livelihood adaptation to climate change in	*	

		agriculture	
2 <sup>nd</sup>	09.00-10.00	Gender discrimination in climate change shocks	*
	10.00-11.00	Duties and responsibilities of community based local, Upazilla, district and national level Officials for Climate Change Adaptation	*
	11.00-11.30	Tea Break	
	11.30-12.30	Soil and Water management in Bangladesh due to climate change	*
	12.30-13.30	Rapid climate change adaptation at the time of emergency	*
	13.30-14.30	Lunch and Prayer Break	
	14.30-15.30	Program planning, budgeting and management of CCA	*
	15.30-15.50	Post-test	Monitoring Team
	15.50-16.10	Tea Break	
	16.10-17.00	Concluding Remarks & Closing session	DG, DAE; EC, BARC; VC, SAU

\*Facilitators to be selected at the time of planning training schedule

### Implementation of the training module

Ten knowledge and skill areas are proposed for the 2-day induction training in this module. Detailed course content and delivery procedure will be developed by high quality national level experts from DAE, different universities, research organizations under NARS and other relevant organizations. With these detailed course content and delivery procedure, training will be conducted for national policy level personnel of DAE, BARC, NARS organizations and universities. One batch of training will be conducted for 30 Trainees for piloting phase.

### Cost estimation for this one (1) batch of training

Items of Expenditure	Amount (BDT)
i. Allowances for 30 trainees @ 1500 per day X 2 days X 30 persons	90,000.00
ii. Allowances for trainers @ 1500 per lecture X 10	15,000.00
iii. Logistics @ 500 x 30	15,000.00
iv. TA for 30 trainees @ 500 X 30	15,000.00
v. Allowances for 4 Evaluators @ 3000 X 4	12,000.00
vi. Allowances for Course Coordinator @ 3000 X 1	3,000.00
vii. Allowances for Co-Course Coordinator @ 3000 X 1	3,000.00
viii. Materials and administrative cost	12,000.00
<b>Total</b>	<b>1,65,000.00</b>

## ANNEXURE I: EVALUATION OF EXISTING TRAINING PROGRAMS IN AGRICULTURE IN BANGLADESH

### Induction training

S.N.	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of times this course can be extended
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
1	Foundation training for university teachers	14 days	Graduate Training Institute, Bangladesh Agricultural University, Mymensingh	Disaster preparedness issues, disaster risk reduction strategies, disaster policy framework in Bangladesh, Academic activities related to disaster management in different universities of Bangladesh (5 hrs)		<ul style="list-style-type: none"> <li>Teaching methods and techniques (60 hrs)</li> <li>Project cycle &amp; research management (20 hrs)</li> <li>Scientific report writing (30 hrs)</li> <li>Administration &amp; Office management (40 hrs)</li> <li>Health &amp; development (5 hrs)</li> </ul>	<ul style="list-style-type: none"> <li>Computer literacy &amp; ICT (20 hrs)</li> <li>Statistical methods &amp; data analysis (40 hrs)</li> <li>Physical conditioning &amp; car driving (40 hrs)</li> <li>Study tour &amp; Co-curricular activities (20 hrs)</li> </ul>	Evaluation by pre& post test, written examination, observation, presentation	Need to be extended for disaster management courses
2	Foundation training course for NARS Scientists (Batch-21)	4 Months	Bangladesh Academy for Rural Development (BARD)	Disaster: definition, types, impact & management (1 hr)		Introducing Bangladesh, Public policies, Government system, leadership behavior, changing public sector, Human resources & Office management, Important laws, financial management, economic theory, Social research	Quantitative analysis, information & communication technology, car driving, field report writing, book reviewing, computer literacy (10 days)	Evaluation by pre& post test, written examination, observation, presentation	Need to be extended for disaster management courses

S.N.	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of times this course can be extended
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
						methods, poverty reduction & development planning, English language skill, globalization, Environment management and sustainable development, gender issues (100 days)			
3	Induction Training course for the newly recruited Scientific Officers of BARI	6 days	Bangladesh Agricultural Research Institute (BARI)			Research program development, BARI service rules, development of human resources & technology transfer, budget preparation, procurement rules & regulations, project planning, labour management (40 hrs)	Experimental design, field plot technique, data collecting procedure and data processing, scientific paper writing and presentation (6 hrs)	Evaluated by post evaluation	Need to be extended for disaster management courses

## In-Service training

S.N	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of times this course can be extended
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
1	Training course on climate change & challenges in agriculture sector	3 days	Central Extension Resources Development Institute	Disaster & disaster management- an over view (1 hr) Flood & flood management (1 hr) Drought, drought management & its classification (1hr) Hazards & Forecasting (1hr) Cropping pattern in flood & drought prone areas of Bangladesh (1hr) Pre-disaster management at grass root level (1hr)	Flood forecasting & its application in agriculture (1 hr) Modern cultivation techniques of different crops in flood & draught prone area (1hr) Year round homestead vegetables production in flood & drought prone area (1 hr) Vegetables production techniques in flood prone areas (Heap process) (1 hr) Field crops & vegetable production techniques in drought prone areas (1hr) Vegetables production techniques in drought prone areas (1 hr) Advance rice production technology (1hr) Community seed bed preparation in drought prone area (1hr) Floating seed bed preparation in flood prone area (1hr)	Introduction to CERDI training norms (30 minutes)		Evaluation by pre& post test	Need to be extended upto 6 days
2	Training courses on disaster	5 days	Central Extension Resources	<ul style="list-style-type: none"> <li>•Concepts of disaster risk management in agricultural sector and Disaster risk situation in</li> </ul>	Livelihood adaptation to climate change in agriculture (1 hr.) Disaster and hazardous materials,			Evaluation by pre& post test	Need to be extended upto 6 days

S.N	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of times this course can be extended
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	management		Development Institute	<p>Bangladesh and global scenarios (1hr)</p> <ul style="list-style-type: none"> <li>•Regulatory framework of Bangladesh disaster management system and Institutional framework of Bangladesh disaster management system (1 hr.)</li> <li>•Disaster mitigation strategies, hazard identification and vulnerability analysis (1 hr.)</li> <li>•Physical and Socio-economic impacts of disaster, animals in disaster, emotional impacts of disasters, trauma and counseling (1 hr.)</li> <li>•Media and disaster management, the role of media in disaster management, types of media, impact of the media, advantages and challenges (1 hr.)</li> <li>•Meteorology and public awareness for disaster management (1 hr.)</li> <li>•Implication of agro-meteorology for agricultural disaster management (1 hr.)</li> <li>•Meteorology and early warning for disaster management in Bangladesh (1 hr.)</li> <li>•Duties and responsibilities of national and local disaster Managers,</li> </ul>	<p>ways of storing and safety handling hazardous materials, coping with exposure to hazardous materials (1 hr.)</p> <p>Geographic Information System (GIS) and disaster management, GIS application, GIS and emergency shelters, GIS and distribution of relief, GIS and data gathering, advantages and challenges of using GIS in disaster management (1 hr.)</p> <p>Global Positioning System (GPS) and disaster management, application of GPS to disaster management, remote sensing and disaster management (1 hr.)</p> <p>Disaster preparedness, disaster risk reduction techniques and bottom-up planning (1 hr.)</p> <p>Emergency healthy services in disasters, infrastructure and procedure in assessing emergency situations, risk factors contributing to the spread of communicable diseases and outbreaks, prevention and control of communicable diseases (1 hr.)</p> <p>Vulnerable group in disasters, people with disabilities, elderly</p>				



S.N	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of times this course can be extended
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
				<p>community based action plan, advantages and disadvantages of the community based approach (1 hr.)</p> <ul style="list-style-type: none"> <li>• Plan of action of DAE in disaster and climate risk management in Bangladesh (1 hr.)</li> <li>• Standing orders on disasters and roles of DMC(s) Comprehensive Disaster Management Programme (CDMP) approach (1 hr.)</li> <li>• The role of technology in disaster management, emergency management system, EMS and the disaster management cycle (1 hr.)</li> <li>• Water resource development in Bangladesh, National water policy, water development plan, flood management strategy, infrastructure development and impact in agriculture (2 hr.)</li> <li>• Vulnerabilities to disaster, development programs to decrease vulnerability, disaster and development policy (1 hr.)</li> <li>• Disaster mitigation and infrastructure disaster management cycle, disaster mitigation (1 hr.)</li> <li>• Wetland management (1 hr.)</li> </ul>	<p>people, internally displaced people and refugees, women and children (1 hr.)</p> <p>Drought management and agricultural rehabilitation for disaster management</p>				
3	Training module on	3 days	<ul style="list-style-type: none"> <li>• Practical Action –</li> </ul>	<ul style="list-style-type: none"> <li>• Concepts of disaster (flood and drought) management (2 hr.)</li> </ul>	<ul style="list-style-type: none"> <li>• Field visit to flood and drought affected families (5 hr.)</li> </ul>			Evaluation by pre&	Need to be extended

S.N	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of times this course can be extended
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	draught and flood pre-management & risk reduction in agriculture sector		Bangladesh • Department of Agriculture Extension	<ul style="list-style-type: none"> <li>• Forecasting procedure and weather forecast (1 hr.)</li> <li>• Gender and disaster (1 hr.)</li> <li>• Institutional management – Role of different stakeholder and disaster management committees and its principles (2 hr.)</li> <li>• Technology dissemination strategies, community bases disaster preparedness (105 minutes)</li> </ul>	<ul style="list-style-type: none"> <li>• Agril technologies for flood and drought prone areas (1 hr.)</li> <li>• Fisheries technologies for flood and drought prone areas (1 hr.)</li> <li>• Livestock technologies for flood and drought prone areas (1 hr.)</li> </ul>			post test	upto 6 days
4	Training module-2 (Drought): Disaster pre-management & risk reduction in agriculture sector	5 days	Support to strengthening of the disaster preparedness in agricultural sector (SSDP)	<p>Disaster, drought and drought management (2 hr.)</p> <p>Risk, vulnerabilities and forecasting of disaster (90 minutes)</p> <p>Gender and drought (2 hr.)</p> <p>Root level preparedness in drought prone areas (5 hr.)</p> <p>Irrigation management and drought resistance cropping pattern (90 minutes)</p> <p>Fisheries technologies in drought prone areas (2 hr.)</p> <p>Livestock management in drought prone areas (90 minutes)</p> <p>Alternative ways for the livelihood in the drought prone areas (90 minutes)</p>	<p>Village level preparation for drought prone areas and field visit (8 hr.)</p> <p>Preparation of Plan (2 hrs)</p>			Evaluation by pre& post test	Need to be extended upto 6 days
5	Drought risk manageme		DAE and FAO	Understanding disaster and drought vulnerability, hazard, warning system	Seed and seedling raising Homestead gardening Livestock, poultry, fisheries				

S.N	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of times this course can be extended
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	nt and preparedness in Agricultural Sector			Gender issues in drought Community participation and planning in drought preparedness Irrigation management	management in drought affected areas, Pond fish culture and drought Preparedness action planning, monitoring and follow up				
6	Flood risk management and preparedness in Agricultural Sector	DAE and FAO		Understanding disaster and flood vulnerability, hazard, warning system Gender issues in flood Community participation and planning in flood preparedness Irrigation management	Seed and seedling raising Homestead gardening Livestock, poultry, fisheries management in flood affected areas, Pond fish culture and flood Preparedness action planning, monitoring and follow up				

## ANNEXURE II: FEEDBACK FORM FOR ASSESSING THE EFFECTIVENESS OF TRAINING

---

Name of the trainee:

Designation:

Address:

Please make your opinion on the following issues:

1. Mention your opinion on the content of the training course.

Excellent ( ), good ( ), fair ( ), poor ( ), Very poor ( )

2. Mention the topics which were very relevant to the training course.

a)

b)

c)

d)

e)

3. Mention the topics which were unnecessary for the training course.

a)

b)

c)

d)

e)

4. Mention the topics you like most.

a)

b)

c)

d)

e)

5. Mention the topics you don't like.

a)

b)

c)

d)

e)

6. Mention the topics which are to be included in the training course.

a)

b)

c)

d)

e)

7. Mention about the duration of the training

a) Appropriate ( )

b) To be increased ( ), the duration may be ..... days

c) To be decreased ( ), the duration may be ..... days

8. Mention about the appropriate month of the year for the training. ....

9. Mention your desire for the frequency of the training in your life

One time ( ), two times ( ), three times ( )

10. Mention your opinion about the trainers of the training by putting (✓) tick mark in the appropriate column.

S.N.	Name of the trainers	Degree of fitness of the trainers				
		Excellent	Good	Moderate	Poor	Very poor
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

11. Mention your opinion about the facilities of the training by putting (✓) tick mark in the appropriate column.

S.N.	Items of facilities	Degree of fitness of the trainers				
		Excellent	Good	Moderate	Poor	Very poor
1.	TA, DA & Honorium					
2.	Fooding & lodging					
3.	Use of training materials					
4.	Environment of the training place					
5.	Others (Specify .....)					

Signature of Trainee with date:

## 3.2 CAMBODIA

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## Abbreviations

CC	Climate Change
CCD	Climate Change Department
DAE	Department of Agricultural Extension
DALRM	Department of Agricultural Land Resource Management
DPPSP	Department of Plant Protection, Sanitation and Photo-sanitation
ESP	Education Strategy Plan
GDA	General Directorate of Agriculture
MAFF	Ministry of Agriculture Forestry and Fisheries
MoE	Ministry of Environment
NGOs	Non Government Organization
PDA	Provincial Agricultural Department
PhD	Doctor of Philosophy
TNA	Training Needs Assessment

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# CAMBODIA PART I: TRAINING NEEDS ASSESSMENTS

## a. Introduction

Climate change has become a real challenge for all countries throughout the world. Attention paid to improving public awareness raising and integrating the concepts of climate change adaptation and mitigation of greenhouse gas into sectoral and national sustainable development plans are becoming more concerns internationally and nationally.

Climate change is an emerging concern not only for environment, but also for development. Both software and hardware are of critical importance for better adaptation to climate variability and change that continue to threaten us. As a least developed agrarian country, Cambodia is highly vulnerable to climate change and has been categorized as having relatively low adaptive capacity to changing climate conditions compared to other Southeast Asia countries and thus is highly vulnerable to climate extremes (Va Dany, 2010).

Most Cambodian households are engaged in **agriculture**. The main agriculture commodity in Cambodia is rice. Although the agricultural productivity has increased during the last decade, but it is still much lower in Cambodia compared to neighboring countries (Heng Chan Thoeun et al., 2001). In recent years, we have witnessed more frequent and severe floods and droughts, which have resulted in a significant impact to agriculture sector as well as to other development sector and considerable economic losses. In agricultural villages, the challenges caused by negative impacts from environmental changes are further intensified by the increasing population coupled with unavailability of new agricultural land.

More than half of Cambodia's rural population depends on **fish and aquatic resources** for some portions of their livelihood (Heng Chan Thoeun et al., 2001). Together with rice, fisheries form the backbone of the country's food security and provide invaluable revenue and employment (direct and indirectly for over 2 million Cambodians). Besides **agriculture, fisheries and forest**, resources play a critical role in supporting livelihoods, especially in providing diversifying subsistence and income-generating activities.

So, Cambodia must be glorified on capacity building to all ranking official to aware about climate change and it's effective on agriculture sector and involved sector , especially to official of Agricultural forestry and fisheries ,because they are directly work on agricultural sector with the farmers.

## b. Objectives and Methodology

### b.1 Objectives

The objectives of this project are:

To undertake appraisal of training needs in terms of knowledge and skill areas for effective adaptation

To design training modules for imparting knowledge and skills for effective adaptation

Extended project (years 2 and 3):

To implement training programs for trainers in the key faculty of training institutions and for key policy-makers in the region,

To assess the impact of the project activities and provide a policy feedback to the countries involved

## b.2 Summary of the Project Methodologies

For Training needs assessment (TNA):

- Institutional survey of existing training programs and training modules being implemented and capacity of the faculty and training environment in terms of infrastructure etc., would be identified through survey techniques
- Preparation of training modules through training module preparation workshops where domain, pedagogic and adaptation experts come together to develop training modules by addressing the gaps identified in the TNA phase.
- Years 2 and 3 of the extended project:
- Piloting of the training modules by implementing two trainers training programs every year
- Impact assessment of the pilot training of trainers programs at the end of the training and provide policy-level feedback to the governments.

To conduct the training need assessment in Cambodia, Cambodian team uses the detail methodology as the following:

Two target groups that their works related to climate change and agriculture sector were selected for the study. The group division basically depended on the role and responsibility of each concerned institution. Those two main target groups are: (i) the concerned trainer's institutions and (ii) trainee's institutions.

The first group consists of Climate Change Department of Ministry of Environment (MoE), Department of Agricultural Extension, Department of Plant Protection, Sanitation and Photo-sanitation and Department of Agricultural Land Resource Management of Ministry of Agriculture, Forestry and Fishery (MAFF) (These institutions are at national level).

The second group consists of 4 provincial agricultural departments such as Agricultural Department of Kampong Cham Province, Agricultural Department of Kampong Speu Province, Agricultural Department of Kampot Province and Agricultural Department of Kandal Province.

Review training modules, materials and documents (such as workshops and training reports, personnel profiles etc.) related to TNA matters of different training institutions.

## b.3 Questionnaire Survey and Data Collection

There are two steps were performed for information/data collection. Desk reviews of existing training programs were done on training programs from 3 departments at national level and other 3 departments at provincial level. The questionnaires developed by IGES and APAN were translated into local languages (Khmer) for their convenience and intended to assess the level of understanding on the concept of climate change and its impacts, in order to identify respective knowledge gaps, training needs and suggestions on training design.

Table 1: Simple size for conducting training needs assessment surveys

No.	Description	No. of Department/Office	Selected respondents for interview
<b>Trainer's institution</b>			
1	Climate Change Department of MoE	1	3
2	Department of Agricultural Extension	1	6
3	Other Agricultural Departments under GDA	2	10

Trainee's institution			
1	Provincial agricultural departments	4	51
<b>Total</b>			<b>Respondents</b>

The results of this project are presented in the following order in this report.

## **c. Institutional Arrangements and policy setup for training and capacity building**

### **c.1 Institutional policy setup for capacity building in the country**

According to Cambodia National Strategy Development Plan 2005-2010, Education is universally accepted as a basic human right. It is also a major contributing factor in poverty reduction. The long-term objective is to ensure that all Cambodian children and youth have equal opportunity to quality education regardless of social status, geography, ethnicity, religion, language, gender or disabilities. Education will also engender a sense of national and civic pride, high standards of morals and ethics and optimism, as well as being responsible for the country and the citizens.

The backbone of any country is a "*critical mass*" of educated, skilled, talented and capable manpower in a variety of economic and social fields. At present, the provision of higher-level education, especially by the private sector, is somewhat lop-sided, responding to short-term market impulses like surge in demand for low and middle-level managerial staff. There is a mismatch between the long-term job profiles and educational attainments. For the country to grow and sustain growth, a whole range of skills were needed such as scientists, engineers, scholars and researchers, and specialists in multifarious fields. The challenge in the education sector is to provide facilities for imparting needed high quality education in a variety of fields, through vocational, technical and university level education and also to be able to attract students to such courses. In this regard, the role of the Accreditation Committee of Cambodia is critical in accrediting only those universities that meet minimum quality criteria, and for the development of a comprehensive Higher Education Strategy. In MAFF, human resource is really very important to implement the National Strategic Development Plan (NSDP), Agriculture Development Policy (ADP), Strategy for Agriculture and Water (SAW) and other agriculture Policies.

Moreover, human resource must develop from day to day so that it can be adapted to suit the new situation of an agricultural development. Especially, human capacity building is playing vital roles in the policy on **promoting paddy production and rice export** (PPPRE).

MAFF plan to create the district agricultural office structure at least at the end of 2011 and also the commune agricultural center structure at least at the end of 2012.

### **c.2 Policies of human resources development in MAFF**

-Ideal human resource that MAFF wishes to develop:

MAFF has strongly requirement to develop human resource on agricultural technique skill and others skill.

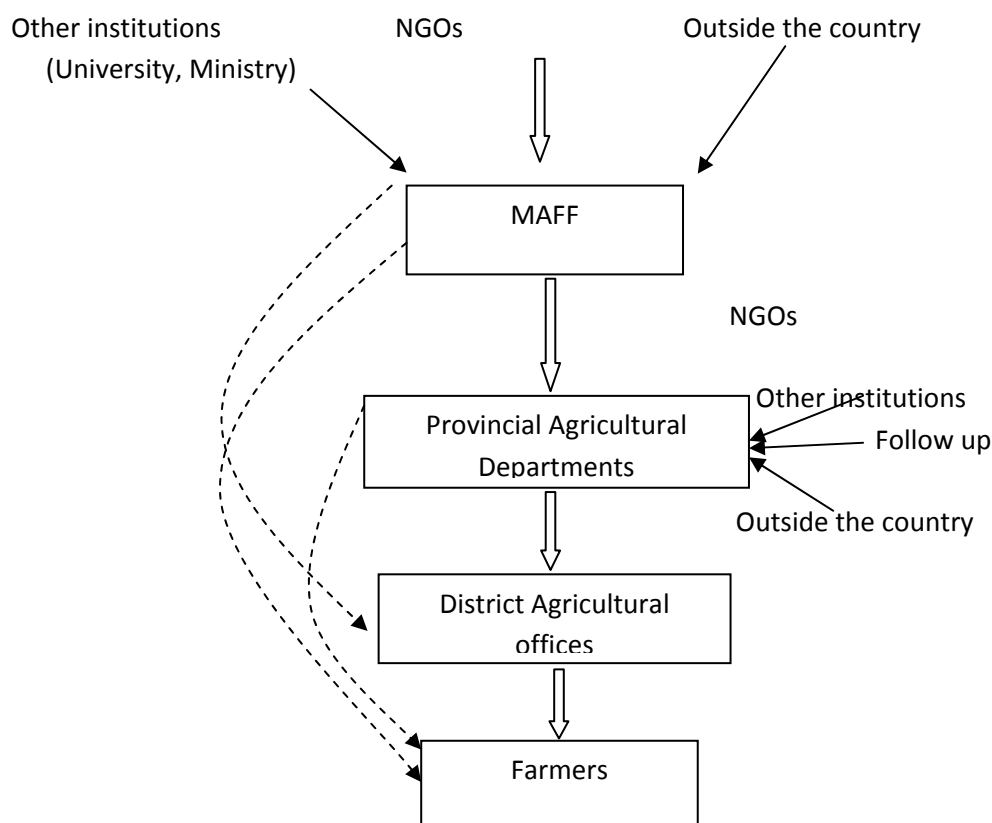
Our policies of HRD are focus on:

- Short term training;
- Medium term training; and
- Long term training, classify into three degrees (bachelor, master and doctoral degree),
- Annual Budget for HRD

MAFF has no annual budget for overseas study, but MAFF always get the scholarship from the donor countries for sending staff to attend overseas training courses.

In local, the roles of long-term training on agriculture, forestry and fisheries skill are born by Royal University of Agriculture, Prek Leap National School of Agriculture and Kompong Cham National School of Agriculture. These academic organs are the part of public institutions which are under control of MAFF.

### c.3 MAFF's Institutional arrangements setup for training



All departments under the authorization of Ministry of Agriculture, Forestry and Fisheries (MAFF) play a collectively important role in providing staff of provincial department of agriculture with a new and practicable knowledge of agriculture and skills in environmentally friendly cultivation. Afterwards, they are highly responsible for disseminating what they have learned to district officers of agriculture working closely with the local community. In order to spread that information successfully to local farmers, district officers are tasked with holding various farming-related training, such as vegetable farming and livestock raising, and with conducting real on-farm experiments with those farmers by taking fieldtrips to where agricultural work has been improved; thus, concepts can be put into action. Furthermore, dissemination of new farming methods from provincial level up to farmers, so follow-ups is put into action by the staff from the national level.

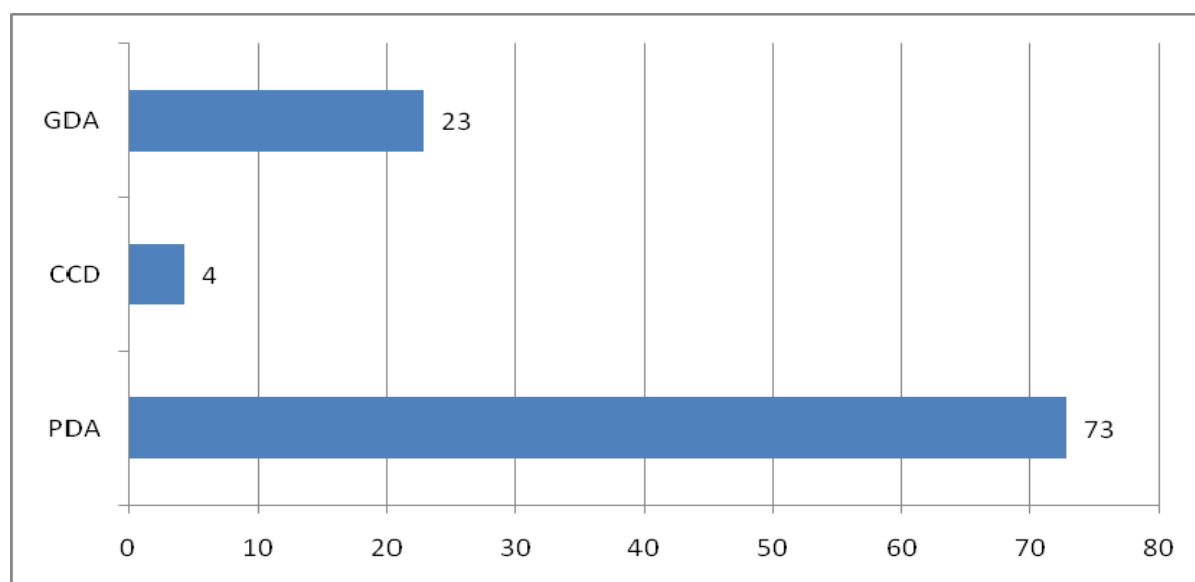
## d. Training needs assessment

### d.1 Evaluation of training program (curriculums)

The results of the survey in Cambodia show that existing training programs on climate change concerning institutions were conducted for a period of one or two days through presentations in training workshops, which were organized by Climate Change Department (CCD) of Ministry of Environment. The topics of those training workshops included a general knowledge of climate change, the UNFCCC and Kyoto Protocol, climate adaptation and mitigation. However, other existing training programs on agriculture, especially on technologies for rice planting and vegetable farming, were regularly organized for farmers for durations of one or two days by several of the chosen institutions at national and provincial level (see evaluation of existing training programs in Annexure I).

### d.2 Evaluation of training facilities

**Percentage of interviewees representing departments from province, district, commune, and national levels.**



Graph 1: Representation of respondents from different departments (Percentage of the total samples)

Studies on the strengthening of trainers' scientific capabilities may create a promising policy aimed at mainstreaming climate change adaptation (CCA) in Asia. In order to achieve this objective, the survey, specifically relevant to knowledge of climate change, was conducted from ministerial level to district level.

The result shows that 73% of respondents came from provincial, district and commune level department of agriculture, 23% of respondents represent GDA, and 4% represent CCD.

Related to the role and responsibility of each involved institution, GDA and CCD (at national level) are considered suitable institutions for selecting trainers; in contrast, Provincial Agricultural Department (PDA) (operates at provincial and district and commune level) is just considered a common institution for trainees to be provided with further capacity-building training programs. GDA consists of Department of Agricultural Extension, Department of plan protection and Department of land management, all of which are under the authorization of Ministry of Agriculture,

Forestry and Fishery (MAFF) (These institutions are at national level). CCD stands for Department of Climate Change that works under the Ministry of Environment (MoE), while PDA consists of 4 provincial departments of agriculture such as Agricultural Department of Kampong Cham Province, Agricultural Department of Kampong Speu Province, Agricultural Department of Kampot Province and Agricultural Department of Kandal Province.

### Percentage of interviewees from each department in GDA and provinces

Table 2: percentage of the interviewees from different departments within GDA and from provinces

Institution	Provincial level				National level			
	Kampot	Kampong Cham	Kampong Speu	Kandal	DALRM	CCD	DPPSP	DAE
General Directorate of Agriculture					38		37	25
Department of Climate Change						100		
Provincial Agricultural Departments	27	18	27	28				

The Table 2 shows officers interviewed based on their skills and institutions, including GDA, CCD and PDA. It can be clearly seen that in each institution, the representation of staff was different with regard to regional level and skill areas.

At national level from within GDA, staff number that took part in the interviews varied considerably from department to department, as 38% of them came from Department of Agricultural Land Resource Management (DALRM), 37% from Department of Plant Protection, Sanitation and Photo-sanitation (DPPSP), and the rest from Department of Agricultural Extension (DAE). It implies that the survey was carried out with personnel whose knowledge was closely related to agricultural extension service. Meanwhile, senior officers who worked at CCD were wholly polled in hope that they would be the target trainers involved in disseminating information on climate change.

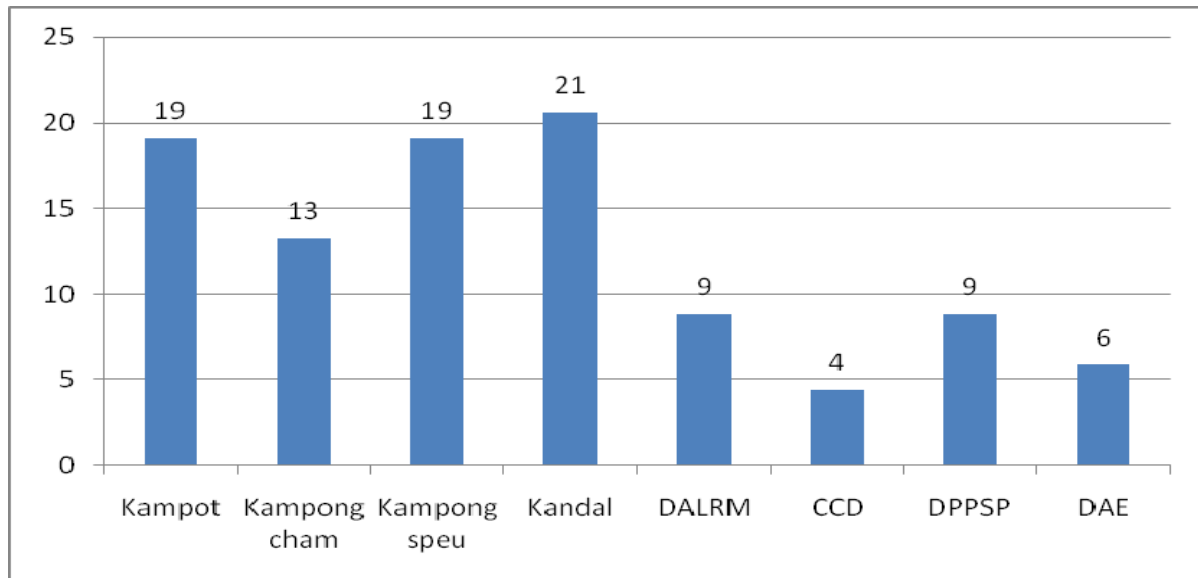
In addition to the survey at national level, data collection was also made at provincial level (PDA) based in some provinces. Staff to whom awareness of climate change was disseminated accounted for 27% in Kampot Agricultural Department, 18% in Kampong Cham Agricultural Department, 27% in Kampong Speu Agricultural Department, and 28% in Kandal Agricultural Department.

### Number of interviewees in relation to each department and skill areas

In contrast with the previous graph, which shows number of interviewees from each department at provincial and national levels, the graph below indicates number of interviewees who worked at national level and provincial level. It is apparent from the above graph that personnel who received interviews on their knowledge of climate change varied greatly in number.

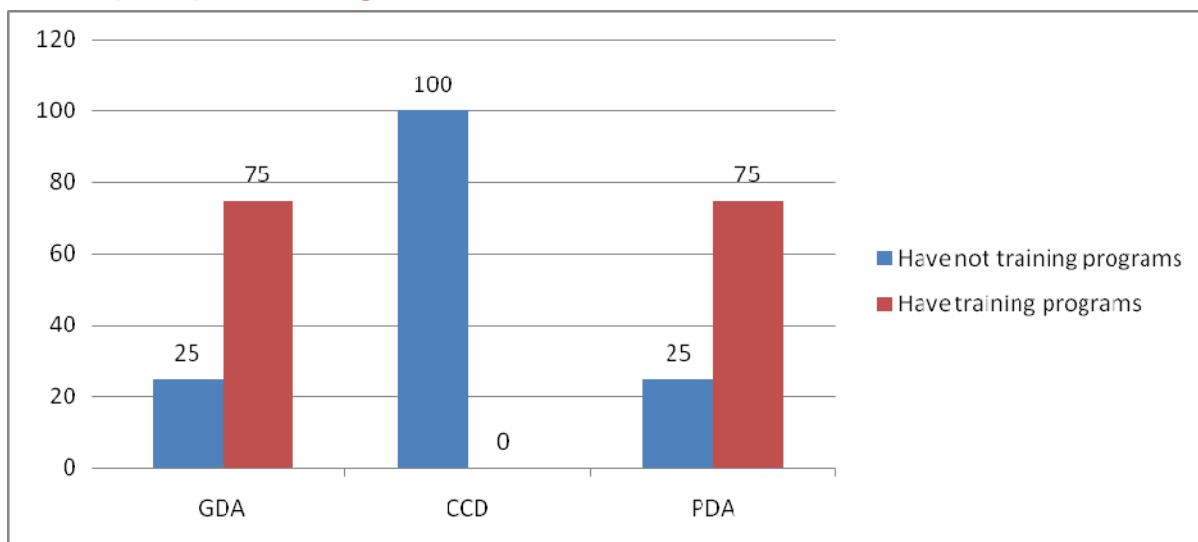


According to the observations made at the provincial-level, number of interviewees was 19% in Kampong Speu provincial agricultural department of the total number, which was the same percentage as that of Kampong Cham provincial agricultural department. This number was slightly lower than that of Kandal provincial agricultural department that accounted for 21%, but was 6% higher than in Kampong Cham provincial agricultural department. The rest which all constituted 28% were unequally divided into four departments at national level, such as DALRM, DPPSP, CCD, and DAE. Number of interviewees who worked in DALRM and DPPSP added up to 9% each, in CCD 4%, and in DAE 6%.



Graph 2: Representation of respondents from different provinces and departments (percentage of the total respondents)

### Training programs on agriculture in each selected institution



Graph 3: Presence of training programs in different department/organizations (percentage of the total respondents)

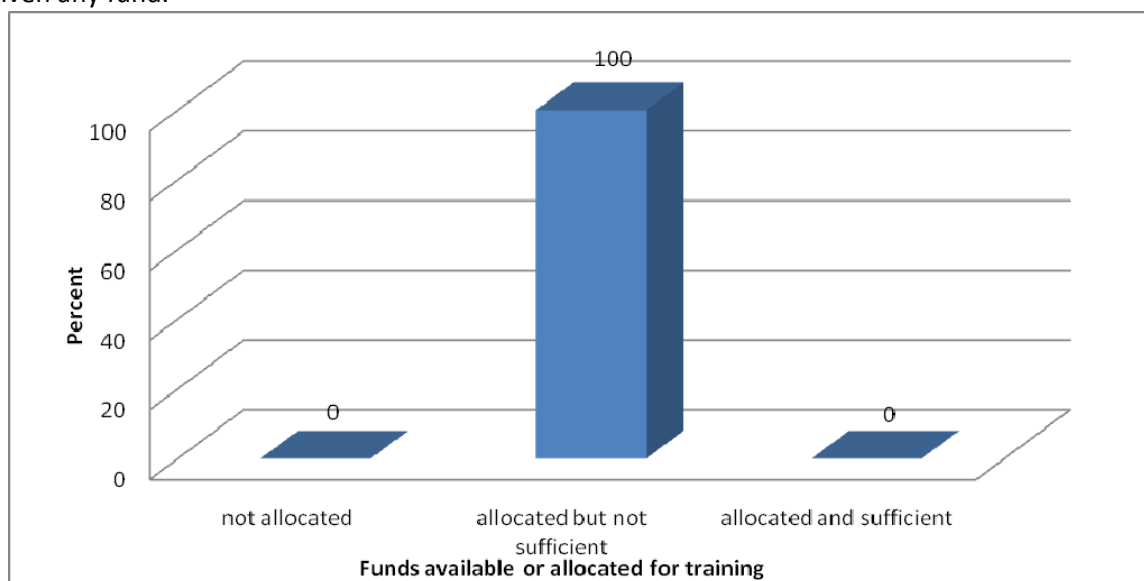
As a result of the research into program activities or policies on human resources development at institutional, ministerial, provincial, and district level, it is can be clearly seen that training provided

for officers or staff who worked in the above institutions was sufficient. Previously, training programs added up to 75% at provincial agricultural departments and 75% at departments of agricultural general director. However, there were some personnel that had not been trained at all, and these numbers were equal to 25% at provincial agricultural departments, 25% at departments of agricultural general director and 100% at department of climate change. The reason why some personnel had not been trained because their job responsibility are not related to the goal of training, each institution have limited fund that they cannot train all staff. The Department of Climate Change have many training program on climate change in general, but very few on climate change in agriculture therefore the answer from the respondent at 100 % had not been train in agriculture.

Come to conclusion that each institution at national and provincial level have own training program that provide regularly or sporadic depend on the level of fund.

### Level of fund allocated for training by each institution

Graph below shows fund that was allocated to conduct training directed towards staff in each institution. It is clearly proved that the fund allocated from both government and non-government organizations was not sufficient. Based on the research on how fund was given and managed, allocation was really made for holding training on some subjects, mostly related to farming system; still, insolvency was found standing for 100%. None of the interviewees were reported not to be given any fund.



Graph 4: Level of fund allocation for training (percentage of the total respondents)

### Trainers in each institution

Table 3: Percentage of trainers who gave training to personnel and their source

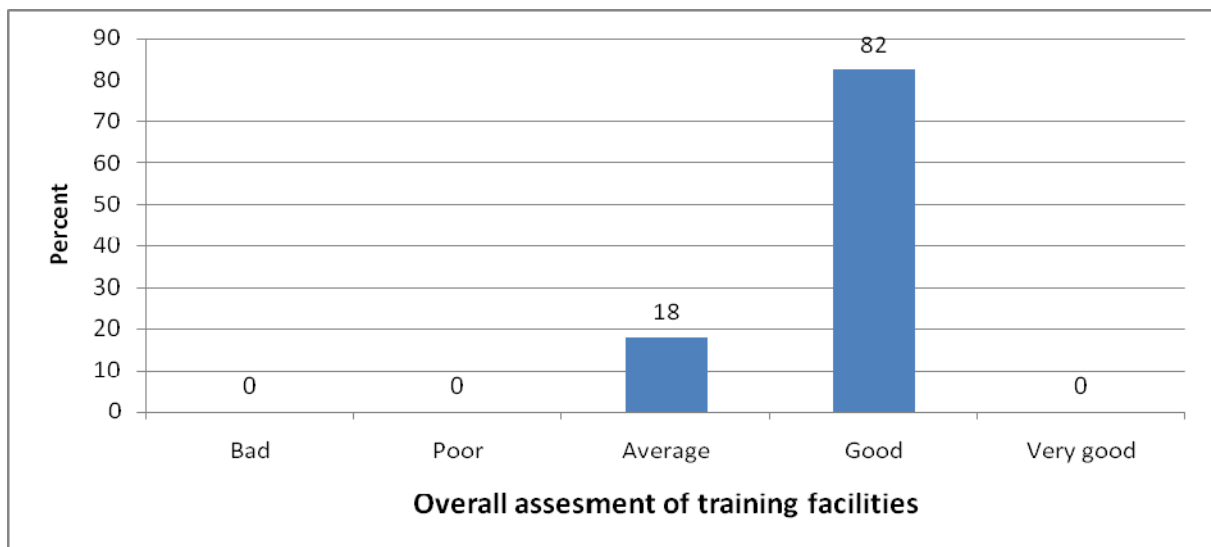
Trainer \ Place	MAFF	University	NGO	Total
University	0 %	100 %	0 %	42 %
in-house training facilities	80 %	0 %	20 %	58 %

Table 3 shows the percentage of training given to personnel in each department or organization. It is obviously seen that personnel who implemented training came from MAFF, relevant universities and

non-governmental organizations. Trainers from relevant university mostly assigned to perform training programs accounted for 42%, a percentage which was inferior to that of in-house training facilities. However, in-house training facilities were made up of MAFF and non-governmental organizations, them all 80% and 20%, respectively.

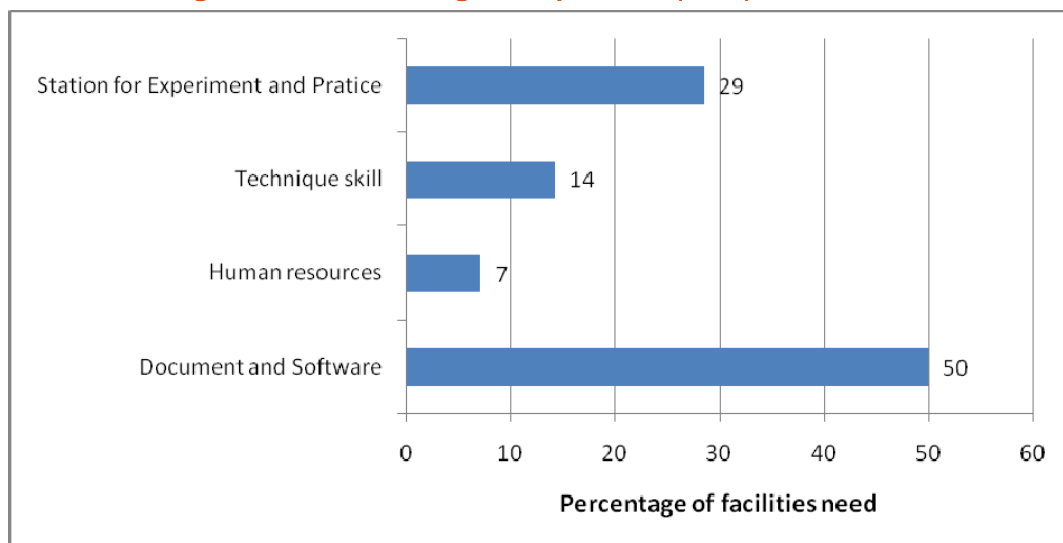
### Overall evaluation of training facilities

Graph below shows overall evaluation of training facilities prepared by each department or organization. This procedure was carried out to assess trained personnel. According to the result, training facilities, both moderately-equipped and well-equipped, accounted for 18% and 82% respectively. In general, all institutions at national and provincial level have well-equipped training facilities.



Graph 5: Evaluation of training facilities (percentage of the total respondents)

### Needs for training in climate change adaptation (CCA)



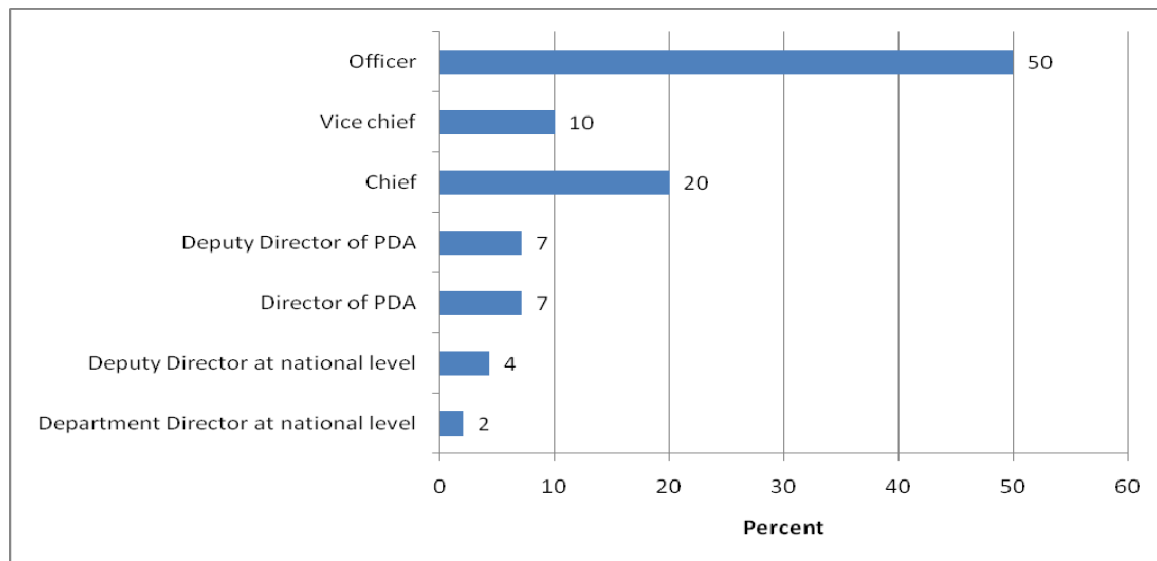
Graph 6: Needs for effective training (percentage of the total respondents)

The above graph shows various materials and resources needed to implement adaptation towards climate change. The training facilities must be accurately specified to effectively improve implementation of training relevant to climate change adaptation (CCA).

It can be clearly seen 50% of respondents said that there is a need for relevant documents and programs to conduct training programs; 7% reported need for better human resources, 14% for technical skills and 29% for stations for experiment and practice.

### d.3 Evaluation of trainer and trainees

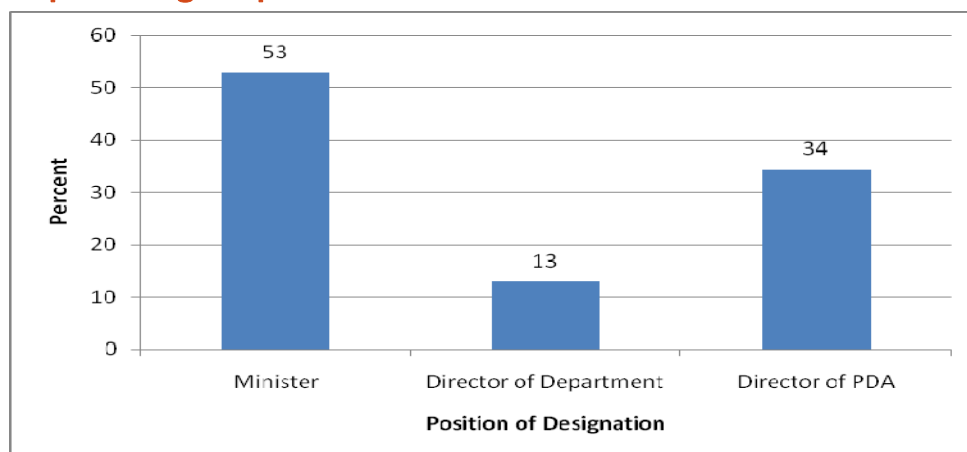
#### Designation and title of the employee



Graph 7: Designation and title of respondents (percentage of the total respondents)

Graph 7 shows the representation of various designations and titles of employee in the survey. It can be clearly seen that the title greatly differed from low to high. As a result, department director at national level accounted for 2%; deputy director at national level, 4%; director of Provincial Agricultural Department at provincial level (PDA), 7%; deputy director of Provincial Agricultural Department at provincial level (PDA), 7%; Chief office at national and provincial level, 20%; vice chief office at national and provincial level, 10%; and officers at both level, 50%, which was the highest interviewed number to be given potential training on climate change.

#### Supervising responsibilities

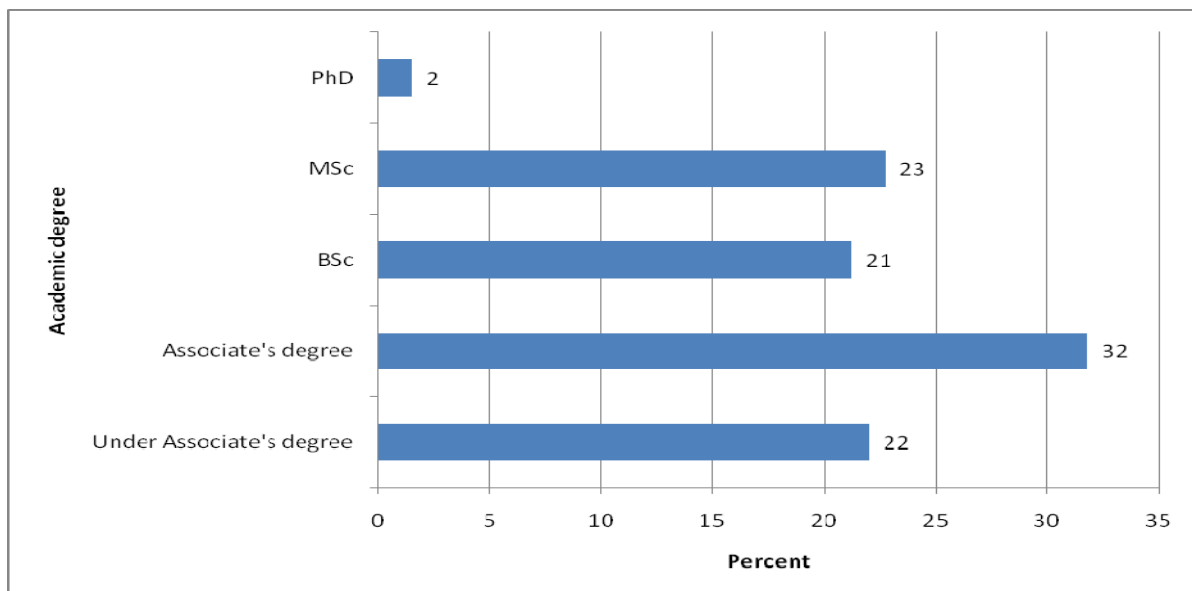


Graph 8: Supervisors of respondents (percentage)

This graph shows the percentage of designation of the supervisor of the employee who were interviewed to see if or not work held is relevant to management. It can be obviously seen that interviewees who worked under minister amounted to 53% and under department director at national level 13%, which was followed by those working under director of provincial agricultural department (PDA) 34%.

### Educational level of interviewees

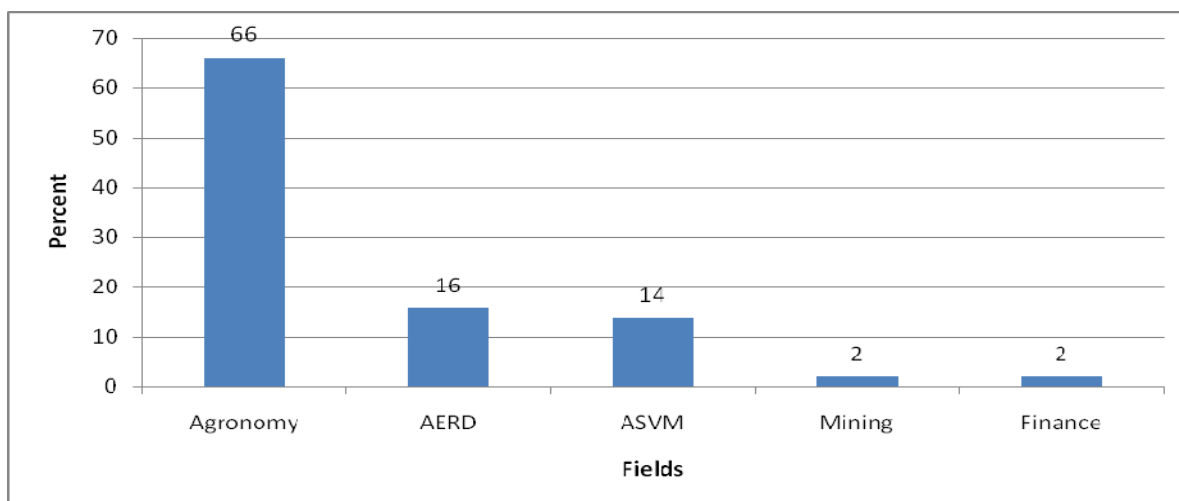
It is very apparent from the above graph that educational level of the interviewees in each institution ranged from under associate's degree to PhD. Of all the interviewed personnel, 22% received education lower than those holding associate's degree and were employed as extension officers in the provinces. However, associate's degree held by the respondents was the highest percentage, as they received their degree from National School of Agriculture and other institutions. Following this number, bachelor's degree mostly in agronomy, agro-economics and rural development, and animal science accounted for 20% in total, which was slightly smaller than those holding master's degree, 23%. There were only 2% of the interviewees that held PhD, which was acquired by furthering education abroad. Thus, these personnel would be screened to be potential trainers of climate change.



Graph 9: Educational level of the interviewees (percentage of the total respondents)

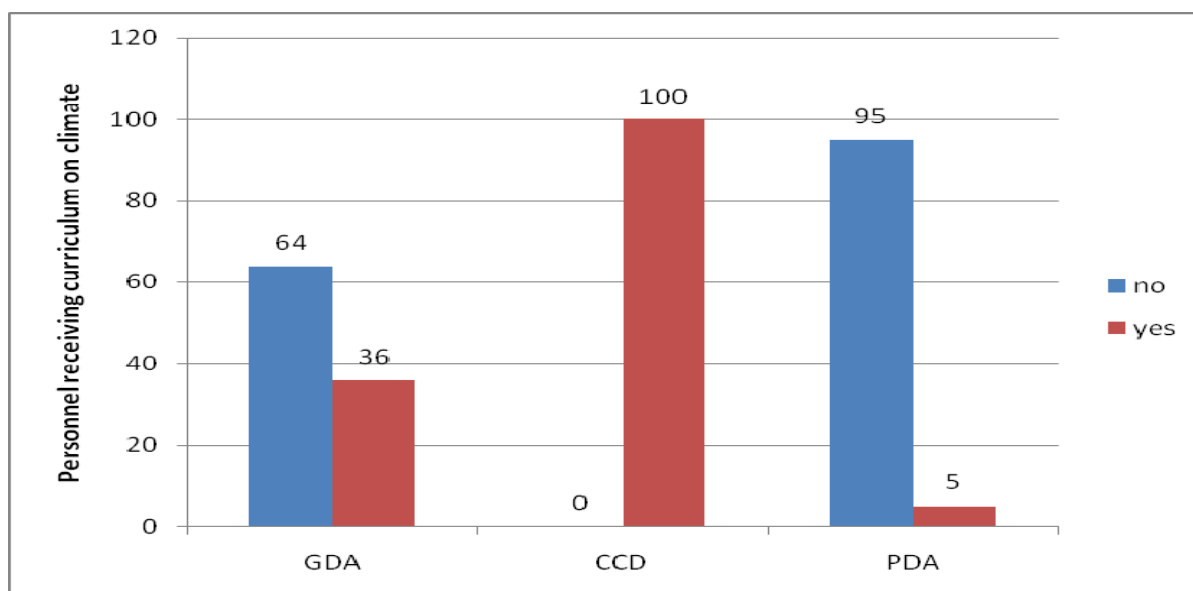
### Skill areas of interviewees

The result of this graph indicates what percentage of skill level the interviewees had, and based on the analysis, those responding to the questionnaire had different skills. Among the interviewees, 66% had a bachelor's degree, or above, in agronomy and were provided with short state-organized training programs on farming, a rate followed by that of officers who studied agronomic economics and rural development for their bachelor's and master's degree. The interviewees who studied animal science at university, or lower institutions, stood at 14%. In addition, those who were skilled at mining and accounting amounted to only 2%.



Graph 10: Skill areas of interviewees (percentage of the total respondents)

### Presence of training Curriculum on climate and climate change by each Institution



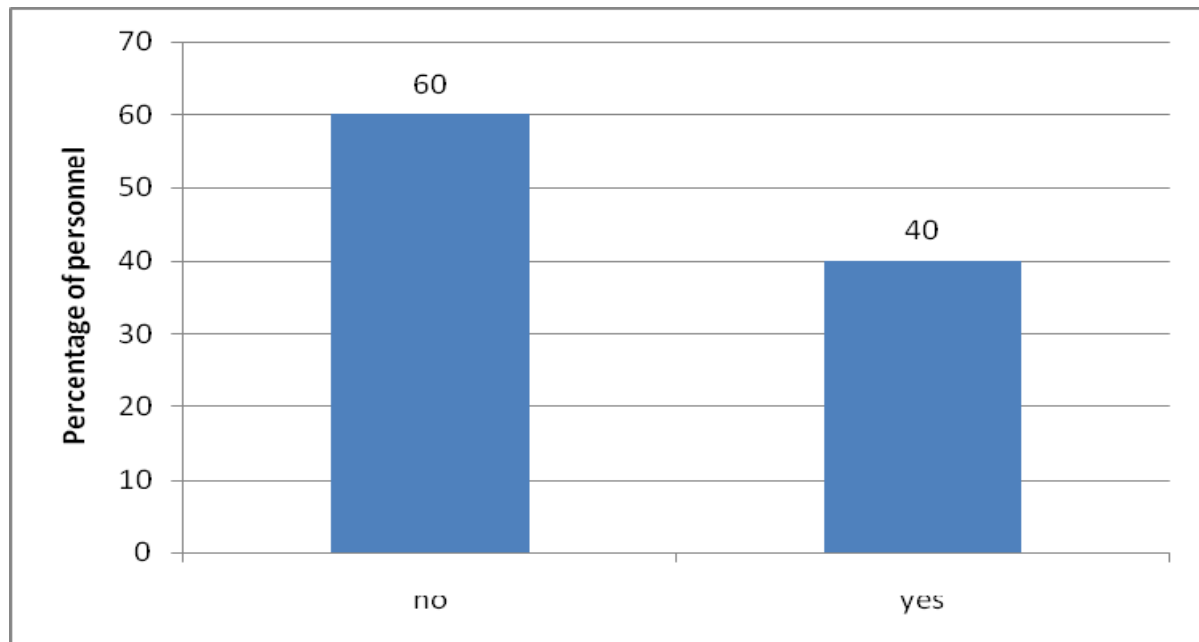
Graph 11: Presence of training curriculum on climate change adaptation by department (percentage of total respondents)

The Graph 11 shows all those from each department who received curricula on climate and climate change. It can be clearly seen that at national level within GDA, under MAFF, curricula on climate change were reported to account for 36%, a rate that was over half lower than the interviewees claiming no such curriculum. Undoubtedly, at CCD when all the personnel were asked if there were any study schedules on climate change, all the answers were yes. In addition to knowing about curriculum provision of climate, or climate change, only 5% of the interviewees said that such curricula were given. This may indicate an inadequate provision of study on climate or climate change at provincial level.

At the same time the existing curriculums on climate and climate change are few at all level under MAFF, some personnel at national level within the MAFF and more at provincial level had not known about these existing training curriculums in their institution. All existing training curriculums on climate and climate change under MAFF are sporadic program.

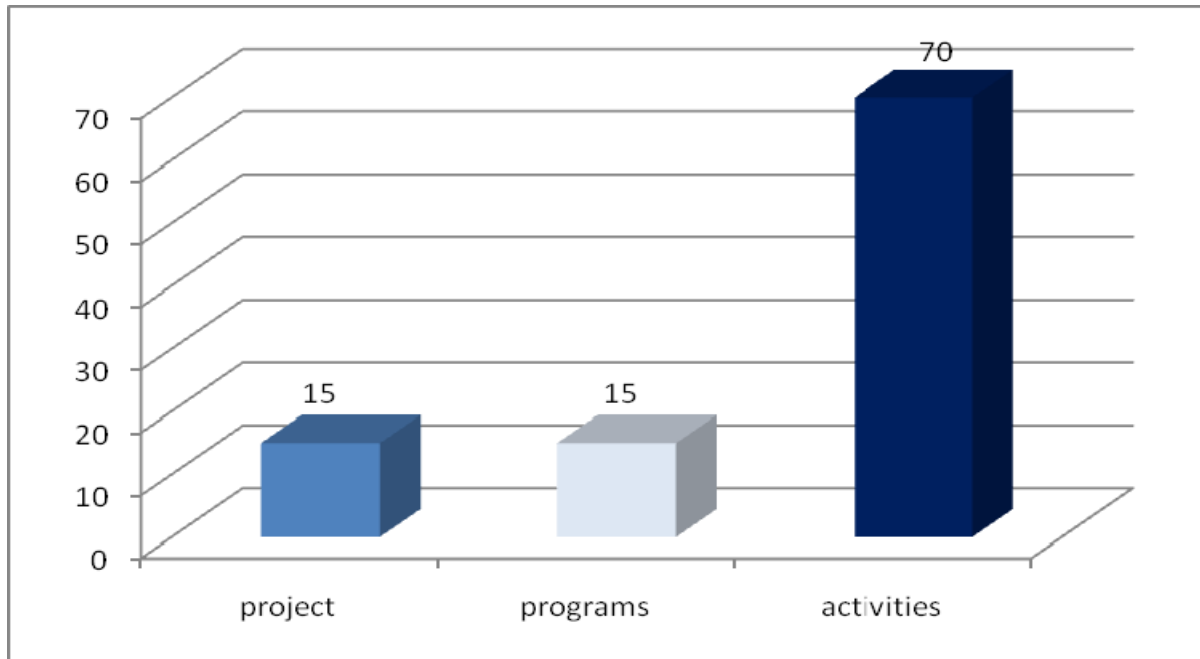
In conclusion, at national level within Department of Climate Change at Ministry of Environment there are existing training curriculum, but very few for General Directorate of Agriculture and it this done by the project. There are any training curriculum on climate and climate change at provincial level, only few personnel working on project collaboration with national level they have had get training.

### Nature of work handled by respondents in climate change



Graph 12: percentage of respondents handling various works related to climate change

The Graph 12 and 13 points out the percentage of respondents who handled various works relevant to CCA, including projects, programs and activities. It can be clearly seen that among all the interviewed personnel, only 40% had handled or were handling any of the climate change related works, and the rest included ordinary personnel working on irrelevant activities, and the seniors handling other works in no relevance to CCA. With a view to further discussion on how much percentage each work was handled, the percentage of aforementioned respondents (40% in total), who claimed handling various works in relation with climate change, was subdivided into three categories: activities, projects and programs. From both graphs, those who executed mere activities related to CCA accounted for 70%, a percentage far higher than a combination of projects and programs, both of which stood at 15% each (see Graph 13).

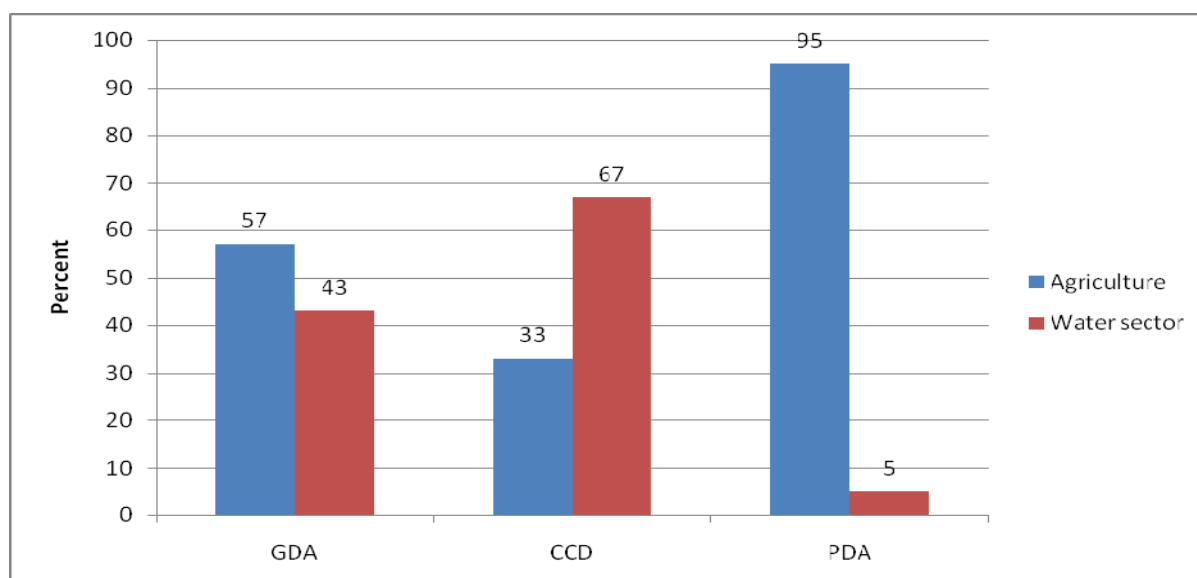


Graph 13: Division of work in terms of projects, programs in climate change among respondents (percentage of the total respondents)

### Number of handled works in climate change adaptation relevant areas

The Graph 14 shows various works handled by the personnel of each department in CCA related fields. Referring back to graphs 13 and 14 which revealed the percentage of work-handling respondents and that of each handled works, it can be jointly seen from the above graph that such a small percentage of handled works relevant to CCA focused full attention on agriculture and water sectors. However, at national level such works were not equally split for the two sectors, as among the respondents who executed such activities in General Directorate, 57% paid much attention to projects that mitigated the effects of climate change on the agriculture, followed by projects on the water sector which accounted for 43%. From within CCD, although such activities in relevance to CCA were vigorously executed, most of them, 67%, were aimed at adapting agricultural practices to the strongly-affected community with little focus on the water sector that stood at 33%. In contrast, superficially many programs held by PDA at provincial level on reducing the effects of climate change on the water sector accounted for 95%, which almost completely dominated agriculture, a sector considered very crucial to assist in tackling climate change effectively. As a result, in order to effectively disseminate information on climate change, there should be some more programs on the agriculture sector and some more activities on the water sector because a big gap among that information was found to be enormous, which led to difficulty in addressing climate change by focusing just one sector.





Graph 14: percentage of respondents who handled projects, programs or activities in climate change adaptation in agriculture and water sectors.

### Nature of works handled by each department

Table 4: percentage of personnel handled or did not handle any work related to climate change in each department at province and national level.

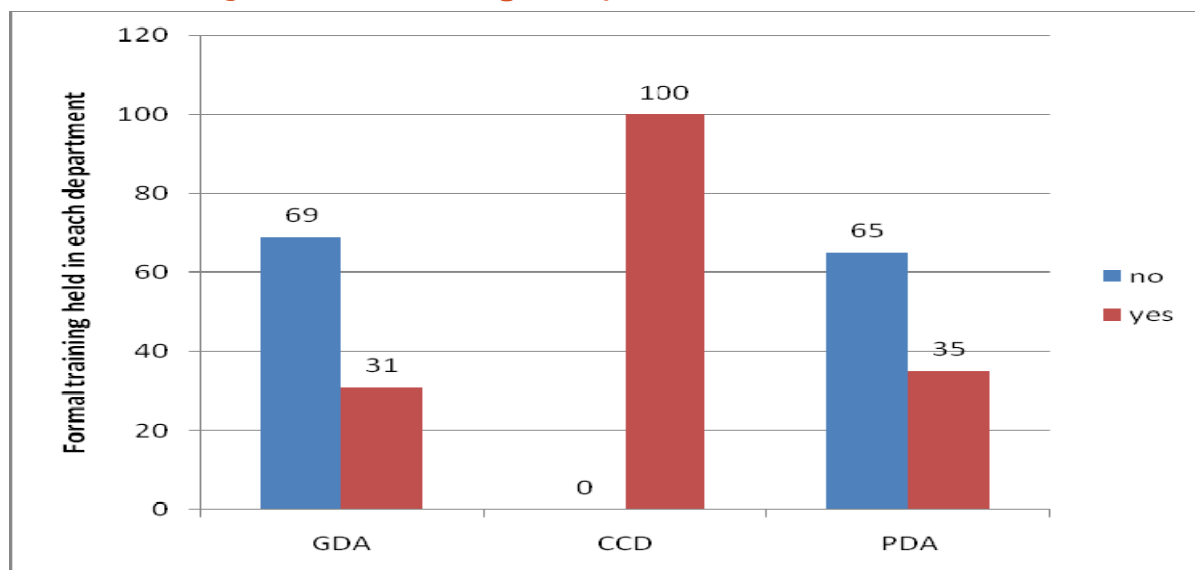
	Provincial level				National level			
	Kampot	Kampong Cham	Kampong Speu	Kandal	DALRM	CCD	DPPSP	DAE
Project	0 %	0 %	0 %	20 %	20 %	20 %	20 %	20 %
Programs	29 %	0 %	0 %	14 %	14 %	29 %	14 %	0 %
Activities	10 %	10 %	65 %	5 %	5 %	0 %	0 %	5 %

Table 4 indicates number of the interviewees handling projects, programs or activities relevant to climate change in the agricultural sector. It can be obviously known that projects were mainly handled at national level, except that in Kandal Provincial Agricultural Department a few projects were implemented. As the personnel of each department were questioned on program handling, there were two provinces reported to have programs on climate change, implicitly relevant to the agricultural sector, and those were Kampot Provincial Agricultural Department, 20%, and Kandal Provincial Agricultural Department, 14%.

In terms of climate change programs, personnel carrying out such programs at national level in GDA accounted for 28%, which was one percent smaller than those had programs on climate change in CCD. The programs were not available in the provinces, which means much more attention should be paid to providing knowledge of climate change to the local community. However, activities relevant to climate change in the agricultural sector at provincial level were handled substantially, particularly in Kampot Provincial Agricultural Department, 10%; Kampong Cham Provincial Agricultural Department, 10%; Kampong Speu Provincial Agricultural Department, 65%; and Kandal

Provincial Agricultural Department, 5%. Only small percentage of such activities in relevance to climate change could be seen to be implemented at national level, in GDA, which was 10%. Surprisingly, there were no activities in that area at CCD.

### Formal training on climate change adaptation and related fields



Graph 15: percentage of respondents receiving the formal training on climate change adaptation

Table 5: Kinds of the training on climate change adaptation received by respondents in each department

Institution	Formal Training	
	Induction (%)	On the job (%)
General Directorate	20	80
Department Climate Change	0	100
PDA	12	88

According to the graph and the table above, formal training programs on climate change, implemented from department level to provincial level, were not sufficient or suitable to be accepted, as within the inside of GDA, formal training was 31% which was much lower than those claiming no formal training. This percentage was very similar to that of provincial level, at which formal training accounted for 35%; non-formal training and no training, 65%.

Based on the table only, induction training at national level held in GDA accounted for 20%, in CCD no percentage, and in the provinces level 12%. The differences were seen to be high between induction and on-the-job training, as much more training programs in focus on job performance were carried out, including GDA, 80%; CCD of the Ministry of Environment, 100%; and PDA, 88%.

### Subjects included in induction training

Formal training programs which were held in each department, included induction training and on-the-job training. Induction training, one of the most important training programs, focused mostly on climate change, impact of climate change and preventive measure, which usually lasted 2 days. Besides that, training on work safety was formally held with an average of 2 days to assist personnel

in avoiding accidental danger. Typically, there were not sufficient induction training programs provided to strengthen novice personnel who just took up their jobs. Much more attention should be paid to lay a foundation of knowledge necessary to building capacities.

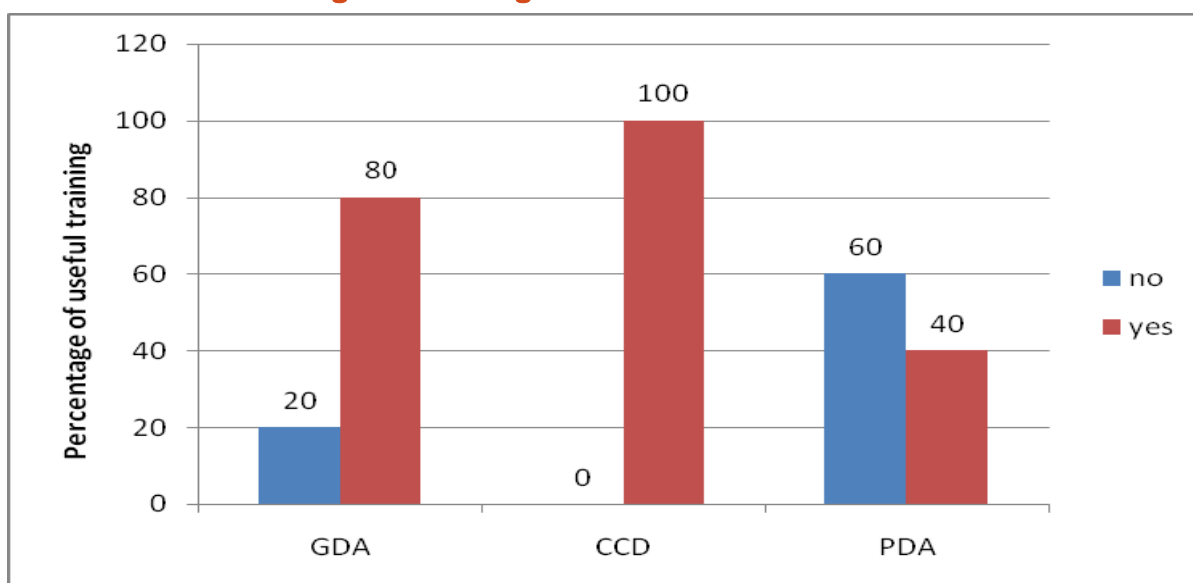
### Subjects of on-the-job training

In addition to induction training, on-the-job training was also formally conducted to build the capacity of personnel in each department; those training programs included CCA and greenhouse gas reduction, all of which ranged from 1 day to 30 days.

Table 6: Subjects on the job training

No.	Subjects	Duration
1	Training on CCA	1 day
2	Factors and impacts of climate change, use of fertilizers and insecticides	3 days
3	Greenhouse gas inventory, evaluation of climate change impact, use of greenhouse software	21 days
4	Integrated strategic development projects of CCA in Cambodia, and community and climate change	30 days
5	Idea mainstreaming of climate change in sustainable land management projects	3 days
6	Negotiation skills, and 15 <sup>th</sup> round preparation and membership of United Nations Framework Convention on Climate Change (UNFCCC)	2 days
7	Greenhouse vegetable farming and rice intensification (impact of climate change and solution)	3 days
8	Climate change and rice crops and disaster management planning on climate change	2 days
9	Greenhouse vegetable farming, livestock raising, breed selection and growing stage of rice and vegetable.	2 days

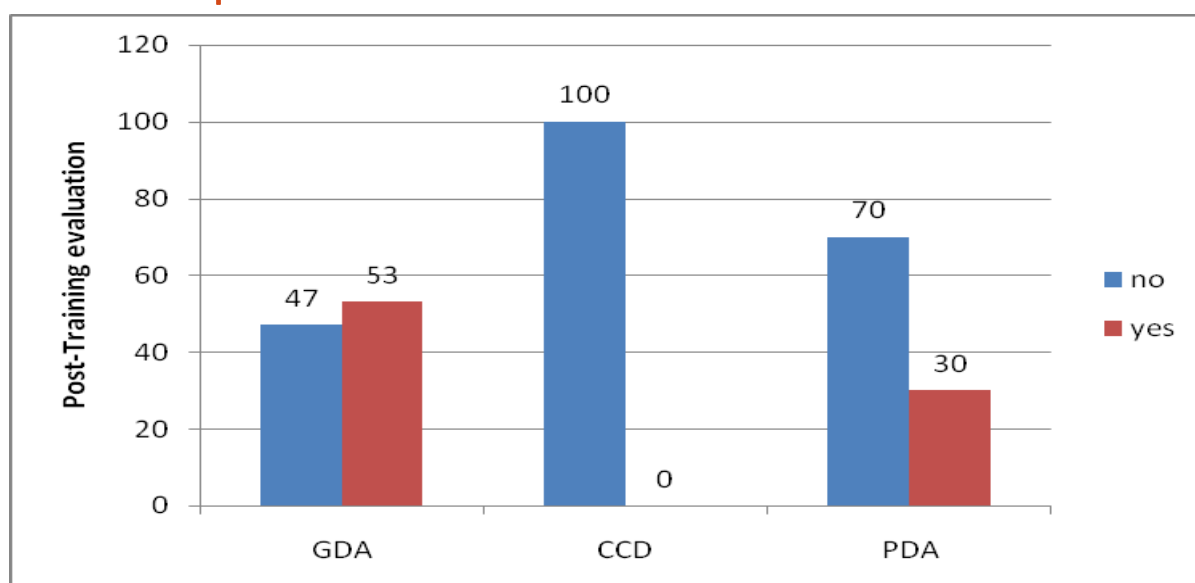
### Usefulness of training in assisting subordinates or farmers



Graph 16: percentage of obtained answers on useful training

The Graph 16 shows the usefulness of training aimed at assisting subordinates and farmers in addressing climate change related issues. It can be clearly seen that at GDA, training that the personnel found very useful to tackle climate change added up to 80%, while those citing no benefits of training was just 20%. When questioned on the usefulness of training, 100% of the personnel at CCD said that the training was advantageous enough to improve their jobs related to climate change. There was also a conflicting idea which was shared at provincial level, as only 40% of the interviewed personnel found the training to be useful and the rest said not useful. These results clearly show that some personnel were attend the training and then were use the knowledge from the training to improve their work but some were not use, because their job responsibility are not related to climate change such as administration and accounting work.

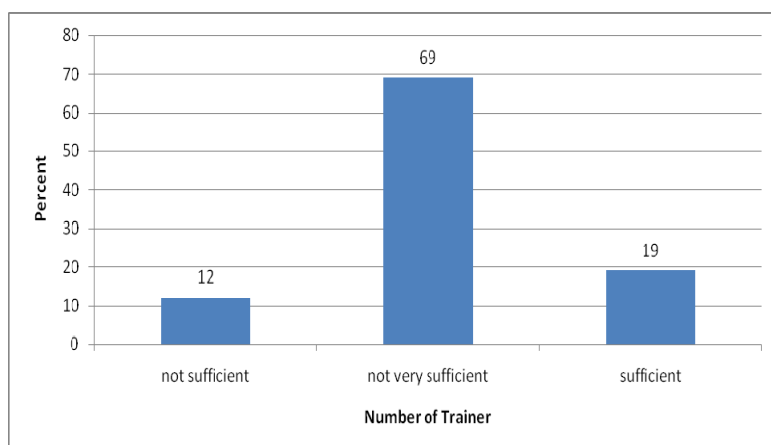
### Evaluation of performance



Graph 17: percentage of answer on post-training evaluation of performance by departments

After any training given to staff of each department had been finished, evaluation was usually conducted to see if there was any improvement or effectiveness in their jobs. It can be graphically seen that at national level within GDA, 38% of respondents said that the training programs are evaluated, while 47% said they are not evaluated. 30% of respondents from provincial level said the training programs are evaluated. The percentage of responses stating presence of post-training evaluation at national level and provincial level under MAFF within GDA and PDA was a much smaller amount than that at national level of CCD of MoE, where 100% of respondents said that the trainings evaluated.

### Evaluation of trainers



Graph 18: Responses (%) on the performance of trainers

The Graph 18 indicates evaluation of trainers, and this evaluation was made in each institution that organized the training. 12% of the respondents reported that the number of trainers are not sufficient, a rate that was a little lower than those who reported sufficient number of trainers (19%). High percentage of number of trainers deemed not very sufficient was 69%, which means that dissemination of new information on any subject was unevenly shared, as departments located in the city had more access to new knowledge. In general the number of trainer on climate and climate change are not very sufficient for institutions at national and provincial level of MAFF. There is some resources person on general climate change at department of climate change of MoE.

### Evaluation of trainer skills

Graph 19 shows overall evaluation of trainers responsible for implementing training by the respondents. 69% of respondents informed that the trainers had good training skills and rest of 31% rated them as average. This percentage was highly associated with an aim to enrich any training program given by employing seasoned personnel from the above department or organization.

Graph 19: Percentage of answer on evaluation of trainer skills on subjects they train

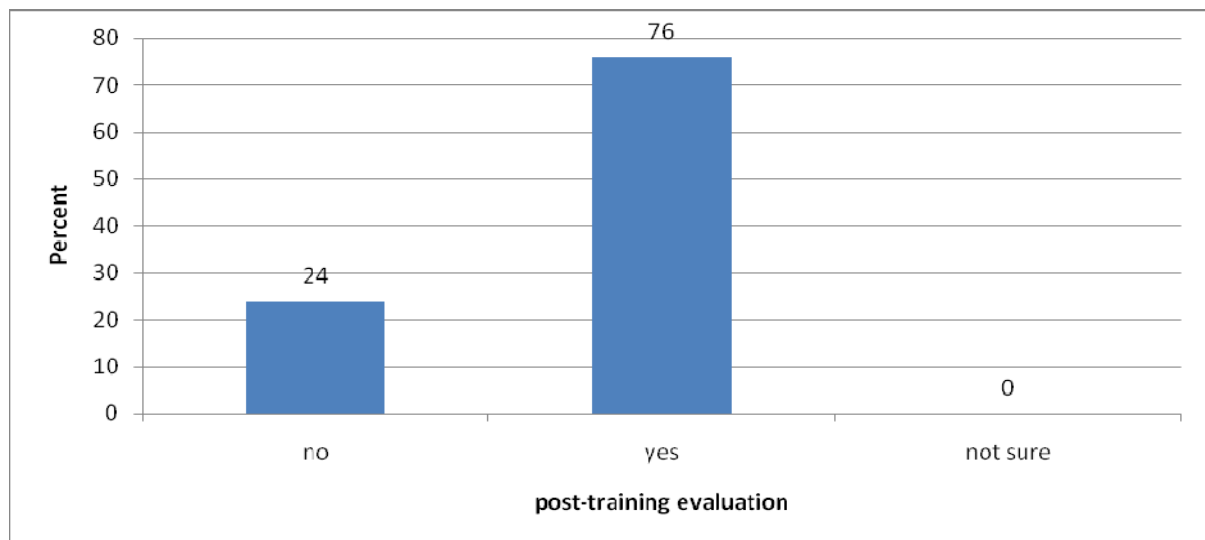
### Evaluation of trainer's knowledge



Graph 20: Percentage of answer on evaluation of trainers' knowledge

Graph 20 shows the evaluation of knowledge that trainers had on the subject they impart training. In addition to the previous graph, when ever trainer number assigned to provide training programs was insufficient, it is apparently revealed that their knowledge for conducting training was still a challenge. Not all of the previous trainers were knowledgeable or experienced in training, nor did they receive higher education; thus, the training they offered was not always good. As shown in the graph, 56% respondents said the trainers had average knowledge; and 44% said they had good knowledge.

### Presence of post-training evaluation in each institution



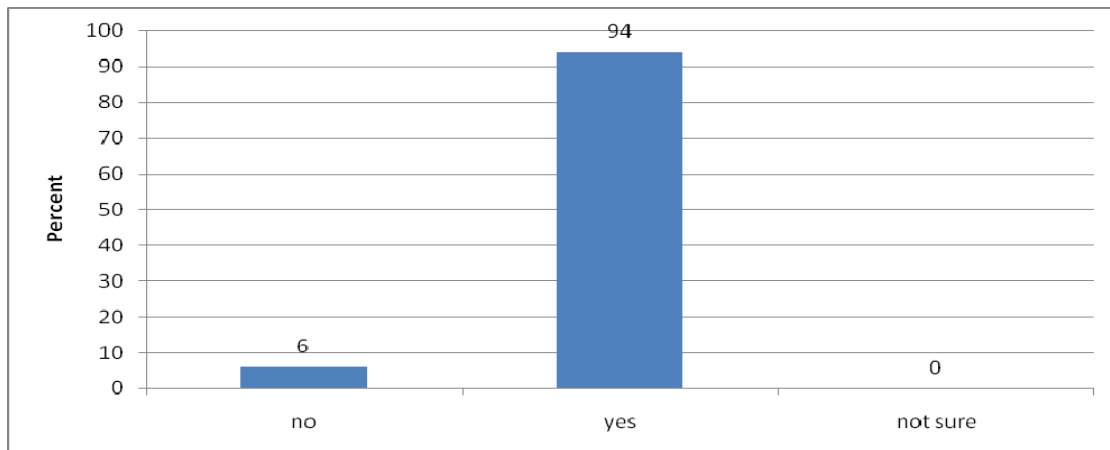
Graph 21: Percentage of answer on post-training evaluation in each department were done

The graph above indicates presence of post-training evaluation to evaluate trainees. Typically, post-training evaluation, which is to see whether or not knowledge given has been put into action, is instrumental to understanding the knowledge of trainees. It can be clearly seen that most trainings were evaluated to identify what staff had achieved and what they had applied in accordance to their knowledge obtained from the training. 76% of the respondents claimed that the post-training

evaluation existed and 24% claimed no evaluation. This difference in response could be due to not all training programs are evaluated after the training.

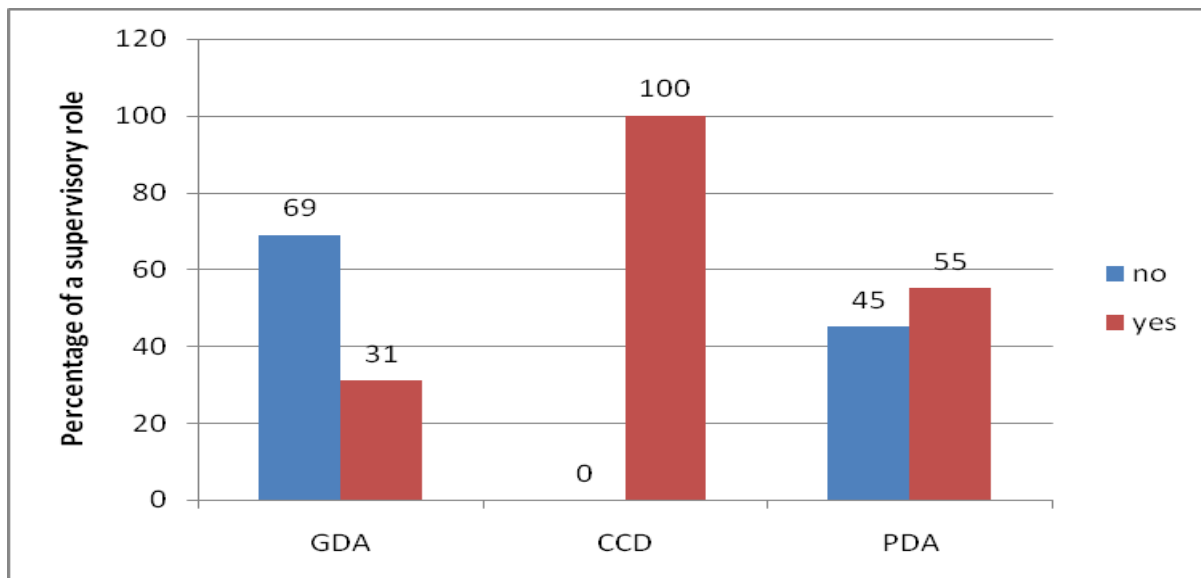
### Improvement in the performance of staff after training

The Graph 22 shows responses on improvement in performance by the trained personnel after training in each department. It is apparent from the figure that after receiving training, 94% of the staff claimed an improvement in their work, followed by 6% indicated no improvement in work after training. This means that after receiving training on new knowledge, or new technology, the staff will know so much that they can develop their work quickly.



Graph 22: Percentage of respondent answer on evaluation of improved work after training

### On the job functions (Current duties and expected changes in roles for CCA) Supervisory roles of interviewed personnel by department



Graph 23: percentage of supervisory roles of interviewed personnel

Information on supervisory roles of personnel from senior to subordinate was collected at national and provincial level in GDA and PDA of MAFF and CCD of MoE. It can be clearly seen that at national level in GDA, the interviewees who played supervisory roles accounted for 31%, while another 69%

had no supervisory role to play. Within CCD, one department under the MoE, 100% of the interviewees played supervisory roles in extending knowledge of climate change to the local community. At provincial level, the interviewed personnel who supervised subordinates accounted for 55%, which was a little higher than those who completely worked as subordinates, 45%.

Table 7: Current job responsibilities of the respondents at national level in CCD

No.	Current job responsibilities of the respondents	Percentage of respondents
1	Institutional and capacity development	100
2	comprehension of all climate change-related activities in term of mitigation, adaptation and negotiation for Cambodia	100
3	Provide extension service	100
4	Responsible for preparing green gas inventory	100
5	Responsible for natural resources management	75
6	Responsible for preparing study on greenhouse gas emission reduction	100
7	Implementing climate change public awareness raising programme	100

Table 7 show that the most respondents at CCD has responsibility to carry climate change activities such as comprehension of all climate change-related activities in term of mitigation, adaptation and negotiation of country position for Cambodia at UNFCCC-COP, preparing greenhouse gas inventory, preparing studies on greenhouse gas emission reduction, implementing climate change public awareness raising programme etc.

Table 8: Current job responsibilities of the respondents at national level in GDA

No.	Current job responsibilities of the respondents	Percentage of respondents
1	Human resources management	12.5
2	Agricultural research	6.25
3	Agricultural extension (provide training)	75
4	Farming system development	6.25
5	Farmer organization development	6.25
6	Technical work	6.25
7	Administration work	12.5
8	Economic land concession	6.25
9	International relation	6.25
10	Research	6.25
11	Identification of pest	12.5
12	Agro-environmental system analysis	6.25
13	Gender facilitation	12.5
14	Training on climate change	12.5
15	Community facilitation	6.25

Table 8 show the responsibility of the respondent at national level in GDA. The result clearly seen that 75 % of the respondents are working as agriculture extension workers, they have to provide training to provincial, district and commune officer on agriculture. Another 12.5 % have responsibility to provide training on climate change, facilitate in gender training courses etc.



Table 9: Current job responsibilities of the respondents at PDA

No.	Current job responsibilities of the respondents	Percentage of respondents
1	In charge of Extension service	69
2	In charge of administrative work	10
3	Creation and implementation of control system	10
4	Marketing work	10
5	Community management	10
6	Management and planning	8
7	International cooperation	8
8	Facilitation private sector on agricultural work and project management	4
9	Agricultural provisions	10
10	Agricultural machinery management	10
11	Agricultural land use	5
12	Farmer group creation	5
13	Creating farmer credit groups	10
14	Animal health work	12
15	Human resources management	10
16	Planning and accounting	8

Similar to Table 8, Table 9 shows the responsibility of the respondents at provincial level. Among all the interviewed personnel at provincial agricultural department, 69% are in charge of extension services, 12% working as animal health worker, and the rest are responsible for creating farmer credit groups, human resource management, community management, in charge of administration work and so on.

Table 10: Number of staff is supervise by the respondents by each department

Department	Minimum	Average	Maximum
General Department of Agriculture	9	196	550
Department of Climate change	7	10	15
Provincial Agricultural Department	4	52	228

Table 10 show that the respondent at national level in GDA of MAFF supervise in average 196 staff and in CCD of MoE only 10 staff. At provincial level the respondent supervise in average 52 staff.

Table 11: Percentage of respondent answer on responsibility of the staff under their supervision by department

No.	Role of the staff under supervision	Percentage answered			Total
		CCD	GDA	PDA	
1	Technical work	1	0	0	1
2	Policies and strategies of climate change adaptation	1	0	0	1
3	Greenhouse gas inventory preparation	3	0	0	3
4	Mitigation study	3	0	0	3

No.	Role of the staff under supervision	Percentage answered			Total
		CCD	GDA	PDA	
5	Training	0	1	0	1
6	Farming system development	0	1	0	1
7	Farmer organization development	0	1	0	1
8	Planning	0	1	0	1
9	Data analysis	0	1	0	1
10	Report writing	0	1	0	1
11	Questionnaire writing	0		0	1
12	Administration work	0	1	4	5
13	Extension work	0	3	31	34
14	General management	0	0	10	10
15	Splitting saving groups	0	0	1	1
16	Being village health agents	0	0	10	10
17	Agricultural community development	0	0	4	4

Table 11 show the responsibility of the staff under supervision of respondent by each department at national and provincial level. The results show that 34% of the staff under supervision of respondent working as extension worker in agriculture and follow by village health agents 10 % and 10% responsible for general management in their office.

#### d.4 Evaluation of skill and knowledge areas

##### Self-evaluation of Knowledge and skill areas

The classification of knowledge and skill areas relevant to CCA was provided by the interviewed personnel as the followings:

##### Knowledge areas

In terms of knowledge areas, they were classified at national level within GDA as bad at 6%, average at 44%, and good at 50%. This was very different from CCD, where knowledge areas in CCA classified as average accounted for 67%; the rest was considered good. At provincial level, the knowledge of CCA was evaluated as bad, 13%; poor, 21%; average, 45%; and good, 21%.

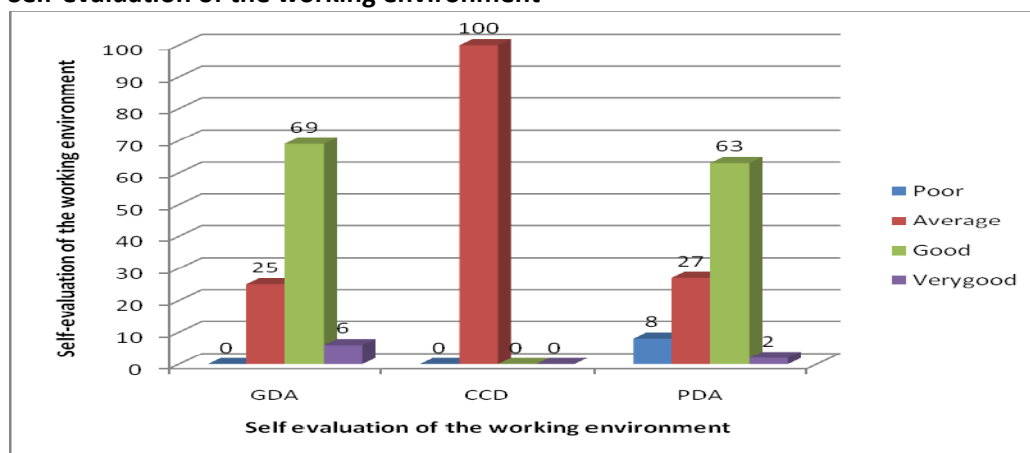
Table 12: percentage of respondents' answers on classification of knowledge and skill areas on climate change adaptation

	Institution	Rating of Knowledge and Skill			
		Bad	Poor	Average	Good
Knowledge	PDA	13	21	45	21
	Department Climate Change	0	0	67	33
	General Directorate	6	0	44	50
Skills	PDA	13	19	51	17
	Department Climate Change	0	0	67	33
	General Directorate	6	0	63	31

**Skill areas** In addition to the self-evaluation of knowledge areas relevant to CCA, skill areas were also rated at national level within GDA, as bad-rated knowledge accounted for 6%; average-rated knowledge, 63%; and good-rated knowledge, 31%. At CCD, the rating of skill areas in CCA was neither bad nor poor because it was interestingly rated as average, 67%, and good, 33%. Every option of evaluation of skill areas was seen at provincial level (PDA), and such skill areas were evaluated as bad, 13%, followed by poor skill areas of 19%. Most of the interviewees were said to have average skill areas, and only 17% had good skill areas.

### Self-evaluation of working environment (cross check with the above institutional evaluation)

#### Self-evaluation of the working environment



Graph 24: percentage of self-evaluation of the working environment

This graph indicates self-evaluation of the working environment for the job responsibility of the personnel in each department. It is very apparent that from within GDA the working atmosphere was evaluated as good, which accounted for 69%, a good indication of the working ground. However, this indicator was not so sufficient that improvement was urgently needed, as 25% of insufficiency of a good working atmosphere was still seen and followed by a good one, 6%. More surprisingly, CCD, a department that focuses full attention on curbing climate change, was a place where the working ground was totally evaluated as average.

Within PDA, a good working environment was also seen to account for 63%, the rest of which was unequally split in three—2% very good, 27% average, and 8% poor. The self-evaluation of the working environment was conducted based on some reasons, including a good match of work for skill areas, substantial technical knowledge, participation of meetings linked to real practices, difficulty in communication with farmers, agriculturally technical extension, inaccurate designation of employee, a practical mismatch for skill areas, good networks from national to ground level, and capacity of subsequent agricultural extension to farmers.

### e. Identifying Ideal Knowledge and Skills for CCA

A group discussion was organized for identifying ideal knowledge and skill areas for CCA for various personnel working in department of agriculture at national level. The group discussion was attended by Ms. Kang Kroesna, dean of faculty of agricultural technology and management of RUA, Mr. Chea Chanthou, deputy director of climate change department of MoE, Mr. Mak Soeun, rector of agriculture extension department of MAFF, Mr. Hok Kimthoun, staff of MAFF, Mr. Yun Sophan, head

office of agriculture extension department, Mr. Nuth Naret, Mr. Hin Lyhour and Mr. Nuth Salan RUA's staff. The results of ensued discussions are presented in this section.

## e.1 Identified priorities for knowledge and skills

### Basic knowledge and skills that need to be imparted to all the staff/trainers

According to the survey results, the basic knowledge and skills that should be common to all trainers and staffs are a general knowledge on climate change, CCA and mitigation and more focusing on agriculture sector.

### Specific knowledge and skill areas need to be imparted to specific staff/trainer

According to the survey results, the specific knowledge and skill areas needed are different by each department as in table below.

Table 13: The training need at national level in CCD

No.	Training Needs	
	Knowledge area	Skill area
1	Deep understanding on climate change vulnerability assessment, assessment of adaptation and mitigation actions	Be able to conduct climate change vulnerability assessment, assessment of adaptation, mitigation for the whole agriculture sector including livestock raising
2	Climate change and economic development assessment	Be able to conduct cost and benefit analysis of the adaptation and mitigation options
3	Climate change policy and strategy development	Be able to draft National Climate change policy, strategic and action plan
4	International negotiations	Be able to negotiate on climate change at UNFCCC-COP
5	Modeling	Be able to carry climate change modeling

Table 13 indicates various additional training needs for both knowledge and skill areas in terms of awareness of climate change in CCD. Although climate change issues are widely known, not all staff who works at national government paid much attention to these issues, except for those working in CCD. However, necessary information on climate change is not still available to relevant personnel even in CCD as they might have a little understanding of the cause and effect of climate change; thus, training on climate change is required to strengthen the capacity of these personnel. When questioned over need for further training on climate change, the respondents who work at CCD said that they needed a much more specific knowledge of climate change, especially deeper understanding on climate change vulnerability assessment, assessment of adaptation and mitigation, climate change and economic development assessment, climate change policy and strategy development, international negotiation and climate change impact modeling. The climate change vulnerability assessment, assessment of adaptation and mitigation was reported to be of great importance because they could be used for identifying farming techniques for adapting to climate change. Apart from adaptive farming methods, general knowledge of climate change and economic development assessment was specified by focusing much attention on assessing costs and benefits of adaptation and mitigation options. Furthermore, climate change policy and strategy development could be taken into account as this knowledge is not widely available.

Table 14: Non-prioritised training needs at national level in GDA

No.	Training Needs	
	Knowledge area	Skill area
1	Policy making	Climate change policy making
		Strategy for GHG reduction
2	Vulnerability and impact assessment of climate change	Vulnerability and impact assessment of climate change and adaptation options in agriculture sector
3	Climate change technologies	Implementing related technologies in agriculture sector
4	Agricultural science	Soil classification
		Soil nutrient management
		Agricultural land use
		Land resources management
		Phyto-sanitation
		Pest control

The Table 14 points out about a broad knowledge of other aspects of climate change mitigation and awareness. The respondents from GDA required training programs on general knowledge of how to make an affective policy on reducing greenhouse gas emissions, which consisted relevantly of two main skill areas: climate change policy making and strategy for GHG reduction. Other interviewed personnel responded that they needed to be trained more on vulnerability assessment and impact analysis of climate change in general, especially in Cambodia. In the case of organizing training on these topics, related skill areas in agriculture sector were preferred since this subject was closely related to the duty of GDA. Additionally, respondents from GDA also requested further training programs on agricultural science to enhance staff's capacities of dealing more effectively with cultivation, currently strongly affected by global warming. With such programs, the personnel wanted to learn more thoroughly about skill areas closely related to soil classification, soil nutrient management, agricultural land use, land resources management, phyto-sanitation, and pest control. These skill areas were reportedly very important to curb the effects of climate change when applied practically to the local affected community.

Table 15: Non-prioritised training needs at provincial level (PDA)

No.	Training Need	
	Knowledge area	Skill area
1	Facilitation skills	Facilitation skills in climate change
		Community facilitation
2	Management skills	Administrative accounting
3	Information Technology	Word and Excel
4	Program on ArcGIS	Interpretation on satellite images
5	Agriculture and Climate change adaptation development.	Climate change adaptation techniques for farming , rice cultivation, livestock raising and fish farming
		How to apply adaptation technology on climate change in the agricultural sector
		Crop adaptation to climate change

		Livestock raising techniques suitable for climate change
6	Agricultural Science	Changes in land use and carbon in land
		Rice production
		Vegetable production
		Pest control
		Technology on animal raising
		Fish, frog and eel production
		Agriculture and human welfare
7	Sustainable agriculture	Usage of fertilizer, insecticide and pesticide
		Communities compromise
		Communities development
8	Agricultural mechanization	Plough technique
9	Farming technique	Impact of different factors on crop production
10	Water and agriculture	Water management
		Irrigation system and management
11	Project management	Project appraisal
		Project writing

Table 15 shows necessary training programs reported by the respondents working at PDA, an institution that is responsible for extending agricultural information and putting concepts into action. When interviewed over general knowledge which was necessary for capacity building, some of the respondents in PDA reported to be trained on facilitation skills that focused heavily on facilitation skills in climate change. In addition to facilitation, management skills such as administrative accounting were also fundamental for them to work more proficiently on their daily activities, as most officers of PDA not only had a relatively low education but also gained a little access to computer or internet due to a shortage of such administrative equipment. In this case, most respondents reported need for short-term training programs on information technology, such as Microsoft Word and Microsoft Excel, and ArcGIS. In PDA, some personnel reported the need for training programs on farming, livestock raising and fish farming, general knowledge of agricultural science, sustainable agriculture, agricultural mechanization and water and agriculture. Based on these topics, the respondents wanted to increase their understanding of agricultural concepts on how to observe changes in carbon dioxide from the soil, how to use properly fertilizer or insecticide and how to farm fish, frogs and rice and how to mechanize the land and manage water properly. In need of either handling their own projects or executing various activities related to climate change, some of the respondents who worked in PDA demanded training programs on project management which involved activities of project appraisal and project writing.

It can be clearly seen that within PDA the general knowledge on modern farming, administrative work and climate change were highly limited due to financial limitations and scarcity of professional staff. Hence, significant numbers of programs are required to increase the capacity of these staff. After the group discussion with the staff of PDA, CCD, GDA, and the project team discussed the priorities expressed by the respondents and finalized a list of priority areas for implementing training programs in agriculture in Cambodia (Table 16). It can be seen that training requirements regarding climate change differed among departments ranging among knowledge areas in climate change and economic development, climate change policy, strategy and action plan development and climate change modeling within CCD. CCD and GDA personnel were more interested in technical and analytical aspects of CCA. Personnel working with PDA asked for additional training on agriculture

and CCA development which was associated with CCA techniques for farming, rice cultivation, livestock raising and fish farming, how to apply adaptation technology on climate change in the agricultural sector.

Table 16: Prioritized topics selected by the group discussions on training needs by each department at provincial and national level

No.	Training Needs	
	Knowledge area	Skill area
CCD		
1	Climate change and economic development	Cost benefit analysis of the adaptation and mitigation options
2	Climate change policy, strategy and action plan development	National climate change policy, strategy and action plan
GDA		
1	Vulnerability assessment and impact analysis of climate change	Vulnerability assessment and impact analysis of climate change and adaptation options development in agriculture sector
2	Climate change technology implementation	Implementing technology in agriculture sector
PDA		
1	Agriculture and climate change adaptation development	Climate change adaptation techniques for farming, rice cultivation, livestock raising and fish farming.
		How to identify climate change adaptation technologies in the agricultural sector

## e.2 Institutional facilities for supporting above knowledge and skill areas

According to the survey results from each department they require additional facilities to be introduced into the training institutions where the training modules will be implemented as in table below.

Table 16: Percentage of respondent's answer on infrastructure needs in each department

Needs for Infrastructure	Institution			Total
	GDA (%)	CCD (%)	PDA (%)	
Training material	35	0	14	48
Technical Data	31	2	8	41
Means of Communication	19	0	6	25
Budget	14	3	8	25
Human Resources	6	3	5	14
Means of Travel	8	0	3	11

This table indicates the answers on various needs in each department. It can be clearly seen as the followings:

- 35% of respondents from GDA opined the need for training materials to deal with work in comparison to PDA where only 14% reported need for training materials.

- Technical data was very important for GDA to track any changes in temperature, signalling climate change, and that accounted for 31%, which was followed by CCD, 2%, and PDA, 8%.
- Communication between department and department was considered useful for spreading new information, but only 19% of respondents in GDA and 6% in PDA said communication facilities are needed,.
- Funds for running any climate change projects were the most important thing for assisting farmers in tackling climate change; thus GDA needed budget of 14%, much more percentage than any other departments—CCD 3% and PDA 8%.
- Compared with various needs stated above, human resources were seen to be less, as GDA needed 6%, CCD 3%, and PDA 5%.
- Traveling from place to place was considered vital to information dissemination, but GDA required only 8%, PDA 3%.
- Apart from those needs, each department also required data system management, network, the internet, LCD, computer, and printer.
- According to the discussion among Cambodia team members, on which each department required various additional needs of infrastructure for implementing the training modules should be: Training material, data system management, laptop, printer and implementing buget.



## f. Policy Suggestions for Capacity Building

There have been a few capacity building initiatives in Cambodia and are insufficient as indicated by limited understanding on climate change among the respondents. Most of the technical officials have had inadequate opportunity in receiving capacity building. Motivation remains a need as indicated by some informants to enable effective participation.

- Majority of respondents indicated less interest in climate change. The study does not dig deep enough to understand any rationale for that response. Most of them, especially technical officers, have neither had opportunity to expose themselves to any CC capacity building nor received sufficient information on CC and significant measures to cope up with, which could result in limited understanding of the complexity of CC. Thus, knowledge on adaptation to climate change is of critical importance. In addition, General knowledge on climate change and mitigation should also be included in order to build the basis for better understanding of adaptation and implementation.
- Many respondents at all level are interested in CCA. Taking into account the scarce resources, this subject should be organized for PDA officials whose are working closely with farmers. Furthermore, General Knowledge on Climate Change should also be attached to build the basis for better understanding on mitigation options as well as sustainable development and low carbon development.
- With limited climate change background of the trainers at national level, introductory training would be required to enable them to integrate the public awareness to their training materials.
- It is important and pertinent in integrating climate change related subjects into curriculum. It is recommended that if already done, it should be part of the existing curriculum. Both capacity and policy remain challenges; thus, careful and sufficient discussions on prior actions to be taken punctually would be made.
- The trainings, if organized, should be conducted in mother tongue with some English-Khmer bilingual terminologies for less than a week's time for each event and preferably on vacation periods (Mid-July to late August) for officials of academic institutions. However, the training schedule for other sources beside the aforementioned is not necessarily fixed. Participatory learning methods should be employed though lectures, at which point this should be part of it. Field trips, either actual or visual, should be included for effective learning.
- Beyond this study, it is clear that comprehensive and systematic training materials/kits, especially training documents for staff at national, provincial level and for farmers should be developed and distributed. Other additional materials and means such as manuals, short articles, both software and hardware leaflets, and website are also highly required.
- There is a need to develop core group of trainers within the General Department of Agriculture for the successful integration and institutionalization of present efforts. In Cambodia, there are some resource persons (experts) available for CCA in general from Department of Climate Change of Ministry of Environment and some resource persons available for agriculture technique from GDA of MAFF, but very few on CCA in agriculture as well. Therefore, our suggestion will be to develop group of core trainers through Master TOT on CCA in agriculture. One week long Master TOT could be developed to the group of GDA trainers working at MAFF.
- Specific training materials and teaching aids to be used by the trainers in implementing the developed module should receive attention. Some of the visual aids and printed materials related climate change impacts/ effects developed by the Department of Climate Change from Ministry of Environment could also be utilized but there is a need to develop specific teaching aids and materials for MAFF.

## **g. References**

- Heng Chan Thoeun, Chea Chanthou, Peou vanna, Am pirum, Va dany, Yem Dararath and Rezaldi Boer, 2001: Vulnerability and adaptation assessment to climate change in Cambodia. Ministry of environment and UNDP/GEF.
- Va Dany, Uy Kamal, and Va Chanmakaravuth, 2010: report on climate change training need assessment for government officials, Academia and Media, Ministry of environment, Cambodia.

## CAMBODIA PART II: TRAINING MODULES

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Induction training:

- i. Induction training module for PDA staff-district and commune level-on climate change adaptation in rice production
- i. Induction training module for GDA-national level-on climate change adaptation in agriculture
- ii. Induction training module for PDA staff-Province level- on climate change adaptation in agriculture sector

In-service training:

- iii. In-service training module for PDA-province level- on climate change adaptation in agriculture sector
- iv. In-service training module for PDA staff-district and commune level-on climate change adaptation in rice production
- v. In-service training module for GDA staff-national level- on climate change adaptation in agriculture sector

### **i. Induction Training Module for PDA-District and Commune Level**

#### 1. INTRODUCTION

The training need assessment of agricultural staff who work at the district level and who used to received the training in agricultural technology work directly with famers in the context of climate change and based on their responsibilities, indicate that the district staff lack the knowledge on what is climate change adaptation in agriculture sector. Therefore, to providing the basic knowledge on CCA district and commune staff will help them to work with farmers in the CCA context better than before.

#### 2. TARGET GROUP

PDA's Extension Staffs at District and Commune Level

#### 3. ENTRY BEHAVIOUR

The extension staffs at district and commune level, who have age under 40 year old and working closely with farmer on the field can participate this training course. The trainers should be held the educational background from BSc. Degree on climate change and have experience in agriculture practice.

#### 4. GOAL AND LEARNING OBJECTIVES

Improve the knowledge on climate change adaptation in agriculture sector among district and commune officers

#### 5. IMPLEMENTATION MODALITIES

The number of trainees should be maximum 30 and the trainer should be at least 2 persons per course. Duration is 7 hrs. The conducting institute should collaborate with other training institutions such as Royal University of Agriculture, Department of Agriculture Extension and Provincial

Agricultural Department. The training facilities required are LCD, Laptop, Multi-media, Study site, mean of transportation, poster/leaflet, flipchart, marker, sticker, paper etc.

#### 6. EXPECTED OUTCOMES

The trainees will be able to guide farmers in practicing climate change resilient practices in their communes and districts.

#### 7. EVALUATION

The trainer will conduct the pre-test and post-test by using simple questions on climate change adaptation and mitigation. During the session the trainers would ask different questions and/or conduct short oral examination.

<b>Title of the module</b>	Induction training module on climate change adaptation in rice production
<b>Target trainees / participants</b>	Extension Staffs at District and Commune Level
<b>Responsibility of the participants after training (they are expected to do what) -</b>	Responsibility of the participants: -Working closely with farmers -Provide skill-based training to farmers
<b>Duration of the module</b>	7hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1	The district and commune officer would be able to transfer knowledge on impacts of climate change and implications for climate change adaptation to farmers	Introduction to climate change and global warming	-Lecture -Question and answer	1hr	Multi-media, reading documents, LCD, Computer	Testing by using short questionnaire	
		Introduce general climate change adaptation and mitigation	-Case study -Group discussion	1hr	Flipchart, marker and sticker for recording	Testing by using short questionnaire	
		Climate change adaptation technology and options in rice production	-Lecture	1hr	Reading documents, LCD, Computer	Ask questions	The trainer should present relevant examples
2	The participants would be able to elaborate necessary conditions to be take into consideration for identification of rice varieties	Introduction of suitable rice crop varieties	-Mini-lecture -Group discussion	1h	-Poster/leaflet, reading documents		The trainer have to focus more on 10 varieties of rice produce by CARDI
		Integrate farming system for adaptation to climate change	-Lecture -Group discussion	1hr 30min	Reading documents, poster	Ask questions	
		Rice production and adaptation techniques	-Case study	1hr 30min	Multi-media, Reading document, LCD, Computer	Exercise	

## **ii. In-service Training Module for PDA-District and Commune Level**

### **1. INTRODUCTION**

Most Cambodian households are engaged in agriculture. The main agriculture commodity in Cambodia is rice. The frequency and intensity of floods may increase with changing climate conditions, and cause severe damage to rice harvests. Successions and combinations of droughts and floods have resulted in a significant number of fatalities and considerable economic losses. Floods have accounted for 70% of rice production losses between 1998 and 2002, while drought accounted for 20% of losses. This year 2010 Cambodia has met very severe drought that is impacting seriously to the agriculture production and human being. Therefore, the staff who work in agricultural sector especially who work directly with farmers need to have the knowledge and understanding on the impact and adaption of agriculture to climate change in order to be able to help the farmer to mitigate the impact.

### **2. TARGET GROUP**

PDA's Extension Staffs at District and Commune Level

### **3. ENTRY BEHAVIOUR**

The age of participants/trainees is not limited. The participants are not based on the education background; everyone who working on agriculture or related sector can attends this training course.

### **4. GOAL AND LEARNING OBJECTIVES**

Improve knowledge of district and commune officers to climate change in agriculture sector

### **5. IMPLEMENTATION MODALITIES**

The number of trainees should be maximum 30 persons and the trainer should be at least 2 persons per course. Duration of training is 20 hr. For conducting the training module the conducting institute should collaborate with other training institutions such as Royal University of Agriculture, Department of Agriculture Extension and Provincial Agricultural Department. The training facilities required are LCD, Laptop, Multi-media, Study site, mean of transportation, Poster/leaflet, Flipchart, marker and sticker for recording.

### **6. EXPECTED OUTCOMES**

The trainees will get knowledge on climate change adaptation and mitigation in agriculture and be able to help farmer to mitigate the impact in agriculture.

### **7. EVALUATION**

The trainer will conduct the pre-test and post-test by using simple questions on climate change adaptation and mitigation. During the session the trainers should ask differences questions and/or conduct short oral exam.

<b>Title of the module</b>	In-service training module on Climate Change adaptation in rice production
<b>Target trainees / participants</b>	Extension Staffs at District and Commune Level
<b>Responsibility of the participants after training (they are expected to do what) -</b>	Responsibility of the participants: -Working closely with farmers -Provide skill-based training to farmers
<b>Duration of the module</b>	20 hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	The participants will get knowledge on climate change and climate change adaptation	Introduction to Climate Change and global warming	-Lecture -Question and answer	2hrs	Multi-media, reading documents, LCD, Computer	Ask questions	
		Introduce climate change adaptation and mitigation	-Case study -Group discussion	2hrs	Flipchart, marker and sticker for recording	Testing by using short questionnaire	
		Impact of climate change on agriculture (crop production, animal production, fish production etc.)	-Lecture -Field visit	6hrs	Reading documents, mean of transportation	Exercise	
		Adaptation technology in agriculture	-Lecture -Case study	2hrs	Reading documents, LCD, Computer	Ask questions	The trainer should present the example technology from deference countries
	The participants will be able to select the crop varieties tolerant to flood and drought areas and adaptation technique on	Introduce crop varieties (rice crop varieties, other crops, vegetable varieties)	-Mini-lecture -Group discussion	2hrs	-Poster/leaflet, reading documents	Exercise	The trainer have to focus more on 10 varieties of rice, mung bean and



SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module designer
	rice production						tomato produce by CARDI
		Integrate farming system adapted to climate change	-Field visit to farmer's plot -Group discussion	4hrs	Study site, mean of transportation	Ask questions	
		Rice production, rice management and adaptation technique /options	-Case study	2hrs	Multi-media, Reading document, LCD, Computer	Exercise	

### **iii. Induction Training Module for PDA-Provincial Level**

#### **1. INTRODUCTION**

The role of the provincial agricultural department (PDA) staff is the subject matter specialist and to trains the district agricultural staff to work with farmers. These officers have basic knowledge in agricultural technique however, in the new context of climate change, base on training need assessment; we found they need to improve their knowledge and skill in the adaptation agricultural technology in order to train the district staff to help farmers to ensure their food security and income in the current impact of climate change.

#### **2. TARGET GROUP**

PDA's Extension Staffs at provincial level

#### **3. ENTRY BEHAVIOUR**

The extension staffs at provincial level, which have age under 40 year old can participate this training course. But the educational background of the trainees is not limited. The trainers should be held the educational background from Bsc. Degree on climate change and have experience in agriculture practice.

#### **4. GOAL AND LEARNING OBJECTIVES**

Enhance climate change adaption knowledge and to develop possible adaptation options for agriculture sector.

#### **5. IMPLEMENTATION MODALITIES**

The number of trainees should be maximum 30 persons and the trainer should be at least 2 persons per course. Duration of training is 7 hr. For conducting the training module the conducting institute should collaborate with other training institutions such as Royal University of Agriculture, Department of Agriculture Extension, Provincial Agricultural Department and Climate Change Department of Ministry of Environment. The training facilities required are LCD, Laptop, Multi-media, Study site, mean of transportation, Poster/leaflet, Flipchart, marker and sticker for recording, paper etc.

#### **6. EXPECTED OUTCOMES**

The trainees will get knowledge on climate change adaptation and mitigation in particular the impact and respond to climate change in agriculture and be able to help farmers to mitigate their impacts.

#### **7. EVALUATION**

The trainers will conduct the pre-test and post-test by using simple questions on climate change adaptation and mitigation. During the session the trainers should ask differences questions and/or conduct short oral exam.

<b>Title of the module</b>	Climate change adaptation in agriculture sector
<b>Target trainees / participants</b>	Agriculture extension staff at provincial level
<b>Responsibility of the participants after training (they are expected to do what)</b>	The responsibility of the participants: -Provide training to district level staffs and to farmers -Train farmers on various agro-technologies
<b>Duration of the module</b>	7hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	The agricultural extension officers will explain the concept, knowledge of climate change and climate change strategy in Cambodia	Introduction to Climate Change and global warming	-Lecture -Question and answer	30min.	Multi-media, reading documents, LCD, Computer	Testing by using short questionnaire	
		Human response to climate change/climate change policies (UNFCCC, Kyoto Protocol etc.)	-Presentation -Panel discussion and reflection	1hr	Leaflets, reading documents, LCD, Computer	Testing by using short questionnaire	
		Cambodia NAPA	-Mini-lecture	30min.	Reading documents, LCD, Computer	Ask questions	The trainer should be highline the NAPA activities related to agriculture and water sector
		Climate change mitigation	-Case study -Group discussion	1hr	Flipchart, marker and sticker for recording	Pre-test Post-test	
		Climate change vulnerability impact	-Lecture -Case study	1hr	Multi-media, LCD, Computer,	Exercise	

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
		assessment and adaptation			Flipchart, marker		
	This session will enable the participants to develop possible adaptation options in agriculture sector	Adaptation options in water resources management	-Lecture -Group discussion	30min.	Flipchart, marker and sticker for recording	Ask questions	The trainer have to focus more on water use in agriculture
		Adaptation options in Soil Conservation and Management	-Mini-lecture	30min.	Reading documents, LCD, Computer, Mean of transportation	Ask questions	
		Adaptation options in crop Production	-Lecture -Discussion	1hr	Mean of transportation	Ask questions	
		Adaptation options in animal Production	-Mini-lecture -Small group discussion	1hr	Flipchart, marker and sticker for recording	Pre-test Post-test	

## **iv. In-service Training Program for PDA-Provincial Level**

### **1. INTRODUCTION**

In Cambodia, the role of the provincial agricultural department (PDA) staff is the subject matter specialist and to train the district agricultural staff to work with farmers. These officers have basic knowledge in agricultural technique however, in the new context of climate change, based on training need assessment; we found they need to improve their knowledge and skill in the adaptation agricultural technology in order to train the district staff to help farmers to ensure their food security and income in the current changing climate condition.

### **2. TARGET GROUP**

PDA's Extension Staffs at provincial level

### **3. ENTRY BEHAVIOUR**

The age of participants/trainees is not limited. The educational background of the trainees is not limited also. But the trainers should be held the educational background from Bsc. Degree on climate change and have experience in agriculture practice.

### **4. GOAL AND LEARNING OBJECTIVES**

Enhance climate change adaptation knowledge and to develop possible adaptation options for agriculture sector.

### **5. IMPLEMENTATION MODALITIES**

The number of trainees should be maximum 30 persons and the trainer should be at least 2 persons per course. Duration of training is 20 hr. For conducting the training module the conducting institute should collaborate with other training institutions such as Royal University of Agriculture, Department of Agriculture Extension, Provincial Agricultural Department and Climate Change Department of the Ministry of Environment. The training facilities required are LCD, Laptop, Multimedia, Study site, mean of transportation, Poster/leaflet, Flipchart, marker and sticker for recording, paper etc.

### **6. EXPECTED OUTCOMES**

The trainees will get knowledge on climate change adaptation and mitigation in agriculture and be able to help farmer to mitigate the impact in agriculture.

### **7. EVALUATION**

The trainer will conduct the pre-test and post-test by using simple questions on climate change adaptation and mitigation. During the session the trainers should ask difference questions and/or conduct short oral exam.

<b>Title of the module</b>	Climate change adaptation in agriculture sector
<b>Target trainees / participants</b>	Agriculture extension staff at provincial level
<b>Responsibility of the participants after training (they are expected to do what) -</b>	The responsibility of the participants: -Provide training to district level staffs and to farmers -Conduct practical work with farmers
<b>Duration of the module</b>	20hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	The participants will explain key concepts on climate change and climate change strategy in Cambodia	Introduction to Climate Change and global warming	-Lecture -Question and answer	2hrs	Multi-media, reading documents, LCD, Computer	Testing by using short questionnaire	
		Human response to climate change/climate change policies (UNFCCC, Kyoto Protocol etc.)	-Presentation -Panel discussion and reflection	1hr 30min	Leaflets, reading documents, LCD, Computer	Testing by using short questionnaire	
		Cambodia NAPA	-Mini-lecture	30min.	Reading documents, LCD, Computer	Ask questions	The trainer should be highline the NAPA activities related to agriculture and water sector
		Climate change mitigation	-Case study -Group discussion	2hrs	Flipchart, marker and sticker for recording	Pre-test Post-test	
		Climate change vulnerability impact assessment and adaptation	-Lecture -Case study	2hrs	Multi-media, LCD, Computer, Flipchart, marker	Exercise	



SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
	This session will enable the participants to develop possible adaptation options in agriculture sector	Adaptation options in water resources management	-Mini-lecture -Group discussion	2hrs	Flipchart, marker and sticker for recording	Ask questions	The trainer have to focus more on water use in agriculture
		Adaptation options in Soil Conservation and Management	-Lecture -Field visit	4hrs	Reading documents, LCD, Computer, Mean of transportation	Ask questions	
		Adaptation options in crop Production	-On site study to see demonstration plot	4hrs	Mean of transportation	Ask questions	
		Adaptation options in animal Production	-Mini-lecture -Small group discussion	2hrs	Flipchart, marker and sticker for recording	Pre-test Post-test	

## **v. Induction Training Module for GDA-National Level**

### **1. INTRODUCTION**

This year 2010 Cambodia has met very severe drought that is impacting seriously to the agriculture production and human being. Base on the survey result from TNA, in terms of knowledge and skill areas on climate change adaptation, the staffs form GDA and PDA have limited knowledge on climate change and climate change adaptation in agriculture sector. Because they did not receive any training or lecture on climate change from university before they were recruiting as a MAFF's staff, Therefore, they need more training to build their capacity in this area in order improve their knowledge on climate change adaptation in agriculture sector.

### **2. TARGET GROUP**

MAFF's new recruit staffs at national and provincial level.

### **3. ENTRY BEHAVIOUR**

The participants/trainees for this training course will have age under 30 years old, because this module pocus on the new recruit staffs that should not have age more than 30 year old. This is a MAFF's criteria. The lowest educational background of the trainees is Bachelor Decree on agriculture science and related field.

The trainers should be held the educational background from BSc. Decree on climate change and have experience in agriculture practice.

### **4. GOAL AND LEARNING OBJECTIVES**

Improve climate change and climate change adaptation knowledge of the new recruit staff in agriculture sector.

### **5. IMPLEMENTATION MODALITIES**

The number of trainees should be maximum 30 persons and the trainer should be at least 2 persons per course. Duration of training is 4 hr. For conducting the training module the conducting institute should collaborate with other training institutions such as Department of Agriculture Extension, Department of Human Resource Development and Personal and Department of Climate Change of the Ministry of Environment. The training facilities required are LCD, Laptop, Multi-media, Study site, mean of transportation, Poster/leaflet, Flipchart, marker and sticker for recording.

### **6. EXPECTED OUTCOMES**

The trainees will get knowledge on climate change adaptation and mitigation in agriculture and be able to work in the new context better than before.

### **7. EVALUATION**

The trainer will conduct the pre-test and post-test by using simple questions on climate change adaptation and mitigation. During the session the trainers should ask differences questions and/or conduct short oral exam.

<b>Title of the module</b>	<b>Climate Change adaptation in agriculture sector</b>
<b>Target trainees / participants</b>	MAFF's new recruit staffs
<b>Responsibility of the participants after training (they are expected to do what)</b>	Responsibility of the participants: -Working at differences departments of MAFF and PDA as researcher, extension worker and training provider to farmers
<b>Duration of the module</b>	4hrs (Integration into existing orientation training program of new recruit staff before they going to work at differences institutions under MAFF)

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	The participants will understand the concept, knowledge of climate change and climate change strategy in Cambodia	Introduction to Climate Change and global warming	-Lecture -Question and answer	30min.	Multi-media, reading documents, LCD, Computer	Testing by using short questionnaire	
		Human response to climate change/climate change policies (UNFCCC, Kyoto Protocol etc.)	-Presentation -Panel discussion and reflection	30min.	Leaflets, reading documents, LCD, Computer	Exercise	
		Climate change mitigation	-Mini-lecture -Group discussion	1hr	Flipchart, marker and sticker for recording	Question	
		Climate change vulnerability impact assessment and adaptation	-Lecture -Case study	1hr	Multi-media, LCD, Computer, Flipchart, marker	Exercise	
		Climate change adaptation techniques	-Mini-lecture -Group discussion	1hr.	LCD, Computer, Flipchart, marker	Exercise	

## vi. In-service Training Program for GDA-National Level

### 1. INTRODUCTION

Most Cambodian households are engaged in **agriculture**. The main agriculture commodity in Cambodia is rice. The frequency and intensity of floods may increase with changing climate conditions, and cause severe damage to rice harvests. Successions and combinations of droughts and floods have resulted in a significant number of fatalities and considerable economic losses. Floods have accounted for 70% of rice production losses between 1998 and 2002, while drought accounted for 20% of losses. This year 2010 Cambodia has met very severe drought that is impacting seriously to the agriculture production and human being. Base on the survey result from TNA, in terms of knowledge and skill areas on climate change adaptation, the staffs form GDA have limited knowledge on climate change and climate change adaptation in agriculture sector. Therefore, they need more training to build their capacity in this area in order to mitigate climate change impact on agriculture sector.

### 2. TARGET GROUP

GDA's staffs (Rectors, vice rectors of department, planning staff and training providers) at national level.

### 3. ENTRY BEHAVIOUR

The age of participants/trainees is not limited and educational background of the trainees is not limited also. But the trainers should be held the educational background from Msc. Decree on climate change and have experience in agriculture practice.

### 4. GOAL AND LEARNING OBJECTIVES

Enhance climate change adaptation knowledge of the policy maker officers in agriculture sector.

### 5. IMPLEMENTATION MODALITIES

The number of trainees should be maximum 30 persons and the trainer should be at least 2 persons per course. Duration of training is 14 hr. For conducting the training module the conducting institute should collaborate with other training institutions such as Department of Agriculture Extension, Department of Human Resource Development and Personal and Climate Change Department of the Ministry of Environment. The training facilities required are LCD, Laptop, Multi-media, Study site, mean of transportation, Poster/leaflet, Flipchart, marker and sticker for recording, paper etc.

### 6. EXPECTED OUTCOMES

The trainees will get knowledge on climate change adaptation and mitigation in agriculture and be able to mainstream this knowledge into their work, work plan, strategy and policy of their work place.

### 7. EVALUATION

The trainer will conduct the pre-test and post-test by using simple questions on climate change adaptation and mitigation. During the session the trainers should ask differences questions and/or conduct short oral exam.

<b>Title of the module</b>	<b>Climate Change adaptation in agriculture sector</b>
<b>Target trainees / participants</b>	GDA's staffs (Rectors, Vice rectors of department, Panning staff and Training providers)
<b>Responsibility of the participants after training (they are expected to do what) -</b>	Responsibility of the participants: -Policy making, planning for agriculture sector -Project designing and implementing -Providing training to provincial staffs
<b>Duration of the module</b>	14 hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	The participants will explain key elements on Cambodia National Action Plan on Climate Change	Climate Change Basic Science	-Lecture -Question and answer	1hrs	Multi-media, reading documents, LCD, Computer	Testing by using short questionnaire	
		International Communities Response to Climate Change	-Presentation -Panel discussion and reflection	1hrs	Leaflets, reading documents, LCD, Computer	Testing by using short questionnaire	
		Cambodia Responses to Climate Change	-Lecture -Group discussion	1hr 30min.	Reading documents, LCD, Computer	Ask questions	
		National Adaptation Program of Action to Climate Change (NAPA)	-Lecture -Group discussion	1hr 30min.	Reading documents, LCD, Computer	Ask questions	The trainer should be highline the NAPA activities related to agriculture and water sector
	The participants will be able to identify the impact of climate change on agriculture production	The Impacts of climate change on crop production	-Case study -Group discussion	3hrs	-Reading documents, LCD, Computer, Poster/leaflet,		

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
					Clip chart		
		The Impacts of climate change on animal production	-Mini-lecture -Field visit	4hrs	Reading documents, LCD, Computer, Mean of transportation		
	The participants will get knowledge on climate change adaptation	Climate change adaptation techniques in agriculture	-Lecture -Case study	2hrs	Reading documents, LCD, Computer	Ask questions	



## ANNEXURE I: EVALUATION OF EXISTING TRAINING PROGRAMS

### Details of induction training programs being offered in Cambodia

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)	
1	Agronomy science	4 years (Bsc.)	Faculty of Agronomy/ Royal University of Agriculture	- Soil Science	- Environment (Climate Change) (64h)	- Soil Science	- Principle of Soil Science - Plant Nutrition - Water and Irrigation System - Land Use (+GIS) - Soil Analysis - Soil Conservation and Management - Agro-ecology	
						Plant Production	- Plant Genetics - Plant Physiology - Plant Biochemistry - Biometry - Fruit Crops - Ornamental Plants - Tropical Crops - Plant Breeding - Vegetable Production - Rice Production - Rubber Production - Seed Production and storage - Mushroom Production	
						Plant Protection	- Crop Protection - Plant Pathology - Weed Science	

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)	
							- Apiculture Science - Sericulture	
2	Animal Science and veterinary medicine	4 years (Bsc.)	Faculty of Animal Science and Veterinary Medicine/ Royal University of Agriculture			- Animal Science	- Animal Genetics and Breeding - Animal Anatomy - Animal Physiology -Animal nutrition -Pig production -Poultry production -Ruminant production	
						-Veterinary medicine	- Veterinary Microbiology - Infectious Disease - Non- Infectious Disease - Veterinary Surgery - Animal Diagnosis and Clinics - Pharmacology - Veterinary Epidemiology and Preventive Medicine - Meat Inspection	
3	Fishery sciences	4 years (Bsc.)	Faculty of Fishery Sciences/ Royal University of Agriculture			Aquatic Biology and Environment	- Fisheries Ecology - Limnology - Systematic Aquatic Botany - Systematic Aquatic Zoology - Water Quality - Coastal and Marine Biology - Fish Physiology - Fish Pathology - Fisheries Environmental Impact	

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)	
							Assessment	
						Aquaculture	<ul style="list-style-type: none"> <li>- Aquaculture Systems</li> <li>- Fish Nutrition</li> <li>- Genetics and Fish Breeding</li> <li>- Integrated Aquaculture</li> </ul>	
				Capture Fisheries & Products	Climate Changes and Fisheries (32h)	Capture Fisheries & Products	<ul style="list-style-type: none"> <li>- Fisheries Management</li> <li>- Fisheries Laws</li> <li>- Fish Processing Technology</li> <li>- Fisheries Community Development and Management</li> <li>- Fisheries Forestry</li> </ul>	
4	Forestry science	4 years (Bsc.)	Forestry Science/ Royal University of Agriculture			Forest Resources	<ul style="list-style-type: none"> <li>- Soil Science Forest Soils</li> <li>- Tree Physiology</li> <li>- Agro-Forestry</li> <li>- Forest Measurement</li> <li>- Forest Road and Engineering</li> <li>- Forest Economics</li> <li>- Silviculture</li> <li>- Wood Technology and Utilization</li> <li>- Forest Mechanization and Saw Milling</li> <li>- Forest and Tree Seed Improvement</li> </ul>	
				Forest Conservation	- Forest Environment & Climate Change(48)	Forest Conservation	<ul style="list-style-type: none"> <li>- Tree Breeding and Improvement</li> <li>- Wildlife</li> <li>- Forest Legislation and Policy</li> <li>- Forest Management</li> <li>- Watershed Management</li> <li>- Environmental Impact Assessment</li> </ul>	

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)	
5	Agro-industry	4 years (Bsc.)	Faculty of Agro-Industry/ Royal University of Agriculture			-Food Science and Technology	- Food Technology - Beverage Technology - Food Processing - Food Engineering - Food Nutrition - Food Safety - Agro-Industry System Development - Analytical Techniques for Quality Assurance - Sugar and Starch Technology - Food Hygiene	
						Food Biotechnology	- Agricultural Waste Management - Food Microbiology - Food Biotechnology - Enzyme Technology - Fermentation Technology - Food Chemistry - Organic Chemistry	
						Postharvest Technology	-Postharvest Technology of Cereals, Fruits and Vegetables, Meats, Fisheries products, Oilseeds - Rubber products, -Packaging and Storage Technology - Total Quality Control of Agricultural Products	
6	Agricultural technology and	4 years (Bsc.)	Faculty of Agricultural Technology and		-climate change (32h)	Resources Conservation and Management	- Natural resource management and conservation -renewable energy	

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)	
	management		Management/ Royal University of Agriculture				<ul style="list-style-type: none"> <li>- Environmental Science</li> <li>- Water Supply and Sanitation</li> <li>- Environmental Impact Assessment</li> <li>- Agricultural Waste Management</li> <li>- Farm Business Management</li> <li>- Agricultural system</li> <li>- Gender and planning</li> <li>-Agricultural Extension</li> </ul>	
						System Engineering	<ul style="list-style-type: none"> <li>- Technical Drawing</li> <li>- Electric power system</li> <li>- Electronic</li> <li>- Mechanization for Water Resource Development</li> <li>- Soil Mechanics</li> <li>- Irrigation system</li> </ul>	
						Agricultural Machinery	<ul style="list-style-type: none"> <li>- Agriculture Machinery</li> <li>- Pre-harvest engineering</li> <li>- Post harvest engineering</li> <li>- Farm structure and equipment design</li> <li>- Agriculture Machinery Management</li> </ul>	
7	Agriculture economic and rural development	4 years (Bsc.)	Faculty of Agriculture Economic and Rural Development/ Royal University of Agriculture		- Economics of Climate Change (48h)	Agricultural Economics	<ul style="list-style-type: none"> <li>- Agricultural Economics</li> <li>- Macroeconomics</li> <li>- Microeconomics</li> <li>- Agricultural Accounting</li> <li>- Economics Development</li> <li>- Financial Management</li> <li>- Environmental Economics</li> </ul>	

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)	
						Agri-Business	<ul style="list-style-type: none"> <li>- Agricultural Marketing</li> <li>- International Economics</li> <li>- Rural Development</li> <li>- Rural Socio-Economics</li> <li>- Agricultural Extension</li> <li>- Rural Tourism</li> <li>- Rural Entrepreneurship</li> <li>- Rural Engineering</li> <li>- Community Organization</li> </ul>	
8	Land management and land administration	4 years (Bsc.)	Faculty of Land Management and Land Administration/ Royal University of Agriculture			Land Policy and Land Administration	<ul style="list-style-type: none"> <li>- Land Administration</li> <li>- Land Policy</li> <li>- Land Information System</li> <li>- Land Law</li> <li>- Land Market</li> <li>- Land Taxation</li> <li>- Land Valuation</li> <li>- Land Economic</li> </ul>	
						Land Management	<ul style="list-style-type: none"> <li>- Land Use Planning</li> <li>- Ecotourism</li> <li>- Land Conflict Reconciliation</li> <li>- Land Readjustment</li> <li>- Land and Soil Conservation</li> <li>- Sustainable Development</li> </ul>	
						Geomantic Surveying and Mapping	<ul style="list-style-type: none"> <li>- Photogrammetry/ Remotes Sensing</li> <li>- Cadastral Mapping</li> <li>- Cartography</li> <li>- Geodesy</li> </ul>	

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)	
							- Geographic Information System	

### Details of on the job training programs being offered in Cambodia

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
1	Training program on rice production and livestock raising	2 days	Department of Agricultural extension (MAFF)			Animal production (7 hrs 30)	<ul style="list-style-type: none"> <li>- varieties and varieties modification (1h30)</li> <li>-Feed and feeding (1h)</li> <li>-cage construction (1h)</li> <li>-poultry production management (1h30)</li> <li>-poultry health</li> </ul>		2 hrs

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							control (1h) -general preventive measures (1h30)		
						Rice production (8hrs)	-rice growing stage (1h30) -sowing technique (1h30) -rice growing technique (1h) -care (water management, weeding, fertilizer use, pest control) (2h) -rice harvest (2h)		2hrs
2	Extension program on agricultural development community	4 days	Department of Agricultural extension (MAFF)			Community development concept	-introduction of agricultural development community concept (1h30)		



No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	concept						<ul style="list-style-type: none"> <li>-what is agricultural development community? and objective of agricultural community establishment (3h)</li> <li>-rationales behind agricultural community (3h)</li> <li>-value of agricultural community (2h)</li> <li>-advantages of agricultural community (1h30)</li> <li>-government support for agricultural</li> </ul>		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							community (1h30) -structure of agricultural community (2h) -main careers available in community (1h30) -Financial sources of agricultural community (1h30)		
3	Training program on small scale chicken raising and vegetable growing	2 days	Agricultural Department of Battam Bang Province			Chicken raising (9h)	-advance of chicken raising (1h30) -site selection for chicken raising (1h) -advantage of cage construction (1h30) -bio-safety cage (Disease-free cage		2hrs

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							construction) (1h) -Genetic selection (1h) -water and feeding (1h) -vaccination and feed mix (2h) -main chicken disease (1h)		
						Vegetable growing (3h30)	-vegetable varieties (1h) -growing technique (2h) -harvesting (1h30)		2hrs
4	Training program on rice crop production	2 days	Agricultural Department of Battam Bang Province			Rice Crop Production	-rice growing stage (30 min) -cleaning rice seeds with salt water (1h) -farming method (1h30)		4hrs

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							-fertilizer and usage (2h) -cutworm and control (1h30) -stem-borer and control(1h30) -plant-hopper and control (1h30) -rice sucking bug and control (1h30) -rodent and control (1h30) -harvesting (30min) -threshing and drying (1h30) -storage and protection (30min) -what can we do to mill rice to		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							obtain high rice yields? (30min)		
5	Training program on straw mushroom growing techniques	6days	Agricultural Department of Kandal Province			Straw mushroom growing techniques	-site selection (1h30) -straw mushroom germinating techniques(2h30) -straw mushroom sessions (1h30) -row preparation for straw mushroom-fist stage(1h) - row preparation for straw mushroom-second and third stages(1h30) -row preparation for straw mushroom-fourth		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							stage(2h) -mulching, burnt straw mulching, reason for burning (1h30) -real practice of land preparation (1h) -raw materials and temperature for germination (1h30) -care, harvest and final test (2h) -real practical show (2h30) -practice of straw mushroom growing and distillation (1day) -follow up (1day)		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							-harvest practice and show day (1day)		
6	Training Programs on Rice Production Techniques for Farmers	5days	Agricultural Department of Kandal Province			Rice production techniques	<ul style="list-style-type: none"> <li>- Rice cycle (2h)</li> <li>- Rice growing stage (1h30)</li> <li>-Study on soil types (2h)</li> <li>- Study on main soil groups (1h30)</li> <li>- Fertilizer usage techniques for rice crop (2h)</li> <li>- Study on insects ( Thrips) (1h)</li> <li>- Study on insects ( Brown plant-hopper) (1h)</li> <li>- On-station trial</li> <li>- Study on insects (Cutworm) (1h)</li> </ul>		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							<ul style="list-style-type: none"> <li>- Study on insects (Stem-borer) (1h)</li> <li>- Safety of chemical insecticide use (1h30)</li> <li>- Problems and impacts of chemical insecticide use (1h30)</li> <li>- Rice disease (2h)</li> <li>- Rice varieties purification techniques (2h)</li> <li>- Harvest techniques and storage (1h30)</li> </ul>		
7	Training Programs on Rice Production	20 days	Agricultural Department of Kandal			Rice production technique	<ul style="list-style-type: none"> <li>- Study on rice growing stage (1h)</li> <li>- Land preparation</li> </ul>	1 day per week	



No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	Techniques for Farmers		Province				(20min) - Land preparation for seedlings (1h45) - Land preparation for transplanting (1h) - Land preparation for direct seeding (1h) - Real practice evaluation (20min) - Growing techniques, transplanting techniques (1h30) - Direct seeding cultivation (45min) - Group discussion		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							and question (2h15min) - Group presentation (1h30) - Water use and care (1h) - Water need for rice crop (30min) - Water management methods (1h30min) - Soil Types, soil groups, and soil classification (1h30min) - Real practice on soil classification (45min) - Chemical		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							fertilizer use and definition of fertilizer use (30min) - Fertilizer use dependent on soil groups (45min) - Methods for fertilizer use (45min) -Real practice on fertilizer use (45min) - Group discussion, question preparation and group presentation on fertilizer use (1h30min)		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							<ul style="list-style-type: none"> <li>- Pest and control (30min)</li> <li>- Effects of pest on rice and control (30min)</li> <li>- Thrips (30min)</li> <li>- Control of thrips (30min)</li> <li>- Cutworm (30min)</li> <li>- Preventive measures and control of cutworm (30min)</li> <li>- Group discussion, question preparation and group presentation on thrips and</li> </ul>		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							cutworm (1h30min) - Stem-borer (30min) - Preventive measures and control of stem-borer (30min) - Brown plant-hopper (30min) - Preventive measures and control of plant-hopper (30min) - Rice sucking bug (30min) - Preventive measures and control of rice sucking bug (30min)		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							<ul style="list-style-type: none"> <li>- Rodent (30min)</li> <li>- Preventive measures and control of rodent (30min)</li> <li>- Chemical pesticide use (1h)</li> <li>- Rice varieties purification techniques (1h)</li> <li>- Harvest and economic analysis (1h)</li> </ul>		
8	Programs on Farming Technique Show and Fertilizer Usage	2days	Agricultural Department of Kandal Province			Rice production techniques	<ul style="list-style-type: none"> <li>-Choosing farmers and Site for rice paddy demonstration (1day)</li> <li>-rice planting by rice paddy owners (30min)</li> </ul>		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							<ul style="list-style-type: none"> <li>-Going to the rice paddy, Sampling and Analysis (Weighing rice yield) (2h30)</li> <li>- Description of economic analysis on rice paddy show (1h30)</li> </ul>		
9	Training Programs on Vegetable Production	3days	Agricultural Department of Kandal Province			Vegetable production techniques	<ul style="list-style-type: none"> <li>- Advantages of vegetables (30min)</li> <li>- Chinese cabbage (2h)</li> <li>- Celery cabbage (1h)</li> <li>- Bok choy (1h30)</li> <li>- Cucumber (2h30)</li> <li>- String bean (1h30)</li> </ul>		4hrs

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							- Broccoli (2h30) - Tomato (2h30) - Sweet pepper (2h)		
10	Training Modules for Village Agricultural Extension Techniques	3days	Agricultural Department of Kandal Province			Agricultural extension techniques	-Agricultural extension service concept, What is agricultural extension service? and Positions and duties for Agricultural extension (2h30) - communication concept, Communication procedure and Difficulties in communication (1h30) - Presentation		4hrs



No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							techniques and Facilitation methods (1h30) - Data collection and planning (1h) - Agricultural extension planning (2h30) - Participatory extension techniques ( Meeting and Presentation) (1h30min) - Rice paddy day and Study concept (2h30) - Rice paddy school (rice farmer field school) (1h)		

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							<ul style="list-style-type: none"> <li>- Techniques and principles of rice paddy school (1h30min)</li> <li>- Facilitation methods for rice paddy school (1h)</li> <li>- Rice paddy school organization and management (2h30)</li> </ul>		
11	Training program on rice production techniques	2 days	Agricultural Department of Kampong speu Province			Rice production techniques	<ul style="list-style-type: none"> <li>-Characteristic of rice (1h)</li> <li>-land prepare (1h30)</li> <li>-rice variety selection (1h30)</li> <li>-Using fertilizer (2h)</li> <li>-protection</li> </ul>		1day

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
							methodology (2h) -Economic analysis (2h)		
12	Training program on gender awareness for agriculture staff	2days	Gender Unit/ Ministry of agriculture forestry and fisheries			Gender awareness	-Gender situation (45 min) -Gender stereotype (1h) -Gender equity and equality (1h) -Gender role (1h) -Gender need (1h) -Gender mindset (1h) -Access and control on resources (1h30) -Extension national report and optional protocol (1h30)		1 morning
13	Climate change	1	CCD/Ministry	Climate	-Climate				

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	awareness raising workshop for senate	morning	of environment	change awareness	Change Basic Science and impact (1h30min) -International Community's Response (30min) - Cambodia Responses to Climate change (30min)				
14	Climate Change Workshop in RUA, P.Penh, 21 Dec.2007	1 morning	CCD, Ministry of environment		-Recent news of CC, -Cause and Impact of CC, -CC adaptation, -CC mitigation				
15	Climate Change	1	CCD, Ministry		-Recent news				

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	Workshop in RUPP, P.Penh, 21 Dec.2007	evening	of environment		of CC, -Cause and Impact of CC, -CC adaptation, -CC mitigation				
16	In-House Seminar on Climate Change 27 August 2009, Battambang City	1 day	CCD, Ministry of environment		- Cause of CC (1h30) -Human response to CC (1h30) -Adaptation to Climate Change with a focus on (NAPA) (2h00 min) -CC mitigation CDM (2h00)				
17	Provincial training WS on CC in Chea	1 day	CCD, Ministry of		-Cause and effect of CC				

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	Sim Kamchaymear University, Prey Veng 16 June 2010		environment		-Human response -CC adaptation (NAPA) -CC mitigation (CDM)				
18	Provincial training WS on CC in Kratie province 18 Oct. 2010	1 day	CCD, Ministry of environment		-Cause and effect of CC -Human response -CC adaptation (NAPA) -CC mitigation (CDM)				
19	Provincial training WS on CC in Siem Reap , province Sept. 2010	1 day	CCD, Ministry of environment		-Cause and effect of CC -Human response -CC				

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
					adaptation (NAPA) -CC mitigation (CDM)				
20	Provincial training WS on CC in Preah Sihanoukville Nov. 2010	1 day	CCD, Ministry of environment		-Cause and effect of CC -Human response -CC adaptation (NAPA) -CC mitigation (CDM)				

## 3.3 LAO PDR

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# LAO PDR PART I: TRAINING NEEDS ASSESSMENT

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## a. Introduction

Climate change is a key issue in the international arena. It is a real threat, concern and challenge for all countries of the world. The phenomenon arises from the significant increase of greenhouse gases in the atmosphere. The Government of the Lao PDR has clearly recognized the issue. As a least developed country, Lao PDR is one of the vulnerable countries to the impacts of climate change. In recent years, Lao PDR has witnessed more frequent and severe floods and droughts which are alternately occurring each year (NAPA, 2009). Temperature is continuously increasing and the rainfall is erratic, resulting in a number of adverse impacts to the economic system, environment and the livelihoods of people of all ethnic groups. Thus, climate change poses a great challenge for the Lao PDR to tackle and the population must adapt to climate conditions and control the emission of these greenhouse gases. However, Lao PDR lacks data, adaptation strategies, funds, human resources, experience, an appropriate approach and the mechanisms to develop immediate and long term solutions.

In order to reduce and prevent the impact of the climate change, the Lao PDR Government has developed the National Adaptation Programme of Action to Climate Change (NAPA) which has the objective to formulate urgently needed action plans for adaptation to climate change in Lao PDR. A focus has been placed on four sectors, namely agriculture, forestry, water resources and public health.

Today in Lao PDR, there are initiatives from organizations and donors to help the Lao PDR government to work on climate changes adaptation such as Global Environment Facility of UNDP and ACIAR. These organizations now work with the National Agricultural and Forestry Research Institute to conduct research on climate change adaptation (CCA).

In response to the NAPA, the Ministry of Agriculture and Forestry has included the CCA in the new strategy for Agricultural Development toward 2020 (MAF, 2010).

The Project “Scientific capacity development of trainers and policy makers for CCA planning in Asia and the Pacific” initiated by the Asia Pacific Adaptation Network (APAN) is going to meet the Lao PDR NAPA objective as the project focus on enhancing the capacity of the agricultural staff by creation of training modules for CCA in agriculture.

## b. Objectives and Methodology

Since 2008, United Nations Environment Programme (UNEP) in partnership with key UN agencies and international organizations has been facilitating the development of a Global Adaptation Network (GAN) which composes of four Regional Networks in developing regions: Africa, Asia-Pacific, West Asia, and Latin America and the Caribbean. The Asia Pacific Adaptation Network (APAN) was launched in Bangkok as a part of the GAN by Prime Minister of Thailand in October 2009 and began its implementation in March 2010. The APAN’s Regional Hub is co-hosted by AIT-UNEP RRC.AP<sup>1</sup> and IGES<sup>2</sup> and currently located in AIT-UNEP RRC.AP, Bangkok, Thailand.

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<sup>1</sup> AIT-UNEP RRC.AP: Asian Institute of Technology-United Nations Environment Programmes Regional Resource Center for Asia and the Pacific

<sup>2</sup> IGES: Institute for Global Environmental Strategies

APAN aims to help countries in the region to build climate resilience of vulnerable human systems, ecosystems and economies through the mobilization and sharing of knowledge and technologies to support adaptation capacity building, policy-setting, planning and practices. One of its objectives is to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream CCA principles and practices into developmental planning and programming in targeted countries, including Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal. For this capacity building objective, one project has been funded by the Asia-Pacific Network for Global Change Research (APN) and started since November 2010 under APAN.

The APN funded project coordinated by APAN, has the following objectives: to assess the capacity needs of trainers, policy-makers, development practitioners and managers, and other important stakeholders involved in designing and implementing adaptation actions at various levels in Asia and the Pacific region, including Lao PDR.

In the extended part of the project, pilot training programs will be conducted using the modules prepared under the APN project which will help revising the training modules for final adoption by various institutions in Laos.

### **b.1 Overall activities**

- Workshop on conducting the training need assessment
- Desk study on national training programs especially the adaptation to climate change
- Carry out training needs assessment (TNA)
- Workshop on progress of training need assessment
- Training need assessment data analysis
- Workshop on training module development for adaptation to climate change
- Training need assessment report writing
- In the extension phase, to conduct and test the training modules developed earlier.

### **b.2 Methodology**

The methodology consists of a three stage process:

1. Collection and review of existing training modules for CCA in agriculture sector in Laos
2. Questionnaire survey of government functionaries and trainers for current levels of knowledge and skill areas. The interviews were conducted at levels of authorities from National to district level.
3. Identifying the training needs by comparing the existing level of knowledge and skill areas with the actual preferable knowledge and skill areas (by constructing ideal knowledge and skill profile).
4. After assessing the training needs, the training modules were drafted in a training module drafting workshop where subject matter experts, training experts and departmental representatives have provided their inputs in a team environment.

## **c. Institutional Arrangements and Policy Setup**

In-country-training and capacity building for the Ministry of Agriculture and Forestry's staff mostly follows the organizational structure of the Ministry (Figure 1). The organization responsible for

training and transfer of agricultural technologies from centre to village level is called National Agricultural and Forestry Extension Service (NAFES). The training of the Lao PDR government staff has been taking place either in the country or overseas, depends on the subject and the budget of the organization that sends its staff for training. From time to time, the technical departments conduct training on specific subjects related to the needs at that moment. The training is organized to the staff under their line of authority. However, the staff of these departments is not full time trainers but spend about 10-15% of their time or job responsibilities.

The extension system in Lao PDR is composed of National Extension Service and Community Extension Service (Figure 2). At the National Extension Service, NAFES form a group of Master trainers (MT). MTs have the role of training provincial and district technical staff and the provincial and district staff in turn trains the village extension workers. At the level of Community Extension Service, the Village Extension Workers (VEW) will train the production groups (farmers) of one or many villages.

The National Annual Conference on Agriculture sector (12-14, January 2011) reported that as of 2010 the Ministry of Agriculture and Forestry (MAF) had 7,881 officers who worked in agricultural development which accounts to 6.56 % of total government officers in the entire country. For the period of 2006-2010 the NAFES has trained 1,360 officers who work for the provincial and district agricultural departments and offices and 50,926 farmers. The livestock department has organized training of trainers (TOTs) 154 persons.

In the new strategy for agricultural development 2011-2020, the MAF has targeted 4 goals in order to contribute to the national poverty eradication by 2020. The 4 goals are:

- Goal 1: the improvement of livelihood has food security as first priority;
- Goal 2: increased and modernized production of agricultural commodities;
- Goal 3: sustainable production patterns, including the stabilization of shifting cultivation and measures for climate change adaptation;
- Goal 4: sustainable forest management will preserve biodiversity and will lead to significant quantitative and qualitative improvement of national forest cover.

To realize the goals mentioned above, the Ministry has identified the human resources development program as key for achieve those goals. In 2020, the MAF estimated to have 12,850 staff, increasing 24% as compared to 2010. With this increase of staff, the training of new and existing staff will be a challenge to any training organization and body. In the next 5-year plan 2011-2015, the MAF plans to train 1,800 staff within the country and 3500 staff overseas in different areas of agriculture and forestry.

For the adaptation to the climate change, as mentioned in the Goal 3, the MAF sets a program to develop and insert teaching modules on adaptive capacity at all educational levels of agriculture and forestry (MAF, 2010). With this goal, for the agricultural staff who do not have opportunity to go back to university, the training on climate change adaptation will be the method of improving their knowledge and skill.

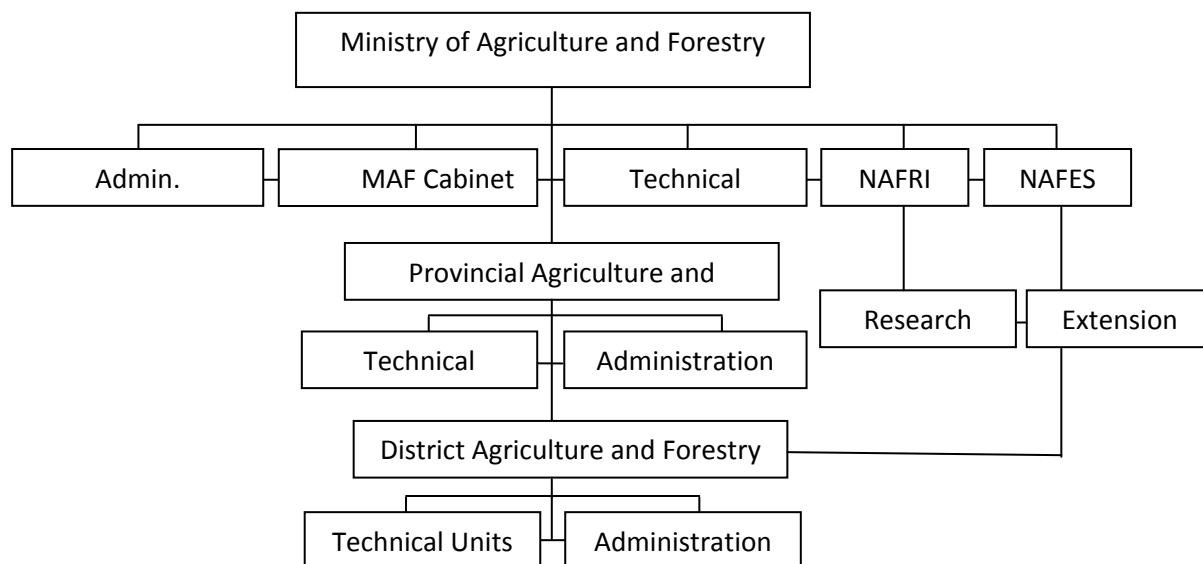


Figure 1: Structure of MAF and training line (MAF, 2007)

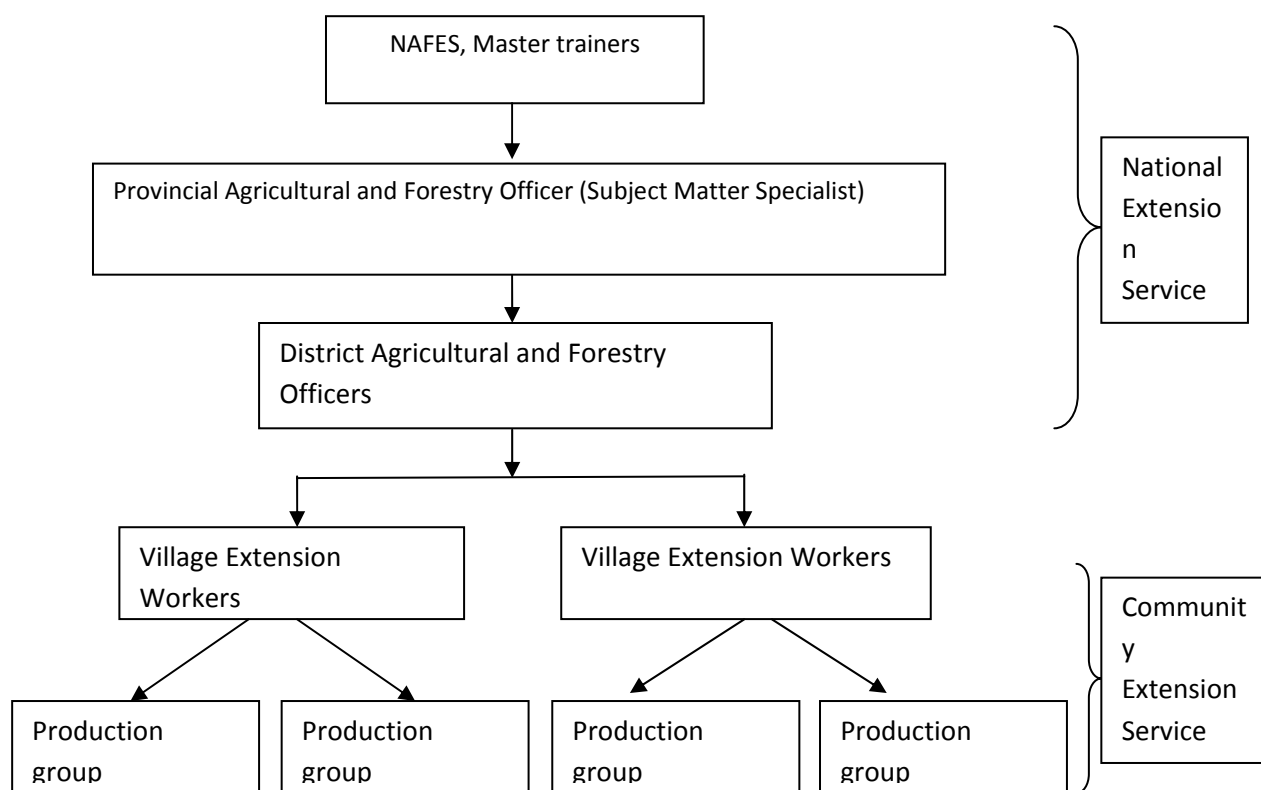


Figure 2: Lao PDR extension approach (NAFES, NAFRI, NUOL, 2005)

## d. Training Needs Assessment

As mentioned in the methodology section of this report, the training need assessment was done for all authority line of the Ministry of Agriculture and Forestry using the form I, II, III and IV (Please refer

to the Annexure XXX [to be inserted by APAN] of the main report). A total of 61 staff was interviewed for filling different forms (Table 1).

Table 1: Number of interviewees for conducting the training needs assessment

No.	Form	Number of interviewees
1	Form I (line of authority)	9
2	Form II (Job description)	9
3	Form III (trainers)	23
4	Form IV (Trainees)	20
Total		61

#### **d.1. Evaluation of training programs (curriculum)**

From the desk study we observed that there were many technical trainings conducted by both private (non government organizations and companies) and public sector (government and educational institution) organizations but only few of them have a clearly defined training modules and even fewer had content on climate change adaptation (CCA). When trainers, both public and private and Non Government Organisation, conduct the training they write the training program activities and submit it to their organization. This program activity contains the subject, objective, number of trainees, date and place and the budget of training. The existing trainings are mostly in-service training while there are very few induction trainings. Among 23 trainers interviewed, only 4.34% had conducted induction training. This existing “induction training” mentioned by the trainers was organized as seminar rather than formal induction training. The average length of training was 1-2 days.

We observe that the training programs conducted by the Ministry of Agriculture and Forestry have no direct link with CCA, they are purely technical training e.g. on rice, mushroom production techniques, organic production techniques, pig and chicken production etc. The reason for having these classical technical trainings was because the CCA is still a new concept for the government officers and private sector in Lao PDR. None of the 20 interviewees of form IV (trainees) have attended any training on CCA. All trainees interviewed have never been trained in climate change adaptation, they have no knowledge on climate change, the possible impacts of the climate change on agriculture sector and on the agricultural techniques for climate change adaptation (for example the increasing the temperature can increase the disease and pest). There is an initiative in Lao PDR’s government during recent years to seek measures to mitigate the impacts of climate change on agriculture. Some research projects on climate change adaptation have been implemented at the National Agricultural and Forestry Research Institute while there is no specific training on agricultural techniques for CCA. The officers work for CCA program at Environment Department Ministry of Natural Resources and Environment confirmed that there was no training program or module related to CCA. Until now The Office of CCA located at this Ministry collaborates with different ministries such as Agriculture and Industry to provide the information on climate change impacts and methods of prevention and mitigation through awareness generation seminars rather than training.

Therefore, there is a huge potential for the instituting standard training programs/modules on CCA especially for the induction training for the newly recruited staff of MAF to have better knowledge and skills on CCA.



Table 2: List of in-service training programs being offered in agriculture and allied sectors in Lao PDR

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
1	Training of trainers on Extension methods	40 hours	NAFES			16 hours	24 hours	very good	
2	Training on curriculum development for training rice and garden growers	40 hours	NAFES			16 hours	24 hours	very good	
3	Training on management of village revolving fund to farmers	24 hours	NAFES			8 hours	16 hours	good	
4	Training on rice seed production	24 hours	NAFES			16 hours	8 hours	good	
5	Training on traditional rice variety for the market	24 hours	NAFES			16 hours	8 hours	good	
6	Training on using agricultural machinery	16 hours	NAFES			8 hours	8 hours	good	
7	Training on SRI	16 hours	NAFES			8 hours	8 hours	good	
8	Training on vegetable production	32 hours	NAFES			16 hours	16 hours	good	
9	Training on traditional poultry rearing and vaccination	24 hours	NAFES			24 hours	24 hours	good	
10	Training on cattle artificial reproduction	16 hours	NAFES			16 hours	16 hours	good	
11	Training on Good Agricultural practice	24 hours	NAFES			16 hours	8 hours	good	
12	Training on being good trainers	24 hours	NAFES			8 hours	16 hours	good	
13	Training on maize production	16 hours	NAFES			12 hours	4 hours	good	
14	Training on production the bio-fertilizer	16 hours	NAFES			5 hours	11 hours	very good	
15	Training on compost production	8 hours	NAFES			2 hours	6 hours	good	
16	Training on organic vegetable production	32 hours	NAFES			12 hours	20 hours	very good	
17	Training on marketing and business plan	16 hours	NAFES			4 hours	12 hours	good	
18	Training on home vegetable production	40 hours	NAFES			16 hours	24 hours	good	

\* this could be a guesstimate depending on the understanding/expertise of the pedagogic expert involved.

## d.2 Evaluation of Training Facilities

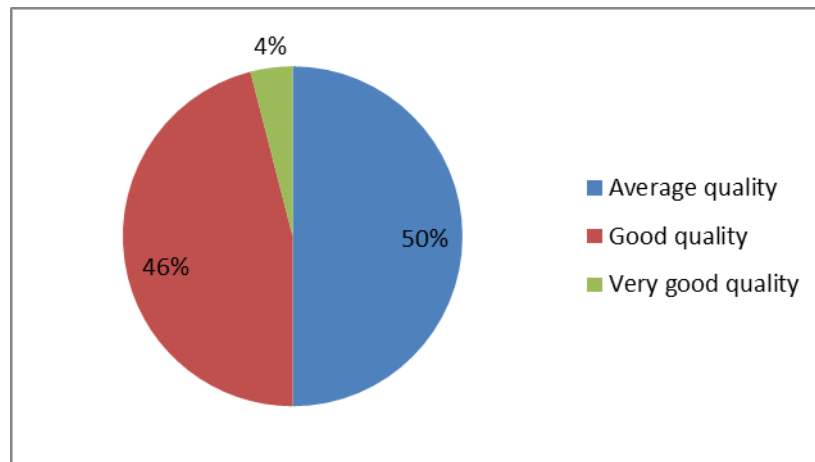
During the training need assessment, we visited research centers those delivers technical training in agriculture. Most of them have a good meeting rooms and average level of equipment but poor accommodation and training materials (Table 3).

Table 3: Evaluation of training facilities for agriculture at various training centers in Lao PDR

No.	Name of Centre	Place	Facilities			
			Training room	Accommodation	Equipment	Material
1	Plant protection Centre, MAF	Vientiane Capital	Good	Poor	Good	Good
2	Clean Agriculture Centre, MAF	Vientiane Capital	Average	Poor	Average	Good
3	Rice and cash crop research Centre (Naphok)	Vientiane Capital	Good	Average	Good	Good
4	Livestock research centre, MAF	Vientiane Capital	Good	Poor	Good	Good
5	Fishery Centre, MAF	Vientiane Capital	Average	Poor	Average	Average
6	NAFES	Vientiane Capital	Very good	No	Very good	Very good
7	Faculty of Agriculture, NUOL	Vientiane Capital	Average	Poor	Good	Good
8	Thasano Crop Research and Multiplication Centre	Savannakhet province	Average	No	Average	Average
9	Rice Research and multiplication centre (Phongnam)	Champasack province	Average	No	Average	Average
10	Coffee Research Centre Boloven	Champassak	Average	Poor	Poor	Poor
11	Northern Agricultural and Forestry Research Centre (Luang Prabang)	Luang Prabang province	Average	Poor	Poor	Poor

During TNA surveys, 50% of interviewees mentioned the training facilities were average, 46% mentioned as good and 4% mentioned as very good (figure 3). They added that training facilities such as the meeting room, equipment, and accommodation and training materials had better quality in the Capital (national institutions) than in the provincial and district training centre. There is a need

to improve these facilities in most case training centers, including setting IT systems and improving the training materials (books, training manuals etc). Only 2 training centres (NAFES and NUOL) and some of NAFRI' centres have internet access in the training room.



### d.3 Evaluation of trainers

Total 23 trainers were interviewed including 11 at national level, 7 at provincial level and 5 at district level. About 96% of respondents mentioned that their organization has the plan for training and 4% answered that no training plan exist. The answer no training plan existing is related to the lack of budget allocated from the government for training at the district level. In the district where there are the development projects (government or non government), the training plan is developed and the fund may be allocated. About funds allocated for training in their department or organization, 14% answered not allocated and 86% answered allocated but not sufficient (Figure 4). The training plan and funds for training are two things go parallel. Most of the interviewed trainers confirmed the fund for training was not enough. We observed that most of the trainings have been conducted with the financial support from the international donors and development projects rather than with the budget support from the national government. This is the reason why some organization did not have training plan as they were not sure if they could have the financial support or not.

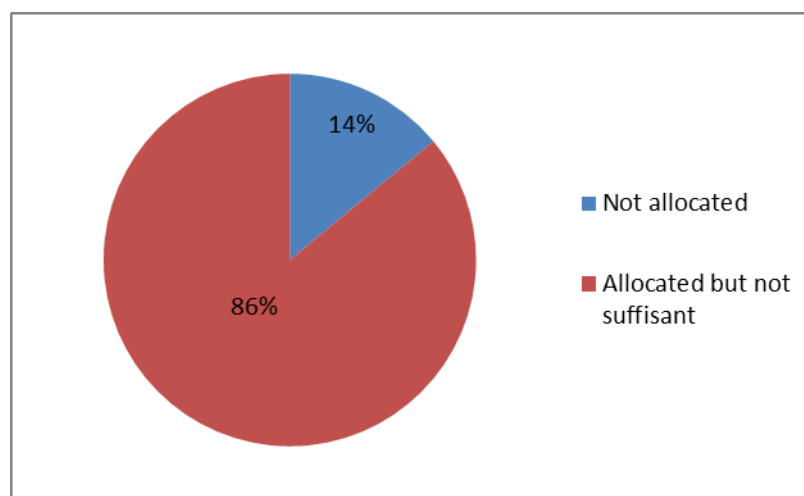


Figure 4: Fund available or allocated of organization for training

Most of the trainings in Lao PDR are in-service trainings and according to interviewed trainers it is to improve both knowledge and skill (46% of responses), improve the knowledge (33% of responses) and improve the skill (21% of responses) (Figure 5). Induction trainings are rare and if there is, the training is organized as seminar rather than formal induction training because of the poor funding from the government. The in-service training can vary from 2-14 days and the average is 5 days.

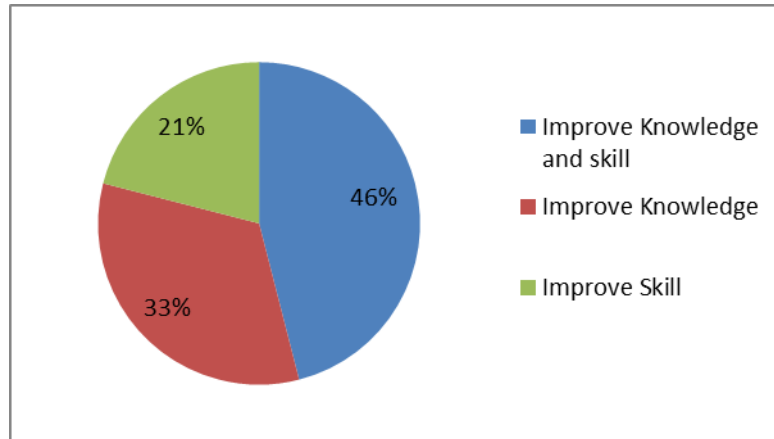


Figure 5: Improving knowledge and skill of training

The institution that implements the training is University 4%, dedicated training institute 11% and in-house training facilities such as technical department of the Ministry, NAFES and NAFRI 85% (figure 6). As mentioned at the section institutional set up for training that training inside the country mostly organized by technical department of MAF to their authority line staff to improve the knowledge and skill based on the need of technique and technology in particular time.

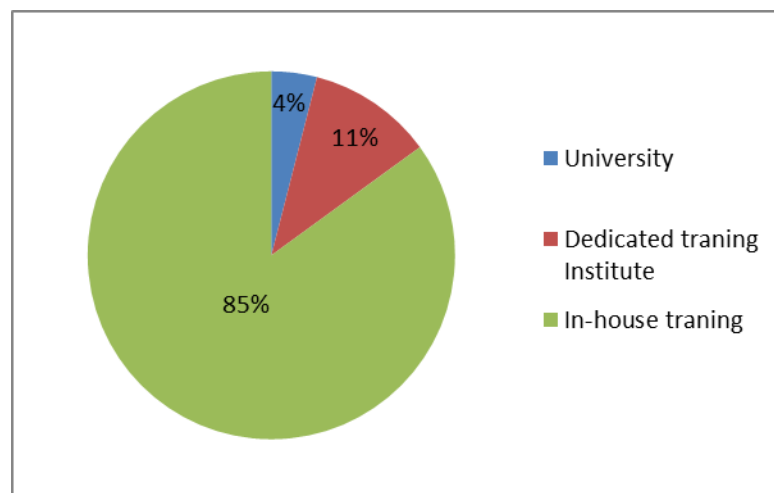


Figure 6: Organizations involved in training agriculture officers in Lao

About 57% of interviewees said the trainers had a good training capacity and 43% said it is average. The good capacity can be observed by the experienced trainers and in some training institution who have learnt training methodology and has experience in conducting training in institutions such as NAFES, NUOL etc.

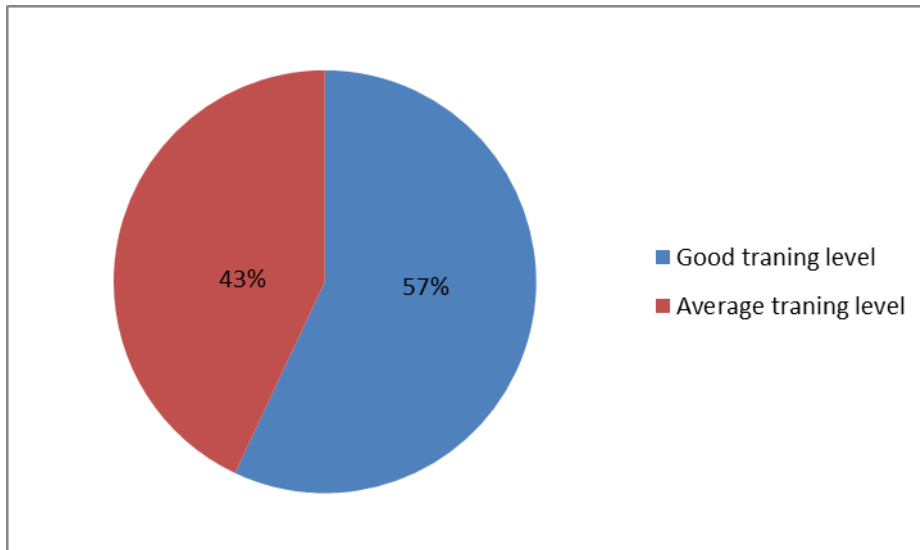


Figure 7: Training capacity levels of trainers in Laos

At the same time 7% of the trainers said the number of trainers was poor (not sufficient), 79% said the number was average and 14% the number was good (sufficient ) (Figure 8).

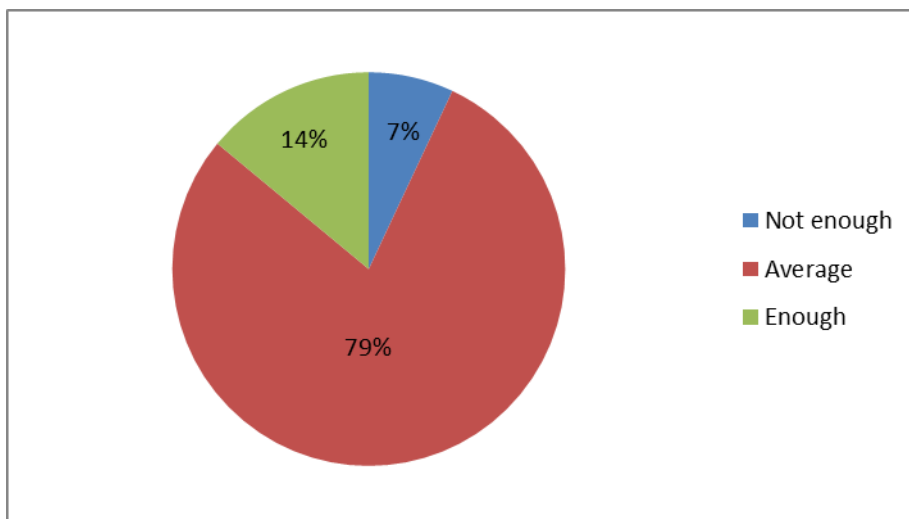


Figure 8: Sufficiency level of trainers in Laos.

Very few respondents have informed that the trainers have very good skill and knowledge on the subject involved (4% of respondents), 39% said have good skills, 50% said have average skills and 7% said have poor skill (Figure 9).

82% of trainers mentioned about the existence of the evaluation of post training performance the of trained staff while 18% mentioned having no evaluation in place. 89% opined that the trainings have led to improvement in on-the job-performance of the staff after training, 7% were not sure and 4% said no improvement after the training (Figure 10). It indicates that the trainings did generally improved knowledge and skills of trainees.

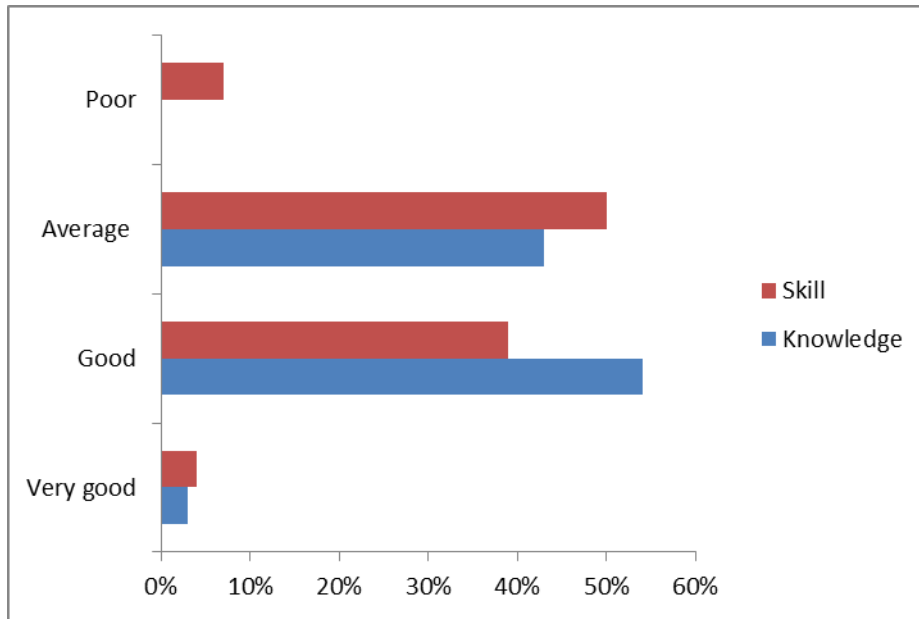


Figure 9: Skill and Knowledge levels of trainers on subjects they train

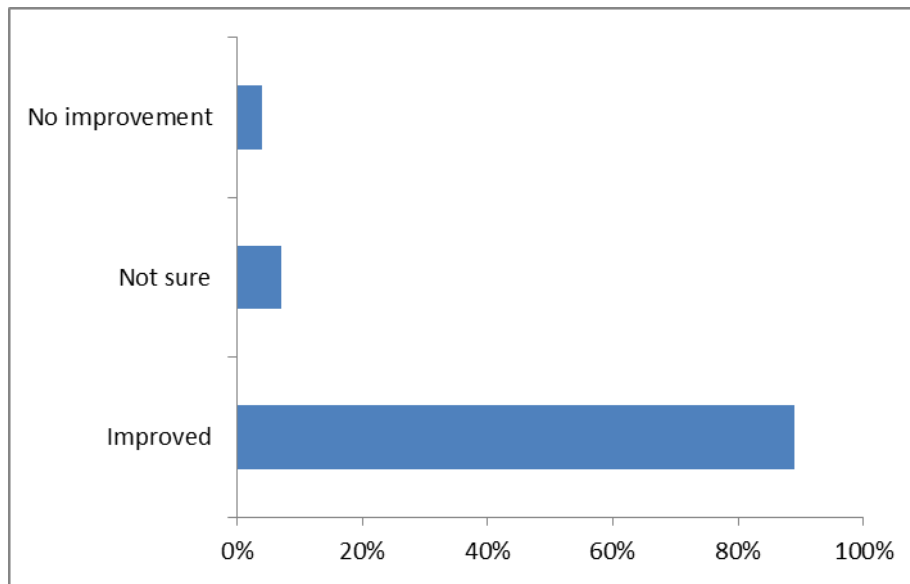


Figure 10: Improvement of staff's performance after training.

For the question on training institute/facility, the respondents have suggested various institutions for implementing training on CCA in agriculture sector in the country. 39% proposed the National Agricultural and Forestry Research Institute (NAFRI), 23% the Faculty of Agriculture, National University of Laos (NUOL), 16% NAFRI or NUOL, 11% NAFES and 11% were not sure about which institute would be appropriate for implementing training on CCA (Figure 11). The high favorable responses for NAFRI and NUOL were because of their good training facilities and presence of qualified trainers. It corroborates the fact that many staff of NAFRI and NUOL has high level of professional education compare to NAFES, the official national trainers.

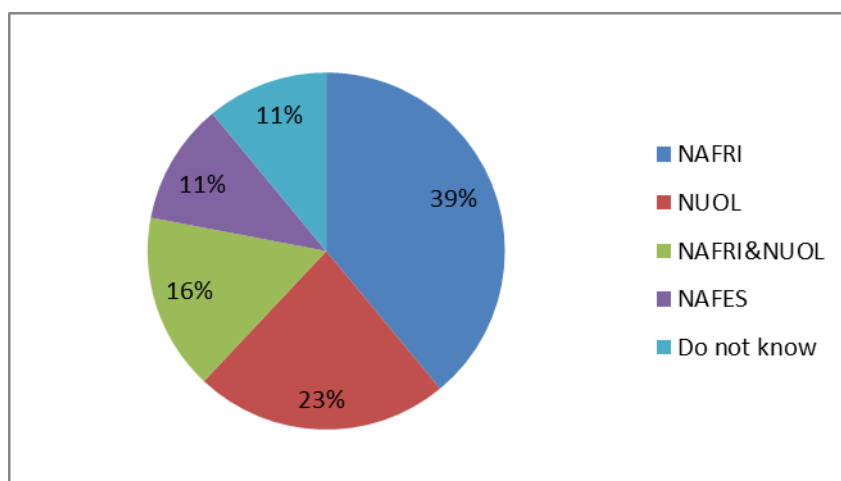


Figure 11: Proposed training institutions for conducting training on climate change adaptation in Lao

#### d.4 Evaluation of trainees

##### Education and training

The qualifications for the job of district agricultural technical staff should be middle technical level or High Diploma, with a minimum experience of 2 years for the High Diploma graduate and 4 years for middle technical level. Among the interviewees, 65% have graduated from middle level technical schools, 33% have High Diploma from agricultural and forestry colleges or university and 2% of them have Bachelor of Science diploma (Figure 12). In their education, they had courses on ecology and agroecology but they no courses on climate change and CCA. None of them were trained in CCA both during induction and or in-service training.

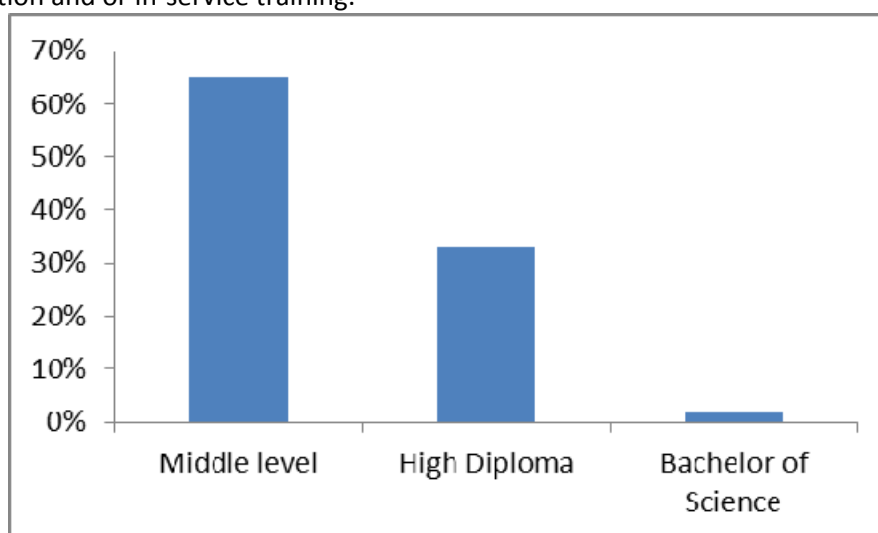


Figure 12: Qualification of trainees

##### On the job functions (current duties and expected changes in roles for CCA)

Among the interviewees, 24% are the heads of technical sections and are responsible for supervising 4-10 sub-ordinate staff and 76% of respondents are technical staff (Figure 13). At the district level, the technical staff works directly with farmers. They train village extension workers and famers' groups on new agro-techniques.

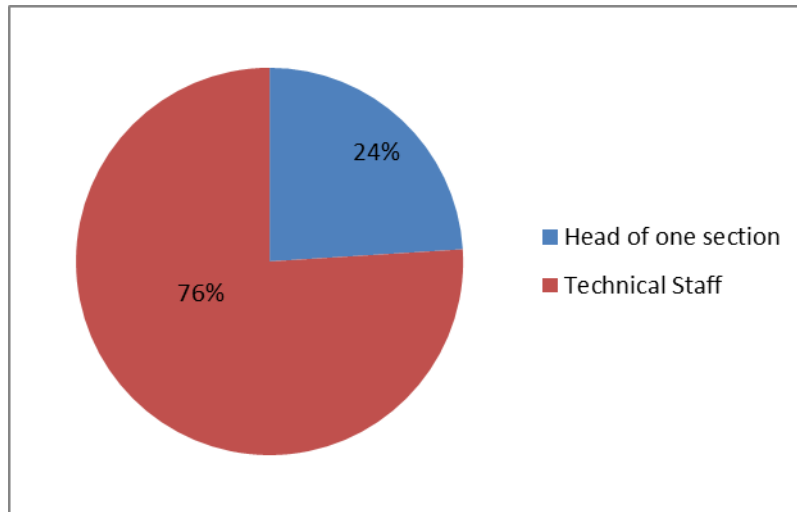


Figure 13: Job functions of trainees

### Evaluation of skill and knowledge areas

25% and 75% of respondents have opined that they have average and poor level of knowledge on CCA respectively. However, 100% of trainees responded as having poor skill levels in CCA (Figure 14). This indicates the need for imparting high levels of skills in the future training programs.

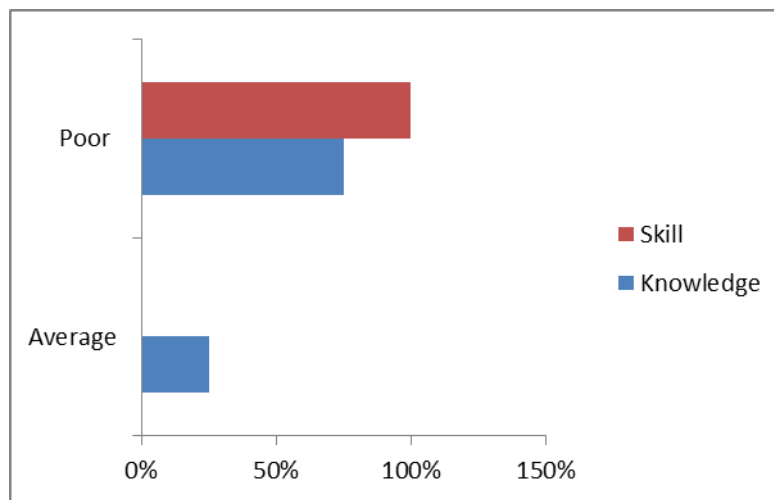


Figure 14: Knowledge level on climate change adaptation

### Self-evaluation of working environment

Based on the TNA, we observed that the working environment at the provincial level is not much better than in district level centers. All the provincial officers rated their working environment as average. They have access to equipment and good office but access to modern technologies such as internet and software are poor. 26% of district officers gave a score of 3 (average) to their working environment while 74% gave score 2 (poor). In many districts, many facilities for the staff to fulfill their job description are not enough. They are lack of computers, printers, internet access and most importantly the transportation and gasoline to go to the field and work with famers for those who have to work directly with farmers.



## e. Identifying Ideal Knowledge and Skills for CCA

To be able to develop the ideal knowledge and skill scenario for CCA in agricultural sector, a consultation was conducted with CCA specialists at National Adaptation Programme for Action office to enumerate the job description of the staff. The results of this consultation are shown in the tables below.

### e.1 Job description of Agricultural and Forestry Officers

Table 4: Job Description of Director of Technical Department of the Ministry of Agriculture and Forestry.

No.	Actual Job Description	Future need of job description
1.	Assistance to Minister	Review the rule, regulation and law to be more compatible to new policies and strategy
2.	Establish the strategy in area of responsibility (crop, livestock, irrigation) for Ministry in short and long term	Strengthen the capacity of staff based on the new policies and strategy including climate change Adaptation
3.	Prepare the law and regulation of the area of responsibility	
4.	Human Resource Development and Management for the department and area of responsibility	
5.	Technical Supervision to the line authority (PAFO and sometime DAFO)	
6.	Development the pilot development village	
7.	International cooperation	

Table 5: Job Description of Director of Provincial Agricultural and Forestry Office

No.	Actual Job Description	Future need of job description
1.	Assistance to Central Ministry, technical Department and Province	Review the strategy for the area of responsibility for the province and region
2.	Develop the strategy in the area of responsibility for province (or region) including the socio-economical plan in short and long term	Strengthen the capacity of staff based on the new policies, strategy and plan
3.	Management of rule and regulation related to the area of responsibility in the province	Strengthen the capacity of staff in efficient management of resources
4.	Human Resource development plan and management at provincial level	
5.	Supervision for the implementation of government strategy and provincial (regional) development plan	
6.	Technical supervision to the line authority ( DAFO)	
7.	Report to the upper line authority (Ministry level)	

Table 6: Job Description of Director of District Agricultural and Forestry Office

No.	Actual Job Description	Future need of job description
1.	Assistance to PAFO in technical area : crop, livestock	Assistance to the villages in the area of agriculture and Forestry
2.	District's Planning and supervision of implementation of the provincial strategy and plan at district level	Help the district staff and farmers to solve the technical problem related to climate change
3.	Assistance to the district officers in technical area	
4.	Train the district officers in technical area	
5.	Report to the upper line authority (PAFO)	

Table 7: Job Description of Provincial Agricultural and Forestry Officer

No.	Actual Job Description	Future need of job description
1.	Assistance to Provincial Agriculture and Forestry Office in developing the strategy and provincial agricultural development plan	Help DAFO officers to solve the technical problem related to climate change and climate change adaptation
2.	Assistance to Provincial Agriculture and Forestry Office in technical area	Strengthen the technical capacity of DAFO officers in order to work better with farmers
3.	Assistance to the DAFO officers in solving the technical problems at district and village level	
4.	Develop the training plan and budget for strengthening the capacity of the DAFO officers in technical area	

Table 8: Job Description of District Agricultural and Forestry Officer

No.	Actual Job Description	Future need of job description
1.	Assistance to District Agriculture and Forestry Office in planning and implement the agricultural strategy and agricultural development plan	Help farmers to solve the technical problem related to climate change and climate change adaptation
2.	Work with villages and famers to improve techniques and technology as well as helping them to solve the technical problems	
3.	Train the new technique and technology to Village Extension Workers and farmers	

Table 9: Summary of TNA results for district and provincial agricultural staff (form 4) - Lao PDR

Code	Job title	Organiza tion	Educat ion level	Experie nce (yeas)	Curriculu m on climate change		Handli ng projec t on CCA	Train ing on CCA	Evaluati on after training CCA	Self evaluation*		Area of training for better job		Rating of working environ ment*
					yes	no				Knowle dge	Skill	Knowledg e	Skill	
1. District Agricultural and Forestry Officers														
D4.1	crop product ion extensi onist	DAFO	Middle	3		1	no	No	no	average	poor	Rice Yield improvement; Soil improvement	Rice productio n techniqu e	average
D4.2	Crop product ion extensi onist	DAFO	Middle	5		1	no	No	no	average	average	Climate change concept, soil improvement	Assessme nt of climate change impact	average
D4.3	Crop product ion	DAFO	High Diplom a	8		1	no	No	no	good	good	Climate change concept and climate change adaptation ;	Assessme nt of climate change adaptatio n Bio-	poor

Code	Job title	Organization	Education level	Experience (years)	Curriculum on climate change		Handling project on CCA	Training on CCA	Evaluation after training CCA	Self evaluation*		Area of training for better job		Rating of working environment*
					yes	no				Knowledge	Skill	Knowledge	Skill	
												Pest and disease control	pesticide; IPM	
D4.4	Livestock	DAFO	Middle	2		1	no	No	no	poor	poor	Animal health	Animal health care	poor
D4.5	Livestock	DAFO	Middle	4		1	no	No	no	average	poor	Animal health	Animal health care	poor
D4.6	Irrigation	DAFO	middle	6		1	no	No	no	average	good	Small scale Water management	Water conservation technique	poor
D4.7	Crop production	DAFO	High Diploma	17		1	no	No	no	good	good	Climate change concept and impact; Organic production	Assessment of climate change impact Organic production	average

Code	Job title	Organization	Education level	Experience (years)	Curriculum on climate change		Handling project on CCA	Training on CCA	Evaluation after training CCA	Self evaluation*		Area of training for better job		Rating of working environment*
					yes	no				Knowledge	Skill	Knowledge	Skill	
													technique	
D4.8	Crop production	DAFO	Bachelor	4		1	no	no	no	good	average	Climate change concept and adaptation ;	Assessment on climate change impact	average
D4.9	Crop production	DAFO	Middle	3		1	no	No	no	average	poor	Rice productivity improvement	Bio fertilizer production technique	poor
D4.10	Livestock	DAFO	High	4		1	no	No	no	average	average	Animal Feed production	Animal feed conservation	poor
D4.11	Livestock	DAFO	Middle	5		1	no	No	no	average	average	Animal health care	Diagnosis of animal disease	poor
D4.12	Crop	DAFO	Middle	7		1	no	No	no	good	average	Plant	Bio-	poor

Code	Job title	Organization	Education level	Experience (years)	Curriculum on climate change		Handling project on CCA	Training on CCA	Evaluation after training CCA	Self evaluation*		Area of training for better job		Rating of working environment*
					yes	no				Knowledge	Skill	Knowledge	Skill	
	product ion										age	protection	pesticide and IPM	
D4.13	Irrigation	DAFO	High Diploma	5		1	no	No	no	average	average	Water Resource management	Small scale irrigation management	poor
D4.14	Crop production	DAFO	Middle level	10		1	no	No	no	good	good	Organic production	Organic production technique	poor
D4.15	Livestock	DAFO	Middle level	3		1	no	No	no	average	poor	Animal Feed Production	Animal feed production and conservation	poor
Provincial Agriculture and Forestry Officers														
P4.16	Crop production	PAFO	Bachelor	18		1	no	No	no	good	average	Climate change concept	Assessment of climate	average

Code	Job title	Organization	Education level	Experience (years)	Curriculum on climate change		Handling project on CCA	Training on CCA	Evaluation after training CCA	Self evaluation*		Area of training for better job		Rating of working environment*
					yes	no				Knowledge	Skill	Knowledge	Skill	
	Specialist											Land use planning change impact Integrated Crop Management		
P4.17	Crop production specialist	PAFO	High Diploma	4		1	no	No	no	average	average	Climate change concept and impact Rice Productivity Soil fertility improvement	Assessment of the adaptation capacity	average
P4.18	Crop production	PAFO	High Diploma	7		1	no	No	no	good	average	Crop management	GAP, Organic production technique	average

Code	Job title	Organization	Education level	Experience (years)	Curriculum on climate change		Handling project on CCA	Training on CCA	Evaluation after training CCA	Self evaluation*		Area of training for better job		Rating of working environment*
					yes	no				Knowledge	Skill	Knowledge	Skill	
P4.19	Livestock	PAFO	High Diploma	6		1	no	No	no	good	average	Animal feed management	Conservation of Animal feed	average
P4.20	Livestock	PAFO	Bachelor of Science	3		1	no	No	no	average	average	Animal disease control	Animal health care	average



## e.2. National Adaptation Programme of Action's priorities for CCA

The Lao PDR NAPA focuses on reviewing various strategies and measures for managing disasters in the past, present and future, as well as assessing the capacity and provides alternative strategies for adaptation to the potential impacts of climate change. In addition, the NAPA identifies urgent needs associated with effectively mitigating and adapting to climate change, with a particular focus on the key sectors that are likely to be negatively affected namely agriculture, forestry, water and water resources and public health. Within this NAPA document 45 priority project proposals are identified which address the needs of CCA in these key sectors in Lao PDR (WREA, UNDP, GEF, 2009). Below is the summary the priority of NAPA for the training area.

Table 10: National Adaptation Program for Action Lao PDR (NAPA) for Agricultural and water sector

	Priority
<b>Priority one</b>	
1	Strengthen the capacity of the National Disaster Management Committees
2	Promote secondary professions in order to improve the livelihoods of farmers affected by natural disasters induced by climate change
<b>Priority two</b>	
3	Land use planning in hazard prone and affected areas
4	Cultivation of short-duration paddy and other cash crops in natural hazard prone areas
5	Technical capacities of local agricultural officers in natural hazard prone areas strengthened.
6	Improve and develop crop varieties and animal species that are better adapted to natural hazard prone areas
7	Improve and construct crop and animal disease laboratories at central and local levels and build related capacity of technical staff
8	Train farmers on processing and storing of food
9	Establishment and strengthening of farmers groups in natural hazard prone areas
10	Promote soil improvement using locally available organic fertilizer and existing agricultural waste
11	Develop appropriate bank erosion protection systems for agricultural land in flood prone areas.
12	Promote integrated pest management (IPM) and use of biopesticides in pest management and livestock treatment
13	Develop the capacity of technical staff in organic fertilizer research

After studying the job description of agricultural staff, discussing with the NAPA officers and studying the related documentation, the following gaps were identified for imparting training to various trainers and agriculture officers:

1. Knowledge about climate change and its impact and
2. Agricultural techniques to be adapted in the climate change context.

Most of the time the agricultural techniques used by farmers are conventional and result in low yields. The elaborate knowledge and skill areas identified based on the above exercise are listed in the table 11.

Table 11: Summary of Knowledge and skill training needs

No.	Knowledge	Skill
1	Concept of global climate change	
2	Climate change impacts	Tools for assessment of climate change impact, diagnosis of problems
	Adaptation to climate change	Tools for assessment of climate change adaptation
3	Prevention and mitigation of impacts of climate change	
4	Biological control of pests and diseases	Integrated Pest Management, bio-pesticide and herbicide
5	Soil and fertilizer management	Soil fertility improvement and soil loss control techniques
6	Integrated cropping systems and intercropping systems	Integrated crop production techniques
7	Improvement of rice yield and rice productivity	Improvement of rice production techniques
8	Environmentally friendly crop production techniques	GAP, organic production techniques
9	Water management	Water conservation methods and efficient water use
10	Animal health control and treatment	Diagnosis and treatment of animal diseases and pests
11	Animal feed improvement	Animal feed production techniques

## f. Policy Suggestions for Capacity Building

Through the TNA on climate change adaptation we found that the training in the area of climate change adaptation is still at very nascent stage in Laos PDR. Most of the staff do not know about the impacts of climate change on agriculture and do not have any knowledge and skill in suitable techniques for climate change adaptation in agriculture sector. To ensure the resources for scaling up the training on this subject, the NAFES, NUOL and NAFRI can play a key role in development and implementation of training modules developed as a part of this project. As mentioned in the chapter on National Institutional set-up for training, the NAFES is playing an important role in training agricultural and forestry staff from central level down to district level in the country. With this institutional set-up, the training modules developed in this project may be implemented.

The government should provide specific budget to this type of training. As we found in the TNA and from the discussion with the NAPA officers, lacking of budget is the obstacle of the training on climate change adaptation. Though the main objective of this project is to draft specific training modules for specific agricultural staff in Lao PDR, this study has also looked into other aspects of training environment and provides the following suggestions to the policy makers for further consideration.

- Drafting a national strategy and roadmap to train all critical staff in the country on climate change adaptation.
- Comprehensive assessment of training needs of various agricultural staff in the country on emerging issues such as sustainable development and climate change adaptation.
- Strengthen various district and provincial training institutions by providing better infrastructure for training.
- Creating a critical mass of trainers and subject matter specialists.
- Review and incorporation of climate change adaptation related subject matter in the higher education and professional degrees offered in the country.

## LAO PDR PART II: TRAINING MODULES

After referring to the job description of officers from central level until the grass root officers following the authority line, the NAPA priority, the TNA we propose 6 basic training modules for climate change adaptation in Lao PDR. One module is for induction training and the other five are in-service training.

The proposed generic training modules:

In-service training programs:

- I. Integrated water management
- II. Storing methods for animal feed
- III. Soil improvement using locally available organic fertilizer and agricultural waste
- IV. Integrated Pest Management and use of biopesticides in pest management
- V. Cultivation of short duration paddy and other cash crops in the natural hazard prone areas

Induction training program:

- VI. Cultivation of climate change impact and adaptation knowledge

### **i. Generic Training Module (In-service): Integrated Water Management**

Title	Integrated Water Management
Target group/participants	Provincial Water and Environment and Agricultural and Forestry Officers
Responsible of participant after training	Provincial Water and Environment and Agricultural and Forestry Officers will need to train district officers and to work with farmers in order to help them to manage the water resource and water uses
Duration of training	4 days

#### 1. INTRODUCTION

The climate change presents today the big problem and has the huge impact in many areas in the world and this impact is going to increase in the future. This training is a necessity and needed for Lao PDR to make the officers who work at Natural Resources and Environment and the Provincial Agriculture and Forestry Office to have appropriate knowledge and skill to manage the water resource and water for irrigation. This training can enable these officers to help farmers to mitigate the impact on agricultural production from drought and floods.

#### 2. TARGET GROUP

The target group is officers from water resource division of provincial natural resources and environment office and provincial agricultural and forestry office.

#### 3. TRAINING NEEDS/GAP ANALYSIS

The role of the district agricultural staff in Lao PDR is to train district officers in order to be able to help farmers to solve the agricultural production problem. These officers have basic knowledge in

water management and irrigation and agricultural production technique. However, in the new context of climate change such as changing scenario of floods and droughts, based on our training need assessment and NAPA's policy of the Lao PDR government, there is a need to improve their knowledge and skill in water resource management and efficient uses of water to sustain the agricultural production and yield.

#### 4. ENTRY BEHAVIOUR

- Participants should have minimum the High Diploma in the field of environmental Science and Agricultural Science
- Age: 23-45 years old

#### 5. GOAL AND LEARNING OBJECTIVES

After training, participants will have knowledge in water resource management in order to be able to suggest suitable techniques on water conservation, efficient water use and water management to farmers.

#### 6. IMPLEMENTATION MODALITIES

The training will be organized by the Ministry of Natural Resources and Environment and NUOL. The organizer will invite two trainers from Faculty of Environmental Science (Department of Water Resource) and from Department of Water, Ministry of Natural Resources and Environment. One training module includes 15-20 participants. The duration of training is 4 days. The training can be taken place at PAFO office or Provincial Natural Resource and Environment office.

#### 7. EXPECTED OUTCOMES

After training, Provincial and District Officers will have a knowledge and skill on water management and they can help farmers to better manage the water resources and efficient use water.

#### 8. EVALUATION

Two evaluations will take place, one before training and second after the training session. The evaluation will be done based on an evaluation form developed in consultation with the trainers and other experts in the field of climate change adaptation.

## 9. SESSION DETAILS

Day I

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
Morning								
	1. Introduction to global change, droughts and floods, the cause, impact and awareness	2 hrs	To have awareness on global change trends, their impacts on crop production and water resources.	Video, LCD Computer	Lecture		discussion	Have to show the film On climate change and impact
	2. Principles of integrated water management 3. Rules, regulations and laws on water resource management	1 hr 1 hr	To explain and discuss principle of integrated water management and on sustainable water resource management		Lecture		Discussion	
Afternoon								
	1. Rule, regulation and law on integrated water management	1 hr			Lecture		Discussion	
	2. Organization who work on water management 3. Information on water resource management 4. Characteristic of development that have an impact on water sector	1 hr 1 hr	To identify approaches to help farmers to solve the problem by using the sustainable water resource management	Flipchart	Group discussion	Research result presentation	Discussion	

Day II

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
Morning								
	1. Water Resource planning 2. Planing process and procedure 3. Role of consultancy and participation in sustainable water resource management.	1 hr 30 minute 30 minutes	To prepare plan for application of suitable water uses technique		Lecture		Discussion	Have to show the film On climate change and impact
	2. Conservation of natural resource and technique of using the water in agricultural production	2 hrs	To explain methods of sustainable water resource management		Lecture		Discussion	
Afternoon								
	Recycle of water	3 hrs	To explain and identify methods of reuse of water	Flipchart video	Group discussion		Discussion	

Day III

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
	Field visit on the case of water use, management and planing	8 hrs	To discuss and identify appropriate solutions	Questionnaire		Interview and visit		

			to solve problem of water uses management in agriculture					
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Day IV

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
Morning								
	Group work on sustainable water resource management and uses	4 hrs	Trainees have the knowledge and experience on water management and uses	Flipchart -			Group presentation	
Afternoon								
	Presentation of results	2 hrs					Presentation of group work	Question



## 10. LIST OF TRAINING MATERIALS

Computer, LCD, video, flipchart, marker pen, white board etc.

## 11. FEEDBACK FORM

Description	Opinion Rating (5 is high and 1 is low)					Remarks
	5	4	3	2	1	
<p>1. Curriculum</p> <ul style="list-style-type: none"><li>- Topic</li><li>- Topic flow and continuous</li><li>- Content reflex the objective of training</li><li>- Possible implication</li><li>- Field visit</li><li>- Management and equipment</li><li>- Timeof training</li><li>- Environment of training</li><li>- Document</li><li>- Suitable Material</li><li>- Training aid</li></ul> <p>2. Workshop room</p> <p>3. Food</p> <p>3. Accomodation and logistics</p>						

## 12. SCHEDULE OF TRAINING PROGRAM

### Day 1

Date	Time	Title of the session	Trainer
	7:30-8:00	Registration	
	8:00-10:00	1. Introduction to global changing, drought and flood, the cause, impact and awareness	Trainer from Department of Environment
	10:00-10:15	Break	
	10:15-12:00	2. Principle of integrated water management	Trainer from Department of Environment
	12:00-13:00	Lunch break	
	13:00-14:30	3. Rule, regulation and law on water resource management	Trainer from Department of Environment
	14:30-14:45	Break	
	14:45-16:30	1. Organization working in water management 2. Information on management of water resource 3. Changing of development and impact on water management sector	Trainer from Faculty of Environment science

### Day 2

Date	Time	Title of the session	Trainer
	8:00-10:00	1. Water Resource planning 2. Planning process and procedure 3. Role of consultancy and participation in sustainable water resource management.	Trainer from Faculty of Environment science
	10:00-10:15	Break	
	10:15-12:00	2. Conservation of natural resource and technique of using the water in agricultural production	Trainer from Faculty of Environment science
	12:00-13:00	Lunch break	
	13:00-14:30	Recycle of water	Trainer from Faculty of Environment science
	14:30-14:45	Break	

	14:45-16:30	Management of recycle water	Trainer from Faculty of Environment science
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Day 3

Date	Time		
	7:00-8:30	Travel	Trainer from Faculty of Environment science and from Environment Department
	8:30-12:00	- Observe the case and interview farmers	
	12:00-13:00	Lunch break	
	13:00-16:30	Observe the case and interview farmers	
	16:30-18:00	Travel	

Day 4

Date	Time		
	8:00-10:00	Group work	Trainer from Faculty of Environment science and from Environment Department
	10:00-10:15	Break	
	10:15-12:00	Group work	
	12:00-13:00	Lunch break	
	13:00-14:30	Presentation	Trainer from Faculty of Environment science and from Environment Department
	14:30-14:45	Break	
	14:45-16:30	Presentation and conclusion	

### 13. Budget

- Honoraria of trainers=2 days x3personsx200US\$=1200US\$
- Accommodation and Per diem of participants: 23 person x 50 \$x 2 days = 2300 US\$
- Material and Equipment, meeting room 1.000 US\$
- Traveling for trainers and trainees= 23 persons x 250\$ = 5750 US\$

**Total Budget: 10,250 US\$**

## ii. Generic Training Module (In-service): Appropriate methods of storing of animal feed

Title of the module	Storing of animal feed
Target trainees / participants	District Agricultural officers
Responsibility of the participants after training (they are expected to do what)	Train the district agricultural officers to work directly with farmers on the storing of animal food stuffs
Duration of the module	13 hrs (2 days)

### 1. INTRODUCTION

Animal rearing in flood and drought prone areas often experience feed shortage. This issue can be partially addressed by improving feed storage that can help provide feed during the times of feed shortage. In this respect, it is necessary to organize training for farmers on storing techniques of animal feed, and imparting of related local knowledge.

### 2. TARGET AUDIENCE

Livestock officers at district level who work with famers in animal production

### 3. TRAINING NEEDS/GAP ANALYSIS

The role of the district agricultural staff in Lao PDR is to trains and help farmers to solve the agricultural problems. These officers have basic knowledge in animal production techniques and some knowledge on feed production. However, in the context of climate change, based on our training needs assessment and NAPA's policy of the government, we found there is a need to improve the knowledge and skills of these staff in feed storage technique so that they in-turn train farmers in the drought and flood prone areas to sustain their animal production.

### 4. TRAINING GOAL/PURPOSE

Build knowledge and skills of farmers to store animal feed in flood and drought prone areas.

### 5. ENTRY BEHAVIOUR

- Participants should have minimum the High Diploma in the field of livestock
- Age: 23-45 years old

### 6. IMPLEMENTATION MODALITIES

This training needs 4 trainers to train 20 trainees in a batch. The duration of the training is 2 days to be organized by NAFES and NUOL. One external resource person on Natural Resource and Environment, 3 trainers from NAFES and NUOL are required. The trainees are the district officers who work with farmers in drought and flood prone areas and the training should take place in the vulnerable areas so that the trainees can learn from field visits.

### 7. EXPECTED OUTCOMES

The DAFO staffs would work better on animal feed conservation with farmers in the hazard prone areas leading to better reserve of feed for their animals.

## 8. EVALUATION

According to TNA, DAFO staff work directly with farmers and help them to deal with agricultural production technology. After attending the training course, the knowledge and skill of trainees will be measured through an evaluation form that will be developed by trainers and subject matter specialists in related fields.

## 9. SESSION DETAILS

Day I

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
I	Global climate change and climate change adaptation in agriculture	2 hrs	To be acquainted with information on global climate change, impacts of CC in Agriculture to trainers		√	Importance of (drought and flood areas	Ask question	Try to make trainees understand climate change and its impact to agriculture by lecturing and VDO illustration
II	Introduction to animal feed storage problems	2 hrs	To identify and discuss the feed shortage problem of animal and animal feed storage concept		√		Ask question and discussion	Trainers focus on feed shortage problems, importance of feed storage. Make the examples on feed shortage problem
III	Technical session on alternative technique of feed storage for stress periods		Participants will be able to explain various principles of animal feed storage techniques		√		Discussion	The trainer will have to introduce the crop varieties used for animal feed storage

Day II

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
IV	Field visits to research and demonstration station	7 hrs	Participants have knowledge and can practice the animal feed storage techniques			√	Discussion	The trainer should contact the fields visit

10. LIST OF TRAINING MATERIALS

This training should provide some special materials (animal feed, milling equipment, drying house) and teaching aids to be used by the trainers in implementing the module is LCD, VDO, material to demonstrate the animal feed conservation techniques.

11. SCHEDULE OF TRAINING PROGRAM

Day 1

Time	Title of the session	Trainer
8:00-8:30	Registration	
8:30-8:45	Opening training course	Chief of DAFO
8:45-10:45	1. Introduction to global climate change and climate change adaptation in agriculture in drought and flood areas	Trainer from Department of Environment/Water resource
10:45-10:55	Break	
10:55-11:55	2. Introduction to animal feed storage problems	Trainer from Department of Environment
12:00-13:00	Lunch break	

13:00-14:00	3. Introduction to animal feed storage problems (continue)	Trainer from Department of Environment
14:00-14:15	Break	
14:15-16:00	1. The alternative techniques of feed storage for stress periods	Trainer from Faculty of agriculture

## Day 2

Time	Title of the session	Trainer
8:00-10:00	Travel to visit to farmers fields who are practicing feed storage techniques	Trainers , participants
10:00-12:00	Visit farmers fields, ask questions and discussion between participants and farmer of success and problems in animal feed storage	Trainers , all participants on farmers' sites
12:00-13:00	Lunch break	
13:00-14:00	Group discussion and planning for implement in their District	Trainer and trainees
14:00-14:15	Break	
14:15-16:15	Travel back to training site	Trainer from Faculty of Environment science

## 11. FUNDING SUPPORT

Following is the tentative estimate of expenses for implementing this training module:

- Honoraria of trainers=2 days x4personsx200US\$=1600US\$
- Subsistence of DAFO = 3 days x 24personsx50US\$= 3,600US\$
- Teaching aids and materials =US\$ 1,000
- Traveling cost for DAFO staff = 24 personx200US\$=4800US\$

**Total: 11,000US\$**



### iii. Generic Training Module (In-service): Soil improvement using locally available organic fertilizers and agricultural waste

Title of the module	Soil improvement using locally available organic fertilizers and agricultural waste
Target trainees / participants	Provincial and district agriculture and forestry staff
Responsibility of the participants after training (they are expected to do what)	Train farmers in improving the soil fertilities using organic fertilizers
Duration of the module	12 hrs

#### 1. INTRODUCTION

Soil conditions such as water holding capacity in hazard prone areas, especially in drought prone areas, are normally poor and degrade rapidly. Chemical fertilizers are costly and are often ineffective because of unpredictable climatic condition such as flood and drought and lack of proper soil moisture to use the applied nutrients. Moreover, the use of chemical fertilizers in unsuitable quantity can degrade soils. Thus, it is necessary to improve soil quality through use of locally available organic fertilizers and agricultural waste, thereby enhancing the adaptive capacities of the farmers living in these areas.

#### 2. TARGET AUDIENCE

Provincial and District Agriculture and Forestry staff

#### 3. TRAINING NEEDS/GAP ANALYSIS

Farmers in many areas of the Lao PDR use chemical fertilizers with increasing quantity every year as they expect to give higher yields and to compensate the loss from climate change impact. However, the use of chemical fertilizers are costly putting farmers to even more financial risk in the wake of crop failure due to natural hazards. Due to presence of animal husbandry in many parts of Lao PDR, the available animal manure and agricultural waste can be recycled as organic fertilizers in these areas. Some of the farms have large herd of animal which can provide large quantity of manure but they do not use it efficiently. In some areas, farmers grow vegetables and other crops but the agricultural waste has not been used to improve the soil fertility due to lack of knowledge and skills. Hence, imparting training on soil improvement using locally available organic fertilizers and agricultural waste will allow farmers to save money and conserve the environment.

#### 4. TRAINING GOAL/PURPOSE

To improve the knowledge and skills of provincial and district agricultural staff in technique of organic fertilizer and recycle of agricultural waste in the flood and drought area. Farmers can have the same yield and have high income using low cost inputs.

#### 5. ENTRY BEHAVIOUR

- Participants should have minimum the High Diploma in the field of crop science
- Age: 23-45 years old

#### 6. IMPLEMENTATION MODALITIES

- The training course is organized for Agriculture technicians in the provincial and district level (PAFO & DAFO).
- Trainers or resource persons come from NAFES and Department of Agriculture.
- The training has the theory and practical parts to improve knowledge and skill.
- After training, there is an evaluation of trainees and trainers.

#### 7. EXPECTED OUTCOMES

The knowledge and skill of PAFO and DAFO staff have improved.

#### 8. EVALUATION

Evaluation will be conducted using evaluation forms developed in consultation with trainers and related subject matter specialists.

## 9. SESSION DETAILS

Day I

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
I	Global climate change and its impacts on agriculture	2 hrs	To elicit various global change trends, the impact of using the chemical fertilizer on the climate change	VDO	Lecture		Asking the questions	Make sure that trainees understand climate change and its impact on agriculture by relating the content to their context.
II	Soil improvement by organic fertilizers	2 hrs	To share knowledge and practical experiences on applications of organic fertilizer production technique: compost, BE and EM	Poster, organic fertilizer production manual	Lecture		Ask questions	Make sure that trainees understand the organic fertilizer and the importance of its use in improvement of soil fertility by providing suitable examples.

Day II

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
III	Practical session on organic fertilizer production for soil improvement	6 hrs	Trainees can be able to produce the organic fertilizer: compost, EM, Bio Extraction	Poster and training manual, - Manure - Bamboo - Rice straw and other waste, - container		Practice	Demonstration on production of organic fertilizer	Make sure that all trainees practice the organic fertilizer production technique. Since the session is planned only once, make sure that the samples of various stages of decomposed organic matter is shown to them.

#### 10. LIST OF TRAINING MATERIALS

Manual, poster, VDO, manure, bamboo, rice straw, vegetable leaves, containers, and moulus.

#### 11. FUNDING SUPPORT

- Honoraria of trainers=2 days x2personsx200US\$=800US\$
- Subsistence for trainers and trainees (PAFO and DAFO staff) = 2 days x22 personsx50US\$= 2200US\$
- Material cost for training US\$ 1000
- Travelling cost for trainers and PAFO and DAFO staff= 22 persons x 250US\$= 5,500US\$

**Total budget: 9500US\$**

## iv. Generic Training Module (In-service): Integrated Pest Management and use of bio pesticides in pest management

Title of the module	Integrated Pest Management (IPM) and use of biopesticides in Pest Management
Target trainees / participants	Provincial and District Agriculture and Forestry staff.
Responsibility of the participants after training (they are expected to do what)	The PAFO and DAFO staff are in charge of training of farmers to on pest and disease management through IPM and biopesticides
Duration of the module	10 hrs

### 1. INTRODUCTION

Modern agriculture involves use of chemicals with associated negative effects on the agricultural ecosystem and the health of farmers and consumers. At the same time, chemical inputs also increase agricultural production costs. Climate change is known to alter the balance between insect pests and their predators or natural enemies leading to high pest related yield losses. Promotion of integrated pest management and use of biopesticides (as natural herbicides and pesticides) are effective alternatives to chemicals in the management and treatment of plant and animal diseases and they are known to not alter the balance between pests and natural enemies. This training will promote the use of integrated pest management (IPM) and biopesticides in the prevention and treatment of plant disease through improve the knowledge and skills of PAFO and DAFO.

### 2. TARGET AUDIENCE

Provincial and District Agriculture and Forestry staff.

### 3. TRAINING NEEDS/GAP ANALYSIS

The district agricultural staff are local subject matter specialists and train farmers on various aspects of crop production in Lao PDR. Climate change is known to increase the population of insects and pests. In addition, PAFO and DAFO staff has limited knowledge and skill to help farmers to control pests and diseases. Farmers often use chemical pesticide with cost, health and environmental implications. The TNA, NAPA and related processes have shown the need to train PAFO and DAFO staff to be able to help famers solving the problem of increasing pests and diseases through IPM and use of bioherbicides.

### 4. TRAINING GOAL/PURPOSE

To increase the sustainability of agricultural ecosystem management through promoting the use of an integrated approach to pest management in agricultural activities. This sustainability will be ensure through training of PAFO and DAFO staff.

### 5. ENTRY BEHAVIOUR

- Participants should have minimum the High Diploma in the field of crop science
- Age: 23-45 years old

### 6. IMPLEMENTATION MODALITIES

There is a need of 3 trainers: one in climate change from the Ministry of Natural resource and Environment, 1 trainer on pest management from Department of Agriculture (more concretely from

the Centre of Plant protection) and one from NAFES. Totally 20 trainees per batch, duration of training is 2 days. The host training organization should be NAFES.

#### 7. EXPECTED OUTCOMES

PAFO and DAFO staff improves their knowledge and skill in plant protection and can work better with farmers in the areas to solve their problem of pest and disease.

#### 8. EVALUATION

Evaluation will be conducted using evaluation forms developed in consultation with trainers and related subject matter specialists.

## 9. SESSION DETAILS

### Day I

No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
I	Global climate change and impacts on agriculture	2 hrs	To enrich understanding on the global climate change, impacts of CC in Agriculture	VDO, leafless	Lecture		Asking the questions	- Show VDO to trainees and explain - Make sure that trainees understand and can explain the climate change concept and its impact on agriculture.
II	Introduction to Integrated pest management (IPM) and biopesticides for pest management	2 hrs	To acquire knowledge on pest management  To enable participants to transfer this technology to the farmers	- LCD - Computer - Paper A0 - Paper marker - Hand book copy - biopesticides - Posters	Lecture		Asking questions and discussion	Trainer have to provide all material to the trainees

### Day II

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
III	Practice on integrated pest management (IPM) and biopesticides pest anagement	5 hrs	To apply knowledge on IPM and biopesticides to manage pest and disease	Demonstration plot, insects, biopesticides, spray equipment		√	Practice	The trainer should prepare materials needed to use for practices. To make sure all trainees pay attention in practical part and can do it by themselves.



#### 10. LIST OF TRAINING MATERIALS

- LCD, computer, A0 paper, paper markers, handout, biopesticides, posters, spray equipment, raw material for field work.

#### 11. FUND SUPPORT

- Honoraria of Trainers 3 persons x 200US\$x 3 days = 1800 US\$
- Subsistence for trainers & trainees (PAFO and DAFO staff) = 2 days x23 persons x 50US\$= 2300US\$
- Material cost for training US\$ 1000
- Travelling cost for trainers and trainees = 23 persons x 250US\$= 5,750US\$

**Total budget: 10850US\$**

## v. Generic Training Module (Induction): Concepts of climate change, impacts and adaptation

Title of the module	Concepts of climate change impact and adaptation
Target trainees / participants	District officers/ New staff
Responsibility of the participants after training (they are expected to do what) -	Work with farmers in transferring of technology
Duration of the module	10 hrs

### 1. INTRODUCTION

Lao PDR is one of many countries vulnerable to impacts of climate change and in recent years it has witnessed more frequent and severe floods and droughts. In order to reduce and prevent impacts of climate change, the Lao PDR Government has developed the National Adaptation Programme of Action to Climate Change (NAPA) which has the objective to formulate urgently needed action plans for adaptation to climate change in Lao PDR. The agricultural sector is one of the priority sectors in the programme of action. Therefore, the agriculture staff who will work in this sector, especially those who work directly with farmers, need to have knowledge on concepts of climate change, climate change impacts and adaptation to climate change in agriculture sector in order to be able to help farmers to mitigate the impact.

### 2. TARGET AUDIENCE

New recruited agriculture officers at district level.

### 3. TRAINING NEEDS/GAPS ANALYSIS

Based on our training need assessment of agricultural staff who work at the district level and who used to received training in agricultural technology and who work directly with famers and based on the needs mentioned in the NAPA and related documentation on agricultural sector, we have identified that the district staff lack of the knowledge on what is the climate change adaptation and what are the policies that the Lao PDR government wants to promote in this area. Therefore, this induction training program has been designed to provide basic knowledge on CCA and government strategy and plan in this area to newly recruited district staff.

### 4. TRAINING GOAL/PURPOSE

The training aims to provide knowledge on climate change impact and adaptation to the newly recruited district agricultural officers who will work with farmers.

## 5. ENTRY BEHAVIOUR

- Participants should have minimum the High Diploma in the field of agriculture (crops, livestock, irrigation, forestry)
- Age: 23-45 years old

## 6. IMPLEMENTATION MODALITIES

There is a need for 2 trainers: one in climate change from the Ministry of Natural resource and Environment and one trainer from the Personal department of the Ministry of Agriculture and Forestry. 20 trainees per batch can be trained for 2 days (10 hours). The host training organization should be the Personal office of the Ministry of Agriculture and Forestry.

## 7. EXPECTED OUTCOMES

Newly recruited staff has the knowledge in climate change, its impact and climate change adaptation, related government strategy and program on climate change mitigation and adaptation.

## 8. EVALUATION

Evaluation will be conducted using evaluation forms developed in consultation with trainers and related subject matter specialists.

## 9. SESSION DETAILS

### Day I

No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
I	Global climate change and its impacts on agriculture	2 hrs	To enrich knowledge and skills to be able to work with farmers in the context of climate change	Computer, LCD VDO	Mini-Lecture		Asking the questions, exercise	- Show VDO to trainees and explain - Make sure that trainees understand and can explain the climate change concept and its impact on agriculture.
II	Concepts and approaches for climate change adaptation in agriculture	1 hrs	To improve knowledge of trainees on climate change adaptation concept and practice in the world	Computer, LCD VDO	Lecture		Asking questions and discussion	

### Day II, Capsule II

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
III	Lao PDR National adaptation program of action to climate change (NAPA)	3 hrs	To enrich knowledge on National Adaptation Program of Action to climate change and priorities program related to	Computer, LCD	Lecture/ Group discussion		Presentation after group work	

S No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
			agriculture					
IV	Strategy for agriculture development 2011-2020 related to climate change adaptation	3 hrs	To enrich knowledge on the strategy for Agricultural Development and how the Ministry adapt NAPA in strategy for development of agriculture	Computer, LCD	Lecture/ Group discussion		Presentation after group work	

10. LIST OF TRAINING MATERIALS

- LCD, computer, A0 paper, paper marker, VDO.

11. FUND SUPPORT

- Honoraria of Trainers 2 persons x 200US\$ x 2 days = 800 US\$
- Subsistence for Trainers and trainees (PAFO and DAFO staff) = 2 days x 22 person x 50US\$ = 2200 US\$
- Materials cost for training US\$ 1000
- Traveling cost for PAFO and DAFO staff and trainers = US\$ 22 persons x 250US\$ = 5500US\$

**Total budget: 9500US\$**

## vi. Generic Training Module (In-Service): Cultivation of short duration paddy and other cash crops in the natural hazard prone areas

Title of the module	Cultivatoin of short duration paddy and other cash crops in the natural hazard prone areas
Target trainees / participants	Provincial Agricultural officers
Responsibility of the participants after training (they are expected to do what) -	Train the district agricultural officers to work directly with farmers on Short-duration paddy and other cash crops technologies
Duration of the module	20 hrs

### 1. INTRODUCTION

Mitigating the impacts of natural hazards is an extremely important activity that can improve the livelihoods of poor farmers living in drought and flood prone areas. Delayed rainfall and floods cause damage to crops. In this regard, providing training to Provincial Agricultural Officers to be able to train the district agricultural staff who work directly with farmers is urgently needed. Food availability during times of extreme conditions can be improved by promoting short duration crops, drought and flood resistant crop varieties, and cropping techniques that mitigate the impacts of droughts and floods.

### 2. TARGET AUDIENCE

Agriculture officers at provincial level

### 3. TRAINING NEEDS/GAP ANALYSIS

The role of the provincial agricultural staff in Lao PDR is to be the subject matter specialist and to train district agricultural staff. Though these officers have basic knowledge in agricultural technique, they lack knowledge in areas of climate change adaptation as indicated in our TNA, NAPA and related policy documentation of the government. We found that these staff needs to be trained on technologies that lead to climate change adaptation and to sustain food security and income during natural hazards.

### 4. TRAINING GOAL/PURPOSE

The training aims to improve the food security of the poor farmers living in the drought and flood prone areas.

### 5. ENTRY BEHAVIOUR

- Participants should have minimum the High Diploma in the field of agriculture (crop science)
- Age: 23-45 years old

### 6. IMPLEMENTATION MODALITIES

There is a need of 3 trainers: one in climate change from the Ministry of Natural resource and Environment, two trainers from the National Agriculture and Forestry Extension Service. Total 20

trainees per batch to be trained for 3 days (20 hours). The training includes both theory and practice.

#### 7. EXPECTED OUTCOMES

PAFO staff has the knowledge and skill in climate change, the new crop production technique adapted to climate change.

#### 8. EVALUATION

Evaluation will be conducted using evaluation forms developed in consultation with trainers and related subject matter specialists.



## 9. SESSION DETAILS

### Day I

No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
I	Global climate change and its impact on agriculture in Lao	2 hrs	To enrich knowledge of the provincial agricultural officers in climate change adaptation to be able to work with farmers in the context of climate change	Computer, LCD VDO	Mini-Lecture		Asking the questions	- Show VDO to trainees and explain - Make sure that trainees understand and can explain the climate change concept and its impact on agriculture.
II	The need for short-duration paddy and other cash crop technologies	2 hrs	To enrich knowledge of the Provincial agricultural officers in short duration paddy Technology such as rotational crops systems (disease and insect control and soil fertility improvement)	Computer, LCD	Lecture		Exercise	
III	Techniques of growing short-duration cash crops	3 hrs	To enrich knowledge and skills of the provincial	Computer, LCD	Lecture		Exercise	

			agricultural officers in short duration cash crop technology Such as rice, vegetables or cash crops adapted to natural hazard prone areas (drought and flood)					
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#### Day II

No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
IV	Identification of suitable crop rotations fitting short duration crops	2 hr	To apply methods to transfer the knowledge in crop rotation to district officer	Computer, LCD flip chart, marker pens, reading materials, paper A4	Reading/Group discussion		Exercise	
V	Managing crop rotation	4 hrs	To apply methods to transfer the technology on crop management (to sustain the soil fertility, the water losses and pest management)	Plot, varieties, fertilizer, munching material	Demonstration/group discussion	Demonstration		

Day III

No	Title of the session	Duration	Learning objectives	Learning aids	Methodology		Evaluation	Trainers notes
					Class room	Field/practical		
VI	Identification of suitable rice, vegetable and other short duration varieties	2 hrs	To apply methods to transfer the technology on identification of rice, vegetable and other, short cycle varieties	Computer, LCD Flip chart, markers, reading material, paper A4	Group discussion		Exercise	
VII	Management of rice, vegetable and other cash short cycle crops varieties	4 hrs	Trainees have a skill and can transfer the technology of the rice, vegetable and other cash short cycle crops varieties	Bus, fuel, microphone	Field visit to farmer's plots		Discussion	Communicate with the site in advance

10. LIST OF TRAINING MATERIALS

- LCD, computer, paper A0, paper marker, VDO, mulching material, bus, fuel, microphone, reading, material, plot, crop variety seeds, and fertilizers.

11. FUND SUPPORT

- Honoraria of Trainers 3 persons x 200US\$ x 3 days = 1800 US\$
- Subsistence for Trainers and trainees (PAFO and DAFO staff) = 3 days x 23 person x 50US\$ = 3450 US\$
- Materials cost for training US\$ 2000
- Traveling cost for PAFO and DAFO staff and trainers = US\$ 23 persons x 250US\$ = 5750US\$

**Total budget: 13,000US\$**

## 3.4 MONGOLIA

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# MONGOLIA PART I: TRAINING NEEDS ASSESSMENT

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## a. Introduction

Mongolia is a vast, land-locked country bordering China and Russia. The average altitude is 1,580m above sea level. The country stretches from the Gobi desert in the south to the forest and forest steppes in the north and from the Altai Mountains in the west to the steppes and desert steppes in the centre and east. Mongolia has a harsh continental climate with four distinctive seasons, high annual and diurnal temperature fluctuations, and low rainfall. Because of the country high altitude, it is generally colder than in other countries on the same latitude. Frequently, the country is hit by so-called dzud events, a succession of a very dry summer, an extremely cold autumn and a harsh winter which deprives livestock of grazing, often leading to high livestock mortality rates.

According to various scientists (P.Batima, L.Natsagdorj, 2005; R.Mijiddorj 2006, 2007), these changes in climate are having and will have a significant impact on natural resources such as water resources, natural rangeland, land use and snow cover.

In recent years, the occurrence of the Dzud has increased dramatically followed by drought according to climate change effect and in order to support their livelihoods, more and more herders and farmers are moving to urban areas.

This movement of herders and farmers is strong negative effect to the animal husbandry industry which is one of the main agricultural industries of Mongolia. Adaptation and capacity building actions must be carried out so that the herders are able to withstand the harshness of winter.

Regards to survey which held during the project implementation there is a gap in awareness, preparedness which leads barrier for policymakers, development practitioners, trainees to understand, implement proper effective action against climate change adaptation (CCA). APAN has taken significant action through the project which brings solution for global issue with local activities. The TNA report will show current status of knowledge and skills in area of CCA and identify capacity building actions for the next decades. The APN project's aim is to focus on agriculture sector as the most vulnerable sector to climate change. Effective implementation of adaptation and capacity building actions is the main element of building resilience to climate change in Asia-Pacific countries. Training needs assessment (TNA) is the first step for the design and development of capacity-building programs.

## b.Overall objectives and methodology

This training needs assessment (TNA) report mainly focusing on identifying knowledge and skill area of policymakers, trainees, development practitioners for designing useful training modules for capacity building on CCA in Mongolian agricultural sector.

### b.1 Objectives:

- To conduct training needs assessment (TNA) based on given questionnaire and desk review of existing training programs in the field of CCA in agriculture and related water resources development
- To identify training gaps for improving existing training programs and design adequate new training modules based on the TNA

- To introduce new training module, capacity building activities for CCA in Asian Pacific region.
- To transmit capacity building knowledge which is gathered by TNA to policy makers, development practitioners, trainees

## **b.2 Methodology:**

- Conducting survey using the pre-designed questionnaire at national and regional level workshops, conferences and at the field level
- Organizing desk reviews of existing training materials, training programmes through focused group discussion with research personals and team members

### **Questionnaire survey**

The *questionnaire* developed by the Institute for Global Environmental Strategies was used for this purpose. According to form I, II, III, IV all questions, forms are filled by more than 600 people in agricultural sector with following distribution of respondents representing different levels as given below.

- 36% national/ governmental level staffs
- 29% Province level staffs
- 28% Soum level (District)
- 3 % representatives of international organization
- 4% honorary guests

The questionnaires were translated into Mongolian language. There are several questions raised during the survey and most of respondents answered that there are no training programs for CCA in Mongolia. There are several national conferences held during the survey which allowed us to collect more accurate information from the conference participants.

### **Desk review**

Desk review of material collected on various training modules and policy status of capacity building in Mongolia at the Ministry of Food, Agriculture and Light Industry We have invited two group of relevant participants, first group of people are policy makers or decision making personal officers of implementation, coordination department of Ministry, directors of Bulgan, Khentii provincial Food, Agriculture and SME department and public professional agencies like veterinary and breeding agency of Ministry, National Agricultural Extension Center.

Second group of people were development practitioners, climate change related project coordinators, working with international organizations such as FAO, ADB, SDA, JICA, representing programmes such as “Sustainable land management on decreasing desertification project” “Pasture for urban area project”, “Green gold project” “Livestock health and livestock market project”, “Mongolian potato project”, “Enhancing the extension system for comprehensive crop-livestock management project”.

Participants of desk review concluded many issues like preparedness for disaster, assessment of vulnerability which is included in the TNA report. (see at acknowledgements).

### **Focused group discussions**

After collecting all information we worked with expert researchers (see at acknowledgements) in this field to clarify results of TNA survey. Professors, researchers of Mongolian State University of Agriculture had delivered comments on TNA survey which is included in this report.



## **c. Institutional arrangements and policy setup for capacity building in Mongolia**

### **c.1 National level**

Mongolia has a well educated population since the time of independence from Soviet Union. More than 98 percent of population has basic education. Mongolia is implementing numerous programs for promoting education. A part of the education policy is to train government officials on management and human resource skills. The Civil Service Council of Mongolia (CSC) organizes programs on leadership skills, human resource management, training for trainers etc.

The capacity building in agriculture sector is the responsibility of the human resource development. The trainings in the field of agricultural include breeding, agronomy, food production technology, SME enterprises. These trainings are conducted as a part of the “State policy on food and agriculture” which is approved by parliament decree in 2003. Mongolian government has been supporting agricultural training, capacity building to build capacity and provide institutional structure for the implementation of development policies and strategies derived from “Millennium development goals-based comprehensive national development strategy” of Mongolian government.

In 2009, Mongolian parliament has approved “National programme on food security” with the support of Food and Agricultural Organization of the United Nations. According to the programme, several sub-programmes are approved including “Mongolian livestock”, “Virgin land-3” which is now the main policy support for organizing training, capacity building actions in the country.

Ministry of Food, Agriculture and Light Industry has significant role in planning trainings and capacity building based on policy implementation departments. Ministry has nine professional occupation oriented agencies and organizations. They are active action in Leading role in training is The National Agriculture Extension Centre of Ministry of Food Agriculture and Light Industry of Mongolia conducts training, consulting, extension activities, distribution of information and introduction of new technologies in rural areas. NAEC cooperates with many international projects and programs and also with the provincial authorities on agricultural extension activities.

Mongolian State University of Agriculture is main organization as training institutional development. As pointed in National climate change programme which is approved first half of 2011 will be main policy document for capacity building and addressing CCA. From section 2 of National climate change programme concludes main priority as building national capacity and sustain natural environmental balance, reduce social and economical vulnerability and risk through CCA actions.

The government has also established an inter-disciplinary and inter-sectoral National Climate Committee (NCC), led by the Minister for Nature and the Environment, to coordinate and guide national activities and measures aimed at adapting to climate change. High-level officials such as Deputy Ministers, State Secretaries and Directors of the main departments of all related ministries and agencies are members of the NCC.

The government of Mongolia has started to formulate legislation and policy measures to prepare for the possible consequences of climate change. In 1993, the government has ratified the United Nations Framework Convention on Climate Change (UNFCCC) and in 2001 it approved a National

Action Program on Climate Change. In addition, several policy documents have been put in places which are directly or indirectly related to climate change. These include:

Laws on Nature and Environment; Laws on Meteorology, Hydrology and Environmental Monitoring; Laws on Land; Laws on Arable Farming; Laws on Disaster Prevention; Laws on Pasture;

- A program on sustainable development of Mongolia, 1999;
- A national program on preventing livestock from drought and dzud disasters, 2001;
- A food program on food supply, security and nutrition, 2001;
- A program on supporting development of intensive livestock-farming, 2003;
- A state policy on the development of food and agriculture; and
- Relevant annual reports on the natural and environmental review in Mongolia.

Include CCA into the MDG-based Comprehensive National Development Strategy, which was ratified by Parliament on the 31st of January 2008. Due to these efforts, chapter six of the strategy now has a very strong focus on climate change and CCA.

## **c.2 Sub-national level**

Provincial Department of Food, Agriculture and SME of Provincial government are responsible for capacity building for agricultural persons who are important participants of agricultural development and CCA in Mongolia. In the capital city, same as provincial level Department of Food, Agriculture and SME of capital city government is responsible for agricultural capacity building. Thus, Ministry of Food, Agriculture and Light Industry is receiving order from departments to imply regional and local training activity. Most of local training activity is implemented in Provincial agricultural extension center which is part of National agricultural extension service.

Main organization is National Agricultural Extension Center of Ministry of Food, Agriculture and Light Industry has branches through its 21 centers in province and capital city, with 329 soum (district) level extension officers (Governor's office of soum)

As pointed in "State policy on Food and Agriculture-2003" Agricultural extension will support rural citizen, workers who are demanding new technology, scientific achievements, owning high affordable businesses, developing new methods for disseminate information in market economy.

Many of international organizations such as ADB, World Bank, FAO, IFAD, JICA, and KOICA are supporting capacity building of rural people in area of poverty reduction, capacity building, development of agriculture, climate change mitigation, and adaptation. Good practices and trainings were implemented through project unit as well as extension branches.

Mongolia faces many difficulties when reaching the rural population because of the vast territory and the scattered population. Many government and non-government organizations are working on establishing a unified information and knowledge database system so that distance and time are no longer a problem for accessing information in the future, even trainings can be imparted via networks. Keeping these considerations in view while developing training programs in Mongolia is of at most importance.

## **d. Training needs assessment for CCA in agriculture sector**

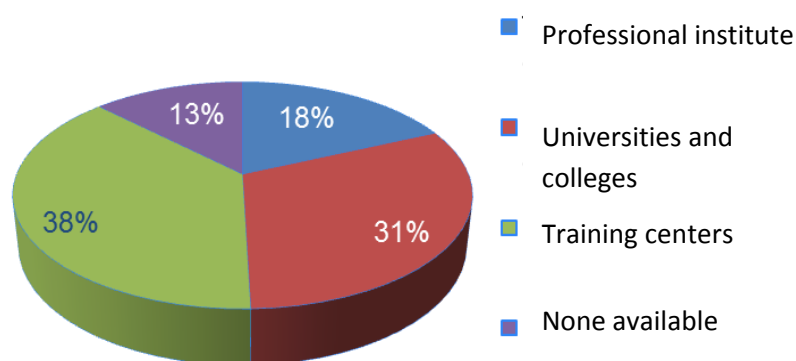
### **d.1 Evaluation of training programs (curriculums)**

The results of the survey in Mongolia showed that almost all existing training programs address climate change issues on some level. It also show that there are no specific CCA programs but rather

theme-based programs which had CCA content in it, for example: the training program entitled “Enhancing livestock bio-capability” will not address general climate change issues but it will address livestock adaptability to climate change. Most of such training content has positive implications in terms of co-benefits for CCA. The training programs mainly aim at herders and small cooperatives and were organized for 2-5 days by the National Agricultural Extension Centre and State University of Agriculture of Mongolia. (For more details, see page ‘Evaluation of existing training programs’ in Annex I).

### **d.2 Evaluation of Training Facilities (buildings, tools, etc)**

At the national level National Agricultural Extension Center is the largest training center in Mongolia. The Mongolian State University of Agriculture, Research Institute of Animal Husbandry and Plant Science, Agricultural Research and Training Institute of Mongolian State University of Agriculture, Darkhan-Uul province have moderate infrastructure and equipment facilities for training. At provincial level, the centers are facing problems with facilities such as training rooms which are used for meetings and conferences of administrative staff of province. There are 21 training centers at provincial centers and one agricultural extension center in the capital city. Most of the participants of survey pointed about the need for increasing training funds as only few trainings are being held at most of the training centers.



**Figure 1. Main training facilities (values are in percentages)**

Research institutes are now leading role in climate change mitigation, adaptation capacity building training in R&D sector. According to survey there is an awareness gap in CCA, mitigation;

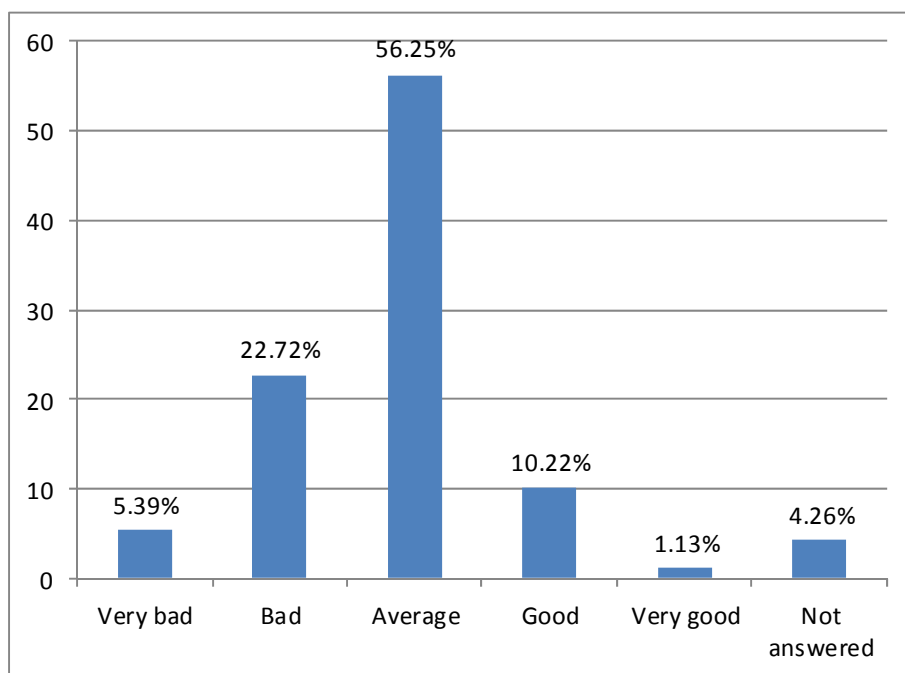


Figure 2: Training facility evaluation (values are in percentages)

In national level, National agricultural extension center is capable of organizing training in field of CCA. Thus, NAEC has potential to organize take capacity building actions with adequate facility resource. Therefore, according to survey much of training institute, research organizations have a potential in both building and equipment. And survey addressing there is strong demand national network for capacity building such as distance learning system, video conference equipment etc.

Table 1: Summary of Evaluation of Training facilities at three levels

Level	Facilities available	Facilities required
<b>National</b> <i>National Agricultural Extension Center</i>	Conference hall Training rooms Multimedia projectors, computers, laptops, printers, scanners, etc Library Internet Servers	Capacity building for Experts/Trainers Establishment of database Video conference equipment for distance learning Increase of training funds
<b>Provincial</b> <i>Provincial Department of Food, Agriculture</i>	Training room Multimedia projectors, computers, laptops, printers, scanners, etc Experts/ Trainers	Increase of computer, printing and scanning facilities Increase of training funds
<b>Soum (district)</b> <i>Livestock veterinary and breeding unit of Soum</i>	Common training hall for all government department Limited computers and printer facilities	Establishment of community base training center

### d.3 Evaluation of trainers and trainees

#### Education and training

70 percent of the respondents had higher education and answered that they have not received any formal training on CCA and related fields. 50 percent of the participants answered that there were curriculums on climate change in their education. Thus, we need to raise awareness of the education sector on climate change, as well as develop training programs which emphasizes climate change and adaptation.

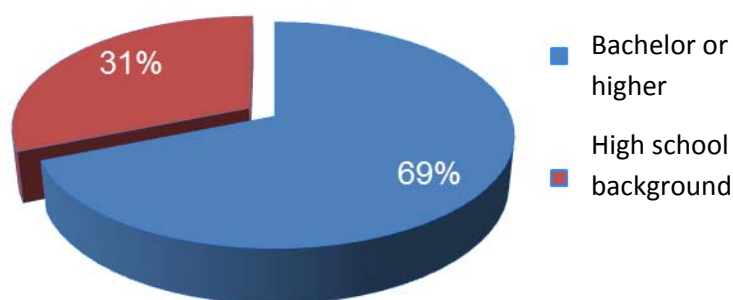


Figure 3: Education level of respondents (values are in percentages)

#### On the job functions (Current duties and expected changes in roles for CCA)

More than 60 percent of the participants have a supervisory role and it was apparent that the staff who had supervisory role felt more that they don't need to change roles for CCA while executive staffs felt that changes should be made in their roles. When asked, it was apparent from the participants that the job descriptions of the staff are very general.

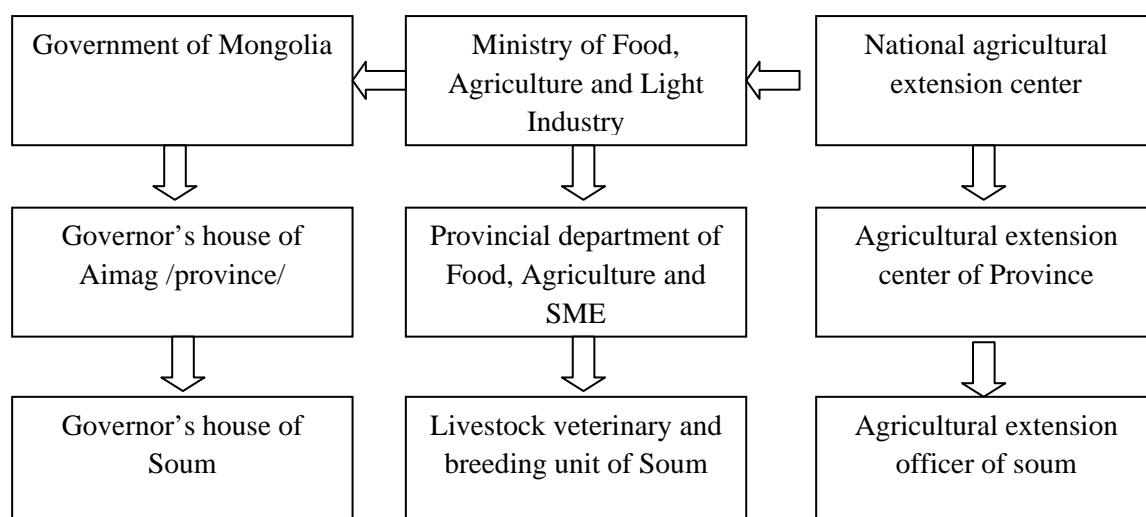


Figure 4 Administrative structure for capacity building in agriculture sector in Mongolia

According to Mongolian livestock sector experts and directors of Provincial Department of Food, Agriculture and SME, Livestock Veterinary and Breeding unit of Soum (district) is playing leading role in implementing capacity building at local level.

Table 2: Job description of interviewed agricultural personals

Organization	Provincial department of Food, Agriculture and SME		Livestock veterinary and breeding unit of Soum	
Position	Director	Officer	Head	Staff
Education	Master of Public Administration, If professional bachelor or master degree will appraisable	Master, with professional expert certificate	Master, with professional expert certificate	Bachelor and above
Background	Public administration, Planning management	Veterinarian, Agronomist, Business administration degree on Livestock production, management	Veterinarian, Agronomist, Business administration degree on Livestock production, management	Veterinarian, Agronomist, Business administration degree on Livestock production, management
Experience	More than three years' experience in relevant field, more than two years of administration related experience	More than three years' experience in relevant field	More than three years' experience in relevant field	Relevant experience in agricultural fields
Skill	Leadership skill Good organizer with team Basic information technology knowledge and skills to use applications English or Russian language is needed	Leadership skill Good organizer with team Basic information technology knowledge and skills to use applications English or Russian language is needed	Leadership skill Good organizer with team Basic information technology knowledge and skills to use applications English or Russian language is needed	Good working skill in team and group Basic information technology knowledge and skills to use applications Foreign language skills needed but not necessary
Functions	Provide leadership, administration for soum (district) level officers, collect	Provide leadership, administration for soum level	Pasture management Report local breeding service	Pasture management Report local breeding service

Organization	Provincial department of Food, Agriculture and SME		Livestock veterinary and breeding unit of Soum	
Position	Director	Officer	Head	Staff
	<p>information from soum level officers and monitoring, evolution on</p> <p>Monitoring herd movement, provide people for certificate origin of livestock</p> <p>Monitoring herd movement, provide people for certificate origin of livestock</p> <p>Report of “Mongolian livestock national programme”</p> <p>“Livestock health national programme”, National programme on Food Security, Main priority of economic and social development of province</p> <p>a/ Human resource development survey</p> <p>b/ Punctually implement civil service standard</p> <p>c. To receive people, entities demand professional advice cooperates.</p>	<p>officers, collect information from soum level officers and monitoring, evolution on</p> <p>Monitoring herd movement, provide people for certificate origin of livestock</p> <p>Monitoring herd movement, provide people for certificate origin of livestock</p> <p>Report of “Mongolian livestock national programme”</p> <p>“Livestock health national programme”, National programme on Food Security, Main priority of economic and social development of province/</p> <p>a/ Human resource development survey</p> <p>b/ Punctually implement civil service standard</p>	<p>activity, implementation make a action on increase quality and scope of work,</p> <p>Organize transmitting new technology, capacity building actions, inform about gap in local level</p> <p>Make a proposal about demanding trainings, good practices, quality of livestock</p> <p>Provide information about local professional department, to unify reports from fields, organize training for capacity building for herders</p> <p>Receive private unit report to monitoring livestock herd movement</p> <p>To control on implementation of standards, technological measures which is implemented</p>	<p>activity, implementation make a action on increase quality and scope of work,</p> <p>Organize transmitting new technology, capacity building actions, inform about gap in local level</p> <p>Make a proposal about demanding trainings, good practices, quality of livestock</p> <p>Provide information about local professional department, to unify reports from fields, organize training for capacity building for herders</p> <p>Receive private unit report to monitoring livestock herd movement</p> <p>To control on implementation of standards, technological measures which is implemented by Livestock breeding and</p>

Organization	Provincial department of Food, Agriculture and SME		Livestock veterinary and breeding unit of Soum	
Position	Director	Officer	Head	Staff
		c. To receive people, entities demand professional advice cooperates.	by Livestock breeding and veterinary service To process local plan for livestock quality improvement, breeding plan, protecting gene to deliver to upper unit Receive order from private unit, herders equipment, license for unify to deliver upper unit Registration of livestock herd to update breeding database. According to current condition collect information, create plan for disaster management, cooperate with various organizations	veterinary service To process local plan for livestock quality improvement, breeding plan, protecting gene to deliver to upper unit Receive order from private unit, herders equipment, license for unify to deliver upper unit Registration of livestock herd to update breeding database. According to current condition collect information, create plan for disaster management, cooperate with various organizations

All the above information was obtained from both official documents about duty and survey results.



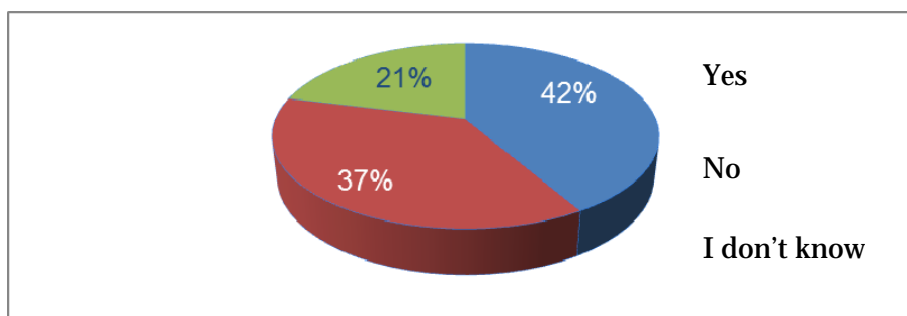


Figure 5: Demand of "Climate change adaptation" priority on job functions (values are in percentages)

#### **d.4 Expected changes in roles for CCA**

Opinions were collected on expected change in role for CCA from block to national level personnel. Based on their opinions some important expected changes in their role for CCA are listed below:

Disaster management is needed to take action on increase involvement of extension workers. Participants suggested clarifying training content; objectives of CCA followed by development of CCA training material such as handbooks, information booklets etc.

Suggested CCA priorities are:

- Develop knowledge and skill related to climate change
- Develop capacity to work on CCA related management issues
- Development of extension programs for CCA
- Recognition from higher authorities for active participation in CCA activities
- Develop ability for disaster management and preparedness

#### **d.5 Evaluation of skill and knowledge areas**

Many survey participants have informed that they are not familiar with climate change related issues in areas of decision making and capacity building. Among knowledge areas, they gave high priority for climate change vulnerability assessment. Among skill areas, participants wanted training on planning, motivation, and evaluation.

All participants agreed that there is room for improvements in knowledge and skill areas. They also emphasized the importance of learning from the experiences of other countries. More than 80 percent of respondents pointed that the technology transfer for climate change is one of the important aspects of CCA. On the other hand according to survey most of participants don't have proper knowledge to implement successful training on CCA and on issues related to policy decision making in CCA.

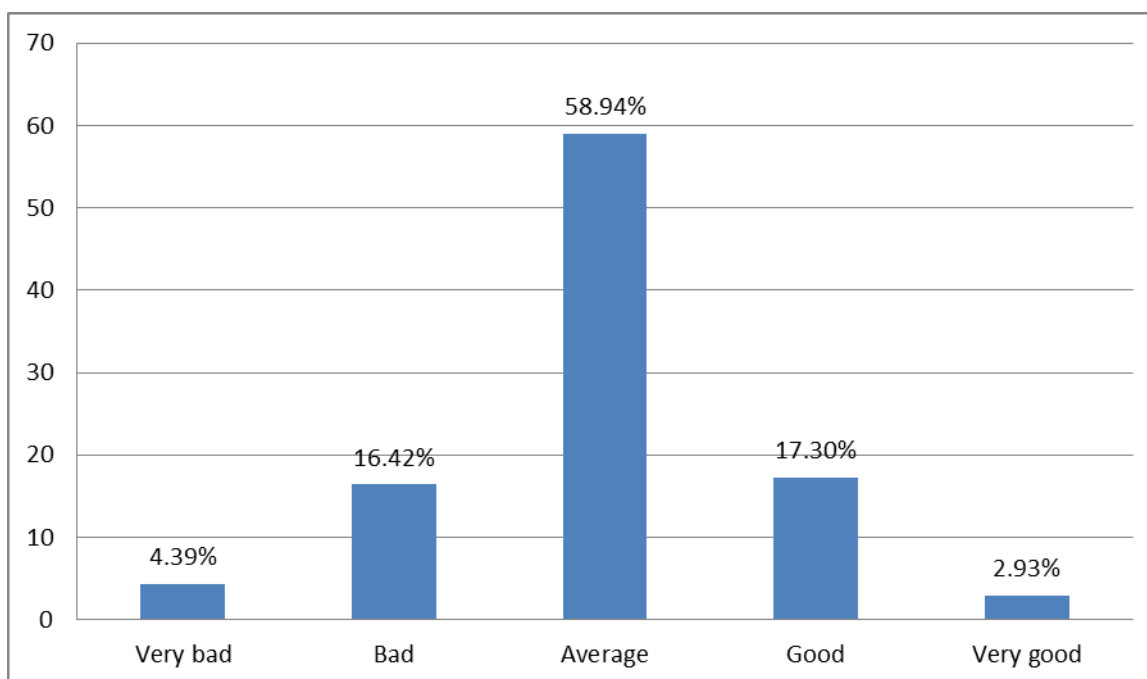


Figure 6: Self- evaluation of working environment (values are in percentages)

#### **d.6 Self- evaluation of working environment (cross check with the above institutional evaluation)**

Policy makers have pointed out that the training budget is about half to 1/8<sup>th</sup> of what it should be to cover issues of herders and crop producers. Improvement needed at national and soum level training facilities. In-house trainings are common at soum level. Therefore CCA knowledge and skills should be disseminated through well-developed handbooks, guides, brochures; survey result shows that most of population has limited access to online resources. Therefore, there is a need to improve access to internet and related information access tools along with stress on producing relevant handbooks and guidance material for all kind of CCA actions.

### **e. Establishing Ideal Scenario of Knowledge and Skill Areas for Agriculture Sector**

#### **e.1 Identified priorities for knowledge and skills**

##### **Basic knowledge and skills that need to be imparted to all the staff/trainers.**

According to collected information from staffs and workers at provincial and soum level offices, most of the respondents have degrees in public administration or bachelor degree in agricultural. Though agricultural officers have required technical knowledge for handling the subject of agriculture, they are not trained on CCA and related subject matter. According to TNA, most of the participants have experienced disasters caused by climate change and felt lack of knowledge in CCA. Though the national policy emphasizes capacity building for herders and crop producers, most policy makers, development partners, trainees don't have the related knowledge and skills to determine their needs for implementing CCA policies. Therefore, the following content are necessary for Mongolia to address the issue of CCA:

- Include the content on disaster management in all relevant training programs in agriculture sector

- Involve the Agricultural Extension Service in CCA
- Improve knowledge on CCA actions agricultural sector in general.

### **Specific knowledge and skill areas need to be imparted to specific staff/trainer**

Mongolian TNA addresses many issues in agricultural sector. The TNA has indicated the need for imparting knowledge and skills on planning, implementation, evaluation of CCA across the spectrum in agriculture sector. For administrative staff in the field of disaster management, preparedness and assessment of CCA, vulnerability assessment, develop knowledge and skill related to climate change was identified as priority areas for training.

**Knowledge areas:** According to TNA results for administrative and policy community, there is a gap in awareness leading to delay in response to climate change. Assessment of adaptation, skills for international negotiations under UNFCCC-COP, CCA types, impact and management, livestock technologies for CCA, and crop production technologies for CCA were identified as priority knowledge areas. Administrative and policy makers need to be informed about assessment of CCA, and coordination, principles of climate change mitigation and adaptation must be included for successful capacity building.

**Skill areas:** Respondents have pointed out need for developing skills in the following areas: planning and implementation of CCA including sectoral and administrative plans and integrating CCA with developmental plans, statistical methods for data analysis, field plot techniques, data collection, bottom up planning, institutional management, developing training materials (developing facilities, documents, graphics, etc.), and designing training plans.

For field technical staff, i.e. agricultural extension officer must be trained on livestock technologies for CCA, crop production technologies for CCA in order to provide training herders and crop producers who are fundamental part of agricultural sector in the country. On the other hand, for technical staff, it is necessary to have skills on organizing induction training, demonstration training, and providing advisory service on CCA. For extension officers having basic knowledge about training and advisory service allows them to provide skills and knowledge on CCA to provincial or district level staff and communities.

### **e.2 Needed institutional facilities for supporting above knowledge and skill areas**

Thanks to our extension centers in all 21 provinces, there is no lack of classrooms for training. However, there is a need for training infrastructure such as projectors, sound systems, and internet connection. Most participants also shared similar view. Because Mongolia is vast and people are scattered throughout the land, reaching them is a challenge. Therefore, there is a great potential for introducing distance learning in the extension centers so that time for travelling and related expenses can be reduced. However, there is a need to continue to organize trainings in traditional method since the older generation may not be able to use distance learning technologies.

### **f. Policy suggestions**

Developing a strong institutional structure for promoting CCA was considered to be a necessary step because experiences from the past have shown that policy measures often only exist on paper and are rarely implemented because of the lack of institutional capacity, vague mandates and lack of

financial resources. The National Action Plan for Climate Change in Mongolia, for instance, which approved in 1999, has not yet been implemented due to lack of financial resources and political commitment. This and other documents will need to be updated in order to make them compact, easy, executable and measurable.

- Reduction of vulnerability of livestock to impacts of climate change through the suggested adaptation measures requires actions in a coordinated way and incorporation in long-term planning.
- Many of the adaptation trainings that have been formulated in the past are often characterized by their generic approach and in many cases little thought went into how they can be financed and implemented.
- Furthermore, adaptation measures are often formulated without taking into consideration other drivers of change. The discussions about climate change vulnerability, for instance, have caused a lot of discussions in Mongolia about whether or not the government should stimulate a shift from traditional livestock activities towards an economy based on farming. However, traditional livestock activities are not only under pressure from climate change but are also influenced by other socio-economic developments, such as the increased demand for cashmere. Without understanding these broader developments, it is hard to develop appropriate policies for dealing with the problems that people are facing.
- Ideas from local farmers and herders and actions to reduce cost of their living need to be considered while promoting CCA in the country.
- Having recognized these issues, the project team has tried to formulate a set of adaptation trainings that are specific, realistic and clear in terms of space and time, and most importantly, they are executable and measurable. The formulation of adaptation measures was further guided by a couple of principles. Firstly, the project team is convinced that traditional livelihoods based on livestock herding will continue to exist in the coming decades. Consequently, the starting point for the formulation of adaptation options is the traditional herding communities. Secondly, rather than focusing on livestock as a point of departure for developing adaptation measures the project team has sought to bring extension officers to the centre of the discussion and has tried to design adaptation measures that can support their communities.
- One of the main lessons learned from survey was that, without a strong institutional environment, it is very hard to implement any adaptation policy or measure. Consequently, this project has sought to contribute to the establishment of a Permanent Sub-Committee on CCA as part of the Standing Committee on Food, Agriculture and Environment of the Mongolian Parliament. At the time of writing, the proposed sub-committee had not yet been approved. Hence, it is recommended that further efforts are taken to realize this aim.
- In addition, and based on the observation that there are already a significant amount of policy documents relevant to the issue of CCA available, it is also recommended to revise and update existing policy documents and to start enforcing existing laws and regulations.

## MONGOLIA PART II: TRAINING MODULES

### Outline of Training Modules:

#### Introduction

Mongolia is vulnerable to heat and desertification. The climate change in the past decade has led to destruction and regression of grasslands and pasturelands by 70% in Mongolia. Mongolia's economy is dependent on agriculture, thus saving, caring, and protecting and restoring the pasturelands has become one of the most important aspects of development. Developing the agriculture has not only has impact on the national economy but will also stabilize life of those who depend on agricultural land.

In order to maintain the stable growth in agriculture, training agricultural extension officers about growing crops on wetlands, watering uplands and reducing risk of environmental disaster will help them indirectly to adjust to the changing environment.

#### List of training modules developed

The following training modules are prepared covering a range of agriculture officers and administrative levels in Mongolia.

Table: List of training modules and their subject content

Target Group	Topic	Designation of officers	Age	Educational level	Working experience
<b>Induction training modules:</b>					
a. Entry level	Training on Climate Change Adaptation basis for the entry level agricultural extension officers of Mongolia	Officers of FASME department of Soum, Province. Officers of MoFALI	Under 26	Bachelor or lower	No need
b. Intermediate level	Training on Climate change adaptation assessment for the intermediate level agricultural extension officers	Officers of FASME department of Soum, Province. Officers of NAEC	Above 26	Bachelor or above	More than 2 years in agricultural sector
c. Experienced level	Training on Climate change adaptation planning for the experienced level agricultural extension officers	Officers of NAEC Officers of MoFALI	Above 32	Master or higher	More than 5 years in agriculture and related sector
<b>In-service training modules:</b>					
d. Field level	Training on Climate Change Adaptation for the field level agricultural extension officers of Mongolia	Officers of FASME department of Soum, Province. Officers of MoFALI	Under 26	Bachelor or lower	At least 1 year in agricultural sector
e. Operational level	Training on Climate change adaptation efforts for the operational level	Officers of FASME department of Soum, Province. Officers of NAEC	Above 26	Bachelor or above	More than 2 years in agricultural sector

Target Group	Topic	Designation of officers	Age	educational level	working experience
	agricultural extension officers				
f. Supervisor level	Training on Climate change adaptation planning for the supervisor level agricultural extension officers	Officers of NAEC Officers of MoFALI	Above 32	Master or higher	More than 5 years in agriculture and related sector

### Entry behavior

- Age- Male under 60; -Female under 55
- Education level -high
- Knowledge –Identified priorities knowledge and skills areas for agricultural sector
- Ability- ability for physically and personally functions

### Goal and learning objectives

Capacity building on climate change adaptation for potential of specialists, trainers and officers of NAEC, Ministry of Food, Agriculture and Light Industry, Mongolia in order to integrate climate change adaptation issues on developing policy, decisions and improve public awareness, preparedness of climate change adaptation issues in agriculture related sectors.

### Objectives

1. To make participants aware about methods and principles of climate change adaptation in agriculture and related sectors.
2. To enable various functionaries to help agricultural extension officers to adapt to climate change and related issues.

### Implementation modalities

- Number of trainers required for implementing each training module: more than 20 people for each training
- Number of trainees per training module: 8-12 trainer
- Training duration of each training module: 1-3 days/8-24 hours/
- Implementing organizations – Training Center’s of Ministry of Food, Agriculture and Light Industry, Ministry of Education, Culture and Science, Ministry of Nature, Environment and Tourism NGO’s.

### Expected outcomes

The trained agriculture officers will be able to better guide the herders and crop producers leading to better adaptation to climate change.

### Evaluation

Evaluation methods	Advantages	Disadvantages
<b>Questionnaire</b>	Possibility to remember before answering Possibility to reveal hidden aspects	It is required to be literate to trainee It is not possible to discuss during evaluation with trainee It is possible to understand wrong to trainee
<b>Test</b> Filling Choosing CASE	The evaluation is related to purpose of studying	Some trainee's are not good to test evaluation It is required well processed test
<b>Interview</b> One by one By group	Possible to urge in order to take correct answer It is possible to check answer whether correct or incorrect	<ul style="list-style-type: none"> <li>• Non confidentiality</li> <li>• It is require interviewing and gathering valuable information skills</li> <li>• It is possible to impress interview and interviewer's character</li> <li>• It is possible to influenced speaking and revealing practice</li> <li>• It is require much more time</li> </ul>
<b>Tracking performance</b> (Past/Present) Performance checking sheet	It is based on personnel's experience and performance	<ul style="list-style-type: none"> <li>• It is critical to see observer's own side</li> <li>• Not possible to give his/her idea</li> </ul>

### List of training materials

White board, LCD, Eraser, marker, paper sheet, flip charts, laptop, extension lead, pointer, sticker, color paper, name card for participants, folders, notebooks, pens, paper sheets, scissors, scotch tape, glue, and ruler.

## **i. Induction training: Training on Climate Change Adaptation basis for the entry level agricultural extension officers**

Title of the module	Training on climate change adaptation basis for the entry level agricultural extension officers
Target trainees / participants	Entry level agricultural extension officers
Responsibility of the participants after training (they are expected to do what)	<p>After receiving the induction training, the entry level officers will be able to:</p> <ul style="list-style-type: none"> <li>- Update their knowledge on climate change adaptation</li> <li>- Plan for climate change adaptation preparedness</li> <li>- Explain climate change adaptation and related issues</li> <li>- update their knowledge on suitable livestock, crop production technologies for climate change adaptation</li> <li>- prepared themselves as a climate change adaptation trainers</li> </ul>
Duration of the module	24 hours /3 days/



## Session details

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning evaluation
1	To explain the present status of climate change in Mongolia	Concept of climate change adaptation and its present status in Mongolia	Lecturing, discussion, data presentation, video show	60 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
2	To discuss and explain physical, social-economic impacts of different types of climate change issues	Physical, social-economic and emotional impacts of climate change	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
3	To assess the extent of damage due to climate change on agriculture in Mongolia	Effects of climate change on livestock and crop production sector of Mongolia	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
4	To explain about meteorology its implication for agricultural forecasting	Implication of meteorology for agricultural forecasting	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
5	To assess preparedness of Dzud, Drought other natural disaster which boosted by climate change	Preparedness of Dzud, Drought	Lecturing, discussion, data presentation, video show	120 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
6	To understand livelihood adaptation climate change in agriculture	Livelihood adaptation to climate change in agriculture	Lecturing, discussion, data presentation, video show	60 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
7	To differentiate the extent of vulnerabilities between male and female due to climate change shocks.	Gender differentiation in climate change shock	Lecturing, discussion, data presentation, video show	90 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
8	To describe rapid adaptation issues at the time of emergency.	Rapid climate change adaptation at the time of emergency	Lecturing, discussion, data presentation, video show	90 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning evaluation
9	To explain and share knowledge about pasture management	Pasture management	Lecturing, discussion, data presentation, video show	120 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
10	To explain about present situation of pastoral animal husbandry and its advantage, pastoral resources	Present situation of pastoral animal husbandry and its advantage, pastoral resources	Lecturing, discussion, data presentation, video show	120 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
11	To organize discussion, share experience for climate change adaptation	Fundamentals of community based actions	Lecturing, discussion, data presentation, video show	120 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
12	To discuss and explain grazing capacity, to compare normal and degraded pasture	Grazing capacity, normal and degraded pasture	Lecturing, discussion, data presentation, video show	120 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
13	To explain about rotating plantation in order to protect soil	Rotating plantation	Lecturing, discussion, data presentation, video show	120 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
14	To understand and share knowledge about early maturing, drought and hot wind resistant species of crop for climate change adaptation	Early maturing, drought and hot wind resistant species of crop for climate change adaptation	Lecturing, discussion, data presentation, video show	120 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion
15	To understand and share knowledge about proper usage of selective breeding and artificial insemination and creating proper knowledge database	Proper usage of selective breeding and artificial insemination and creating proper knowledge database	Lecturing, discussion, data presentation, video show	120 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion

## ii. Induction training: Training on Climate change adaptation assessment for the intermediate level agricultural extension officers

Title of the module	Training on Climate change adaptation assessment for the intermediate level agricultural extension officers
Target trainees / participants	the intermediate level agricultural extension officers
Responsibility of the participants after training (they are expected to do what)	After receiving the induction training, the entry level officers will be able to: <ul style="list-style-type: none"> <li>- Update their knowledge on climate change adaptation</li> <li>- Plan for climate change adaptation preparedness</li> <li>- Provide training on climate change adaptation for herders and crop producers</li> <li>- Assess climate change adaptation vulnerabilities</li> <li>- Identify the ways of minimizing agricultural losses</li> <li>- Prepared themselves as a climate change adaptation trainers</li> </ul>
Duration of the module	15 hours /2 days/

### Session details

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning evaluation
1	To understand the present status of climate change in Mongolia	Actions of climate change adaptation and its present status in Mongolia	Lecturing, discussion, data presentation, video show	60 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
2	To discuss and explain physical, social-economic impacts of different types of climate change issues	Physical, social-economic and emotional impacts of climate change	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
3	To explain about public awareness and role of media for climate	Public awareness and role of media for climate change	Lecturing, discussion, data presentation,	60 min	Handouts, CD, white board, A2 sheet,	By evaluation sheet and

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning
	change adaptation	adaptation	video show		calendar	feedback discussion
4	To differentiate between the extent of vulnerabilities between male and female due to climate change shocks.	Gender differentiation in climate change shock	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
5	To describe rapid adaptation issues at the time of emergency.	Rapid climate change adaptation at the time of emergency	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
6	To explain and share knowledge on present situation of pastoral animal husbandry and its advantage, pastoral resources	Concepts of pastoral animal husbandry and its advantage, pastoral resources	Lecturing, discussion, data presentation, video show	120 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
7	To organize discussion, share experience for climate change adaptation	Fundamentals of community based actions	Lecturing, discussion, data presentation, video show	120 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
8	To outline the duties and responsibilities of community based local, provincial and national level extension officers for climate change adaptation	Duties and responsibilities of community based local, provincial and national level extension officers for climate change adaptation	Lecturing, discussion, data presentation, video show	120 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion
9	To understand and share knowledge on exploiting condition, growth number of the livestock, composition of the herd, character of the breed and productivity.	Growth number of the livestock, composition of the herd, character of the breed and productivity its impact on pasture	Lecturing, discussion, data presentation, video show	120 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning
10	To understand and share knowledge about grain varieties resistant to drought, excess heat and dry wind	Grain varieties resistant to drought, excess heat and dry wind	Lecturing, discussion, data presentation, video show	120 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion

### iii. Induction training: Training on Climate change adaptation planning for the experienced level agricultural extension officers

Title of the module	Training on Climate change adaptation planning for the experienced level agricultural extension officers
Target trainees / participants	the experienced level agricultural extension officers
Responsibility of the participants after training (they are expected to do what)	After receiving the induction training, the experienced level officers will be able to: <ul style="list-style-type: none"> <li>- Update their knowledge on climate change adaptation</li> <li>- Discuss about climate change adaptation planning</li> <li>- Search new mechanism for climate change adaptation</li> <li>- Plan for climate change adaptation preparedness</li> <li>- Assess climate change adaptation vulnerabilities</li> <li>- Determine vulnerabilities for climate change adaptation</li> <li>- Provide climate change adaptation planning for developing policy</li> </ul>
Duration of the module	8 hours /1 days/

#### Session details

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning evaluation
1	To outline the duties and responsibilities of community based local, provincial and national level extension officers for climate change adaptation	Duties and responsibilities of community based local, provincial and national level extension officers for climate change adaptation	Lecturing, discussion, data presentation, video show	60 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
2	To discuss and understand physical, social-economic impacts	Physical, social-economic impacts of different types of	Lecturing, discussion, data	60 min	Handouts, CD, white board, A2 sheet,	By evaluation sheet and

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning
	of different types of climate change issues	climate change issues	presentation, video show		calendar	feedback discussion
3	To understand and explain the preparedness of Dzud, drought.	Preparedness of Dzud, drought.	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
4	To evaluate, plan actions for climate change adaptation	Actions for climate change adaptation, fundamentals of statistical analysis for climate change adaptation	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
5	To determine appreciate technologies, communication skills for climate change adaptation	Appreciate technologies, communication skills for climate change adaptation	Lecturing, discussion, data presentation, video show	60 min	Tape measure, notebook, balance, bag, rope, fiber	By evaluation sheet and feedback discussion
6	To update, reinforce and provide new information on climate change adaptation management	New information on climate change adaptation management	Lecturing, discussion, data presentation, video show	60 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
7	To discuss and understand the technical aspects of climate change adaptation	Complete comprehension on technical aspects of climate change adaptation	Lecturing, discussion, data presentation, video show	60 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion
8	To develop necessary skills to mobilize climate change adaptation practices in his/her job;	Necessary skills to mobilize climate change adaptation practices in his/her job;	Lecturing, discussion, data presentation, video show	60 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion

#### iv. In-service training: Training on Climate Change Adaptation for the field level agricultural extension officers

Title of the module	Training on Climate Change Adaptation for the field level agricultural extension officers
Target trainees / participants	the field level agricultural extension officers
Responsibility of the participants after training (they are expected to do what)	After receiving the in-service training, the field level officers will be able to: <ul style="list-style-type: none"> <li>- Update their knowledge on climate change adaptation</li> <li>- Plan for climate change adaptation preparedness</li> <li>- Explain climate change adaptation and related issues</li> <li>- update their knowledge on suitable livestock, crop production technologies for climate change adaptation</li> <li>- prepared themselves as a climate change adaptation trainers</li> </ul>
Duration of the module	12 hours /2 days/

##### Session details

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning evaluation
1	To discuss and understand physical, social-economic impacts of different types of climate change issues	Physical, social-economic impacts of different types of climate change issues	Case study report, ,Observation, discussion and sharing ideas,	60 min	Tape measure, notebook, balance, bag, rope, fiber	By evaluation sheet and feedback discussion
2	To review and understand livelihood adaptation to climate change in agriculture	Livelihood adaptation to climate change in agriculture	Case study report, ,Observation, discussion and sharing ideas,	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
3	To describe the techniques of modern cultivation	The techniques of modern cultivation	Case study report, ,Observation,	60 min	Handouts, CD, white board, A2 sheet,	By evaluation sheet and



SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning
			discussion and sharing ideas,		calendar	feedback discussion
4	To gain knowledge on fodder production techniques using natural resources for Dzud preparation	Fodder production techniques using natural resources for Dzud preparation	Case study report, ,Observation, discussion and sharing ideas,	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
5	To discuss and understand about pasture management	Pasture management	Case study report, ,Observation, discussion and sharing ideas,	60 min	Tape measure, notebook, balance, bag, rope, fiber	By evaluation sheet and feedback discussion
6	To explain about actions against desertification	Actions against desertification	Case study report, ,Observation, discussion and sharing ideas,	60 min	Tape measure, notebook, balance, bag, rope, fiber	By evaluation sheet and feedback discussion
7	To gain knowledge about veterinary medicine	Veterinary service	Case study report, ,Observation, discussion and sharing ideas,	120 min	Tape measure, notebook, balance, bag, rope, fiber	By evaluation sheet and feedback discussion
8	To gain knowledge about pest management and plant nutrition	Pest management and plant nutrition	Case study report, ,Observation, discussion and sharing ideas,	120 min	Tape measure, notebook, balance, bag, rope, fiber	By evaluation sheet and feedback discussion
9	To prepare production plan on climate change adaptation to reduce losses in local area.	Bottom-up planning for climate change adaptation to reduce losses	Case study report, ,Observation, discussion and sharing ideas,	120 min	Tape measure, notebook, balance, bag, rope, fiber	By evaluation sheet and feedback discussion

## **v. In-service training: Training on Climate change adaptation efforts for the operational level agricultural extension officers**

Title of the module	Training on Climate change adaptation efforts for the operational level agricultural extension officers
Target trainees / participants	the operational level officers
Responsibility of the participants after training (they are expected to do what)	After receiving the in-service training, the operational level officers will be able to: <ul style="list-style-type: none"><li>- Update their knowledge on climate change adaptation</li><li>- Plan for climate change adaptation preparedness</li><li>- Provide training on climate change adaptation for herders and crop producers</li><li>- Assess climate change adaptation vulnerabilities</li><li>- Identify the ways of minimizing agricultural losses</li><li>- Prepared themselves as a climate change adaptation trainers</li></ul>
Duration of the module	12 hours /2 days/

Session details

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning evaluation
1	To explain the present status of climate change in Mongolia	Present status of climate change in Mongolia	Lecturing, discussion, data presentation, video show	60 min	Multimedia projector, Handouts, CD, white board, A2 sheet, calendar, marker	By evaluation sheet and feedback discussion
2	To assess the extent of damage due to climate change on agriculture in local area	Extent of damage due to climate change on agriculture	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
3	To update, reinforce and provide new information on climate change adaptation for public	Public relationship practices	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
4	To conclude gender issues for climate change adaptation	Considering genders in planning, monitoring, evaluating	Case study report, ,Observation, discussion and sharing ideas,	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
5	To implement traditional and modern good practices of pasture management	Traditional and modern good practices of pasture management	Case study report, ,Observation, discussion and sharing ideas,	120 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
6	To cooperate with herding groups, NGO's for climate change adaptation	Cooperation with herding groups, NGO's for climate change adaptation	Lecturing, discussion, data presentation, video show	120 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
7	To prepare production plan to	Bottom-up planning for	Lecturing,	120 min	Handouts, CD, white	By evaluation

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning
	reduce climate change adaptation losses in local area.	climate change adaptation to reduce losses	discussion, data presentation, video show		board, A2 sheet, calendar	sheet and feedback discussion
8	To prepare action plan on climate change adaptation	Action plan to climate change adaptation	Case study report, ,Observation, discussion and sharing ideas,	120 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion

## vi. In-service Training: Training on Climate change adaptation planning for the supervisor level agricultural extension officers

Title of the module	Training on Climate change adaptation planning for the supervisor level agricultural extension officers
Target trainees / participants	Supervisor level agricultural extension officers
Responsibility of the participants after training (they are expected to do what)	After receiving the in-service training, the supervisor level officers will be able to: <ul style="list-style-type: none"> <li>- Update their knowledge on climate change adaptation</li> <li>- Discuss about climate change adaptation planning</li> <li>- Search new mechanism for climate change adaptation</li> <li>- Plan for climate change adaptation preparedness</li> <li>- Assess climate change adaptation vulnerabilities</li> <li>- Determine vulnerabilities for climate change adaptation</li> <li>- Provide climate change adaptation planning for developing policy</li> </ul>
Duration of the module	8 hours /1 day/

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning evaluation
1	To understand and explain about good practices for climate change adaptation of Mongolia	Good practices for climate change adaptation of Mongolia	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
2	To cooperate with herding groups, NGO's for climate change adaptation	Cooperation with NGO's for climate change adaptation	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	
3	To assess of current situation of climate change adaptation in	Assessment of current situation of climate change adaptation in	Lecturing, discussion, data	60 min	Handouts, CD, white board, A2 sheet,	By evaluation sheet and

SN	Enabling objectives	Contents	Methods / Activities	Duration	Resources used	Methods of learning
	Mongolia	Mongolia	presentation, video show		calendar	feedback discussion
4	To assess preparedness of Dzud, Drought in Mongolia	Assessment of preparedness of Dzud, Drought in Mongolia	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar	By evaluation sheet and feedback discussion
5	To update knowledge about modern cultivation technologies and pasture management	Modern cultivation technologies and pasture management	Case study report, ,Observation, discussion and sharing ideas,	60 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion
6	To design training models for climate change adaptation	Design training models for climate change adaptation	Lecturing, discussion, data presentation, video show	60 min	Handouts, CD, white board, A2 sheet, calendar, Statistical data analysis methods	By evaluation sheet and feedback discussion
7	To gain necessary skills to mobilize climate change adaptation practices in his/her job;	Necessary skills to mobilize climate change adaptation practices	Case study report, ,Observation, discussion and sharing ideas,	60 min	Demonstration field trip, Statistical data analysis	By evaluation sheet and feedback discussion

## ANNEX I: EVALUATION OF EXISTING TRAINING PROGRAMS

### In-service training

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
	To establish planted pasture.	1	SUA	2		4	4		2
15	To improve water source availability for pastureland	2	SUA	2		4	4		2
16	Climate change adaptation of livestock management	3	SUA	2	2	4	4		2
17	Enhance livestock bio-capability	3	SUA	2	2	4	4		2
18	Proper usage of selective breeding and artificial insemination and creating proper knowledge database	2	SUA			4	4		4
19	To expand research on livestock productivity	1	SUA			4	4		4
20	To provide renewable energy resources for herders	2	NAEC	2		4	4		2
21	To introduce herder insurance system	2	NAEC			4			2

No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		
22	To support the development of urban dairy and meat production	2	NAEC	2		4	4		2
23	To create tree lines for protecting against soil erosion and desiccation.	3	NAEC	2	2	4	4		
24	The support rotating plantation instead of wheat fallow for protecting soil	3	SUA	2	2	4	4		
25	Production of climate change resilient seeds	4	SUA	2	2	4	6		
26	Establishing monitoring network for climate change	3	SUA	2	4	2	4		
27	Prediction and prevention of 'Dzud' and extreme drought.	4	NAEC	2	4	4	4		



## Annexure II: Feedback Form

Please mark (X) the chosen line. Not necessary to write your name

The feedback form consists of a central circle divided into four quadrants by a vertical and a horizontal line. Each quadrant is labeled with a category: 1. OBJECTIVES (top-left), 2. CONTENT (top-right), 3. METHODOLOGY (bottom-left), and 4. ATMOSPHERE (bottom-right). Each quadrant contains five concentric circles, with the innermost being the smallest and the outermost being the largest. The circles are intended for marking an 'X' to indicate the chosen evaluation level for each category.

### Evaluation Rating:

1-Worse

2-Poor

3-Enough

4-Good

5-Excellent

1. Did you gain your expected result from this training?

Not satisfied

Satisfied

Much better

2. Which subjects were useful to you improve your work, please list them?

....., .....  
 ....., .....

3. Does the duration of training.

Long  Appropriate  Short?

In your opinion how much time is appropriate for this training? \_\_\_\_\_ days/ hours

4. How about training material and recourses?

Bad

Enough

Good

5. Your comment to improve this training?

.....

## 3.5 NEPAL

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## ABBREVIATIONS

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APAN	Asia Pacific Adaptation Network
APN	Asia Pacific Network for Global Change Research
CCA	Climate Change Adaptation
CC	Climate Change
DAT	Directorate of Agricultural Training
DoA	Department of Agriculture
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GoN	Government of Nepal
HRD	Human Resources Development
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
NPC	National Planning Commission
NAPA	National Adaptation Program of Action
NASC	Nepal Administrative Staff College
NARC	Nepal Agriculture Research Council
MoAC	Ministry of Agriculture and Cooperatives
RATC	Regional Agriculture Training Center
SMS	Subject Matter Specialists
SRI	System of Rice Intensification
TNA	Training Needs Assessment
ToT	Training of Trainers

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Nepal Team

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## NEPAL PART I: TRAINING NEEDS ASSESSMENT

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### a. Introduction

Agriculture sector is the backbone of Nepal's economy. It contributes nearly 35 percent to the national GDP and engages more than 65 percent of the total labor force (NPC, 2010; Gurung et.al., 2011). There is predominance of mixed farming system in which crop, livestock and forestry are integrated. During recent years, Nepalese agriculture has been gradually transforming from subsistence to commercial farming. High value crops, mainly fruits and vegetables, dairy and poultry production are taking lead compared to other commodities. However, there are various issues and challenges that the agriculture sector is facing. One of such challenges posing serious threats to food security and livelihood of the people is the climate change impacts.

Nepal is known to be highly disaster prone and vulnerable to climate change. A study by the Department of Hydrology and Meteorology revealed that the average temperature in Nepal has been increasing at a rate of approximately 0.06 degree centigrade per year (Dahal et.al, 2010; ICIMOD, 2009). The temperature differences are most pronounced during winter season and least after the summer monsoon begins. Consistent with the global trend, the temperature is increasing at a faster rate in the higher elevations compared to the lower elevations. Notably the rate of warming is greater in the western half of the country compared to the eastern half (ICIMOD, 2009). Unlike temperature trends no evidence of change in aggregate precipitation has been noted though studies have shown an increased variability and intensity of rainfall in some regions of the country. Significantly glacial retreat as well as aerial expansion of glacial lakes in the high mountain region has also been documented in recent decades and there is a higher likelihood that such change is related to rising temperature. Glacial retreat not only contributes to the variability in river and stream flows but also can be an additional source of risk to agriculture.

Studies have shown that global warming could delay the start of the summer monsoon by five to fifteen days within the next century and substantially reduce rainfall in South Asia (ICIMOD, 2009). Temperature rise will negatively impact rice and wheat yields in Terai and tropical part where these crops are already being grown close to their temperature tolerance threshold. Indirect impact of rise in temperature will be in water availability, change in soil moisture and the incidence of pest and disease outbreak (Dahal, et.al, 2010).

It is clear that the food security in Nepal would be drastically affected by climate change. Unless new measures are taken to help farmers adapt to changing climate, the situation will be severe. Understanding the potential impact of climate change on agriculture in Nepal is critical for two reasons. First, the existing system of food production is highly climate sensitive because of its low level of capital and technology. Second, agriculture is the main source of livelihood for majority of the population. If agricultural production is adversely affected by climate change the livelihoods of large number of people will be at risk.

In this context, the project entitled **“Scientific capacity development of trainers and policy-makers for climate change adaptation planning in the Asia and Pacific”** (Hereafter termed as APN project) has been implemented in collaboration with the Asia-Pacific Network for Global Change Research

(APAN) and the Institute for Global Environmental Strategies (IGES) during November 2010- October 2011 for capacity building of key stakeholders in agriculture sector in Nepal. The Asia Pacific Network for Global Change Research (APN) has funded the project.

The APN project aims to assess training needs of important stakeholders in Bangladesh, Cambodia, Lao PDR, Mongolia, and Nepal and develop targeted training modules based on training needs assessment in a participatory manner. The present project will contribute significantly to the capability building of various professionals and policy makers in agriculture sector.

## **b. Overall objectives and Methodology**

### **b.1 Goal and Objectives**

The goal of the the project is to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation (CCA) principles and practices into developmental planning and programming in targeted countries.

This TNA report presents the findings of Nepal component that is based on:

- Undertaking appraisal of training needs (training needs assessment, TNA) in terms of knowledge and skill areas for effective adaptation; and
- Designing training modules for imparting knowledge and skills for effective adaptation.

The APN project has aimed to focus on agriculture sector as the most vulnerable sector to climate change in the project countries. The specific objectives of APN project are following:

- 1) to undertake appraisal of training needs in terms of knowledge and skill areas for effective adaptation;
- 2) to design training modules for imparting knowledge and skills for effective adaptation.

The capacity building objectives of APAN goes beyond the above objectives that have direct relevance with the continuity of the APN project:

- Help create enabling environment in project countries for strengthening capacity building through interventions at the policy level;
- Help deliver training programs for trainers in key training institutions and for key policy makers in the region;
- Enable training institutions and trainers to implement training programs to the ultimate beneficiary i.e. staff employed by agriculture sector; and
- Institutionalize the modalities for assessing the impact of the above activities and provide policy feedback to the countries involved.

### **b.2 Questionnaire surveys**

Set of questionnaires, TNA form I to IV developed by the Institute for Global Environmental Strategies (IGES) to all the country partners were used to assess training needs of target functionaries in the Ministry of Agriculture and Cooperatives (MoAC), Nepal.

During first TNA meeting (January 31, 2011), an introduction to APAN and its capacity building agenda was made besides reaching a consensus on the modalities for implementing APAN project on training modules development.

**The form I** provided information on line of authority and structure of decision making within the MoAC. It also provided the staffing situation at different levels within MoAC.

**The form II** comprised of job description for different job positions according to the hierarchy within MoAC. The job description of policy level employees, implementation level and frontline extension workers were reviewed.

**Form III** helped assessing training facilities at various levels within the Department of Agriculture (DoA), Ministry of Agriculture and Cooperatives.

**The form IV** helped in assessing the training needs of potential trainees, their prior knowledge and experience and self evaluation of the knowledge and skill areas on CCA.

A total of 50 questionnaires for 3 different level of employees were filled. Separate focused group discussions were held for identifying training areas for better job performance.

### **b.3 Focused group discussion**

Besides interview with DoA staff, various forums were also used to collect and validate relevant information. Focused group discussions with trainees attending the training courses at central and regional level were made. Field level technicians and officers participating in the regional level review meetings were also engaged in the discussion in three regions in Nepal: eastern, central and western regions.

### **b.4 Desk review**

Review of training curriculum published by the Directorate of Agricultural Training (DAT) was done to identify the possibilities for integration of CCA related content for different level of agricultural professional. Similarly, the annual training program of the Directorates and Regional Agriculture Training Centers, program implementation guidelines and norms were also reviewed to estimate the cost for implementing training modules and for elaborating on the implementation mechanisms for these modules. Training evaluation reports were also reviewed to identify any CCA contents and possible areas for improvement in training planning and implementation. Relevant national policies and plan documents such as National Adaptation Plan of Action (NAPA, 2010), Climate Change Adaptation Policy of the Government of Nepal (2010), Nepal Agriculture Research Council Vision (NARC vision, 2011-2031), Three Year Plan of the Government (2010-2013), National Agriculture Policy (2004) were reviewed for assessing the priority areas, institutional and capacity development policy framework at the national level and sector level (mainly in agriculture). In an effort to review the non-government sector initiatives in capacity building, it was learnt that FAO, Helvetas, Nepal and other national NGOs in collaboration with donor partners have assessed climate change impacts, carried out awareness raising workshops at district level and helped local governments to prepare level disaster management plans. The report on Climate Change in the Mid-hills of Nepal by Helvetas, Nepal and Inter-cooperation has revealed various facts from the farmers' perspectives at grassroots level in the agriculture sector.

The preliminary results were shared with the project team during 2nd TNA meeting held on March 11, 2011 at AIT Center, Bangkok.

Based on the feedback from the 2nd TNA review meeting, further information were collected regarding organizational hierarchy, organizational structure, job description of agricultural officers and technicians working at different level. In addition, information on training facilities, assessment



of working conditions, prior knowledge of the prospective trainees, their educational background and knowledge and skills areas for future training were collected and analyzed (Summary form IV).

### **b.5 Observation visits**

Observation visits were made to assess the training facilities; class rooms, teaching aids, dormitories, laboratories etc. both at Directorate of Agricultural Training and Regional Agriculture Training Centers. During the visit, staffing situation, logistic support and training workload were also discussed with the respective staff of these Centers.

## **c. Institutional arrangement and policy setup for training and capacity building in the country**

### **c.1 National level**

The Ministry of General Administration, Government of Nepal promulgates the national policy on training and human resources development for the civil service employees. The policy is based on Civil Service Act and Regulations (1993). There are provisions for different types of training for civil service employees that includes basic induction training, institutional training, subject specific training and basic in-service training (meant for career development at different level with minimum of one month duration). Under senior executive development program, the NASC organizes training (for joint secretary level) besides administration and management training courses, project planning and management courses for officers from government and public enterprises. The Civil Service Employee Training Policy authorizes training centers under technical ministries to organize induction training, subject specific training and the basic in-service training for their employees.

### **c.2 Sector level (Agriculture and related sector)**

The human resources development policy of the government and the civil service act and regulations form the main basis for all kinds of training at the sectoral level. There have been studies on human resources development in agriculture in the past. The latest study was in 2007, which clearly shows that there is limited service coverage due to low staffing and there is competency gap in tackling various new emerging issues such climate change (APPSP, 2007, NAPA, 2010). Strong collaboration between education institutions, research institutions and the extension departments for the need-based and competent human resources development was emphasized by the study. Similarly, the need for regular updating of the educational training curriculum to meet the needs of the changing job market has also been highlighted in the report.

The National Agriculture Policy (2004), the National Agricultural Extension Strategy (2004) and the Three Year Plan of the government provide guidelines for planning training programs, in addition to the feedback from the quarterly regional program review workshops. The research needs and training on various technologies for scaling-up and wider dissemination are identified and coordinated through Regional Agriculture Technology Working Group (RATWG) and National Agriculture Technology Working Group (NATWG). These platforms are research and extension interface where research priorities are worked out to make it more need-based and result-oriented.

## **d. Training Needs Assessment for agriculture sector**

### **d.1 Evaluation of training curriculum**

The training curriculums published by the Directorate of Agricultural Training, Department of Agriculture (DoA) were reviewed to identify courses suitable for integrating CCA related contents derived from the TNA exercise. The evaluation of existing training programs for integrating CCA related contents is presented in Annex-I.

There is ample scope for incorporating climate change related topics in the existing curriculum for officers' and field level technicians. However, appropriate technologies and knowledge for CCA and mitigation are limited as not many location specific technologies are development for dissemination due to poor resource allocation for research and development in this area.

The following broad conclusions are made from the review of existing training curriculum:

- In the officer level induction training course, one session to sensitize about the emerging challenges of climate change and adaptation measures in agriculture would be effective. Similarly, for the field level technicians, there is no provision for orientation/induction training. There is a need for induction training for this staff where one to two sessions based on the background of the participants could be incorporated.
- For the officer level in-service training of one month duration, two to three sessions would be appropriate to provide insights on issues and challenges related to CCA and measures to overcome them.
- For trainers working at the Directorate of the Agricultural Training and the Regional Agriculture Training Centers (RATC), one week master ToT should be organized.

### **d.2 Evaluation of Training Facilities**

There are five training centers under the Directorate of Agricultural Training with full fledged training facilities such as training halls, dormitories, canteens, residence facilities for trainees, farm for practical sessions, classroom equipment, audio-visual aids and teaching materials. All of the five training centers are headed by the joint secretary level (senior officer) where training for officers, field level technicians and leader farmers are conducted. The DAT is located at the headquarters and is normally responsible for conducting officer level courses; and five Regional Agriculture Training Centers are mainly responsible for the training of frontline extension workers and leader farmers. In addition to these, there are reasonably good training facilities in the horticulture stations, agronomy farms, and agriculture research stations. The training facilities outside the DoA training structure are also being used as satellite training venue depending upon the nature of the course. Therefore, it can be said that there are reasonably good training facilities available with the Department of Agriculture.

There are both inductions training as well as in-service (on the job training) training courses for the officers. For non-officers (field technicians), there are subject specific in-service courses on different disciplines of agriculture (DAT, 2009). Annually, about 350 junior technicians and 190 officers receive training on various subjects from the DoA training system. However, the total number of persons trained by various development projects under the ministry and other technical directorate varies from year to year but the number is quite significant (DAT, 2010).

There is a need to develop demonstration farms on various technologies related to CCA. Some priority areas include conservation farming, efficient water use technologies such rain water

harvesting, drip irrigation, resource optimization; cultivation of crops resistant to droughts, water lodging conditions, disease/pests . There is a need for demonstration units/models, laboratories and equipment including computer labs and software for modeling/weather forecasting, appropriate training manuals and teaching aids/materials. At present most of the training centers are located in tropical and sub-tropical regions. But climate change impacts are projected to be more significant in hills and high mountain regions; therefore, development of training facilities in these eco-zones will enrich learning experience of the participants. There are possibilities to strengthen training facilities within the department's structure by establishing satellite training venue in farms/research stations under MoAC.

### **d.3 Evaluation of Trainers and Trainees**

It is interesting to note that there is no separate faculty of trainers in the Department of Agriculture. The faculties are based on area of specialization such as agriculture extension, horticulture, agronomy, plant protection etc. There is frequent transfer of personnel from training center to technical directorates, regional directorates, regional laboratories, District Agriculture Development Offices within the same faculty. Therefore, retention of trained person is the major challenge in present system of staff management. Due to this reason, no differentiation on educational background of the persons interviewed was made in terms of trainers and trainees.

The target functionaries for training needs assessment are classified into three categories:

- a) **Senior officers:** mostly in the policy level such as program directors, deputy director generals, director generals, joint secretaries, and regional directors etc.
- b) **Officers:** They are officers generally engaged for implementation such as chief of the district office, subject matter specialists etc.
- c) **Frontline extension workers:** junior technicians and junior technical assistants. They either work at the village level service centers or at the District Agriculture Development Offices.

There are 8 faculties in agriculture service of the government of Nepal under Department of agriculture namely; agricultural extension, horticulture, fisheries, agronomy, plant protection, agri-engineering, soil science, agricultural economics. There are three tiers in officer level and two tiers in non-officer level. At the district level, there are subject matter specialists (SMS) belonging to agri. extension, plant protection, horticulture and agriculture economics faculties. In some districts, there are fisheries and agronomy SMS.

### **d.4 Education and training**

The salient findings from the survey are (Table 1):

- More than 90 percent of the senior level officers (joint secretary level or policy level) have educational qualification of master degree or above.
  - At the officer level there are two categories; junior officers and senior officers. Among the junior officers, 60 percent have bachelor level education, 20 percent have master level qualification and 10 percent have intermediate level education (below bachelor level after matriculation). Whereas in case of senior officers (under secretary level), 80 percent have masters level qualification and the remaining 20 percent have bachelor level education.
- Among field level technicians, 100 percent of the interviewees have intermediate level qualification.

Table 1: Education levels of respondents within DOA.

SN	Level	Master Degree or above	Bachelor degree	Intermediate
1	Policy level	90%	10%	x
2	Officer level			
	Junior officer	20%	60%	10%
	Senior officer	80%	20%	
3	Filed level technicians	x	x	100%

### d.5 Evaluation of skill and knowledge areas

Forty percent of the officers had climate change related contents in their academic course curriculum (both bachelor level and master level) (Table 2). The topics were: environmental ecology, global warming, agro-meteorology, climate change, greenhouse gas effect, carbon sequestration, IPCC, carbon trade, possible measures for mitigation and adaptation (for details see Annexure II ). In case of senior officers, only 10 percent reported that they had climate change related curriculum in their academic course. The field level technicians told that they did not have any course on climate change in their course.

Table 2: Climate change related contents in academic courses attended by the respondents (% responses).

SN	Level	CC in academic	No cc in academic
1	Senior officer	10%	90%
2	Junior officer	40%	60%
3	Field Technicians	None	

Only ten percent of the senior officers and 20 percent of the junior officers have handled projects related to climate change (Table 3). This indicates that climate change related projects are recent. None of the field technicians had any experience of working with climate change related projects. This is mainly because most of the absence of CCA workshops for these functionaries that are concentrated at national and regional level. Only 10 percent of the senior officers and 20 percent of the junior officers received training in climate change with no evaluation on usefulness of the training.

Table 3: Respondents (% responses) receiving training in climate change

SN	Level	Training Received in CC	No Training Received in CC
1	Senior officer	10%	90%
2	Junior officer	20%	80%
3	Field Technicians	None	

The evaluation of knowledge and skills areas for three categories of trainees revealed average level of knowledge and skill among the policy level officers (Table 4). The level of climate change knowledge among 40 percent of the junior officers was found to be of average level and 50 percent of them had good knowledge and rest 10 percent had poor level of knowledge. But the level of skill was relatively weaker than the level of knowledge for junior officers in general.

In case of senior officers, about 35 percent had poor, 55 percent had average and 10 percent had good knowledge on CCA. The level of skill however was of average level for 55 percent and 35 percent of them had poor skill level.

**Table 4: Level of knowledge among the respondents (% responses)**

SN	Level	Good Knowledge	Average Knowledge	Poor Knowledge
1	Senior officer	10%	55%	35%
2	Junior officer	50%	40%	10%

It is interesting to note that the level of knowledge and skills of the grassroots level extension workers in agriculture is very poor indicating poor penetration of CCA training to this level.

#### **d.6 Self-evaluation of the working environment**

Most senior policy level officers have evaluated the working environment as good (Table 5). Comparatively, more junior officers have reported it as very good (33 percent) and good (50 percent).

**Table 5: Self-evaluation of working environment (% responses)**

SN	Level	Very Good	Good	Average
1	Senior officer	10%	45%	45%
2	Junior officer	33%	50%	17%

### **e. Establishing ideal scenario of knowledge and skills areas for agriculture**

The ideal scenario of knowledge and skill areas were identified by referring to national policy documents such as National Adaptation Plan of Action (NAPA), by reviewing relevant scientific and technical literature on climate change and adaptation in agriculture sector in Nepal, and by identifying the gap between the required competency and current competency levels.

#### **e.1 Literature review**

##### **Priorities identified in NAPA**

The Government of Nepal has prepared NAPA in 2010 and promulgated the Climate Change Policy in the same year. The review of the NAPA and the Climate Change Policy of the government clearly shows that there is need for capability building at different level and the trainable needs could be derived as following. The Box 1 lists various priority areas for capacity building as identified by the NAPA.

**Box 1: Training Needs in Agriculture Sector (based on NAPA prioritized programs in agriculture and food security thematic area) (non-prioritized list)**

- Capability building for climate change adaption planning and implementation at different level; community level, district level, regional level and national level.
- Assessment of climate risks, identifying adaptation options and prioritizing specific adaptation responses; vulnerability analysis/mapping (drought prone, flood prone areas, food security)
- Climate change adaptation in terms of policy, technological and management responses
- Forecasting, early warning; weather, flood, drought, precipitation and other climatic variability and their implications
- Livelihood diversification for coping climate change impacts/ risks
- Drought resistant crop varieties (cereals, fruits, vegetables, cash crops) suitable for different eco-zones
- Crop/livestock insurance mechanism
- Climate change induced disaster risk management

### **Climate Change in the Mid-hills of Nepal**

A study conducted by the Helvetas, Nepal and Inter Cooperation in the hills and mountains region of the central, western and far-western Nepal clearly shows the impacts of climate change in agriculture and rural livelihood from the farmers' perspective (Helvetas Nepal and Inter Cooperation, 2010). The significant observations from the farmers at varying altitudes are summarized below which clearly shows that the extension personnel should be equipped with necessary knowledge and skills to advise farmers to overcome the impacts of climate change. Some of the study highlights are summarized below.

- Farmers have reported observations of changing environmental conditions in recent years. Weather patterns are becoming more erratic and unpredictable, delayed rainfall, shorter in duration and more intense in nature. Associated with these rainfall patterns are prolonged periods of drought, decreased level and frequency of snowfall in higher altitude and overall increasing temperature.
- Farmers are no longer able to plant crops due to unpredictable weather pattern and are increasingly losing crops due to droughts. Intense, heavy rainfall later in the season also often damages crops. Farmers reported similar problems with vegetable crops even though they are now growing a wider diversity of vegetable crops and varieties.
- Fruit trees such as apple, peach, mango, plum, oranges and wild pear were reported to flower and fruit approximately two months earlier than usual. As a result, fruits are often dried and shriveled and of poor quality than in previous years. Changing flowering time of wild species such as rhododendron, cotton tree and Himalayan cherry have also been reported. Productivity of cereal crops such as wheat, maize and rice is significantly affected by the erratic and un-predictable weather pattern.

Changing temperature appear to be having a significant impact on fruit production; for example on orange, mango, and wild pear, which are increasing losing quality at lower altitudes as they ripen earlier in the season, on the other hand, improved fruit production is reported at high altitudes. The productivity of 'high chilling' apple cultivars grown in the higher regions has been declining.

- Pest infestations were most extensive during periods of drought. Increased severity of diseases such as blight in potato and powdery mildew in tomato and pea was also reported.

The impact of climate change in agriculture and the associated food insecurity situation is very alarming in Nepal as Nepalese farmers have low adaptive capacity. Therefore, capability building of the community to cope with climate change impacts is very important. In this context, the proposed training modules would be highly useful in enhancing the capacity of the extension service providers in the country.

## **e.2 Identified priorities for knowledge and skills**

The identification of prioritized training gap in terms of knowledge and skills for MoAC officials operational at three different levels in organization hierarchy namely; policy level (Joint secretaries, Directors), execution level (District Agriculture Development Officers, Subject Matter Specialists) and frontline extension workers (Junior Technicians) are derived from the following series of steps:

1. The required competency was derived (ideal competency) from the analysis of job description (TNA form number II). The required knowledge and skills to perform each particular main task was identified.
2. The existing competency level of the employees and their level of performance for the corresponding knowledge and skill identified for the tasks were rated in terms of poor, satisfactory and good categories from the TNA survey. It was assumed that no training is required if the performance level is rated as good. Moderate training is necessary if the performance level is rated as satisfactory, and high level of training is required if the performance level is rated as poor. This exercise is done through the analysis of information from TNA form IV and focused group discussions.
3. Once the competency gap is identified by comparing desired level of performance and the actual level of performance, the next step is to converse them into training gaps in terms of knowledge and skills required.
4. Finally, the training needs were prioritized into first priority and second priority and the first or high priority training needs are entered into the training module design. The analysis of TNA forms, national policy documents and government priorities in agriculture this step was useful for this purpose. The details of the assessment is presented in the following section in order of followings:

### Policy Level Officers

- A. Required Competency for Policy Level Official (Ideal Competency)
- B. Existing Competency for policy level staff and their level of performance
- C. Training Gap of Policy Level Staff
- D. Prioritization of Training Gaps of Policy Level Staff

### Execution Level Officers

- A. Required Competency for Execution Level Officers (Ideal Competency)
- B. Existing Competency for Execution Level Officers and their level of performance
- C. Training Gap of Execution Level Officers
- D. Prioritization of Training Gaps of Execution Level Officers

### Frontline Extension Workers

- A. Required Competency for Frontline Extension Workers (Ideal Competency)

- B. Existing Competency for Frontline Extension Workers (Junior Technicians) and their level of performance
- C. Training Gap of Frontline Extension Workers
- D. Prioritization of Training Gaps of Frontline Extension Workers



### e.2.1 Policy Level Staff

Table 6: Required competency for policy level officials (Ideal Competency)

S.No	Main Tasks	Knowledge of	Skills in
1	Formulation of policies, strategies and activities in line with overall government policies and priorities	Basic concept of climate change Climate change scenario of the country Government policy in relation to CCA International obligations and commitments of GoN Climate change sensitive program planning and management	
2	Develop and update periodically the technical norms and operational guidelines	Impact of climate change in agriculture sector	
3	Facilitation for the implementation of strategies and activities at various level	Impact of climate change in crop production	
4	Provide technical backstopping support to the regional directorates and District Agriculture Development Offices	Technological recommendations on mitigation of climate change impacts	
5	Act as a national focal point and maintain information related to concerned discipline at national level, prepare rooster of the experts, organize national level workshop, seminar and interaction programs	National, regional and global initiatives in CCA	

Table 7: Existing competency and level of performance of policy level staff

Knowledge of	Level of performance	Skills in	Level of performance
Basic concept of climate change	Satisfactory	x	x
Climate change scenario of the country	Satisfactory		
Government policy in relation to CCA	Poor		
International obligations and commitments of GoN	Poor		
Climate change sensitive program planning and management	Poor		
Impact of climate change in crop production	Poor		
Technological recommendations on adoption and mitigation of climate change impacts	Poor		

National, regional and global initiatives in CCA	Poor		
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Note: the levels of performance have been categorized as Good, Satisfactory and Poor

Table 8: Training gaps of policy level staff

Knowledge of	Skills in
Government policy in relation to CCA	X
International obligations and commitments of Government of Nepal (GoN)	
Climate change sensitive program planning and management	
Impact of climate change in crop production (cereal, cash, horticultural crops)	
Technological recommendations on mitigation of climate change impacts	
National, regional and global initiatives in CCA	

Note: Good equals no training needs, Satisfactory equals moderate training needs, Poor equals high training needs

Table 9: Prioritized training gaps of policy level staff

First Priority	Second priority
Knowledge of	Knowledge of
Government policy in relation to CCA	National, regional and global initiatives in CCA
International obligations and commitments of GoN	
Climate change sensitive program planning and management	
Impact of climate change in crop production	
Technological recommendations on mitigation of climate change impacts	

## e.2.2 Execution Level Officers

Table 10: Required competency for execution level officers (Ideal Competency)

S.No	Main Tasks	Knowledge of	Skills in
1	Coordinate planning and management of agriculture program of the district	Government policy and strategy in relation to CCA Effects and impacts of climate change in agriculture	Early warning, weather forecasting skills Vulnerability assessment

S.No	Main Tasks	Knowledge of	Skills in
		Program planning and budgeting in CCA Creating database of climate change and adaptation measures Overview of climate change scenario of the country Climate change sensitive program planning and management	
2	Maintain coordination with line agencies and non-government organizations	Overview of climate change scenario Government policy and strategies in relation to CCA International obligations and commitments of GoN on CCA Livelihood diversification	
3	Facilitate supply of agricultural inputs such as seed, saplings, fertilizer	Suitable crops varieties for different domains Low carbon agriculture practices	
4	Facilitate construction of small-scale irrigation schemes through farmers cooperatives	Crop water requirement and package of practices of various crops	Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture
5	Control of pest and diseases in field crops	Climate change and its relation to pest havoc Disease resistant varieties of cereal, cash crops and vegetables	Design appropriate demonstrations

Table 11: Existing competency and level of performance of execution level officers

Knowledge of	Level of performance	Skills in	Level of performance
Government policy and strategy in relation to CCA	Poor	Early warning, weather forecasting skills	Poor
Effects and impacts of climate change in agriculture	Poor	Vulnerability assessment	Poor
Program planning and budgeting in CCA	Poor	Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture	Poor
Creating database of climate change and adaptation measures	Poor		
Overview of climate change scenario of the country			

<b>Knowledge of</b>	<b>Level of performance</b>	<b>Skills in</b>	<b>Level of performance</b>
Climate change sensitive program planning and management	Poor Satisfactory Poor	Design appropriate demonstrations for disease resistant varieties	Poor
International obligations and commitments of GoN on CCA Livelihood diversification Suitable crops varieties for different domains Low carbon agriculture practices	Poor Poor Satisfactory Poor		
Crop water requirement and package of practices of various crops	Satisfactory		
Climate change and its relation to pest havoc Disease resistant varieties of cereal, cash crops and vegetables	Poor Satisfactory		

Note: the levels of performance have been categorized as Good, Satisfactory and Poor

Table 12: Training gap of execution level officers.

<b>Knowledge of</b>	<b>Skills in</b>
<ul style="list-style-type: none"> <li>• Government policy and strategy in relation to CCA</li> <li>• Effects and impacts of climate change in agriculture</li> <li>• Program planning and budgeting in CCA</li> <li>• Creating database of climate change and adaptation measures</li> <li>• Climate change sensitive program planning and management</li> </ul>	<ul style="list-style-type: none"> <li>• Early warning, weather forecasting skills</li> </ul>
<ul style="list-style-type: none"> <li>• International obligations and commitments of GoN on CCA</li> <li>• Livelihood diversification</li> <li>• Low carbon agriculture practices</li> </ul>	<ul style="list-style-type: none"> <li>• Vulnerability assessment</li> </ul>
<ul style="list-style-type: none"> <li>• Crop water requirement and package of practices of various crops</li> </ul>	<ul style="list-style-type: none"> <li>• Setting up demonstration; drought conditions, water stagnation</li> </ul>

Knowledge of	Skills in
	resistant varieties, conservation agriculture
<ul style="list-style-type: none"> <li>• Climate change and its relation to pest havoc</li> <li>• Disease resistant varieties of cereal, cash crops and vegetables</li> </ul>	<ul style="list-style-type: none"> <li>• Design appropriate demonstrations for disease/ pest resistant varieties</li> </ul>

Note: Good equals no training needs, Satisfactory equals moderate training needs, Poor equals high training needs

Table 13: Prioritized training gaps of execution level officers

First Priority	Second priority
<b>Knowledge of:</b>	<b>Knowledge of :</b>
<ul style="list-style-type: none"> <li>• Climate change and its relation to pest havoc</li> </ul>	<ul style="list-style-type: none"> <li>• International obligations and commitments of GoN on CCA</li> </ul>
<ul style="list-style-type: none"> <li>• Low carbon agriculture practices</li> </ul>	<ul style="list-style-type: none"> <li>• Livelihood diversification</li> </ul>
<ul style="list-style-type: none"> <li>• Climate change sensitive program planning and management</li> </ul>	<ul style="list-style-type: none"> <li>• Creating database of climate change and adaptation measures</li> </ul>
<ul style="list-style-type: none"> <li>• Government policy and strategy in relation to CCA</li> </ul>	
<ul style="list-style-type: none"> <li>• Effects and impacts of climate change in agriculture</li> </ul>	
<ul style="list-style-type: none"> <li>• Program planning and budgeting in CCA</li> </ul>	
<b>Skills in:</b>	<b>Skills in:</b>
<ul style="list-style-type: none"> <li>• Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture</li> </ul>	Early warning, weather forecasting skills
<ul style="list-style-type: none"> <li>• Design appropriate demonstrations for disease/ pest resistant varieties</li> </ul>	
<ul style="list-style-type: none"> <li>• Vulnerability assessment</li> </ul>	

### e.2.3 Frontline Extension Workers

Table 14: Required competency for frontline extension workers (Ideal Competency)

S.No	Main Tasks	Knowledge of	Skills in
1	Collect farmers demand for seed, sapling and fertilizer and report to the District Agriculture Office	<ul style="list-style-type: none"> <li>Overview of climate change scenario of the country</li> <li>Suitable crops varieties for different agro-ecological zones and climatic requirements</li> <li>Climate change sensitive program planning and management</li> </ul>	<ul style="list-style-type: none"> <li>Filling in demand collection forms</li> <li>Calculation of seed and fertilizer amount based on research recommendations</li> </ul>
2	Provide technical advice and services to farmers on various aspects of crop production, soil nutrient management, control of pest and diseases, marketing services	<ul style="list-style-type: none"> <li>Effects and impacts of climate change in agriculture</li> <li>Suitable crops varieties for different domains</li> <li>Livelihood diversification</li> <li>Package of practices of various crops from climate change perspectives</li> <li>Low carbon agriculture practices</li> <li>Marketing management</li> <li>Drought tolerant varieties of cereals, cash crops and vegetables</li> <li>Varieties suitable for water stagnation</li> <li>Crops suitable for flooded area reclamation</li> </ul>	<ul style="list-style-type: none"> <li>Setting up demonstration on soil and water management (such as rain water harvesting in plastic ponds)</li> <li>Demonstrate community adaptation practices on CCA</li> <li>Demonstrate IPM tools and techniques</li> <li>Select suitable varieties for flooded area reclamation, drought and water lodging conditions</li> </ul>
3	Conduct local level farmers' training on various aspects of crop production, soil management, integrated pest management and marketing services	<ul style="list-style-type: none"> <li>Effects and impacts of climate change in agriculture</li> <li>Community adaptation practices</li> <li>Livelihood diversification</li> <li>Indigenous knowledge on conservation agriculture</li> <li>Water saving technologies such as SRI, zero tillage</li> <li>Low carbon agriculture practices</li> <li>Integrated Plants Nutrient Management</li> <li>Emerging pest and diseases on CC context and application</li> </ul>	<ul style="list-style-type: none"> <li>Setting up demonstration on soil and water management</li> <li>Demonstrate suitable community adaptation practices on CCA</li> <li>Demonstrate IPM tools and techniques</li> <li>Select suitable varieties for flooded area reclamation, drought and water lodging conditions</li> </ul>

S.No	Main Tasks	Knowledge of	Skills in
		of IPM Organic agriculture Marketing management	
4	Organize farmers groups, cooperatives and supports in planning and implementation of the program	Climate change sensitive program planning and management	Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture
5	Facilitate distribution of seed, saplings, fertilizer to the farmers.	Disease resistant varieties of cereal, cash crops and vegetables	Storage and handling of seed and fertilizer application
6	Conduct method and result demonstrations on different crop varieties/ new technologies.	Design appropriate demonstrations on improved seeds and fertilizer application	Conduct result and method demonstration on specified crop and technology
7	Maintains coordination with other line agencies in program planning and implementation for complementarities and collaborations	Climate change sensitive program planning and management Participatory program planning and management Community adaptation practices	Facilitate program planning exercise

Table 15: Existing competency and level of performance of frontline extension workers (Junior Technicians).

Knowledge of	Level of performance	Skills in	Level of performance
Overview of climate change scenario of the country	Satisfactory	Filling in demand collection forms	Good
Suitable crops varieties for different agro-ecological zones and climatic requirements	Poor	Calculation of seed and fertilizer amount based on research recommendations	Satisfactory
Climate change sensitive program planning and management	Poor	Setting up demonstration on soil and water management (such as rain water harvesting in plastic ponds)	Poor

<b>Knowledge of</b>	<b>Level of performance</b>	<b>Skills in</b>	<b>Level of performance</b>
Effects and impacts of climate change in agriculture	Poor	Demonstrate community adaptation practices on CCA	Poor
Livelihood diversification	Poor	Demonstrate IPM tools and techniques	Satisfactory
Package of practices of various crops from climate change perspectives	Poor	Select suitable varieties for flooded area reclamation, drought and water lodging conditions	Poor
Marketing management	Satisfactory	Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture	Poor
Drought tolerant varieties of cereals, cash crops and vegetables	Poor	Storage and handling of seed and fertilizer application	Satisfactory
Varieties suitable for water stagnation	Poor	Conduct result and method demonstration on specified crop and technology	Satisfactory
Crops suitable for flooded area reclamation	Poor	Facilitate program planning exercise	Satisfactory
Community adaptation practices	Poor		
Indigenous knowledge on conservation agriculture	Satisfactory		
Water saving technologies such as SRI, zero tillage	Poor		
Integrated Plants Nutrient Management	Poor		
Emerging pest and diseases on CC context and application of IPM	Poor		
Organic agriculture	Satisfactory		
Disease resistant varieties of cereal, cash crops and vegetables	Poor		
Design appropriate demonstrations on improved seeds and fertilizer application	Satisfactory		
Participatory program planning and management	Satisfactory		

Note: the levels of performance have been categorized as Good, Satisfactory and Poor



Table 16: Training gap of frontline extension workers (Junior Technicians)

Knowledge of	Skills in
<ul style="list-style-type: none"> <li>Suitable crops varieties for different agro-ecological zones and climatic requirements</li> </ul>	<ul style="list-style-type: none"> <li>Setting up demonstration on soil and water management (such as rain water harvesting in plastic ponds)</li> </ul>
<ul style="list-style-type: none"> <li>Climate change sensitive program planning and management</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate community adaptation practices on CCA</li> </ul>
<ul style="list-style-type: none"> <li>Effects and impacts of climate change in agriculture</li> </ul>	<ul style="list-style-type: none"> <li>Select suitable varieties for flooded area reclamation, drought and water lodging conditions</li> </ul>
<ul style="list-style-type: none"> <li>Livelihood diversification</li> </ul>	<ul style="list-style-type: none"> <li>Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture</li> </ul>
<ul style="list-style-type: none"> <li>Package of practices of various crops from climate change perspectives</li> </ul>	
<ul style="list-style-type: none"> <li>Drought tolerant varieties of cereals, cash crops and vegetables</li> </ul>	
<ul style="list-style-type: none"> <li>Varieties suitable for water stagnation</li> </ul>	
<ul style="list-style-type: none"> <li>Crops suitable for flooded area reclamation</li> </ul>	
<ul style="list-style-type: none"> <li>Community adaptation practices</li> </ul>	
<ul style="list-style-type: none"> <li>Water saving technologies such as SRI, zero tillage</li> </ul>	
<ul style="list-style-type: none"> <li>Integrated Plants Nutrient Management</li> </ul>	
<ul style="list-style-type: none"> <li>Emerging pest and diseases on CC context and application of IPM</li> </ul>	
<ul style="list-style-type: none"> <li>Disease resistant varieties of cereal, cash crops and vegetables</li> </ul>	

Note: Good equals no training needs, Satisfactory equals moderate training needs, Poor equals high training needs

Table 17: Prioritized training gaps of execution level officers

First Priority	Second priority
<b>Knowledge of:</b>	<b>Knowledge of:</b>
<ul style="list-style-type: none"> <li>• Climate change sensitive program planning and management</li> </ul>	<ul style="list-style-type: none"> <li>• Livelihood diversification</li> </ul>
<ul style="list-style-type: none"> <li>• Effects and impacts of climate change in agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable crops varieties for different agro-ecological zones and climatic requirements</li> </ul>
<ul style="list-style-type: none"> <li>• Package of practices of various crops from climate change perspectives</li> </ul>	<ul style="list-style-type: none"> <li>• Disease resistant varieties of cereal, cash crops and vegetables</li> </ul>
<ul style="list-style-type: none"> <li>• Drought tolerant varieties of cereals, cash crops and vegetables</li> </ul>	
<ul style="list-style-type: none"> <li>• Varieties suitable for water stagnation</li> </ul>	
<ul style="list-style-type: none"> <li>• Crops suitable for flooded area reclamation</li> </ul>	
<ul style="list-style-type: none"> <li>• Water saving technologies such as SRI, zero tillage</li> </ul>	
<ul style="list-style-type: none"> <li>• Integrated Plants Nutrient Management</li> </ul>	
<ul style="list-style-type: none"> <li>• Emerging pest and diseases on CC context and application of IPM</li> </ul>	
<ul style="list-style-type: none"> <li>• Community adaptation practices</li> </ul>	
<b>Skills in:</b>	
<ul style="list-style-type: none"> <li>• Setting up demonstration on soil and water management (such as rain water harvesting in plastic ponds)</li> </ul>	
<ul style="list-style-type: none"> <li>• Demonstrate community adaptation practices on CCA</li> </ul>	
<ul style="list-style-type: none"> <li>• Select suitable varieties for flooded area reclamation, drought and water lodging conditions</li> </ul>	
<ul style="list-style-type: none"> <li>• Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture</li> </ul>	

### e.3 Summary of Prioritized Training Needs in Agriculture Sector

The summary of prioritized training needs based on analysis of information from TNA questionnaire forms, focused group discussion with potential trainees, review of policy and plan documents, expert consultation and the exercise on establishing ideal scenario for the training is presented in the following table.

Table 18: Summary of training needs of the officials in agriculture sector

S. N.	Level of course	Knowledge	Skills
1	Policy level officers	<ul style="list-style-type: none"> <li>• Government policy in relation to CCA</li> <li>• International obligations and commitments of GoN</li> <li>• Climate change sensitive program planning and management</li> <li>• Impact of climate change in Nepalese agriculture</li> <li>• Technological recommendations on CCA</li> </ul>	
2	Implementation level Officers and Subject matter specialists	<ul style="list-style-type: none"> <li>• Climate change and its relation to pest havoc</li> <li>• Low carbon agriculture practices</li> <li>• Climate change sensitive program planning and management</li> <li>• Government policy and strategy in relation to CCA</li> <li>• Effects and impacts of climate change in agriculture</li> <li>• Program planning and budgeting in CCA</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture</li> <li>• Design appropriate demonstrations for disease/ pest resistant varieties</li> <li>• Vulnerability assessment</li> <li>•</li> </ul>
3	Frontline extension workers (junior technicians, junior technical assistants)	<ul style="list-style-type: none"> <li>• Climate change sensitive program planning and management</li> <li>• Effects and impacts of climate change in agriculture</li> <li>• Package of practices of various crops from climate change perspectives</li> <li>• Drought tolerant varieties of cereals, cash crops and vegetables</li> <li>• Varieties suitable for water stagnation</li> <li>• Crops suitable for flooded area reclamation</li> <li>• Water saving technologies such as SRI, zero tillage</li> <li>• Integrated Plants Nutrient Management</li> <li>• Emerging pest and diseases on CC context and application of IPM</li> <li>• Community adaptation practices</li> </ul>	<ul style="list-style-type: none"> <li>• Setting up demonstration on soil and water management (such as rain water harvesting in plastic ponds)</li> <li>• Demonstrate community adaptation practices on CCA</li> <li>• Select suitable varieties for flooded area reclamation, drought and water lodging conditions</li> <li>• Setting up demonstration; drought conditions, water stagnation resistant varieties, conservation agriculture</li> </ul>

## f. Policy Suggestions and Implementation Plan

### Recommendations for capacity building

Generally, capability building programs are not accorded high priority for funding. As a result, higher studies, study visits and training activities are under financed, scattered and lack coordination among projects and concerned training institutions within the ministry. Following suggestions should receive attention for the improvement of capacity building of government staff in Nepal;

- There is a need to give high priority to human resources development to address climate change impacts in Nepal.
- Capacity building of communities to adopt or mitigate the climate change should be stressed and strong collaboration among local governments, district agriculture offices and the farmers' institutions on CCA should be emphasized.
- Incorporate climate change adaptation related topics in educational curriculum implemented in various colleges, universities, technical schools (they produce frontline extension workers) so as to mainstream the CCA.
- Collaborate with regional and international agencies for human resource capacity building through research, exchange visits, twinning arrangement.
- The thematic area identified in NAPA should receive national priority across different sectors and ministries due to the inter-dependent nature of the subject. For example, the agriculture sector is very much affected by the land use policy for which another ministry is responsible.
- As there are no regular training courses for the policy level officers within the Ministry of Agriculture and Cooperatives. It is recommended that a half-a-day orientation training be developed as per the TNA gaps identified in this report. The main objective of this training program would be making them aware of CCA and to integrate in national development plans and programs.
- There was a provision for induction training (called orientation training) for Frontline Extension Workers in the past but eventually discontinued. These training programs should be reinstated considering their high importance.
- As demonstrated in this report, there should be three training modules targeting policy level officials, implementation level officers (SMS and in-charge of the district level extension offices) and frontline extension workers or the agriculture technicians working at the village level.

### Recommendations for Scaling up of Project Outputs

- **Developing critical mass of trainers:** There is a need to develop a core group of trainers within the Department of Agriculture for successful integration and institutionalization of present efforts. There are resource persons (experts) available for CCA in general and few on CCA in agriculture. Excessive dependence on external resource persons will constrain internalization of the training modules. Therefore, our suggestion will be to develop a group of core trainers through Master ToT on CCA in agriculture. One week long Master ToT should be developed to the group of DoA trainers working at DAT and RATC. Nepal Administrative Staff College could organize such course with sufficient funding for the course. It would be very encouraging for the project country team if APAN organizes training for trainers' from the project countries.
- **Training materials and facilities:** Specific training materials and teaching aids to be used by the trainers in implementing the developed module should be developed and disseminated. Some of the visual aids and printed materials related climate change impacts/ effects developed by the agencies such as ICIMOD, WWF etc. could also be utilized but there is a need to develop specific teaching aids and materials in the training institutions under DoA.

## Funding support

Following will be the tentative fund requirements for piloting modules developed in this project.

- a) Master ToT for agriculture trainers (after APAN training on CCA to agriculture trainers) one week 20 persons (US\$ 10,000)
- b) Development of teaching aids and materials (visual aids on case studies- 5 case studies US\$ 10,000)
- c) 4 modules for three levels of officials (policy level officer- half-a-day orientation training to be developed), implementation level officer (existing in-service and induction training courses) and field level training (existing in-service training). The total funds requirement will be US\$ 15,000. No added fund is required for induction training (Newly recruited agriculture officers) suggested in this workshop.

## g. References

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## NEPAL PART II: TRAINING MODULES

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Part II of this report contains the following modules designed for Policy (In-service), Implementation (In-service & Induction) and Frontline (In-service & Induction) officials working in agriculture.

- In-service Training
  - I. Policy Level Officers
  - II. Implementation Officers
  - III. Frontline Extension Workers
- Induction Training
  - IV. Implementation Officers
  - V. Frontline Extension Workers

### I. In-service Training for Policy Level Officers

#### 1. Introduction

The policy level officials have important role in planning and implementation of agricultural program, developing commodities and disciplinary policies on various aspects of agriculture. Usually there are no regular courses for policy level official. However, it is realized that this level of officials should have good understanding of the climate change adaptation (CCA) and mitigation measures. The proposed training course will be a standalone module.

#### 2. Target Audience:

Policy level officials of the government (joint secretaries, director general, deputy director generals, program directors, regional directors)

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#### 3. Entry Behavior:

Usually policy level officers have more than 20 years of experience from the entry level. They have specialized degree in different disciplines of agriculture.

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#### 4. Implementation modalities:

There are 67 policy level officials within the Ministry of Agriculture and they can be trained in 15-20 participants per batch. These in-service training courses should be conducted at the Directorate of Agriculture Training. Nomination of the participants is done by the Ministry of Agriculture.

## 5. Session Details

<b>Title of the module</b>	Government policies and priorities on climate change adaptation in agriculture
<b>Target trainees / participants</b>	Policy level officers of the Ministry of Agriculture and Cooperatives
<b>Responsibility of the participants after training (they are expected to do what) -</b>	Mainstream the key provisions and priorities of the GoN policies, strategies in relation to climate change adaptation
<b>Duration of the module</b>	3.0 hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	<p>Explain key features of climate change policy of the GoN</p> <p>Describe major agreements and obligations at national, regional and</p>	<p><b>Government policy &amp; obligations</b></p> <p>Government policy in relation to CCA</p> <p>International obligations and commitments of GoN</p>	<p>Question/Answer,</p> <p>Short lecture</p>	<b>1.5 hrs</b>	<p>Reading materials and examples in relation to impact of CC in agriculture</p> <p>Multi-media, flip chart, white board, markers, visual aids</p>	<p>Ask participants to share their understanding of the key learning points at the end of the session</p>	<p>The facilitator of this session should have thorough understating of the key policy documents; NAPA, CC</p>

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
	international level						policy, Agriculture Policy
	<p>Identify climate change sensitive program planning and management</p> <p>Describe major impacts of climate change in different sub-sectors within agriculture</p> <p>Explain common technologies and policies suitable CCA in agriculture</p>	<p><b><u>Program planning &amp; impact of climate change in agriculture</u></b></p> <ul style="list-style-type: none"> <li>• Climate change sensitive program planning and management</li> <li>• Impact of climate change in Nepalese agriculture</li> <li>• Technological and policy recommendations on CCA</li> </ul>	Q & A and short lecture	<b>1.5 hrs</b>	Reading materials and examples in relation to CC sensitive program planning Multi-media, flip chart, white board, markers, visual aids	do	The facilitator has to be familiar with government planning procedure Relevant visual aids on various technologies representing existing efforts on CCA should be used for better understanding.



## II. In-service Training for District Agriculture Development Officers/Subject Matter Specialists

### 1. Introduction

The basic in-service training is usually conducted for more than one month. It is linked with the career development of the officers. The Senior Agriculture Development Officer and SMS have important role in implementation of the government programs at district level and coordinating various non-government sector programs in agriculture. Therefore, it is important to impart necessary knowledge and skills to this level of officers to bring desired changes at the field level.

One of the critical tasks of DADOs is to implement agriculture extension services at the district or implementation level. Therefore, they are the supervisors of the SMS and field level technicians while implementing the district agriculture development programs. Understanding of climate change adaptation helps to design and implement the district agriculture development programs to be more sustainable and cost efficient.

### 2. Target Audience:

District Agriculture Officers/Subject Matter Specialists

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### 3. Entry Behavior:

Minimum five years experience in the field.

### 4. Implementation Modalities:

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Participants are 20-25 per batch. Trainings are conducted at Directorate of Agricultural Training. Nomination of the participants is done by Department of Agriculture.

### 5. Session Details

<b>Title of the module</b>	Effect of Climate Change in Nepalese Agriculture
<b>Target trainees / participants</b>	Senior Agriculture Development Officers and Subject Matter Specialists

<b>Responsibility of the participants after training (they are expected to do what) -</b>	Prepare climate change adaptation program plan for implementation at district level agriculture offices in view of the climate change in agriculture in general Follow Government Policy and Strategy and NAPA document while program planning and budgeting in CCAD 3. Demonstrate how VA tool(s) could be used for CCA effectively
<b>Duration of the module</b>	9 hours

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	Explain the concepts of climate change as per IPCC report;  State impacts and effects of climate change in agriculture in general while working at the district level.	<b>Climate change and its effects and impacts</b> Understanding climate change Climate change and agriculture Impacts of CC in agriculture	Brainstorming, Question/Answer, Short lecture	1.5 hrs	Reading materials and examples in relation to impact of CC in agriculture Multi-media, flip chart, white board, markers, visual aids	Ask participants to share their understanding of the key learning points at the end of the session	The facilitator of this session should highlight how important is understanding climate change and its impact and effects in agriculture

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
							as they need to work directly in the development field.
	Identify the climate change friendly crop varieties suitable for different ecological regions and production environments such as disease resistance, drought tolerance, water stagnation/ flood tolerance	<b>Suitable crops varieties for climate change induced production environment (K)</b> Ecological consideration Drought tolerant/ flood conditions Pest resistant varieties	Group work followed by field visit	3 hrs	Reading materials and examples in relation to crop varieties suitable to different production environment Multi-media, flip chart, white board, markers, visual aids	Ask participants to share their understanding of the key learning points at the end of the session	The facilitator could combine field visit considering other modules.
	Describe the meaning of carbon sequestration, concept of low carbon agriculture	<b>Low carbon agriculture practices</b> <ul style="list-style-type: none"> <li>• Concept and meaning of low carbon agriculture</li> <li>• Sources of carbon</li> <li>• cultivation practices to</li> </ul>	Brainstorming, lecture	1.5 hrs	Reading materials and examples in relation to low carbon agriculture practices Multi-media, flip	do	The facilitator could show a relevant movie to make the

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
	Explain low carbon agricultural practices	minimize the carbon production			chart, white board, markers, visual aids		session interesting and motivating
	Explain the importance of VA for climate change program planning;  State VA assessment in the context of climate change planning;  Use VA tool(s) effectively in cc program planning	<b>Vulnerability assessment</b> <ul style="list-style-type: none"> <li>• What is vulnerability assessment</li> <li>• Need of VA</li> <li>• VA process</li> <li>• Tools of VA ; VAM</li> </ul>	Individual and group exercise with vulnerability assessment tool	1.5 hrs	Reading materials and examples in relation to VA Multi-media, flip chart, white board, markers, visual aids	do	The facilitator has to prepare or identify the appropriate assessment tool(s)
	Explain the concept of program planning and budgeting & their processes in the context of CCA;  Describe the key components of NAPA priorities	<b>Program planning and CCA</b> <ul style="list-style-type: none"> <li>• Climate change sensitive program planning and management</li> <li>• Government policy and strategy in relation to CCA: NAPA, CC policy</li> </ul>	Q & A and short lecture	1.5 hrs	Reading materials and examples in relation to CC sensitive program planning Multi-media, flip chart, white board, markers, visual aids	do	The facilitator has to be familiar with NAPA priorities specifically agriculture theme

### **III. Induction Training for newly recruited Agriculture Development Officers**

#### **1. Introduction**

The newly recruited government officers in Agriculture Service have to undergo one week induction training after they join the service. The overall objective of the induction course is to acquaint with the organizational setup and working procedures specifically administrative, financial and the policy provisions.

It is important to equip new officers with existing efforts and the provisions of key policy documents on CCA in agriculture so that they could demonstrate better performance in the job situation. As SMS, these have important role in advising farmers and guiding field level extension workers in their subject matters including CCA.

The induction training is the beginning of the career for newly recruited officers. As they belong to different disciplines of agriculture, they undergo subject specific training of short duration (usually one week). Therefore, technological aspects related to CCA will be dealt in such subject specific trainings such as vegetable production, organic farming, IPM, IPNMS, crop production as so on. The training needs identified should be integrated into these specific areas.

#### **2. Target Audience:**

Newly Recruited Agriculture Officers

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#### **3. Entry Behavior:**

After completion of bachelor level education in agriculture, graduates will be eligible for public service examination for the position of agriculture officers.

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#### **4. Implementation modalities:**

There will be 20-25 participants per batch. The induction training courses are conducted at the Directorate of Agriculture Training. Nomination of the participants is done by Department of Agriculture.

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## 5. Session Details

<b>Title of the module</b>	Government policies and strategies in climate change adaptation
<b>Target trainees / participants</b>	Newly recruited agriculture development officers
<b>Responsibility of the participants after training (they are expected to do what) -</b>	Incorporate the key provisions of the GoN policies and strategies specifically the NAPA priorities, climate change adaptation policy and national agriculture policy in planning agriculture
<b>Duration of the module</b>	3.0 hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	Explain the key provisions of NAPA priorities, Climate Change Policy and Agriculture Policy	<b>Government policies and strategies on CCA</b> <ul style="list-style-type: none"> <li>• Key priorities of NAPA in agriculture thematic area</li> <li>• Climate change policy of GoN</li> <li>• National agriculture policy and CCA</li> </ul>	Question/Answer, Short lecture	1.5 hrs	Reading materials and examples in relation to impact of CC in agriculture Multi-media, flip chart, white board, markers, visual aids	Ask participants to share their understanding of the key learning points at the end of the session	The facilitator of this session should have thorough understating of the key policy documents; NAPA, CC policy, Agriculture Policy

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
	Explain the concept of program planning and budgeting & their processes in the context of CCA	<b>Program planning and CCA</b> <ul style="list-style-type: none"> <li>• Climate change sensitive program planning and management</li> <li>• Existing CCA efforts in agriculture</li> </ul>	Q & A and short lecture	1.5 hrs	Reading materials and examples in relation to CC sensitive program planning Multi-media, flip chart, white board, markers, visual aids	do	<p>The facilitator has to be familiar with government planning procedure.</p> <p>Relevant visual aids on various technologies representing existing efforts on CCA should be used for better understanding.</p>

## **IV. In-service Training for Frontline Extension Workers**

### **1. Introduction**

The frontline extension workers working under the Ministry of Agriculture and Cooperatives of the Government of Nepal are the key personnel active at the community level for the delivery of extension services. These frontline extension workers, have important role in advising and guiding farmers on CCA. There are two levels termed as Junior Technician (JT) and Junior Technical Assistant (JTA) with different basic academic qualifications. Frontline extension workers receive different training courses on various subject matters related to agriculture such as crop production, plant protection, vegetable production, extension methodology, training of trainers etc. The training course is implemented for one week as in-service training. As per the Civil Service Act and regulations of the Government, JT/JTAs has to undergo in-service training for 30 net working days and such training are linked with the career development opportunities. The proposed climate change adaptation module is expected to be integrated into one month in-service training.

### **2. Target Audience:**

Frontline Extension Workers

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### **3. Entry Behavior:**

Minimum four years experience in the field.

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### **4. Implementation Modalities:**

20-25 per batch. Trainings are conducted at Regional Agriculture Training Centers. Trainers are from different related organizations as Research centers, District Agriculture Development Offices, regular staff, NGOs, INGos, etc.

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## 5. Session Details

<b>Title of the module</b>	Technologies and Best Practices for Climate Change Adaptation
<b>Target trainees / participants</b>	Frontline Extension Workers
<b>Responsibility of the participants after training (they are expected to do what) -</b>	Upon completion of the training program, frontline extension workers will be able to assist farmers to adopt appropriate climate change adaptation technologies in various field crops
<b>Duration of the module</b>	Total 10 hours (includes 5 hours field visit)

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
1	<p>Explain general concepts of CCA</p> <p>Describe the importance of CCA in Nepalese context</p> <p>List important community adaptation practices in agriculture</p>	<p><b>Climate Change Adaptation Technology</b></p> <p>Concept of climate change adaptation</p> <p>Importance of CC in Nepalese agriculture</p> <p>Community based adaptation practices in agriculture</p>	<p>Question/Answer,</p> <p>Short lecture</p>	1.0 hr	<p>Reading materials and examples in relation to concept of CC in general, CCA in agriculture, visuals on community based adaptation practices, multi-media, flip chart, white board, markers, visual aids</p>	<p>Ask participants to share their understanding of the key learning points at the end of the session</p>	<p>The facilitator of this session should have thorough understanding of the concept on CCA, community based adaptation technologies</p>

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
							in agriculture,
	<p>Identify suitable crops and their varieties for drought conditions</p> <p>Select suitable crop varieties for water stagnation conditions</p> <p>Identify suitable crops for flooded area reclamation</p>	<p><b>Package of practices of various crops from climate change perspectives I</b></p> <ul style="list-style-type: none"> <li>• Identification of drought tolerant varieties of cereals, cash crops and vegetables</li> <li>• Selecting crop varieties suitable for water stagnation situation</li> <li>• Selection of crops varieties suitable for flooded area reclamation</li> </ul>	Q & A and short lecture	2.0 hrs	Reading materials and examples in relation to different crop varieties suitable for different farm conditions multi-media, flip chart, white board, markers, visual aids	do	The facilitator should have thorough understanding of different crop varieties suitable for various farm conditions
	<p>Describe water saving technologies suitable Nepalese conditions</p>	<p><b>Package of practices of various crops from climate change perspectives II</b></p> <ul style="list-style-type: none"> <li>• Application of water saving technologies</li> </ul>		2.0 hrs			

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
	<p>Explain concept and application of integrated plant nutrient management</p> <p>List out emerging pest and diseases resulting from the climate change in recent years</p>	<p>such as SRI, zero tillage</p> <ul style="list-style-type: none"> <li>•Adoption of Integrated Plants Nutrient Management System</li> <li>•Emerging pest and diseases on CC context and application of IPM</li> </ul>					
	<p>Appreciate the suitable technologies and best practices for adoption.</p>	<p><b>Field work</b></p> <ul style="list-style-type: none"> <li>•Field observation of best practices on soil and water management (such as rain water harvesting in plastic ponds), community adaptation practices on CCA and drought conditions, water stagnation resistant varieties, conservation agriculture</li> </ul>		5 hours			

## **V. Induction Training for Frontline Extension Workers**

### **1. Introduction**

The Frontline Extension Workers are recruited at two levels: Junior Technician (JT) and Junior Technical Assistant (JTA) with different basic academic qualifications. Those JT/JTAs are assigned to work with farmers in the field. Government has stopped to conduct induction training to this staff for the last few years. However, there is a growing realization for these training programs. Therefore, there are chances that these induction training programs will be conducted for a week after they join the service.

The overall objective of the induction course is to acquaint with the organizational setup and working procedures specifically procedures, organizational structure and the policy provisions. It is important to equip new staff about concept and existing situation on CCA in agriculture so that they could demonstrate better performance in the job situation. As Frontline Extension Workers, have important role in advising and guiding farmers on CCA.

### **2. Target Audience:**

Newly Recruited Frontline Extension Workers

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### **3. Entry Behavior:**

JTs have two years training in agriculture after High School or three years training in agriculture after Grade 10. JTAs have one year training in agriculture or two-year course in agriculture after Grade 8. They are semi-skilled staff and different kinds of need-based long- and short-term trainings are given (e.g. Group formation, human resource management skills, farm management, gender and social inclusion, Beekeeping, vegetable production, seed production, value chain management etc).

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### **4. Implementation Modalities:**

15-25 per batch. Trainings conduct at Regional Agriculture Training Centres Trainers are from different related organizations such as Research centres, District Agriculture Development Offices, regular staff, NGOs, INGOs, etc.

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### **5. Session Details**

<b>Title of the module</b>	Concepts and existing situation in climate change adaptation in agriculture
<b>Target trainees / participants</b>	Newly recruited Frontline Extension Workers
<b>Responsibility of the participants after training (they are expected to do what) -</b>	Aware farmers about climate change situation and its effect in agriculture
<b>Duration of the module</b>	3.0 hrs

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
	Explain the concepts and existing situation of CCA in agriculture	<b>Concept and existing situation on CCA</b> <ul style="list-style-type: none"> <li>• Concept of climate change adaption</li> <li>• Key priorities of NAPA in agriculture</li> <li>• National agriculture policy and CCA</li> </ul>	Question/Answer, Short lecture	1.5 hrs	Reading materials and examples in relation to impact of CC in agriculture multi-media, flip chart, white board, markers, visual aids	Ask participants to share their understanding of the key learning points at the end of the session	The facilitator of this session should have thorough understating of the concept on CCA, priorities of NAPA in agriculture and National

SN.	Enabling objectives	Contents	Methods / Activities	Duration (min./hr.)	Resources used	Methods of learning	Note by module
							Agriculture Policy
	Explain the efforts taken by Government of Nepal on CCA and food security	<b>Efforts of GoN on CCA and food security</b> <ul style="list-style-type: none"> <li>Existing CCA efforts in agriculture</li> <li>Food security relating climate change</li> </ul>	Q & A and short lecture	1.5 hrs	Reading materials and examples in relation to CC sensitive program planning multi-media, flip chart, white board, markers, visual aids	do	The facilitator has to be familiar with efforts taken by GoN on CCA and food security situation relating climate change

## Annexure I: Evaluation of Existing Training Programs

### Induction Training

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)		
1	Basic Orientation Training (Officer level)	2 weeks (12 working days)*	DAT	None	None				

Note: \* There will be 3 sessions in officer level comprising 90 minute per session. DAT stands for Directorate of Agricultural Training.

### In-Service Training

#### A. Officer level

Note: There will be 3-4 sessions in officer level course comprising 90 minute per session. DAT stands for Directorate of Agricultural Training.

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
1	Basic In-service	30 working days	DAT	Disaster management		Agriculture and related sectoral	administration and management skill	NA

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
	training on agricultural planning and management (G-II & G-III)			(1.5 hrs), Food security (1.5 hrs) & Agriculture development & environment (1.5 hrs)		policies and strategies, Tools and techniques of agricultural program planning, WTO and its implications on Nepalese agric., Social inclusion, gender mainstreaming, poverty alleviation, bilateral and international trade, agricultural marketing,	development, project work; project concept note writing, KAP test, proposal writing, report writing, sampling techniques, data processing and analysis	
2	Advance management training (G-II)	6 working days	DAT	None	None	Change management, Motivation, Administrative management, Good governance, Budgeting and accounting, ICT application in agricl,	Group exercise, field visit (7 hrs)	NA



S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
						program implementation and monitoring, national agril. extension strategies and devolution of agril. services		
3	Project based Agricultural Planning, Monitoring and Evaluation	12 working days	DAT	None	None	Project planning, project management, project monitoring and evaluation	None	NA
4	World Trade organization	6 working days	DAT	None	None	WTO; genesis, objectives, major agreements, domestic support measures, Market access, SPS measures, Technical barrier to trade, TRIPS, implications on	None	NA

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
						Nepalese agriculture, comparative and competitive advantage, import surge and trade remedy measures, dispute settlement mechanism, regional trading arrangements,		
5	Group approach, technology transfer and marketing management	6 working days	DAT	None	None	Transfer of technology, group dynamics, market management, production planning and marketing, preparation of food balance sheet, market information system, price collection and analysis,	production and use of audio-visual aids, field visit and exercises	NA
6	Bee keeping	6 working days	Commercial Entomology			Bee biology, annual cycle of a bee colony,	None	NA

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
			Directorate & DAT			seasonal management of bee, foraging behavior, bee pasture management, queen rearing, honey bee diseases and pests, bees and pesticide, bee products, its use and importance, apiary selection		
7	Disease and pest management in mandarin orange	6 working days	National Citrus Development Program & DAT	Overview of disease and pest problem (1.5 hrs), IPM approach (1.5 hrs), disease management (1.5 hrs)	None	Citrus decline, citrus greening, virus free citrus planting material development, fruit drop problem in citrus, roots rot, post harvest technology, post harvest disease management, IPM approach in insect disease management,	None	NA

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
8	Training of Trainees	12 working days	DAT	None	None	Organization of training course & implementation of training, evaluation & follow up of training	Planning & designing training course	NA
9	Biodiversity & agriculture	6 working days	DAT	Concept, importance & status of agro-biodiversity (ABD)-1.5 hrs, issues & policy of environment protection in Nepal (1.5 hrs), climate change & its implementation in agriculture (1.5 hrs), challenges in the biodiversity & food safety in	None	WTO/TRIPS & IPR, acts & regulation of ABD conservation & utilization, community biodiversity registration (CBR), experience of IUCN & ICIMOD related to CBR	None	NA

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
				Nepal (1.5 hrs)				
10	Mainstreaming gender equity in agriculture development	6 working days	DAT	None	None	Gender concepts, gender perspective in agricultural development policies & plans, mainstreaming gender in agriculture	_____	NA

## B. Frontline Extension Workers

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E (% of Technology adoption )
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
1	Cereals seed production technology (rice, wheat , maize)	6 working days	RATCs	None	None	Principle of seed production, characteristic of quality seed, certification of seed, sample collection, seed examination, storage, rule, regulation & norms of seed, insects & diseases of rice ,wheat & maize & their control measures	None	53%
2	Agricultural communication and extension	6 working days	RATCs	None	None	Importance, model/element, media, principle, strategy, system of communication, extension system, agri extension methodology, research, training, farmer group, motivation, women participation, decentralization, contract out & effective communication tools	None	45%

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E (% of Technology adoption )
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
3	Training of trainers	12 working days	RATCs	None	None	TNA, course design, training methods, lesson plan, facilitation skill, listening skill, motivation, communication skill, team work, training management, training evaluation,	TNA, course design, training methods, lesson plan	82%
4	Basic in-service training	35 working days	RATCs	Soil management (1.5 hrs), erosion (1.5 hrs), IPM (1.5 hrs), agro-metrology (1.5 hrs)	None	Agri-extension, agri-marketing, plant protection, horticulture, agronomy, fisheries	None	58%
5	Group formation and social mobilization	6 working days	RATCs	None	None	Concept, types of group, meeting conduction, promotion, accounting & M & E of the group, conflict	None	53%

S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E (% of Technology adoption )
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
						management, leadership		
6	Market management & planning	6 working days	RATCs	None	None	APP, steps of planning, M & E, PC/PS, PRA, C/B analysis, data collection, BUP/projectization, log frame	None	46%
7	Offseason vegetable and seed production	6 working days	RATCs	None	None	Importance, present situation, demand, feasible area of off-season vegetable, APP, seedling production, manure, micro nutrient for off- season vegetable, off-season vegetable production techniques for different kinds of vegetables, quality seed production techniques of vegetables	None	60%
8	World trade organization and Nepal's agricultural sector	10 working days	RATCs	None	None	Objective of WTO, AOA, TRIPS, SPS, quarantine measures, SAARC, BIMSTEC	None	30%



S.No	Course Title	Overall Duration	Implementing agencies	CCA course contents (if any)		Other course content (list of sessions)		Important notes from M&E (% of Technology adoption )
				Knowledge areas (duration, hrs)	Skills areas (duration, hrs)	Knowledge (hrs)	Skills (hrs)	
9	Human resource development and farm management	12 working days	DAT	None	None	Positive thinking, leadership, motivation, community development, presentation skill, ethics, team building, interpersonal communication, life management, need assessment, PC/PS, KAP, farm record keeping, data analysis, C/B analysis, planning, project proposal, report writing	None	80%
							Average	56.3 %

Note: There will be 3-4 sessions in frontline extension workers level course comprising 90 minute per session.

Source: Training Curriculum Manual, Directorate of Agricultural Training (DAT), 2009 and DAT Annual Progress Report, 2010,

## Annexure II: Summary of perceived changes, impacts on livelihoods, coping mechanisms and future risks

Communities' perception of change	Experienced impacts on livelihood systems	Coping and adaptation	Potential future risks
Decrease in rainfall and unpredictable onset of monsoon	Overall decline in agricultural productivity	Replacement of rice with finger millet; purchasing rice; barter; improvising with new (cash) crops; delayed sowing	Growing food and livelihood insecurity
Longer dry spells; in some places drought like conditions	Drying up of springs; less flow in springs and streams	Irrigation systems opened on a rotational basis; traditional water sharing system in Almora Delayed sowing time in irrigated fields at the far end of channels	Scarcity of water for drinking and agriculture; increase in health problems; increased workload for women and children; children staying away from school Crop failure
Higher temperatures linked with decreased water availability	Lack of fodder; in some places lack of water for animals Land becoming less productive	Sell off dairy animals; shift to smaller livestock, particularly goats (maladaptation?); barter fodder for manure Less land area under cultivation; buying food	Risk of malnutrition; increased drudgery Dependence on cash income; food insecurity
Warmer winters and significantly less snowfall	Increased incidence of pests and diseases, e.g. white grub 'karmula' attacking roots Double flowering of Malta orange and apple trees	Installation of karmula traps; increased use of insecticides and pesticides; use of ash and salt No coping strategy	Increased food and livelihood insecurity Degradation of orchards; income insecurity

Source: List of priority actions, NAPA, 2010

## Annexure III: Climate Change Adaptation Framework for Food Security

Adaptation refers to the adjustments in human and natural systems to respond to actual or expected climate change impacts. It is also policies, practices and strategies to moderate damage or realizing opportunities associated with climate change variability and extremes. Two major kinds of adaptation are autonomous and planned adaptation. Autonomous adaptation is an automatic and gradual inbuilt capacity to adjust to climate change whereas planned adaptations are intended and conscious policy and strategic responses aimed at altering the adaptive capacity of the system or facilitating specific adaptations. There are ranges of adaptive measures – technological, managerial and policy or political measures. Any adaptive measures aim to ensure people’s livelihoods and economy that are resilient to the climate change. It is a process and not a one-shot activity. Adaptation framework must include some key elements of process like assessment of climate risks, identifying adaptation options and prioritizing specific adaptation responses, implementation, and monitoring and evaluation to see that changes are occurring and actions taken are effective.

In view of the diverse climate conditions and associated impacts on agriculture, adaptation planning cannot be done on the basis of global knowledge alone. It is therefore important to conduct local research to generate knowledge of climate change risks and identifying cost-effective mitigation and adaptation options. Agricultural research and development has to play a key role in developing adaptive technology and diffusion of innovations under climate change context. Extension services are also expected to be more effective in promoting farmers adaptation practices, knowledge and capacity building to be able to sustain agriculture and food security at household and regional levels. Apart from research the range of measures that are used to address the climate change adaptations are diverse that may include policy, technological and management responses. The climate change adaptation framework for food security is presented below.

### Climate change adaptation framework for food security in Nepal.

Sector/ Subsector	Strategy	Adaptation Measures
A. Food Availability		-
Crop Production Management	Food Self Sufficiency	<ul style="list-style-type: none"> <li>- Develop &amp; select tolerant crop varieties and cultivars through adaptive research for drought, heat and flood situation</li> <li>- Use more disease and pest tolerant varieties</li> <li>- Promote local and indigenous crop cultivars</li> <li>- Develop early maturing varieties</li> <li>- Adjust sowing dates based on rainfall patterns</li> <li>- Alter the use of fertilizer/pesticide</li> <li>- Invest on resource centers</li> <li>- Ensure good quality seeds and planting materials</li> <li>- Implement food production &amp; self reliance program in food deficit remote districts</li> </ul>
Agricultural Infrastructure	Improved Efficiency	<ul style="list-style-type: none"> <li>- Develop Agricultural Road</li> <li>- Improve &amp; rehabilitate existing irrigation facility</li> <li>- Promote rainwater harvest and micro irrigation systems in hill and mountain districts</li> <li>- Develop market structure, collection centers and</li> </ul>

Sector/ Subsector	Strategy	Adaptation Measures
		information system - Encourage gravity rope way to reduce transport cost - Improve post harvest technology to reduce losses
Redesign Cropping System	Enhancing Sustainability	- Encourage secondary, indigenous crops, tubers and beans in the upland and dry areas - Encourage horticultural crops, agro forestry, herbs and non-timber forest products - Encourage nitrogen fixing and legume crops - Promote the use of organic fertilizer, manure bio pesticide - Implement resource conservation technology - Crop diversification, multiple cropping and catch crops - Practice crop rotation and conserve agro- biodiversity - Integrated nutrient management and soil fertility improvement
Livestock Production and Management	Improve Production	- Improve feeding practices - Breed livestock for greater tolerance and productivity - Plant, suitable fodder and grass species - Improve pasture and grazing management - Provide better management and veterinary services - Better surveillance and control of trans-boundary pest and diseases - Livestock product diversification
B. Food Access (Physical & Economic Access to Food)	Enhance local food production and income	- Invest on high value crops and commodities - Establish community seed and food bank - Develop market networks - Remove market and trade barriers - Create local employments for food unsecured households - Price control and subsidized food for poor and vulnerable - Implement cash for work program - Food for food production program - Targeted food distribution as emergency aid
C. Food Utilization	Achieving Nutritional Security	- Implement food preparation and dietary diversity program - Include varieties in food distribution and consumption - Encourage kitchen gardening and vegetable intake - Create awareness on balance and nutritious food, sanitation practices and health care
D. Stability and Sustainability	Promoting stability in food production, supply and livelihood recovery	- Establish and strengthened early warning system - Launch crop and livestock insurance - Incorporate disaster risk management program and emergency preparedness in agriculture - Establish and enlarge agriculture disaster relief and recovery fund within the ministry (MOAC) - Improve the capacity of Nepal Food Corporation - Establish DRM unit in MOAC - Assess vulnerability and produce maps

Sector/ Subsector	Strategy	Adaptation Measures
E. Policy Support on Food Security	Building environment for achieving food security	<ul style="list-style-type: none"> <li>- Develop a comprehensive National Food Security Plan</li> <li>- Establish Food Security Division and Climate Change Unit in the Ministry of Agriculture and Cooperatives</li> <li>- Improve Nepal Agriculture Research Council's capacity to generate knowledge and technology under climate change</li> <li>- Promulgate National Food Security Act and Land Use Act</li> <li>- Bring out food policy and biotechnology policy in relation to bio-security, LMO and GMO food</li> <li>- Implement and Enforce Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security (Adopted by the 127th Session of FAO Council, 2004)</li> </ul>

Source: Food security and climate change adaptation framework; issues and challenges by Dr. H. Dahal and Dr. D.R. Khanal.

----- **END of Country Reports** -----

## 4.0 CONCLUSIONS

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From overall observation on the initiation, progress and implementation of the project, it can be concluded that the objective with which this project was developed has been fulfilled successfully. The TNA was conducted by the countries using the methodology developed by the Institute for Global Environmental Strategies (IGES) and based on its findings training modules were developed in a multi-disciplinary approach. During the process, gaps were identified and recommendations were made by the countries in terms of inadequacies of human resources and infrastructures in addressing climate change adaptation issues as well as areas where research is necessary. Although, needs, curriculum requirements and gaps were common across the countries, there were areas where these differed contextually and these have been meticulously covered.

During the module development workshop, it was observed that the course designers and trainers who have had background and practiced in teaching or training at university level or training institute were able to learn faster than those who were from government agencies. The common challenges found in all countries was that the training modules were overwhelming with training contents, lack of focuses and not satisfactorily aligned with the training objectives. This is a typical drawback from limitation of knowledge on application of adult learning in training design.

It was important to address that not all gaps of capacity could be solved by training intervention. Most of the countries needed to revisit whether capacity of governments to implement climate change adaptation should be intervened by only training. One has to understand that some causes of having less capacity may be from policy regulations, administration, personnel management and incentive & motivation. It is essential to separate gap of knowledge, skills and practices from other people management gaps so appropriate training solutions could be prescribed.

With regard to training methodology, most countries knew that it is important to select effective training methods, however, it was reflect that the methods used were conventional and not consider long term impact of the training. Since climate change adaptation practices would take time to yield tangible results generated by target audience. The adaption itself is part of learning process and it would be effective when there is time and resources that allow target audience to pilot and learn from mistake. This way it would lead to sustainability of the programs.

## 5.0 FUTURE DIRECTIONS

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When addressing CCA in policies, it is appropriate to consider its overlap with development issues and implications as well as deliberate other drivers of change besides climate variability. Deriving from the discussions during the meetings and information given in the country reports, the overall policy suggestions are divided into four categories, which are:

- i) Research
- ii) Human resource and institutional strengthening
- iii) Awareness, knowledge and information dissemination

### **i) Research**

- There is no sufficient information in terms of knowledge and skill areas that training designers can readily refer and use for developing appropriate training programs. Most available information is too broad and difficult to use for developing targeted training programs for targeted audience. At the current level of available information, it is only possible to identify broad areas of knowledge and skills in training programs and the specific content would have to be improvised by the subject matter specialists at the time of imparting the training.
- When formulating policies, designing materials, preparing curriculum for CCA, it is absolutely necessary to integrate local knowledge and practices on adaptation activities. It is therefore necessary to encourage on climate change risks, vulnerabilities, cost-effective and tangible adaptation options and possible funding sources at local level research.
- Agricultural research and development has to play a key role in developing and diffusing innovative adaptive technologies in the context of climate change.
- Training content must include some key elements of processes like assessment of climate risks, identifying adaptation options and prioritizing specific adaptation responses, implementation, and monitoring and evaluation to see that changes are occurring and actions taken are effective.

### **ii) Human resource and institutional strengthening**

Implementation of CCA requires strong institutional back up with capable human resource system and available institutional mechanisms. Lack of proper institutional arrangement, human resource to deal with adaptation issues and proper facilities to implement trainings and outreach activities are some of the common limitations faced by the countries. Hence the suggested policy provisions are:

- The human resource development plans and policies of the individual countries are the paramount instruments influencing capacity building the project countries. There is very little emphasis given to human resource development in general in many of the project countries reflecting the developmental status of each country. Hence, there is a need to review the existing human resource policies and plans in project countries and to integrate elements related to climate change adaptation, reflecting lessons learned from this project, so that the effect can be seen in all important climate vulnerable sectors in these countries.

- Revive, upgrade and/or establish training institutions to deliver CCA related trainings and other capacity building activities. Clear terms of reference, tangible outputs and secured financial resources are the key factors to ensure institutional strengthening.
- Develop a core group of trainers specialized in CCA through collaborations with regional and international agencies. Upgrade the capacity of trainers at various ministries and department in curriculum development through various mechanisms like TOT, research, exchange visits, twinning arrangement, etc.
- Enhance knowledge and build capability of communities through development and dissemination of IEC materials on CCA and organization of knowledge sharing forums in collaboration with the local governments and line agencies.
- Build capacities of extension services which can effectively promote farmers' knowledge on adaptation practices to enable them to sustain agriculture and food security at household and community levels.
- When designing trainings, specificity regarding the source of fund for adaptation programs or activities is essential.

### **iii) Awareness, knowledge and information dissemination**

The country reports suggest that climate change is an emerging issue; however, there is lack of adequate knowledge and information among general people as well as policy makers regarding climate change adaptation. In many countries, mitigation is given more priority over adaptation despite the countries' vulnerability to the impacts of climate change and a dire need to implement adaptation practices. This void is creating much difficulty in implementing adaptation actions and needs to be addressed with urgency. Some of the suggested policy provisions are:

- Organize awareness raising programs on climate change adaptation with the involvement and participation of academia, professionals from public and private sectors, and people and organizations from the formal and informal sectors directly or indirectly associated with climate change issues.
- Inclusion of climate change adaptation in educational curricula at colleges, universities, technical schools and professional certificate programs as part of CCA mainstreaming.
- Integrate CCA plans and policies with the national development plans and poverty reduction strategy and implement as adequately linked programs than as discrete programs undertaken isolation.
- Update, share and disseminate climate change data across different sectors for regional/national knowledge management.



## 6.0 REFERENCES

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## **APPENDICES**

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### **APPENDIX 1: Meetings proceedings (3 meetings)**

Appendix 1a: 1<sup>st</sup> TNA Meeting, 31<sup>st</sup> January 2011, Bangkok

Appendix 1b: 2<sup>nd</sup> TNA Meeting, 11<sup>th</sup> March 2011, Bangkok

Appendix 1c: 3<sup>rd</sup> Meeting (Training Module Design Workshop), 10<sup>th</sup> – 12<sup>th</sup> August 2011, Bangkok

### **APPENDIX 2: All forms and outlines**

Appendix 2a: Training Needs Assessment Forms

Appendix 2b: Evaluation Sheet of Existing Training Programs

Appendix 2c: Outline of a Generic Training Module

Appendix 2d: Outline of Country Reports

### **APPENDIX 3: Article for APN Newsletter and Progress Report**

Appendix 3a: Article for APN Newsletter

Appendix 3b: Progress Report

**APPENDIX 1: Meetings proceedings (3 meetings)**

Appendix 1a: 1<sup>st</sup> TNA Meeting, 31<sup>st</sup> January 2011, Bangkok

Appendix 1b: 2<sup>nd</sup> TNA Meeting, 11<sup>th</sup> March 2011, Bangkok

Appendix 1c: 3rd Meeting (Training Module Design Workshop), 10<sup>th</sup> – 12<sup>th</sup> August 2011, Bangkok



## Proceedings

1<sup>st</sup> Training Needs Assessment Meeting  
Asian Institute of Technology, Bangkok, Thailand  
January 31, 2011

**APN Funded Project CBA2010-09NSY-Okayama:  
Scientific Capacity Development of the Trainers  
and Policy-Makers for Climate Change Adaptation  
Planning in Asia and the Pacific**

UNEP Asia-Pacific Adaptation Network  
AIT, Bangkok, Thailand



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## Acknowledgements

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This activity would not have been successful without the financial support from the Asia-Pacific Network for Global Change Research (APN) through funding of the project entitled 'Scientific Capacity Development of the Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific' which is being implemented in Cambodia, Lao PDR, Mongolia, Bangladesh and Nepal.

### **Toshinao Okayama**

Coordinator

Regional Hub for Asia Pacific Climate Change Adaptation Network

## Key Messages

The following key messages have emerged out of the presentations made and ensued discussions during the First Training Needs Assessment Meeting:

1. Climate change adaptation is also an issue of capacity building and capacity building of key stakeholders is of paramount importance for promoting climate change adaptation in some of the most vulnerable sectors and countries in the Asia-Pacific region. Awareness generation and capacity building of policy makers is the key since they are crucial to bring change in various government related processes and the society at large.
2. There have already been several initiatives by various international and national agencies for training and capacity building of key stakeholders. Training and capacity building of various government staff and trainers in the region have been facilitated by both formalized systems consisting of induction and on-the-job training programs and ad-hoc training programs that are conducted from time to time when resources are available. However, they are too few and inadequate in terms of their design and implementation.
3. Discussions revealed the presence of training and capacity needs assessments for adaptation for priority sectors in some of the project countries. However, the nature and details of these training and capacity needs are not yet clear and have to be taken into consideration before making any further interventions in this area.
4. Formulation of draft training modules and pilot programs should not be seen as an end but only as a beginning for creating enabling environment for engagement of different stakeholders. Active and coordinated engagement of national and local governments and other stakeholders is crucial to regularize training and capacity building programs in the Asia-Pacific region.
5. The Asia-Pacific Adaptation Network is well placed to play an important role as a facilitator to bring various stakeholders together and to initiate training needs assessment and formulation of draft training modules and pilot training programs for the most vulnerable sectors in the Asia-Pacific region. However, piloting and scaling up of these initiatives require proactive participation of various stakeholders including the support from governments, NGOs, national and local institutions and donor agencies.

### 1. BACKGROUND AND MEETING OBJECTIVES

Climate change has been projected to have critical impacts on socio-economic development and poverty reduction globally and in the Asia-Pacific region. The Asia-Pacific region, which accounts for two-thirds of the world's poor living on less than \$1 a day depending on primary sectors such as agriculture, is one of the most vulnerable regions to climate change. Thus, effective implementation of adaptation and capacity building actions is the key to reducing vulnerability of the Asia-Pacific countries to climate change.

Since 2008, United Nations Environment Programme (UNEP) in partnership with key UN agencies and international organizations has been facilitating the development of a Global Adaptation Network (GAN) which composes of four Regional Networks in developing regions: Africa, Asia-Pacific, West Asia, and Latin America and the Caribbean. The Asia Pacific Adaptation Network (APAN) was launched in Bangkok as a part of the GAN by Prime Minister of Thailand in October 2009 and

began its implementation in March 2010. The APAN's Regional Hub is co-hosted by AIT-UNEP RRC.AP<sup>3</sup> and IGES<sup>4</sup> and currently located in AIT-UNEP RRC.AP, Bangkok, Thailand.

APAN aims to help countries in the region to build climate resilience of vulnerable human systems, ecosystems and economies through the mobilization and sharing of knowledge and technologies to support adaptation capacity building, policy-setting, planning and practices. One of its objectives is to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into developmental planning and programming in targeted countries, including Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal.

For this capacity building objective, the project entitled "Scientific capacity development of trainers and policy-makers for climate change adaptation planning in the Asia and Pacific" has been approved by the Asia-Pacific Network for Global Change Research (APN) for funding starting November 2010. The main objectives of this project are to:

- Undertake appraisal of training needs (training needs assessment, TNA) in terms of knowledge and skill areas for effective adaptation; and
- Design training modules for imparting knowledge and skills for effective adaptation.

As a pilot initiative, the APN project has aimed to focus on agriculture sector as the most vulnerable sector to climate change in the project countries. However, the extended objectives during and beyond this project duration that have direct connection to the continuity of the APN project are to:

- Help create enabling environment in project countries for strengthening capacity building through interventions at the policy level.
- Help deliver training programmes for trainers in key training institutions and for key policymakers in the region;
- Enable training institutions and trainers to implement training programs to the ultimate beneficiary i.e. staff employed by agriculture sector; and
- Institutionalize the modalities for assessing the impact of the above activities and provide policy feedback to the countries involved.

Therefore, as training needs assessment (TNA) is the first step for the design and development of capacity-building programmes, this meeting was organized to:

- Introduce the partners to APAN and its capacity building agenda,
- Reach a consensus on the modalities for implementing APN project on training modules development,
- Obtain preliminary information and discussion on national systems for capacity building, and
- Agree to cooperate to develop national strategies for capacity building (long-term).

As a part of the APN project, key national level training institutions active in training policy makers and other government staff were targeted to survey on their existing training programmes or modules for agriculture sector (and water sector related to agriculture) and to identify the specific needs and gaps of the trainers. The national or sub-national government staff working in these sectors was also invited as they are the end-users of the training modules developed after TNA.

In addition, the national level training institutions, as national partners of APN project and beyond, through this meeting have provided an opportunity to discuss about the APN funded project and roadmap beyond along with some guidelines on how to conduct specific TNA. At the same time, by

<sup>3</sup> AIT-UNEP RRC.AP: Asian Institute of Technology-United Nations Environment Programmes Regional Resource Center for Asia and the Pacific

<sup>4</sup> IGES: Institute for Global Environmental Strategies



keeping the national and sub-national level staff informed about APAN, the meeting also has contributed to the expansion of the network to different departments, institutions, and organizations working on climate change adaptation.

## 2. MEETING PROCEEDINGS

Ms. Izumi Tsurita, IGES Headquarters, welcomed all participants and informed participants about the agenda. The meeting participants shortly introduced about themselves.

### 2.1 Opening Remarks and Introductions

- **Opening remarks – Dr. Toshinao Okayama, Coordinator of APAN’s Regional Hub:**

Dr. Okayama welcomed all participants and delivered his opening remarks. He informed the audiences about APN project, donors and how the project is getting helps from various partners, especially the adaptation platform which is one of the implementing partners of APAN. He stressed that capacity building is an important aspect of adaptation and it is one of the major components of APAN. The final goal of the project for 2011 is to develop the training modules which then will be piloted in the Asia-Pacific region. APAN activities were initiated in 2010 and have steadily progressed over the past year. The Keio University in Japan also becomes implementing partner for APAN. He hoped that this meeting will be successful and establish a baseline for future meetings.

- **Overview of APAN – Dr. Toshinao Okayama:**

UNFCCC SBSTA has observed the importance of adaptation for most of the developing countries and how networks can help in meeting this objective. To respond to this suggestion, UNEP has organized several consultation meetings, such as international consultation meeting in 2008 and four regional consultation meetings in Asia, Pacific, Latin America, and Caribbean in 2009. It has established 4 regional networks among which Asia Pacific Adaptation Network (APAN) was officially launched on 3<sup>rd</sup> October 2010. Asia Pacific region is hence a pioneer among the four networks. The Latin America and Caribbean network is also being launched in March 2011.

APAN has three important bodies. Steering Committee is the decision making body of APAN. Under Steering Committee, the Regional Hub is the implementing body of APAN and it is co-hosted by UNEP-AIT/RRC.AP and IGES. The Regional Nodes are nodal points for APAN activities at sub-regional level. Among these bodies, Steering Committee has already been established with the representation from Japan and other countries in the AP region with a total strength of 11 members. Sub-regional nodes have not yet been decided, thus one of the main objectives of APAN in 2011 is to establish the sub-regional nodes in each sub-region.

In the inception phase of APAN, 2010-2011, four included components are (1) Improving availability and accessibility of adaptation knowledge, (2) strengthening knowledge support to governments, communities, and development partners, (3) improving access to adaptation finance mechanism, and (4) building capacity on adaptation knowledge and technology. The first two components are organized through an online portal, organizing forums, etc. This first TNA meeting is one of the activities of component 4.

Dr. Okayama explained about the case of Mongolia which is implementing various knowledge and capacity building activities. He informed that in 2011 the UNFCCC is developing the toolkits to access adaptation fund. Hence, after developing the toolkit, the Adaptation Fund Board will organize regional workshop and APAN will organize sub-regional workshops to disseminate the toolkits. Under capacity building component, he informed that a new project has been established and funded by Japanese government starting from this year. The purpose of this

project is to transfer technologies from Japan to Asia and the Pacific through collaboration with international organizations, private companies and research institutes.

**Q&A:**

Dr. King highlighted the importance of the involvement of sub-regional nodes. It is impossible or a little bit risky to jump from regional to national without involving sub regional nodes. In response, Dr. Okayama said that in the next meeting the role of the sub regional nodes would be defined.

Dr. Kumar highlighted two points: (1) There is a risk of duplication as many other similar projects have been (and being) done. Therefore, there should be the need of establishing collaboration to avoid duplication and to study the projects ongoing at the national level. (2) Often no knowledge is available at the national level, thus there is the need to develop new knowledge to apply. Dr. Okayama responded that APAN is establishing collaborations and sharing knowledge.

- ***Capacity Building Component of APAN – Dr. Le Thi Thu Huong, APAN:***

As adaptation is a multi- and inter-disciplinary solution to cope with the climate change, Dr. Le highlighted that capacity building on adaptation is vital for AP region which is one the most vulnerable areas to climate change impacts. However, capacity building on adaptation is being one of the neglected areas of governance in the region. Thus, under APAN, capacity building component has two main activities which are: (1) strengthening training institutes and training programs and (2) building/developing capacity of public and private decision makers. In other words, through providing training to trainers, it aims to influence the policy makers and practitioners. Under this component, the innovative adaptation knowledge and good practices will also be transferred and shared among countries in the region. She informed the participants about the APN project, its scopes and objectives, expected outputs. Different events and activities under this project and beyond will also be planned with a clear timeframe for 2011 until March 2012.

**Q&A:**

Dr. King raised a question on the relation of ‘capacity building’ component to sub-regional nodes. In response, Dr. Okayama said that from beginning APAN did have the sub-regional nodes, thus capacity building component did not consider the sub-regional nodes. Right now, the criteria for identifying sub-regional nodes have not yet been decided. Thus, only after the decision is made, the sub-regional nodes will be involved in project activities. Dr. King also questioned on the training modules developed by APN project, either one synthesis module for all five countries or separate module for each individual country. Dr. Le explained that because the targeted countries have different contexts and characteristics, the project aims to develop separate module for each country (as “no one can fit all”).

Dr. Kumar concerned about the linkages between APN project with other capacity building activities on adaptation being done in the region and how can this project benefit from the others. Mr. Haryadi questioned on the sectors and countries covered by the project. In response, Dr. Le explained that APN project is just a part of APAN and it covers only agriculture sector; while capacity building component of APAN covers broader sectors including agriculture and water in the vulnerable areas such as high mountains and glaciers, mega river basins, dry-lands and coastal zones. Dr. Prabhakar explained that the five countries were chosen because they are the most vulnerable areas for agriculture in the AP region and were identified as priority countries during the initial consultation meetings organized for formation of APAN. Dr Prabhakar also has clarified that the project will review the ongoing training and capacity building activities in the project countries and will benefit from those experiences at the national level.

- ***Climate Change Adaptation and System of Rice Intensification (SRI)– Dr. Abha Mishra, AIT:***

Dr. Mishra presented about the project of herself and her colleagues on SRI in relation with climate change. They have reports from various countries on SRI performance not only about rice but also for wheat and sugar cane. She emphasized that we are working with SRI on learning mode rather than on recommendation mode. However, in most cases, SRI is treated as technology rather than concept and so progress has been slow so far. The SRI concept has to be converted into local practices to address the location specific needs.

#### **Q&A:**

Dr. Prabhakar questioned on the capacity related challenges of SRI that the project team experienced. Dr. Mishra explained that most of the time, SRI is treated as technology rather than a concept, and so during implementation peoples do not give considerable emphasis on location-specific adaptation rather they operate with 'technology transfer' mode. As for example, one of the SRI principles is to transplant very young seedling i.e. at 2-3 leaf stage or 12-15 day-old. She explained that it is important to consider the 2-3 leaf stage (physiological stage of the plant) rather solely focusing on 12-15 days. Since 2-3 leaf stage will vary according to temperature, humidity and other climatic factors. Location specific approach is necessary to accommodate the bio-physical and socio-economic heterogeneity of the farming system. One of the representatives of Laos told that the technology has not expanded due to the problem related to transplanting.

When conventional, they can easily transplant but now with very young seedling they need to be very careful to transplant. So, this consumes labor and Laos has labor problem. Dr. Mishra explained that this is one of the constraints reported in Thailand as well. However, farmers of Ratchaburi province of Thailand, as a part of adaptation work supported by AIT and funded by UNEP's APFED Showcase Programme, came up with very innovative idea. They integrated Parachute transplanting method with SRI's young seedling principle to reduce labour, transplanting time, and associated cost.

## **2.2 Country Presentations**

- **Bangladesh:** (there was no presentation but the slides are included in meeting documents)
- **Cambodia:**

Dr. Kang, Dean of Faculty of Agricultural Technology and Management, Royal University of Agriculture, provided the information on education and agriculture capacity building based in her university. She talked about the history, system of providing credits, and constrains in conducting training such as low technical capacity of local staff, lack of climate change research, limited funding and financial resources. The issues raised in relation to climate change studies were the lack of reliable data availability, limited cooperation from institutional agencies on research and studies on climate change, and lack of qualified national climate change experts.

As more than 80% of people in Cambodia are rural population who have been mostly employed in agriculture sector, there is a need to increase the adaptation capacities through training. Therefore, she expected that the Network will help her country to increasing cooperation and collaboration with international agencies, help in building capacity for local staff and improve training materials on subjects related to climate change.

- **Lao:**

Dr. Sacklokham, Vice-Dean of Faculty of Agriculture, National University of Lao, provided general overview of the university such as staff numbers and education programs, especially the bridging program and training for government staff from ministries and departments. Then the national adaptation projects supported by AusAIDs, GEF, and ADB were briefly introduced. She pointed out that there was no information on NGO activities which needs to be explored from now on.

### **Q&A for both presentations of Cambodia and Lao:**

There is a need to increase awareness of policy makers because if they are blinded or do not want to help contribute to issues related to climate change, no change will take place. Therefore, the mindset of these policy makers needs to be changed. In other words, policy makers can represent the barrier to the application of adaptation strategies.

A question was raised on whether there is any self assessment conducted for each project or not. In response, Laos participants said that beyond training needs assessment (TNA), they have also conducted vulnerability assessments for the poor farmers to help increase their capacity. In Cambodia, there have been several assessments conducted for NAPA project which started in 1999 and submitted first report in 2002. The latest report was in 2006 and Cambodia needs updates. In Nepal, climate change adaptation for food security needs TNA. As climate change is a new venture in education and training, every sector needs awareness raising especially for policy makers so that they can make change in policy framework.

- **Mongolia:**

Dr. Tumurtogtokh, Director of School of Ecology and Technological Development, State University of Agriculture, firstly introduced the aim and targets of his university in education and training. Then the general information of Agriculture in Mongolia was presented including the past climatic impacts such as desertification, drought, and dzud. He also presented some planning options for Mongolia to adapt to the changing climate in which the training upon the existing capacity was stressed as one of the most important measures for strengthening the adaptive capacity.

- **Nepal:**

Mr. Shrestha, Director of Center for Organization Development, Nepal Administrative Staff College, presented that his institution is the only national level training institution. He emphasized that climate change training needs awareness raising activities and sustainable approaches to each project. Some challenges ahead in training were also concerned such as lack of training modules and materials, insufficient trainers' competency, as well as little understanding and awareness on the need of training for climate change adaptation.

### **Q&A for both presentation of Mongolia and Nepal:**

Dr. King raised a question on the prioritized level to provide training in Nepal (or all levels at the same time). Mr. Shrestha answered that first priority is to training the policy makers because it is difficult to access and change the attitude of policy makers in applying adaptation knowledge into their policies. Then, through top-down process these policy makers can bring down to the community level. He highlighted the issue of sustaining and institutionalizing the training modules. He also suggested that APAN should meet the national partners more often to keep updated.

One other participant from Nepal, Mr. Paudyal, presented the training needs from government side. According to him, government staff, especially the ministry level staff, needs to be trained on assessment of climate change vulnerability, diversification of climate change and climate change risk or disaster management.

## **2.3 APN Project and Training Needs Assessment for Agriculture Sector**

Dr. Prabhakar, Adaptation Team, IGES Headquarters, presented the purposes and process of TNA. He provided detailed guidelines on how to conduct TNA and explained about the questionnaire forms. He also summed up for what needs to be done after this TNA meeting, especially the need to establish a TNA Team in each country which includes agriculture expert, climate change

adaptation expert and departmental expert (i.e. who works within the agriculture department). His presentation was ended with a list of issues for open discussion which is summarized in the following session.

## 2.4 Discussions

Dr. Prabhakar led the discussion session with the supports from APAN and IGES colleagues.

### ▪ General discussions:

Questions/issues of concern	Answers/responses
To what level of staff does APN project target to provide training? (Dr. King)	All levels from national to village level
What kind of training will the project provide? (Dr. King)	Induction training and on-the-job training.
How many respondents are needed for questionnaire survey (sample size)? (Mr. Hok)	It is not a quantitative research, thus it is not necessary to fix the sample size. For instance, 2-3 national staff, 4-5 provincial staff, 4-5 departmental staff, etc.
How to analyze questionnaire result (which program will be used, eg. SPSS?) (Mr. Hok)	Cannot use SPSS if the number of respondents in five countries is not comparable. We do not need the statistical analysis.
APAN should produce training materials (manuals) (Mr. Shrestha)	Yes, training modules will be developed and kept for one year to be piloted. Training materials (manuals) will be developed before piloting the modules but not as a part of APN project.
Countries have different context, thus does the same questionnaire can work effectively? Is it better to provide a check list to know what kinds of training they need? (Dr. Alam)	The national context and framework have actually been taken in to account in developing this questionnaire. However, the questionnaire will have to be modified to make it little less open ended by providing a broad categories of checklist of knowledge and skill areas.
How about the climate change adaptation and agriculture experts? Is the project going to train the experts? (Dr. King)  We need to create agriculture experts with climate change adaptation knowledge who later will be the trainers in their own countries	Not yet included in the current APN project but this group can be included in the suggestions part in each country report and in the synthesis report. This is because the process to produce experts are different from the process and ultimate stakeholders

(Mr. Paudyal)	envisaged in the current APN project.
Several modalities of training can be applied to different target groups	These issues will be covered by APAN under capacity building component.

▪ **Overall process of TNA:**

- Establish TNA team:

The national partners of APN project should be the national level training institute like Nepal Administrative Staff College. For the universities (like the case of Lao, Cambodia and Mongolia), they need to link with the training institutes and include them in the TNA Team.

- Characterize the ‘ideal capacity’ scenario through desk review of: In order to compare the existing knowledge and skill areas, each country needs to characterize what is called an ‘ideal knowledge and skill scenario’ for each trainer and agriculture officer in their countries for the job duties they perform. This ideal scenario/profile can be formulated by reviewing the following documents. This should be done through formulation of the TNA team (discussed above) and with the helps of the agriculture and adaptation experts of the team.

- IPCC reports
- NAPAs
- Vulnerability & Risk Assessments
- Technology needs assessments
- Climate change impact assessments

- Conduct questionnaire survey (forms I, II, III, and IV)

▪ **Funding utilization, financial guidelines, etc.**

The financial regulations of APN were shown and explained such as remuneration, rates for per diem, how to submit receipts/bills, etc. There were several discussions on these such as it is difficult to get receipts for all activities, why there is difference in the rates for accommodation and daily subsistence allowance (DSA) for countries, etc. Especially if the contract is signed through the institutions, there will be a matter of administration, overhead cut, financial auditing, etc.

The APN project team agreed that there was certain constraint in applying these regulations and the team would write a letter to APN for clarification and negotiation.

Questions from partners	Response from APAN team
Funding: Certain collaborators expressed concern over the submission of bills for supporting financial expenditure incurred as a part of the APN project activities.	APAN will be informed about the difficulties and partners will be informed about the response.
Differential rates for per diem: Partners from Laos and Cambodia expressed concern over differential rates of per diem and hotel accommodation rates stipulated by APN in its financial regulations.	Partners were explained that those rates were fixed by APN through its internal guidelines and methodologies over which APAN has no jurisdiction and that it would be appreciated if partners follow the financial regulations set forth by APN. However, APAN will write to

	APN to clarify the differences between certain countries.
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▪ **TNA Review meeting:**

Cross-checked with other activities of APAN in February and March, the proposed time for TNA Review Meeting is **from 7<sup>th</sup> to 11<sup>th</sup> March 2011**. The participants discussed and agreed with this proposal. For this coming meeting, the national partners (and their TNA teams) are expected to come with:

- A short presentation on what have been done on TNA from now until meeting day, advantages, constraints and issues for further discussions
- Completion of the questionnaire Form I - III and one tested response on Form IV. Guidelines:
  - Form I: Recheck the current version
  - Form II: Fill for all administrative and trainer hierarchy mentioned in Form I
  - Form III: Major training institutions training the staff mentioned in Form I (these institutions are necessarily the one where trainers are offering training to all officers mentioned in Form I and II)
  - Form IV: just fill a test form of form IV so that you can raise concerns when you come for review meeting. Collaborators are requested to note down the problems they faced while filling this form and to bring those issues to the review meeting in March 2011.

▪ **Training Module Design Workshop (TMDW)**

From beginning the proposed time for TMDW is July 2011. However, as the APN project started a little bit late in November 2010, the project team planned to extent the activities until November 2011. Therefore, the time for TMDW will be decided later and the project team needed to contact APN for ending time of the project.

## 2.5 Conclusions and Closing Remarks

***a) Important deadlines (for February until 7<sup>th</sup>-11<sup>th</sup> of March):***

- First week of Feb.:
  - APAN sends draft letters of consent for partners to initiate the project activities without waiting for the Contract/MOU.
  - Partners send list of contacts to APAN for ccing the letters
  - Fax/email the final letters by APAN
  - Send financial guidelines by APAN
  - APAN write to APN about financial concerns raised by partners
- Second week of Feb.: APAN drafts TOR for consideration of partners
- Last week of Feb.: APAN sends the final TOR to partners
- March 7-11: First TNA review meeting

***b) Agreed Outline of Country Reports***

- Introduction
- Overall objectives and methodology



- National level: Institutional arrangements and policy setup for training and capacity building in the country
- Sector level: Institutional arrangements and policy setup for training and capacity building in agriculture and related sectors (e.g. irrigation for agriculture)
- Training needs assessment (from questionnaire survey) for agriculture sector
  - Evaluation of training programs (curriculums)
  - Evaluation of training facilities (buildings, tools, etc.)
  - Evaluation of trainers and trainees (Form II, job description)
- Education and training
  - On the job functions (current duties and expected changes in roles for climate change adaptation)
  - Evaluation of skill and knowledge areas
  - Self evaluation of working environment (cross check with the above institutional evaluation)
- Establishing ideal scenario of knowledge and skills areas for agriculture sector
  - Identified priorities for knowledge and skills
  - Needed institutional facilities for supporting above knowledge and skill areas
- Training modules:
  - Officer I:
    - Session outline
    - Prerequisites for implementing training such as number of additional trainers needed, additional financial resources needed, additional institutional facilities needed (class rooms/training tools etc), implementation mechanisms (collaboration with other agencies if needed)
  - Officer II: (the same contents as for officer I)
  - Officer III: (the same contents as for officer I)
- Policy suggestions for promoting capacity building
  - E.g. how to secure resources for scaling up
  - What institutional changes need to be implemented (if any)
  - Implications/linkages in terms of education curriculum and developing expert base (if any)

***c) Closing Remarks***

Dr. Mozaharul Alam, Regional Climate Change Coordinator, UNEP-ROAP, expressed his thanks to all participants for their attendance and the active and meaningful discussions. He stressed that the success of APN project on TNA and training modules design depends on the national participants and their commitment, not the project team, APAN and himself. The piloting of training modules later all will also depend on the efforts of national partners and the participants.

For the training needs, he mentioned that there were some TNAs conducted at national level, thus the project team and national partners need to look at these. The variety of the countries in terms of context, institutional framework, and governance structure need to be taken into account when developing training modules. Although there is a need to harmonize all together, it is also necessary to keep the specific characteristic and context.



To sum up, Dr. Alam repeated that APN project is just a part of APAN's capacity building component. Therefore, APAN needs to consider the medium term and long term of this component as well. Especially, he highlighted that the Network is open for negotiation with the partners and collaborators.

### 3. APPENDICES

#### Appendix 1: Meeting Agenda (January 31, 2011 - AITCC Meeting Room B144B, AIT, Thailand)

8:30-9:00	Registration
9:00-9:30	Welcome speech and introduction of participants Dr. Toshinao Okayama, <i>Coordinator of the Regional Hub for Asia Pacific Climate Change Adaptation Network (APAN)</i>
9:30-10:00	Overview, background and activities of Asia-Pacific Adaptation Network (APAN) Dr. Toshinao Okayama
10:00-10:20	Capacity building component of APAN Dr. Le Thi Thu Huong, <i>Climate Change Adaptation Specialist, Institute for Global Environmental Strategies, Bangkok Office – APAN</i>
10:20-10:40	Tea break and networking
10:40-11:00	Climate change adaptation and SRI@AIT Dr. Abha Mishra, <i>Senior Research Specialist-cum-Affiliated Faculty, Agricultural Systems &amp; Engineering, School of Environment, Resources and Development, Asian Institute of Technology</i>
11:00-12:00 (15' for each presentation and 15' for Q&A)	Brief presentations by national partners on institutional framework and policy priorities for capacity building in agriculture and allied sectors including climate change adaptation  <ul style="list-style-type: none"> <li>• <b>Bangladesh:</b> Dr. Abul Kalam Azad, <i>Chief Scientific Officer, Bangladesh Agricultural Research Council</i></li> <li>• <b>Cambodia:</b> Dr. Kang Kroesna, <i>Dean, Faculty of Agricultural Technology and Management, Royal University of Agriculture</i></li> <li>• <b>Lao PDR:</b> Dr. Silinthone Sacklokham, <i>Vice Dean, Faculty of Agriculture, National University of Lao</i></li> </ul>
12:00-13:00	Lunch Break (at AITCC)
13:00-13:40 (15' for each presentation and 10' for Q&A)	Brief presentations by national partners on institutional framework and policy priorities for capacity building in agriculture and allied sectors including climate change adaptation (cont.)  <ul style="list-style-type: none"> <li>• <b>Mongolia:</b> Dr. Erdenetsogt Tumurtogtokh, <i>Director, School of Ecology and Technological Development, Mongolian State University of Agriculture</i></li> <li>• <b>Nepal:</b> Mr. Ram Bhakta Shrestha, <i>Director, Centre for Organization Development, Nepal Administrative Staff College</i></li> </ul>
13:40-15:10	APN project: Training Needs Assessment (TNA) for Agriculture Sector (purposes, process, guidelines, and introducing questionnaires) Dr. SVRK Prabhakar, <i>Policy Researcher (Adaptation), Natural Resources Management Group, Institute for Global Environmental Strategies</i> and Dr. Le Thi Thu Huong
15:10-15:30	Tea break and networking
15:30-17:00	Discussion on overall process, TNA questionnaires, national reports, and guidelines, expectations for 2 <sup>nd</sup> TNA meeting in February 2011, and final

	<b>outputs.</b> Dr. SVRK Prabhakar and Dr. Le Thi Thu Huong
17:00- 17:15	<b>Closing address</b> Dr. Mozaharul Alam, <i>Regional Climate Change Coordinator, United Nations Environment Program (UNEP) - Asia and the Pacific, Thailand</i>

### Appendix 3: Meeting Photos



Participants of 1<sup>st</sup> Training Needs Assessment Meeting, 31<sup>st</sup> January 2011, Bangkok, Thailand



Opening Remarks and Introduction about APAN– Dr. Toshinao Okayama



Discussion Session



Closing Remarks – Dr. Mozaharul Alam





## Proceedings

### 2<sup>nd</sup> Training Needs Assessment Meeting

Asian Institute of Technology, Bangkok, Thailand

March 11, 2011

## APN Funded Project CBA2010-09NSY-Okayama: Scientific Capacity Development of the Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific

UNEP Asia-Pacific Adaptation Network  
AIT, Bangkok, Thailand



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## Acknowledgements

This is to acknowledge that this meeting would not have been successful without active participation and contribution of the country partners of APN project including Cambodia, Lao PDR, Mongolia, Bangladesh and Nepal. Their hard work on preliminary training needs assessment made the meeting more effective with passionate discussion. We acknowledge the support in varied forms from the Ministry of Environment, Government of Japan; UNEP ROAP and AIT-UNEP RRC.AP.

This activity would not have been successful without the financial support from the Institute for Global Environmental Strategies (IGES) through Asia Pacific Adaptation Network (APAN) and the Asia-Pacific Network for Global Change Research (APN) through funding of the project entitled 'Scientific Capacity Development of the Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific' which is being implemented in Cambodia, Lao PDR, Mongolia, Bangladesh and Nepal. We acknowledge the technical support provided by Dr. S.V.R.K. Prabhakar, Policy Researcher, IGES who has been instrumental in designing and overseeing the methodology for this project and Dr. Le Thi Thu Huong, Climate Change Adaptation Specialist, IGES-APAN for coordinating the activities and compiling the proceedings. The valuable inputs provided by Mr. Voravate Chonsalin, Head of Public Sector Capacity Building Unit, AIT Extension through his lecture has helped the project partners to understand the process of TNA. We also wish to express our thanks to the distinguished guest, Dr. Mozaharul Alam, Regional Climate Change Coordinator, UNEP-ROAP for his valuable closing remarks. Last but not the least, sincere thanks need to be sent to Mr. Bayasgalan Sanduijav, Senior Program Officer of AIT-UNEP RRC.AP, for being an interpreter for Mongolia team during the meeting, Mr. Abhishek Nair, Intern at AIT-UNEP RRC.AP for taking the meeting minutes, and all support staff of IGES and AIT-UNEP RRC.AP.

**Toshinao Okayama, Ph.D.**

Coordinator

Regional Hub for Asia Pacific Climate Change Adaptation Network



## Executive Summary

The meeting consisted of presentations by project partners on the status of the TNA project covering aspects related to the process followed, the establishment of TNA team, recruitment of research assistant, desk review of existing training programs, questionnaire survey process, etc. and certain results. The practical survey of questionnaire brought certain concerns to the country TNA teams as well as the project team such as how to identify who is trainer and who is trainee (since there is an overlap of responsibilities (or without a clear distinction) between these two in some cases); how to determine the sample size while there is an absence of information on prevalence rate of staff which are trained in climate change adaptation in comparison with total population (total number of staff); what should be the sectoral focus since 'agriculture and water related sectors' cover different fields such as animal husbandry, crops, horticulture, etc.; how to apply the questionnaire forms appropriately/effectively to the right persons; how to keep a balance of content between adaptation and mitigation since these two are interrelated and sometimes overlapped in climate change issue, and so on. Summaries of all discussions are as follows:

### **Identification of Trainer and Trainee:**

There was considerable discussion on who is a trainer and who is a trainee especially in countries where there is an overlap of responsibilities (or without a clear distinction). The decision was a trainer is one whose main job is to train others and a trainee is one gets trained and uses the gained skills and knowledge to help others.

### **Sample size**

Determining sample size requires information on variance/prevalence rate of the characteristic (in this project it is the rate of staff which are trained in climate change adaptation) of the population. In absence of such information, it was decided that the each surveyor would determine the sample size by closely monitoring the variation in responses as they survey in an administrative hierarchy. The surveyor can determine to stop sampling in the same level of administration or trainers if the responses they are getting are consistently uniform. It is to be kept in mind that the statistically determining the sample size is not an absolute necessity for this project since most of the government officers are from the same education system and the climate change adaptation is still a relatively new area of intervention in the administrative capacity building provisions.

### **Sectoral focus**

The general decision was to focus on crop agriculture sector. However, it again depends on the country systems, how the job/functions of agriculture staff are organized, and how the OJT and IT are designed for the government officers.

- If the agriculture officers in the country handle all agriculture fields (animal husbandry, crops, horticulture etc) and if the OJT and IT are comprehensive covering all the subjects, then the country TNA team must include all these sectors for the TNA.
- If the agriculture officers' main duty is to support field crops and the OJT and IT are focused on only field crops then the TNA should be focused only on field crops.
- If nothing is available, the country TNA team can review other related sectors for lessons and use for designing the modules for agriculture sector.

### **Filling of forms**

There was considerable confusion on which form is for whom. It will be clear if all TNA teams keep in view that the TNA survey is for both the trainers and trainees, and that the form I, Form II and Form IV are linked, and form III is for assessing the training facilities.

- Form I: Both for government officers (trainees) and for trainers (if there is a hierarchy of trainers starting from national level to the prefecture and district levels).
- Form II: Both for government officers and for trainers
- Form III: For training facilities. The source of information/interviewee could be a senior trainer or the administrative head of a training facility that has an understanding of the training facility. Fill this form for all important training facilities in the country. Training facility could be a training institute, university, NGO, etc.
- Form IV: Both for government officers (trainees) and for trainers.

### **Balance of content between adaptation and mitigation**

In general, the aim of the project is to mainstream CCA into the existing OJT and IT modules. There is no doubt that there are overlaps between adaptation and mitigation. However, the project team expects that there would be lot of contents burden even if it decides to focus only on adaptation. Hence, the better approach would be to aim to design:

- Base module: A generic module touching the principles of adaptation and co-benefits of mitigation
- Ad-on module: To design the specific module based on the job responsibilities of the target staff

### **Desk review of existing training programs**

- Most of the desk reviews so far focused on climate change adaptation (CCA) only training programs. However, the main aim of this project is to mainstream the CCA into the existing on-the job training (OJT) and induction training (IT) programs. Hence, there is a need to review the existing OJT and IT programs in addition to the stand-alone/ad-hoc training programs implemented for CCA.
- The desk review should include both governmental (for OJT and IT for standard training programs and ad-hoc training programs for CCA) and NGO (mostly for ad-hoc training on CCA) initiatives. While reviewing, it is important to capture the following characteristics:
  - Length of the existing OJT and IT (to make sure that incorporating CCA wouldn't prolong them beyond the permissible length of training)
  - Lessons from the training evaluations if available (would give indication on what should be ideal length of training, training facilities, trainer capabilities etc)

Most of the existing training programs appear to be in the form of workshops which cannot be termed as 'training' in real sense. However, if the actual training programs don't exist, the partners need to include these workshops for getting information on the curriculum these workshops implemented.

### **Some thoughts on contents of the policy suggestions chapter**

- Estimation of trainer and subject matter specialist numbers needed: For providing an estimate of how many staff may need to be trained and at what trainer-trainee ratio, it is necessary to come up with approximate estimates of the existing staff working in government agriculture departments (from national to village level) for the entire nation. From this number, it is necessary to use a standard trainer-trainee ratio and arrive at the possible number of trainers need to be produced through TOTs.

- Education curriculum: There is a general consensus that the entire demand of subject matter specialists cannot be met only through ToTs and other means and that there is a need to incorporate the CCA into the subject matter at various stages of formal education. The project partners should think about how this can be done while drafting their country report.

In short, the discussions after each session and at the end of the meeting, more informal than formal, had reached at certain consensuses on how to continue TNA in the specific context of each country. The meeting also came up with an agreement on the schedule of following activities that include the TNA monitoring process, submission of country reports and the preparation for training modules design workshop in July.

#### 4. BACKGROUND AND MEETING OBJECTIVES

Climate change has been projected to have critical impacts on socio-economic development and poverty reduction globally and in the Asia-Pacific region. The Asia-Pacific region, which accounts for two-thirds of the world's poor living on less than \$1 a day depending on primary sectors such as agriculture, is one of the most vulnerable regions to climate change. Thus, effective implementation of adaptation and capacity building actions is the key to reducing vulnerability of the Asia-Pacific countries to climate change.

Since 2008, United Nations Environment Programme (UNEP) in partnership with key UN agencies and international organizations has been facilitating the development of a Global Adaptation Network (GAN) which composes of four Regional Networks in developing regions: Africa, Asia-Pacific, West Asia, and Latin America and the Caribbean. The Asia Pacific Adaptation Network (APAN) was launched in Bangkok as a part of the GAN by Prime Minister of Thailand in October 2009 and began its implementation in March 2010. The APAN's Regional Hub is co-hosted by AIT-UNEP RRC.AP<sup>5</sup> and IGES<sup>6</sup> and currently located in AIT-UNEP RRC.AP, Bangkok, Thailand.

APAN aims to help countries in the region to build climate resilience of vulnerable human systems, ecosystems and economies through the mobilization and sharing of knowledge and technologies to support adaptation capacity building, policy-setting, planning and practices. One of its objectives is to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into developmental planning and programming in targeted countries, including Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal.

For this capacity building objective, the project entitled "Scientific capacity development of trainers and policy-makers for climate change adaptation planning in the Asia and Pacific" has been approved by the Asia-Pacific Network for Global Change Research (APN) for funding starting November 2010. The main objectives of this project are to:

- Undertake appraisal of training needs (training needs assessment, TNA) in terms of knowledge and skill areas for effective adaptation; and
- Design training modules for imparting knowledge and skills for effective adaptation.

<sup>5</sup> AIT-UNEP RRC.AP: Asian Institute of Technology-United Nations Environment Programmes Regional Resource Center for Asia and the Pacific

<sup>6</sup> IGES: Institute for Global Environmental Strategies

As a pilot initiative, the APN project has aimed to focus on agriculture sector as the most vulnerable sector to climate change in the project countries. However, the extended objectives during and beyond this project duration, that have direct connection to the continuity of the APN project are to:

- Help create enabling environment in project countries for strengthening capacity building through interventions at the policy level.
- Help deliver training programmes for trainers in key training institutions and for key policymakers in the region;
- Enable training institutions and trainers to implement training programs to the ultimate beneficiary i.e. staff employed by agriculture sector; and
- Institutionalize the modalities for assessing the impact of the above activities and provide policy feedback to the countries involved.

Therefore, as training needs assessment (TNA) is the first step for the design and development of capacity-building programmes, the 1<sup>st</sup> TNA meeting was organized on 31<sup>st</sup> of January 2011 to introduce the partners to APAN and its capacity building agenda, reach a consensus on the modalities for implementing APN project on training modules development, obtain preliminary information and discussion on national systems for capacity building, and agree to cooperate to develop national strategies for capacity building (long-term). Since the 1<sup>st</sup> TNA meeting already came up with certain agreements on the modalities for conducting TNA in five targeted countries, this 2<sup>nd</sup> TNA meeting aims to:

- Review the process of conducting TNA in five countries by the national partners,
- Discuss on the advantages, constraints, challenges and other issues practically faced by the national partners in conducting TNA,
- Find out the solutions to overcome and the ways forward to continue detailed TNA.

For these purposes, the national partners of the project are requested to prepare a presentation on TNA in their country. The focus of presentation include: (i) current process of conducting TNA such as establishment of TNA team, recruitment of research assistant, questionnaire survey process, desk review of existing training programs, etc.; (ii) results of TNA including complete form I to III of questionnaire and a tested form IV (with notes on the problems faced while filling it); and (iii) details of analysis/desk review of existing training programs or modules (if available). In addition, the meeting will also provide a short lecture on principles of training which helps the partner gain basic understanding on how to design the training modules and evaluate the implementation of training modules in the next phases of the project.

## 5. MEETING PROCEEDINGS

On behalf of the organizers, Dr. Le, IGES Bangkok Office welcomed all participants, introduced about meeting objectives and informed participants about the agenda. The meeting participants shortly introduced about themselves. Then, the project partners from five targeted countries started their presentations on TNA which has been conducted so far in their countries. Following each presentation was a discussion session led by Dr. Prabhakar, IGES Headquarters, and Dr. Le.

### 5.1 Cambodia

#### *a) Presentation of Cambodia team:*

On behalf of Cambodia team, Dr. Kang, Dean of Faculty of Agricultural Technology and Management, Royal University of Agriculture, presented the methodology of her team for TNA including team composition, process of identifying the trainers and trainees at all levels from national to village, the questionnaire survey at Department of Agriculture Extension and Fisheries

Administration. She also described the process and results of collecting existing training programs at several departments of Ministry of Agriculture, Forestry and Fisheries (MAFF) and Ministry of Environment which showed that most of the current training programs are short term for one or half day and in the forms of workshops which are not regularly conducted but very much depended on donor's fund. The workshops covered some climate change related subjects such as global warming and climate change, impacts of climate change to agriculture, GHG and role of forestry, effects of climate change on fishery, etc., however, the curriculums are not yet clear.

**b) Discussions:**

- Which agencies are mainly used in training and capacity building in your country?  
→ Answer: There are no such training agencies. Most of the training is conducted through workshops and National Climate Change Committee (NCCC) has some initiatives for capacity building on CC. Thus, we think induction and on job training programmes need to be conducted more than the workshops.  
→ Response: Is there any evaluation after these workshops? If yes, it is necessary to take their evaluation and look into the lessons learned.
- Who did you meet to take the interviewees (according to you presentation you could not meet actual trainers)? So who have you trained? Are they general staff at the national level?  
→ Answer: We went to administrators but they were not the actual trainers. Then, we contacted the department heads to get the number of trainees.
- The sample size needs to be discussed.  
→ Response: Sample size can be flexibly chosen by your team, for instance, based on the number of interviews that you can conduct with the trainers and trainees. For policy recommendation there is a need to give a national estimation of the number of members (trainers and trainees). Thus, we can suggest increasing the number of trainers and trainees in the recommendation
- How about non-governmental institutions involvement, is it good to train them?  
→ Answer: Yes, involvement of NGOs is good as they can train the ground level practitioners as well.
- How do we evaluate training using a common framework?  
→ Answer: This is important and has to be developed in the later stages.
- It is good that the Cambodia TNA team also looked at fisheries department. However, the focus still should be agricultural department, more specifically, the field crops.  
→ Response: But under agriculture department there are many departments such as forestry, fisheries, etc. → In that case it is better to stick to agriculture sector alone.
- One participant suggested that training module should incorporate adaptation and mitigation:  
→ Response: As long as adaptation component is not diluted we can incorporate mitigation, but it is not the overwhelming topic. Mitigation should be a small component in the training programme as the training sessions are small. Mitigation component should be pertinent to the national strategy of the agriculture sector.
- How will we train people in regard to integrating farming practices? How do we deliver this training?  
Response:
  - Our work is to intervene in the training module to make it more suitable.

- Training is conducted on the most important sector under/in relation to agriculture
- Intervention of CCA into existing modules
- Training of trainer on CCA issues
- What should be the relevant proportion of induction training and on-job training?
  - Response: For induction training, small intervention of content burden about 20% only, but more for “on-job training” (much more ambitious content burden)
    - What is the intervention at the training level?
  - Response: Specialize the training programmes and look at the most important sector under agriculture, eg: for Bangladesh it will be field crops, fruit crops and animal husbandry

## 5.2 Lao PDR

### a) *Presentation of Lao team:*

On behalf of Lao TNA team, Dr. Sacklokham, Vice-Dean of Faculty of Agriculture, National University of Lao, also started her presentation with the methodology of TNA has been done so far. In addition to the team composition, number of questionnaires filled, etc. her presentation showed a nice structure of training line from ministry to village level. Her major concern was how to consider people as trainers or trainees because some of trainees are also the trainers for lower levels of training line. The current state of training programs including training subjects and trainers was put in a cohesive table in which the number of trainees per year was estimated by the team. These existing training programs are mostly on-job training which has evaluation process and good outcomes (responded by 15 of 19 respondents). However, as climate change is a new subject in Lao, there is no curriculum on CCA yet. Similar to the case of Cambodia, these training programs are also depended on the donors' fund.

### b) *Discussions:*

- Some trainers are also trainees, thus how can we consider them? As trainers or trainees, or need to make interviews with them two times?
  - Response:
    - Need to identify master trainers (top level trainers) and train these master trainers
    - Form IV is to be filled by both trainers and trainees
    - Those who have designation as trainers are to be treated as trainers
    - Those who have designation as trainees are to be treated as trainees:
- Training is disseminated from top to bottom and it is important to include technical department in both in induction and on-job training.
- There is no separate training division in Lao, thus include all possible trainers and trainees in induction and on-job training according to time allowance.
- For district to lower level, is it necessary to provide induction training?
  - Actually not necessary, but if there is induction training below district level, it has to be included in TNA. The focus should be to train technical persons for on-job training. Universities are good to give training to district level, thus consider them as trainers.
- Consensus: All those who have designation as trainers are to be treated as trainers, the others else are trainees:
  - From I: trainers/trainees for departments (grouping of officers)

- From II: Everyone can fill
- From III: Assess training facilities, any person can fill.

### 5.3 Mongolia

#### **a) Presentation of Mongolia team:**

On behalf of Mongolia TNA team, Mr. Purevsuren, Director, Natural Agriculture Extension Center (NAEC), Ministry of Food, Agriculture and Light Industry (MoFALI), started with the overall structure of NAEC in relation with training line in Mongolia for agriculture sector. NAEC has organized both induction and on-job training which covers 6 sectors and involves more than 250 researchers and lecturers. The team has conducted a significant questionnaire survey with about 210 participants through the staff meeting organized by MoFALI in February 2011. The results of survey have given the team several interested subjects that need to be trained for livestock and field crop adaptation.

#### **b) Discussions:**

- How many people attended the staff meeting in February from all levels?
  - About 90 at national level, 60 at provincial level, 30 at Soum<sup>7</sup> level, 20 represented for national international organization and about 10 were honorary guests.
- Did you fill Form I, II? Do you have induction and on-job training?
  - Everything has been filled. All are for on-job training

### 5.4 Nepal

#### **a) Presentation of Nepal team:**

On behalf of Nepal TNA team, Mr. Paudyal, Program Director, Director of Livestock Services Training and Extension, Department of Livestock Services, Ministry of Agriculture and Cooperatives presented a schematic diagram of training processes. His presentation focused more on the results of questionnaire forms which have been filled by several departments at different levels. At each level, the training needs were assessed in both knowledge and skill that provided a clear picture of the needs. The presentation came up with some suggestions for further exercise that especially stressed on the piloting of training in respective countries and the development of core trainers group.

#### **b) Discussions**

Some suggestions emerged throughout the discussion such as NGOs' training module to be reviewed, the concrete responsibilities and roles need to be set, local participants need to be looked as people who can contribute to policy decisions (bottom to top approach for training).

### 5.5 Bangladesh

#### **a) Presentation of Bangladesh team:**

On behalf of Bangladesh TNA team, Dr. Azad, Chief Scientific Officer, Bangladesh Agricultural Research Council (BARC), Ministry of Agriculture firstly provided the information on the national agriculture research system in Bangladesh that showed the number of institutions, departments involved and number of staff working in agriculture sector. He then described the climate change scenario from Bangladesh perspective in relation with agriculture in the country context. In response to the serious impacts of climate change to agriculture, the Department of Agriculture Extension

<sup>7</sup> Soum is a lower unit of province, similar to district of national-level city.



(DAE) has played the major role in transferring the technology to the end-users. The training wing of DAE which is in charge of capacity building can be a core actor in conducting TNA. The team has started questionnaire survey at different departments and all forms have been filled with significant information.

**b) Discussions (also for other country cases):**

Major points of discussion include:

- Priority is more on adaptation and less on mitigation
- Identification of trainers and trainees
- The focus is field crop but it does not need to be limited to field crop only, can expand to other fields under agriculture sector dependently on country specifics.
- The focus of project is mainstreaming CCA into on-job training programs
- Gender is an important cross-cutting issue but should not included in TNA due to time and resource constraints
- Language of training module should be in English and in the native language

### 5.6 Lecture on Training Principles

Mr. Voravate, Senior Training Specialist, AIT Extension, delivered one-hour lecture on Training Cycle and the Design of Training Programs. The lecture provided basic understanding for the participants on how to identify three domains of learning, how to convert gaps into learning objectives, and how to evaluate the training in both pre- and post-period. It aims to enhance knowledge and review key concepts of training that help the participants conduct TNA more effectively and to be ready for training modules design workshop later. Reading materials were provided and the participants have more discussions throughout the lecture.

### 5.7 Plan for Next Steps

In order to guide the partners on what to continue, Dr. Le explained the plan for next activities including TNA monitoring in five countries, submission of TNA reports, date proposed for training modules design workshop, and the submission of country final reports. She also briefly provided the outline of TNA and country reports that will be sent in more details to the partners later. All participants have discussed and concluded with a time frame for these activities. In addition, Dr. Prabhakar showed some examples of training modules and explained the contents that need to be designed in the workshop later as the outcomes of this project.

### 5.8 Concluding remarks

Dr. Alam, UNEP-ROAP, expressed his thanks to all participants for their hard work on TNA and active discussions during the meeting. The meeting is a very useful for the country partners to share their on-going TNA process with certain concerns, difficulties, challenges, as well as positive results. Through the meeting, all partners can learn from each other for going ahead with TNA more effectively. The lesson on training principles also provides a good preparation step to the partners for the training modules design workshop organized later by this APN project. He also stressed on the possibility of implementing the training modules through not only the extended phases of the project but also other collaborative training programmes that will be organized in October 2011. The continuity of their hard work for this project is very important for the following activities of capacity building programmes.



## 6. APPENDICES

### Appendix 1: Meeting Agenda (March 11, 2011 - TV Room, AIT Conference Center, Thailand)

8:30-8:50	Registration
8:50-9:00	Welcoming remarks Dr. Toshinao Okayama, <i>Coordinator of the Regional Hub for APAN</i>
9:00-10:00	Presentation of Cambodia TNA team Dr. Kang Kroesna, <i>Dean, Faculty of Agricultural Technology and Management, Royal University of Agriculture</i> and Colleagues Discussions: Led by Dr. SVRK Prabhakar, <i>Policy Researcher, IGES Headquarters</i> and Dr. Le Thi Thu Huong, <i>Climate Change Adaptation Specialist, IGES Bangkok Office – APAN</i>
10:00-11:00	Presentation of Lao TNA team Dr. Silinthone Sacklokham, <i>Vice Dean, Faculty of Agriculture, National University of Lao</i> and Colleagues Discussions: Led by Dr. SVRK Prabhakar and Dr. Le Thi Thu Huong
11:00-11:30	Tea break
11:30-12:30	Presentation of Mongolia TNA team Mr. Purevsuren Buyan-Ulzii, <i>Director, Natural Agriculture Extension Center, Ministry of Food, Agriculture and Light Industry</i> Discussions: Led by Dr. SVRK Prabhakar and Dr. Le Thi Thu Huong
12:30-13:30	Lunch break (at AITCC)
13:30-14:30	Presentation of Nepal TNA team Mr. Shyam Prasad Paudyal, <i>Program Director, Director of Livestock Services Training and Extension, Department of Livestock Services, Ministry of Agriculture and Cooperatives</i> Discussions: Led by Dr. SVRK Prabhakar and Dr. Le Thi Thu Huong
14:30-15:30	Presentation of Bangladesh TNA team Dr. Abul Kalam Azad, <i>Chief Scientific Officer, Bangladesh Agricultural Research Council</i> and Colleagues Discussions: Led by Dr. SVRK Prabhakar and Dr. Le Thi Thu Huong
15:30-16:00	Tea break
16:00-17:00	Lecture on training principles Mr. Voravate Chonlasin, <i>Senior Training Specialist, AIT Extension</i>
17:00-17:30	Summaries and Conclusions Dr. SVRK Prabhakar
17:30-17:45	Plans for next steps of TNA Dr. Le Thi Thu Huong
17:45-18:00	Closing remarks Dr. Mozaharul Alam, <i>Regional Climate Change Coordinator, UNEP ROAP</i>
18:00	Reception Dinner

<b>Appendix 2: List of Attended Participants</b>			
<b>No.</b>	<b>Name</b>	<b>Position and Organization</b>	<b>Country</b>
<b>Project Partners</b>			
1	Dr. Abul Kalam AZAD (Mr.)	Chief Scientific Officer, Bangladesh Agricultural Research Council (BARC), Ministry of Agriculture	Bangladesh
2	Mr. Md. Fazlul KARIM	Director, Training Wing, Department of Agriculture Extension, Ministry of Agriculture	Bangladesh
3	Dr. KANG Kroesna (Ms.)	Dean, Faculty of Agricultural Technology and Management, Royal University of Agriculture (RUA)	Cambodia
4	Mr. HOK Kimthourn	National Project Manager Project Support Unit, Ministry of Agriculture Forestry and Fisheries (MAFF)	Cambodia
5	Mr. CHEA Chan Thou	Deputy Director, Climate Change Department (CCD), Ministry of Environment (MoE)	Cambodia
6	Dr. Silinthone SACKLOKHAM (Ms.)	Vice Dean, Faculty of Agriculture, National University of Lao (NUL)	Lao PDR
7	Dr. ERDENETSOGT Tumurtogtokh (Mr.)	Director, School of Ecology and Technological Development, Mongolian State University of Agriculture (MSUA)	Mongolia
8	Mr. PUREVSUREN Buyan-Ulzii	Director, Natural Agriculture Extension Center, Ministry of Food, Agriculture and Light Industry (MoFALI)	Mongolia
9	Mr. Ram Bhakta SHRESTHA	Director, Centre for Organization Development, NASC, Nepal Administrative Staff College (NASC)	Nepal
10	Mr. Shyam Prasad PAUDYAL	Program Director, Director of Livestock Services Training and Extension, Department of Livestock Services, Ministry of Agriculture and Cooperatives	Nepal
<b>Distinguished Participants</b>			
11	Dr. Mozaharul ALAM	Regional Climate Change Coordinator, United Nations Environment Program - Regional Office for Asia and the Pacific (UNEP-ROAP), Thailand	
<b>Resource Persons</b>			
12	Mr. Voravate CHONSALIN	Head of Public Sector Capacity Building Unit, AIT Extension, Asian Institute of Technology (AIT)	
<b>Organizers and Support Staff</b>			
13	Dr. Toshinao OKAYAMA	Coordinator of the Regional Hub for Asia Pacific Climate Change Adaptation Network (APAN) - Institute for Global Environmental Strategies (IGES) Bangkok Office	
14	Dr. LE Thi Thu Huong	Climate Change Adaptation Specialist, APAN - IGES Bangkok Office	
15	Dr. SVRK PRABHAKAR	Policy Researcher (Adaptation Team), Natural Resource Management Group, IGES Headquarters, Japan	
16	Ms. Narudee LERDPHORNSUTTIRAT	Administrative Staff, IGES Bangkok Office	
17	Mr. Abhishek Nair	Intern, Adaptation Knowledge Platform, AIT-UNEP Regional	

		Resource Center for Asia and the Pacific (AIT-UNEP RRC.AP)	
18	Ms. Hiromi Inagaki	Associate Program Officer, Adaptation Knowledge Platform, AIT-UNEP RRC.AP	
19	Mr. Bayasgalan Sanduijav	Senior Program Officer, AIT-UNEP RRC.AP	

### Appendix 3: Meeting Photos



Participants of 2<sup>nd</sup> Training Needs Assessment Meeting - March 11, 2011 - Bangkok, Thailand



Lecture on "Training Cycle and Design of Training Program"

Appendix 1c: 3rd Meeting (Training Module Design Workshop) – 10<sup>th</sup> – 12<sup>th</sup> August 2011,  
Bangkok



## Proceedings

### Training Modules Design Workshop

Conference Center, Asian Institute of Technology, Bangkok, Thailand  
August 10-12, 2011

**APN Funded Project CBA2010-09NSY-Okayama: Scientific Capacity  
Development of the Trainers and Policy-Makers for Climate Change  
Adaptation Planning in Asia and the Pacific**

UNEP Asia-Pacific Adaptation Network  
AIT, Bangkok, Thailand



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2.6 Lecture on introduction to training course development framework and training objectives and identification of training contents

2.7 Lecture on agriculture technology for climate change adaptation

2.8 Lecture on modularization of training contents/training methods and resources plan

2.9 Country presentations and feedback

2.10 Wrap up

2.11 Concluding remarks

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## Acknowledgements

This is to acknowledge that this meeting would not have been successful without active participation and contribution of the country partners of APN project including Cambodia, Lao PDR, Mongolia, Bangladesh and Nepal. Their hard work on training needs assessment and drafting training modules made the meeting more effective with passionate discussion. We acknowledge the support in varied forms from the Ministry of Environment, Government of Japan; UNEP ROAP and AIT-UNEP RRC.AP.

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## Executive Summary

### Introduction

During August 10th to 12th, 2011 APAN organized a Training Module Design Workshop at the Asian Institute of Technology. There were sixteen (16) participants who represented five national partners participated in this workshop. These includes Cambodia, Lao PDR, Mongolia, Bangladesh and Nepal. The workshop was a continuous event after the second training needs assessment (TNA) meeting held in March 2011. The objectives of this workshop were to review training module development concepts, techniques and framework to enable participants to prepare training modules as well as to provide feedbacks and suggestions on the modules that participants developed. It also aimed to familiarize the participants with training modules design process so that they will be able to take lead in preparation of training programmes in their own country in the future.

In summary, activities that participants had to do and share during this workshop included:

- Presentation of methodology used to carry out the TNA exercises;
- Presentation and discussion on institutional arrangement and policy set up in the country;
- Presentation and exchange information on national scenario of TNA results;
- Sharing experiences and thoughts on ideal scenario for implementation of training modules in terms of knowledge, skills and practices; and
- Setting priorities for the content and challenges in designing the modules.

It was found out from the previous workshops that all the national partners were capable to conduct systematic and result-oriented TNA which can be used as raw materials for training module design. However, in term of readiness of national partners and stakeholders in implementing training programmes on CCA, there were concerns from each country as follows:

- Partners from Bangladesh addressed the lack of proper infrastructure and training facilities that will support technical training programmes related to climate change and adaptation. It also needs to assure readiness of trainers and training materials. The partners shared their concern on strengthening coordination amongst government organizations as well as financial resources for implementation of CCA.
- In view of the partners from Cambodia, the TNA revealed that training materials and technical data were in much needed. Existing training modules were mainly focused on adaptation techniques, vulnerability assessment and cost-benefit analysis among others, while very less focuses on agricultural aspects in adaptation. It was recommended that funding should be provided to the particular training programmes.
- From Lao PDR, the concerns were related to available subject contents which are not properly linked to climate change adaptation. The partners raised the issues of poor readiness of training facilities at the provincial and district levels. It was suggested that the sub-national offices should be funded to set up modernized training centers. In addition, in the training modules basic knowledge and skills on agro-meteorology, integrated cropping system, agro-irrigation and climate change adaptation should be included.
- According to the survey of the partners from Mongolia, the concerns were mostly on lack of integrated policies and training plans on climate change and adaptation amongst concerned government agencies. Also the issue of insufficient funding to start CCA training programmes, it could not be relied only on government funds. In terms of human resource capacity and readiness, it was addressed that basic knowledge on computer, IT skills and basic English are needed to enhance training capacity. It was suggested that training modules need more focuses on CCA, training of trainers, poverty reduction strategies and



the role of private sector in agriculture. Like other partners, the concern on poor – readiness of training facilities was raised as well.

- Partners from Nepal pointed that the challenges ahead were training a large number of extension workers with limited knowledge and preparing training materials for different target groups. Although the training facilities are in place, the teaching aids and training materials related to CCA have not been properly updated. Using of audio-visual equipment is jeopardized by long hours of load shedding so investment on appropriate facilities should be thought of. Given that the hills and mountains are more prone to the CC impacts, the need for training facilities and demonstration sites in these areas is very essential.

The actual module development preparation phase has started in the second TNA meeting in March 2011. In that meeting, the consultant on training and development conducted intensive training sessions on basic knowledge in training and development. In this workshop the overview sessions on module design and organizations of training contents were conducted to make sure that all national partners were provided with same background of knowledge and working procedures.

In addition, during the workshop two lectures were conducted to give broader perspectives to the participants on agriculture technology for climate change adaptation and on methods and techniques for training module design. These two sessions were used as supplementary elements that helped the participants considering more aspects while designing the modules.

The workshop highlighted three key elements of module design, and these elements are very practical that national partners can apply immediately after they return back to their countries. The three elements are: enabling objectives, selection of appropriate training contents and using appropriate delivery methods. The participants had spent two-third of the workshop period to draft two training modules namely In-service Training Modules and Induction Training Modules. These two modules were used as an exercise to familiarize participants with module design templates.

There were three types of subject areas that were proposed for future training in CCA:

- Training related to policies and strategies in CCA and its application in agricultural sector;
- Training related to specific subjects in agriculture such as livestock management, appropriate farming technology, etc;
- Technical training related to climate change adaptation and management.

It was expected that after the workshop the national partners could develop six modules for in-service training and six modules for induction training. At the same time, the national partners also needed to propose their implementation plan for piloting these modules in their own country. The workshop ended with the guidelines for national partners on how to prepare the country project reports which include both TNA results and training modules developed.

## **7. BACKGROUND AND MEETING OBJECTIVES**

Climate change has been projected to have critical impacts on socio-economic development and poverty reduction globally and in the Asia-Pacific region. The Asia-Pacific region, which accounts for two-thirds of the world's poor living on less than \$1 a day depending on primary sectors such as agriculture, is one of the most vulnerable regions to climate change. Thus, effective implementation of adaptation and capacity building actions is the key to reducing vulnerability of the Asia-Pacific countries to climate change.

Since 2008, United Nations Environment Programme (UNEP) in partnership with key UN agencies and international organizations has been facilitating the development of a Global Adaptation Network (GAN) which composes of four Regional Networks in developing regions: Africa, Asia-

Pacific, West Asia, and Latin America and the Caribbean. The Asia Pacific Adaptation Network (APAN) was launched in Bangkok as a part of the GAN by Prime Minister of Thailand in October 2009 and began its implementation in March 2010. The APAN's Regional Hub is co-hosted by AIT-UNEP RRC.AP and IGES and currently located in AIT-UNEP RRC.AP, Bangkok, Thailand.

APAN aims to help countries in the region to build climate resilience of vulnerable human systems, ecosystems and economies through the mobilization and sharing of knowledge and technologies to support adaptation capacity building, policy-setting, planning and practices. One of its objectives is to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into developmental planning and programming in targeted countries, including Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal.

For this capacity building objective, the project entitled "Scientific capacity development of trainers and policy-makers for climate change adaptation planning in the Asia and Pacific" has been approved by the Asia-Pacific Network for Global Change Research (APN) for funding starting November 2010. The main objectives of this project are to:

- Undertake appraisal of training needs (training needs assessment, TNA) in terms of knowledge and skill areas for effective adaptation; and
- Design training modules for imparting knowledge and skills for effective adaptation.

In order to meet the first objective, APAN has organized two Training Needs Assessment Meetings in Asian Institute of Technology, Bangkok with the participation of partners from five countries above. The 1st TNA meeting was organized on January 31, 2011 to introduce the partners to APAN and its capacity building agenda; reach a consensus on the modalities for implementing APN project on training modules development; obtain preliminary information and discussion on national systems for capacity building; and agree to cooperate to develop national strategies for capacity building (long-term). The 2nd TNA meeting was held on March 11, 2011 to review the process of conducting TNA in five countries by the national partners; discuss on the advantages, constraints, challenges and other issues practically faced by the national partners in conducting TNA; find out the solutions to overcome and the ways forward to continue detailed TNA.

Based on the results of TNA, this workshop, therefore, was organized to meet the 2nd objective of the project - to design training modules for imparting knowledge and skills for effective adaptation. For this purpose, the major activities of the workshop included:

- Country presentations on the TNA results and findings,
- Lectures on training course development framework, training objectives and identification of training contents, modularization of training contents and training methods, etc.
- Group exercises on identification of training contents, contents organization and selection of training methods, training course design, etc.
- Group presentations after exercises and followed by discussion/feedback.

The understanding of the knowledge of the participants on climate change adaptation with focus on agriculture was bolstered by an additional lecture on "Agriculture Technology for Climate Change Adaptation". By the end of the workshop, the participants were expected to come up with a training module designed by all the five country team members for adaptation in agriculture sector. The effectiveness of this module would be judged through the feedback on the pilot training programs to be conducted in the respective countries in the coming year. The feedbacks from the staff employed by the agriculture sector would be then used for further improvisation of the training module thus developed and used.

For these purposes, the national partners of the project were requested to prepare a presentation

on TNA in their country. The focus of presentation include: (i) methodology used to carry out the TNA exercise (ii) institutional arrangement and policy set up in the country; (iii) TNA results; (iv) ideal scenario for implementation of training modules in terms of knowledge, skills and practices; and (v) priorities for the content and challenges in designing the module. The meeting primarily focused on imparting the theoretical knowledge on designing the training module supplemented with practical experience the same through group exercises.

## 8. MEETING PROCEEDINGS

### DAY 1: August 10, 2011

On behalf of the organizers, Dr. Mozaharul Alam, from UNEP ROAP, welcomed all participants to the workshop. He thanked all participants for their hard work on TNA since January and gave an introduction to the objectives of the meeting. Dr. Le Huong, APAN, introduced some new participants and briefed the participants on the agenda of the meeting for the coming three days. This was followed by presentations from the participating countries. Each country presented their findings from the TNA exercise. Each presentation was followed by discussion sessions led by Dr. Prabhakar and Dr. Le Huong.

### 8.1 Bangladesh

#### *Presentation of Bangladesh team:*

On behalf of Bangladesh TNA team, Dr. Ali, Associate Professor, Department of Agriculture Extension & Information System, Sher-e-Bangla Agricultural University, explained about the methodology adopted for TNA exercise and the tools used for the same. He gave an introduction to DAE, which is a core organization under the Ministry of Agriculture for technology transfer to the end users, and its organizational profile. The presentation also focused on the vulnerable areas to natural disaster and impacts of climate change. During the training needs assessment exercise, the existing training programs, institutions involved, training infrastructure, trainers and trainees and the training contents were all evaluated at national, district, upazilla and blocks level. From this evaluation, they were able to identify the gaps and challenges that lie ahead for conducting such training course in future at all the four levels mentioned above. Lack of proper infrastructure and facilities, trained human resource, meteorological instruments, organizational fundings and coordination among national and local organizations were identified as the challenges that lie ahead in imparting an effective training for adaptation in agriculture sector.

#### *Discussions:*

- In the existing modules, contents are rich in terms of Disaster Risk Reduction (DDR), thus please make clear whether climate change adaptation (CCA) is there in the current training programmes or not.
- What have you found from existing training programs?
- Who did you use the outputs of workshop in the TNA?
- What is the current level of understanding of climate change among survey respondents?
- Ideal scenario: How did you arrive at this ideal scenario?
- What is the difference between priorities of subjects and ideal scenario.
- Institutional facilities needed: Should be limited to implementation of the module.
- How did you choose the adaptation measures? From research findings?

## 8.2 Cambodia

### ***Presentation of Cambodia team:***

On behalf of Cambodia team, Dr. Kang, Dean of Faculty of Agricultural Technology and Management, Royal University of Agriculture, presented the methodology the team adopted for assessing the training needs in Cambodia for agriculture sector in adaptation. Initially, the information on training modules, materials and documents were collected through desk review which was followed by semi-structured interviews. She also discussed about the policy set up at national and sub-national level on the human resource development. The evaluation results showed that the existing training programs were conducted on climate change and agriculture and that the climate change department (CCD) does not have any training program on agriculture while Provincial Agriculture Departments did not have any training program on climate and climate change. Although funds are allocated at each level they are not sufficient. The assessment revealed that training materials and technical data were the facilities that were much needed. The content requirements were mainly concerned with adaptation techniques, vulnerability assessment and cost-benefit analysis among others. Also the challenges in the implementation were identified as module implementation from funding point of view, participation and cooperation among the concerned institutions.

### ***Discussions:***

- What was missing from the existing training programs?
- Do you have sufficient trainers to train on subjects identified?
- Or do you have enough human resource to deliver the training modules? The presentation did not mention about the need in terms of human resource for training (need for trainers/experts).
- Have you identified the target groups for knowledge and skill development area? It is very important for developing modules.
- The sustainability of training depends on the availability of fund and donor, among others.

## 8.3 Lao PDR

### ***Presentation of Lao team:***

On behalf of Lao team, Dr. Sacklokham, Vice-Dean of Faculty of Agriculture, National University of Lao, presented the tools and methodology used for the TNA. The Lao team had National University of Laos, National Agricultural and Forestry Extension Service and Master Trainers, Provincial and District trainers as the participants in the survey. He explained the institutional set up of the country and how the Lao extension approach and training line were arranged. As stipulated in the 5 years plan (2011-2015) of the Ministry of Agriculture and Forestry, it plans to develop human resource through in-country trainings for 1800 staff and overseas training for 3500 in different areas of agriculture and forestry relevant to climate change adaptation. The results from the TNA revealed that almost all training programs had no module and they were only related to technical subjects with no link to climate change adaptation. The training facilities were inadequate, more so at the provincial and district levels, hence requiring proper training centers with IT systems, curriculum and materials. The team identified that the modules need to address knowledge, skills and practices on impact of climate change, possibilities to adapt and research on the techniques. In addition, the training modules also need to provide basic knowledge and skills on agro-meteorology, integrated cropping system and agro-irrigation among others. Basic knowledge

on adaptation among the trainers and trainees, the availability of adaptation technologies and fund for testing the prepared module were some of the barriers identified.

**Discussions:**

Major comments included:

- How many training programs conducted both by public and private sector in service and induction training?
- The evaluation shows that trainings at the central level are good due to better facilities but at the provincial level they are bad due to the lack of facilities. The facilities are poor as there are no LCDs or OHPs.
- Most of the trainers are on the job training and no induction training.
- Are there sufficient trainers for imparting training on adaptation or they are only general training?: The trainings are for general purpose only.
- How did you arrive at the ideal scenario?
- What kind of research information is available for CCA in agriculture techniques in your country?
- Why erosion control when you said drought is an important disaster in your country?
- Please refer to the NAPA and identify skill and knowledge areas.

## 8.4 Mongolia

**Presentation of Mongolia team:**

Mrs. Burmaa Badral, Director-General, Department of Information and Monitoring, Ministry of Food, Agriculture, Food and Light Industry presented the TNA results of Mongolia. The participants in the TNA were the governors of sub-provinces and provincial authorities, extension managers, agriculture experts and field workers and herders, farmers and small private enterprise owners and the local level. She informed that the public policies to reduce the negative impacts of the climate change and specific measures to adapt to the changes has been announced in the “National Implementation Plan on Climate Change” in 2010, by the Mongolian parliament. The TNA process revealed that most of the training programs conducted had some elements of CCA and were mainly catered to the herders and small cooperatives, however, any training solely focusing of this aspect were very few. According to the survey, although the departments and/or organizations had human resource development plans and policies of which trainings form an inherent component, the funds allocated were not sufficient. Besides some basic knowledge on computer, IT skills and basic English, there was a need for good training facilities with equipments like projectors, sound systems, and internet connection. While the content of the training module needs to be focused around CCA, ToT, additional income generation for herder families and the role of private sector in agriculture, the challenges that lie ahead are mostly related with funds, good incentives to the qualified trainers, adequate training infrastructure and facilities and the willingness among the targeted trainees to be a part of the training programmes.

**Discussions**

- The knowledge and skill areas are missing, please refer to the NAPA and identify knowledge and skill areas.

## 8.5 Nepal

**Presentation of Nepal team:**

On behalf of the Nepal team, Mr. Shyam Prasad Paudyal, Program Director, Director of Livestock Services Training and Extension, Department of Livestock Services, Ministry of Agriculture and Cooperatives presented the TNA methodology and results. Besides conducting desk review and using the survey questionnaire availed by APAN to interview the training center chiefs, trainers, policy level officials, SMS and DADOs, field technicians, the team also used other tools like focused group discussions with officers attending training, regional level review workshops and interaction programs and on the spot observation of the training facilities. He informed that the “Civil Service Employee's Training Policy” had mandatory provisions for training and capacity development of the human resources through various types of basic trainings as well as subject specific trainings. The evaluation results informed that although the training facilities are in place, the teaching aids and training materials related to CCA are weak and training activities are jeopardized by long hours of load shedding. Given that the hills and mountains are more prone to the CC impacts, the need for training facilities and demonstration sites in these areas is deemed essential. The knowledge on climate change among the policy level officers and senior officers is poor and the case is even worse for the field level technicians and extension workers who have very poor knowledge in agriculture and virtually no understanding of climate change concept. An ideal scenario would be basic knowledge on the concept of CC, its effects/impacts on agriculture sector and its adaptation/mitigation measures. Mr. Paudyal asserted that special knowledge and skill are required on vulnerability assessment, community adaptation measures, forecasting, techniques/technologies for adaptation and conservation agriculture for which some of the key institutional requirements, knowledge and skill areas were also identified. The challenges ahead were training large number of extension workers with very limited knowledge and preparing training materials for different target groups. The team suggested that there is a need for two prong strategies to realize wider and quicker impacts on CCA.

### 8.6 Lecture on introduction to training course development framework and training objectives and identification of training contents

Mr. Voravate, Senior Program Specialist, AIT Extension delivered lecture on training course development framework and training objectives and identification of training contents. The lecture provided a clear understanding of the types and nature of objectives for both the trainees and the trainers and guided on the step-wise process of filling in the template for writing the objective.

#### **Discussion:**

- Use of a single term “module” only rather than programs, curriculum, modules, etc. to avoid confusion.
- Some discussions were carried on the induction training and in-service training. For instance, in case of Lao PDR, since there is no induction training, one induction training module should be developed together with integrating CCA into the existing training programs. These should be put in the policy suggestions.

The lecture was followed by a group exercise on identification of training contents and designing modules in a standardized framework. Voravate instructed the participants on the group exercise which will continue for another two days. Throughout the two-day exercise, the participants were required to design two modules: (i) the induction module and (ii) the in-service module. But before doing this, a clear definition of the induction training program and its scope needs to be clarified. It was agreed that the induction training will be provided for newly recruited officials with their new responsibilities while in-service training will be given to those who have been working but need to be updated in their knowledge and skills.

The first session of exercise was to identify the **purpose** of training module, to **whom** (target groups), **why**, and **titles** of two training modules. Five country groups have worked under the



facilitation of Mr. Voravate and then presented their group exercise results as follows:

- For Lao PDR, the induction training will be primarily targeted for the district officers to familiarize them with basic knowledge on CC while an in-service training will be given to the provincial agricultural staff to improve their specialized knowledge on rich production technology. This technology was chosen as it is one of the priorities in their NAPA and is also a finding from the TNA survey.
- For Bangladesh, CCA should be added in the job description for newly recruited staff for the induction training.
- In case of Cambodia, it was agreed that the induction trainings will be targeted to cadre of newly recruited staff at national level who do not have an understanding of the concept of CC and CCA in agriculture sector. While in-service trainings should be targeted for the extension workers at the district and commune levels to enhance their capacity on the knowledge and skills related to “CC adaptation technology on rice production”.
- For Mongolia, the induction trainings will be given to the provincial extension officers in order to increase their awareness on CCA and enhance effective communication using simple language regarding CCA while the in-service training will be given on basic crop production technology.
- Finally, in case of Nepal, the capability of the subject matter specialist (SMS) and technical workers will be developed through induction training on CC impacts on farming whereas the district agricultural officers will be given in-service trainings on CC .

## **DAY 2: August 11, 2011**

### **8.7 Lecture on agriculture technology for climate change adaptation**

Dr. Abha Mishra, a senior research specialist and an affiliated faculty at the Agricultural Systems Engineering field of study at the Asian Institute of Technology, delivered lecture on “Agricultural technology for climate change adaptation. She focused her lecture on the projected climate change impacts on agriculture in specific countries of the Asia Pacific region and provided information on the CCA technologies that are being advocated and researched. She explained that the major identified impacts on the agriculture sector would be on agricultural crops, water availability, livestock and aquaculture and pest and diseases for which adaptation technologies are both being researched and developed. The technologies have been developed for adaptation to drier conditions, for soil, water and nutrient management, for delivering ecosystem services, to support farmers gain access to new adaptation practice for early warning systems and climate forecast and last but not the least, for better links between local, national and regional institutions. She emphasized that the identified technologies should be able to reduce vulnerability to CC impact and ultimately contribute to sustainable development. The adaptation strategies should consider improving monitoring, implement sustainable agricultural practices, seek active participation of stakeholders at all levels for natural resources management and use strategies for efficient conservation of water.

### **8.8 Lecture on modularization of training contents/training methods and resources plan**

Mr. Voravate Chonlasin, Senior Program Specialist of AIT Extension, Asian Institute of Technology gave input session on modularization of training contents as part of training module design workshop. This session was the continuity of training and development session conducted in the second TNA meeting in March 2011. The main objectives of the session were to guide the participants on techniques used for selecting training contents and approaches that could be used for organization of contents in the training modules. The session addressed that selection of training

contents has to be according to training objectives as well as expectation on works that the trainees have to perform after the training. It is also very important to consider training contents that suit with education background and work experiences of the trainees. The trainees or training participants will pay attention and willingness to learn will increase if the contents of training help them to solve problems they face in the field or in work place. Likewise, most of trainees in this project are adult learners, therefore, training delivery approaches should be participatory and exploratory which depend on how contents are organized and will be delivered. For instance, the contents may present complex situation which will allow participants to analyze and identify solution. At the end, the contents present simplified but concrete theories and concept that would allow participants to remember easily. Mr. Voravate also highlighted that training delivery methods are very important to achieve the effectiveness of learning. Long input session (more than 20-25 minutes) was not recommended because trainers never know what the trainees have in mind or want to take away from training session. Participatory approach will allow trainers to know and to respond to specific aspects that trainees really want to know for solving their problems.

### **Discussion**

#### **Bangladesh:**

- Training objective has two levels. One is overall objectives which indicate outputs after completion of the training program. The other is enabling objectives that the trainers expect trainees to achieve in term of Knowledge and Skill after completion of each training activity/session.
- The training contents that related to rules, regulations and policies are not necessarily delivered in the classroom sessions. Reading assignments can be given to target staff in the organization or can be developed as manual or guideline.

#### **Lao:**

- Change of attitude of trainees is very difficult to measure, therefore, it is recommended to measure behavioral changes of target trainees. For example, trainers can observe the new way of transplanting rice of farmers. The point is that trainers should allow and give time to trainees to test new knowledge and skill and let them find out whether they can apply in real life situation or not.

#### **Mongolia:**

- Mini-input session is a term used for training session that resource person will lecture only 15 minutes to review concepts or theories. The mini-input session is normally followed by discussion or brainstorming sessions.
- It is very important to ask ourselves as trainers or training designers that “what we expect our trainees to perform after the training” so that we can delivery meaningful contents to them. In many cases their mandatory duties have already specified the tasks they need to perform. It is then possible to review job description of the trainees.

### **DAY 3: August 12, 2011**

#### **8.9 Country presentations and feedback**

On Day 3, the countries presented the training modules prepared during the group exercise on precious days. Mr. Voravate, Dr. Prabhakar and Dr. Le Huong gave their comments and feedbacks on the designed training modules. Some key feedbacks and queries made are given hereunder:

#### **Discussions:**



**Bangladesh:**

- More contents on Disaster Risk Reduction (DRR), so need to remove some parts and make it more on focused on CCA. There should be a conceptual clarity between CC (global warming) and disaster because CC does not lead to disasters.
- Lot of contents and some are not interrelated, for eg. meteorology is combined with public awareness.
- Use of words in English should be carefully assessed. For eg. the use of terms “discrimination” or “difference” in gender are for different purposes.
- Modules are good in terms of training, but in terms of subject matters or specific contents, they are still weak.
- The draft modules need to be linked with the perfect scenarios in the TNA reports.
- When making training objectives, there should be a logistical flow starting from knowledge and then skill. One objective should be achieved by one subject content.
- The local level modules should be more skill-oriented.
- Regarding the duration of training, the draft module should be split into smaller sub-modules.

**Nepal:**

- The training contents need to be grouped into two clusters.
- For induction training, the contents have to fit very much with the TNA, the technologies related to CCA should be included in the modules.
- Induction training sounds more policy oriented than functional nature of these officers.

**Cambodia:**

- For in-service training, the target groups should be changed to fit with the project objectives. The CCA component has to be incorporated into the existing training programs and a new/separate module need not be developed.
- The induction training should be targeted to extension workers.
- Although brainstorming is a strong technique,, it should be used too much in a training program.
- The methodology seems to be repeated in several sessions so need to be revised. Also contents are very general like pest management, animal production etc. which need to be more focused.

**Mongolia:**

- Too many objectives, some are skill training. It is better to have one objective + several contents or one module + several sub-modules.
  - The relation of the subjects to CC (mechanization) needs to be justified.
  - Why meterological data collection is focused? Is it national priority/part of some kind of national program?
- Response: Data collection is a part of the job description for provincial extension managers.

**Lao:**

- Since it was mentioned that there are no induction training in Lao PDR, is the strategy developed?

- The responsible agencies for implementing these modules need to be mentioned.

## 8.10 Wrap up

Firstly, for administrative purpose, Dr. Le Huong guided the country team leaders on how to submit the country report (content, format, timeframe) and financial documents (invoice, receipts, financial report/break-down, etc.). She also discussed and suggested the countries to develop a clear work plan for the implementation or piloting period of the training modules developed. Secondly, in order to help the country teams improve their draft training modules and revise the final country reports, Dr. Prabhakar wrapped up the meeting with some important points for the teams to consider for revision. Details are given hereunder:

### Bangladesh:

- Report: (i) Include data from surveys, (ii) Make sure that there is clear connection between subjects chosen and responses from the respondents, and with the subject in the modules, (iii) Discuss responses and identify training needs by level of officers who were interviewed.
- Module (in-service): (i) Make sure that the general contents like livestock, etc. are about climate change related specific information, (ii) Best management practices may be dealt in other training programs, but in this module, it is necessary to consider how specific it is to CCA.

### Cambodia:

- Report: (i) Identify training needs by class of officers rather than PDA, GDA department-wise. However, it is okay if trainings in the country are carried by department wise and not by level of officers. Please refer to Nepal report if needed, (ii) Include job descriptions of officers interviewed (same to all countries).
- Module: Enabling objective: to enhance the capacity: Qualify it either knowledge and skill, etc. (Make them 'SMART').

### Lao:

- Report: (i) Include data from surveys, (ii) Refer to NAPA for finalizing the 'ideal scenario' and identify training needs by comparing ideal scenario with the job description and survey responses, (iii) Training needs are to be identified for each class of staff who have been interviewed, (iv) Review other training modules on climate change available in the country (As Cambodian team members referred that there are training programs on climate change). See if they are administered to agriculture personnel or not (even if the module is a general one but if agriculture officers have attended). This module can be used to identify other subject matter content.
- Modules: (i) Make sure there is sufficient link with TNA, (ii) For short duration varieties module: Mention clearly the reason behind choosing this subject in the introduction section, (iii) For induction training, provide appropriate context in the implementation modalities section on how this module can be implemented, what are assumptions made about 'induction training program' that doesn't exist yet.

### Nepal:

- Report: (i) Include data from surveys, (ii) Organize such a way that the order of ideal scenario, prioritization of training gaps, and training needs is intuitive to the reader.
- Module: Make sure that assumptions made for induction training are clearly indicated in the introduction and implementation modalities.

### Mongolia:

- Report: (i) Refer to NAPA and other published literature for finalizing the ‘ideal scenario’ and identify training needs by comparing ideal scenario with the job description and survey responses, (ii) Training needs are to be identified for each class of staff who have been interviewed and link to the module developed for them.
- Modules: (i) Make sure there is sufficient link with TNA, (ii) For meteorology module, mention clearly the reason behind choosing this subject in the introduction section, and see that it has sufficient link with the training needs identified and the ideal scenario, (iii) Rephrase sub-modules to a standard terminology ‘capsules’.

In short, Dr. Prabhakar listed out the common suggestions for all five country teams for them to revise the training modules and develop final country report. These include:

#### **For the final country report:**

- Refer to NAPA of the country and make sure that the priorities listed under agriculture and allied sectors are included in the ‘Ideal Scenario’ that the team has developed.
- Refer to other literature (scientific or otherwise) for identifying technologies and practices/policies suggested for the country.
- Provide references or sources wherever the country team referred /brought content from in the report (e.g. review of policy and institutional systems, review of modules).
- Organize the content according to the outline provided.
- Include job description of officers who have been interviewed.
- Mention about factual situation of the response given by respondents: e.g. when they say there is no training, please look for evidence that there is no training and discuss why they may have said doesn’t exist (awareness gap).
- Include policy suggestions section in the country report (Part I) to overcome various issues that the team found from TNA (for e.g. lack of infrastructure, critical mass of trainers etc). Refer to specific policies in the country on how they can support overcoming these limitations.

#### **For the training modules:**

- Insert the table into the format supplied and shown on the screen.
- Each team needs to develop 6 modules in total which include:
  - 2 classes (induction and in-service)
  - 3 levels (entry, middle level, and senior policy level)
- Mention clearly which module is for to what specific officers (e.g. Provincial agricultural officer, not level I or entry level)
- Course Content: Review for identifying appropriate course content suiting to different levels of officers, talk to different experts if needed.
- Revisit the training methods and be practical about it.
- Make sure that there is connectivity in the flow of contents in each module.

### **8.11 Closing remarks**

Dr. Mozaharul Alam, Regional Climate Change Coordinator of UNEP-ROAP, delivered the concluding remarks. He thanked the entire team of APAN for successfully organizing the workshop. He also

thanked the country participants for their hard work and perseverance in developing a product which will be useful not only for them but also for other countries across Asia and the Pacific that are working towards building capacity in the adaptation sector.

He reminded the countries that being the first initiative in terms of TNA, the product will be internally shared through internet, therefore the countries should try to make the output at its best. He assured the participants that the resource materials for pilot program will be identified soon. He also informed that some of the participants from this meeting will also be invited for the pilot training which will be organized on October 25-26, 2011 back to back with the Adaptation Forum 2011 in Bangkok.

At the end, he once again thanked all the colleagues, organizer and donors for funding the APN and APAN projects.

## 9. APPENDICES

### Appendix 1: Meeting Agenda

Wednesday - August 10, 2011	
8:30-9:00	Registration
9:00-9:15	Welcome remarks Dr. Mozaharul Alam, Regional Climate Change Coordinator, United Nations Environment Program (UNEP) - Asia and the Pacific, Thailand
9:15-10:45	Country presentation on results/findings of TNA (20 min./presentation and 10 min./discussion) Bangladesh, Cambodia and Lao PDR Facilitators: Dr. SVRK Prabhakar, Senior Policy Researcher, IGES Dr. Le Thi Thu Huong, Climate Change Adaptation Specialist, IGES Regional Center – APAN
10:45-11:00	Tea break
11:00-12:00	Country presentation on results/findings of TNA (continue) Mongolia and Nepal Facilitators: Dr. SVRK Prabhakar, Senior Policy Researcher, IGES Dr. Le Thi Thu Huong, Climate Change Adaptation Specialist, IGES Regional Center – APAN
12:00-13:00	Lunch break (at AITCC)
13:00-14:00	Lectures: Introduction to training course development framework. Training objectives and identification of training contents Mr. Voravate, Training Expert, AIT Extension
14:00-16:00	<b>Group exercise:</b> Identification of training contents (Tea break at 15:00)
16:00-17:30	Presentation and feedback (15-20 min./group)
Thursday - August 11, 2011	
9:00-10:00	Agriculture technology for climate change adaptation ( and Q&A) Dr. Abha Mishra, Senior Research Specialist and Affiliated Faculty, Asian Institute of Technology
10:00-10:30	Modularization of training contents/training methods and resources plan Mr. Voravate, Training Expert, AIT Extension
10:30-10:45	Tea break
10:45-12:30	<b>Group Exercise:</b> Contents organization and selection of training methods Facilitators: Mr. Voravate, Training Expert, AIT Extension

	<p>Dr. SVRK Prabhakar, Senior Policy Researcher, IGES</p> <p>Dr. Le Thi Thu Huong, Climate Change Adaptation Specialist, IGES Regional Center – APAN</p>
12:30-13:30	Lunch break (at AITCC)
13:30-17:00	<p><b>Group Exercise:</b> Finalization of training course design and preparation for country presentation</p> <p>Facilitators:</p> <p>Mr. Voravate, Training Expert, AIT Extension</p> <p>Dr. SVRK Prabhakar, Senior Policy Researcher, IGES</p> <p>Dr. Le Thi Thu Huong, Climate Change Adaptation Specialist, IGES Regional Center – APAN</p>
Friday - August 12, 2011	
9:00-12:00	<p>Country presentation and feedback (20 min./presentation and 10 min./discussion)</p> <p>(tea break at 10:30)</p>
12:00-13:00	Lunch break (at AITCC)
13:00-13:30	<p>Work plan for next steps:</p> <p>Dr. Le Thi Thu Huong, Climate Change Adaptation Specialist, IGES Regional Center – APAN</p>
13:30-14:00	<p>Wrap up:</p> <p>Dr. SVRK Prabhakar, Senior Policy Researcher, IGES</p>
14:00-14:30	<p>Closing remarks:</p> <p>Dr. Mozaharul Alam, Regional Climate Change Coordinator, United Nations Environment Program (UNEP) - Asia and the Pacific, Thailand</p>

## Appendix 2: List of Attended Participants

No.	Name	Position and Organization	Country
1	Dr. KANG Kroesna (Ms.)	Dean, Faculty of Agricultural Technology and Management, Royal University of Agriculture (RUA)	Cambodia
2	Mr. HOK Kimthourn	National Project Manager Project Support Unit, Ministry of Agriculture Forestry and Fisheries (MAFF)	Cambodia
3	Mr. CHEA Chan Thou	Deputy Director, Climate Change Department (CCD), Ministry of Environment (MoE)	Cambodia
4	Dr. Silinthone SACKLOKHAM (Ms.)	Vice Dean, Faculty of Agriculture, National University of Lao (NUL)	Lao PDR
5	Mr. Somphanh PASOUVANG	Associate Professor, Research and Training Division, Faculty of Agriculture, National University of Lao	Lao PDR
6	Mr. Fongsamouth SOUTHAMMAVONG	Dean, Faculty of Agriculture, National University of Lao (NUL)	Lao PDR
7	Mr. Somphone NOIVONG	Agronomist/Trainer, National Agricultural and Forestry Extension Service (NAFES), Ministry of Agriculture.	Lao PDR
8	Mrs. BURMAA Badral	Director-General, Department of Information and Monitoring, Ministry of Food, Agriculture, Food and Light Industry (MoFALI)	Mongolia
9	Mr. PUREVSUREN Buyan-Ulzii	Director, National Agriculture Extension Center, Ministry of Food, Agriculture and Light Industry (MoFALI)	Mongolia
10	Dr. OYUNTUYA Sharavjamts	Vice Director, School of Ecology and Technological Development, Mongolian State University of	Mongolia
11	Mr. OTGONBAATAR Bayaraa	National Agricultural Extension Center, Ministry of Food, Agriculture and Light Industry, Project Assistant	Mongolia
12	Dr. Md. Sekender ALI (Mr.)	Associate Professor, Department of Agriculture Extension & Information System, Sher-e-Bangla Agricultural University, Dhaka-1207, Bangladesh	Bangladesh
13	Mr. Md. Fazlul KARIM	Director, Training Wing, Department of Agriculture Extension, Ministry of Agriculture,	Bangladesh
14	Mr. Ram Bhakta SHRESTHA	Director, Centre for Organization Development, NASC, Nepal Administrative Staff College (NASC)	Nepal
15	Mr. Shyam Prasad PAUDYAL	Program Director, Director of Livestock Services Training and Extension, Department of Livestock Services, Ministry of Agriculture and Cooperatives	Nepal
16	Mr. Ganesh Kumar SHRESTHA	Agronomist, Senior Horticulture Development Training Officer, Directorate of Agricultural Training, Harihar Bhawan, Lalitpur,	Nepal
17	Dr. Mozaharul ALAM	Regional Climate Change Coordinator, United Nations Environment Program - Regional Office for Asia and the Pacific (UNEP-ROAP), Thailand	Distinguished participant
18	Ms. Raji DHITAL	Assistant Program Officer, UNEP-ROAP	Distinguished

			participant
19	Mr. Voravate CHONSALIN	Senior Program Officer, Head of Public Sector Capacity Building Unit, AIT Extension, Asian Institute of Technology (AIT)	Lecturer
20	Dr. Abha MISHRA	Senior Research Specialist and Affiliated Faculty	Lecturer
21	Dr. SVRK PRABHAKAR	Policy Researcher (Adaptation Team), Natural Resource Management Group, IGES Headquarters, Japan	Resource person
22	Dr. LE Thi Thu Huong	Climate Change Adaptation Specialist, APAN - IGES Bangkok Office	Organizer
23	Ms. Narudee LERDPHORNSUTTIRAT	Administrative Associate, IGES Regional Center	Organizer
24.	Ms. Supaporn PHUSATORN	Administrative Associate (APAN) AIT/UNEP Regional Resource Center for Asia-Pacific (RRC.AP)	Organizer



### Appendix 3: Meeting Photos



Participants of 3<sup>rd</sup> workshop: Training Modules Design Workshop  
August 10-12, 2011 - Bangkok, Thailand



Country presentation on training needs assessment



Lecture on “Training Cycle and Design of Training Program” by Mr. Voravate



Wrap up session by Dr. Prabhakar

## **APPENDIX 2: All forms and outlines**

Appendix 2a: Training Needs Assessment Forms

Appendix 2b: Evaluation Sheet of Existing Training Programs

Appendix 2c: Outline of a Generic Training Module

Appendix 2d: Suggested Outline of Country Reports

## Appendix 2a: Training Needs Assessment Forms

### TRAINING NEEDS ASSESSMENT FORMS

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APN Project on Scientific Capacity Development of the Trainers and Policy Makers for Climate Change Adaptation Planning in Asia and the Pacific

Asia-Pacific Climate Change Adaptation Network, UNEP and IGES



The purpose of this training needs assessment exercise is to assess the knowledge, skill and environmental needs of different staff in agriculture and irrigation departments in order to deal with climate change impacts through designing and implementing training programs that enhances their capacity to mainstream climate change adaptation in the sectoral activities, plans and programs.

This form is to be filled by the representative of the department or the employee/interviewee themselves in order to help the interviewer assess the training needs in knowledge and skill areas. As a part of this TNA, the following information is solicited from the interviewee.

- Line of command or the structure of decision making authority within the department/organization being assessed (in this case the aim is to assess training needs in agriculture sector including water for agriculture)
- TOR or job description of each personnel (including any expected change in the role to be assigned for an effective adaptation decision making within the department)
- A questionnaire that assess the training facilities available in each country or geographical area of the respondent
- A questionnaire to be answered by the employee to assess his knowledge, skill and environmental areas

**For further clarifications, please contact:**

SVRK Prabhakar (prabhakar@iges.or.jp) or Le Thi Thu Huong (le@iges.or.jp)

**Acknowledgements and disclaimer:** This survey is being conducted by IGES, UNEP and other partner institutions of the Asia-Pacific Climate Change Adaptation Network. This project receives financial support from the Asia-Pacific Network for Global Change Research, Japan project no. CBA2010-09NSY-Okayama. The data collected in this exercise will be strictly used for designing training modules and for research and developmental purposes and will be treated according to the privacy regulations of the partner institutions.

Date: \_\_\_\_\_

**FORM I: LINE OF AUTHORITY OR STRUCTURE OF DECISION MAKING**

1. Department (please limit to Agriculture and or water sectors related):
  
2. Designation of personnel (from the top unit of decision making within the department such as districts or provinces to the ground level such as village level).

S No	Level of authority <sup>8</sup>	Official Designation (and total number of staff) <sup>9</sup>
1	e.g. Province or district	1. Director general 2. 3.
2	e.g. sub-Province or sub-district	1. 2. 3.
3	e.g. Block or Mandal etc	1. 2. 3.
4	e.g. Group of villages	1. e.g. Agricultural officer 2. 3.
5	e.g. Smallest unit of administration	1. e.g. Village worker 2. 3.
6		1. 2. 3.
7		1. 2.

<sup>8</sup> Fill district, province, block, village etc. Please fill for all levels from the top level to the village level

<sup>9</sup> Please mention in parenthesis the total number of staff under each category in your country (rough estimate may be sufficient)

		3.
8		1. 2. 3.
9		1. 2. 3.
10		1. 2. 3.



Date: \_\_\_\_\_

## FORM II: JOB DESCRIPTION

(Please use multiple sheets for individual designation/title)

1. Department: \_\_\_\_\_
2. Level of authority: Province / District / Block / Mandal / Division / Village
3. Designation/title of the employee whose job is being described (e.g. Director): \_\_\_\_\_

4. Designation of the immediate supervisor of the above employee: \_\_\_\_\_

5. Qualification for entry into this job: Education:

\_\_\_\_\_ Experience: \_\_\_\_\_

### Job description:

S No	Current Job Description <sup>10</sup>	Desired change in job description if any <sup>11</sup>
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

<sup>10</sup> Tasks to be performed on the job, please include both skill areas and knowledge areas, mention if this job involves supervision of staff, how many will be supervised etc

<sup>11</sup> Please suggest any changes in the job description you may think necessary in order to promote the climate change adaptation in your sector/administrative area

### FORM III: QUESTIONNAIRE ON TRAINING FACILITIES

1. Is there any human resource development plan or policy available to your department or organization that stipulates certain training activities to be carried out at regular intervals? Yes  
No

2. Funds available or allocated for training in your department or organization:

not allocated,  allocated but not sufficient,  allocated and sufficient

3. What kind of training is being or was implemented in your department or organization so far:

Parameter	Induction training	On the job training
Duration (days)		
Knowledge areas included	<input type="checkbox"/>	<input type="checkbox"/>
Skill areas included	<input type="checkbox"/>	<input type="checkbox"/>
Regular or sporadic	<input type="checkbox"/> Regular <input type="checkbox"/> Sporadic	<input type="checkbox"/> Regular <input type="checkbox"/> Sporadic

3. Who implements training to the personnel in your department or organization:

Dedicated training institute University In-house training facilities; please specify \_\_\_\_\_

\_\_\_\_\_

#### Evaluation of training and facilities:

4. Overall assessment of training facilities: Bad Poor Average Good Very good

4a. What specific training facilities need to be improved for effective implementation of climate change adaptation related training: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Overall assessment of trainers: Bad Poor Average Good Very good

6a. Number of trainers: Bad Poor Average Good Very good

6b. Trainers training skill: Bad Poor Average Good Very good

6c. Trainers knowledge to train: Bad Poor Average Good Very good

7. Evaluation of post training performance of trained staff:

7a. Is there any post-training evaluation done within your organization? Yes No Not sure

7b. Do you observe an improvement in the on the job performance of staff after the training?



Yes No Not sure

8. Which training institute/facility do you suggest in your country for implementing training on climate change adaptation in agriculture sector? \_\_\_\_\_

\_\_\_\_\_

#### FORM IV: QNR. FOR EMPLOYEE TRAINING NEEDS ASSESSMENT

This questionnaire helps assessing the specific tasks being carried out where training intervention may be required to address the climate change adaptation in agriculture and water sectors. Your cooperation is solicited.

1. Designation or job title:

\_\_\_\_\_

#### a. Education and training:

2. Education qualification for the

job: \_\_\_\_\_ Experience qualification  
needed if any: \_\_\_\_\_

3. Your qualification: Education:

\_\_\_\_\_ ;

Experience: \_\_\_\_\_

4. Was there any curriculum on climate, climate change, and addressing climate change in your sector in your education? Yes No

5. Please mention if you have handled projects/programs/activities in climate change adaptation relevant areas in agriculture and water sectors: Yes No

6. Have you received any formal training (induction or on the job) on climate change adaptation and related fields? Yes No

7. If yes, please provide a brief list of subjects and duration of training: Duration (total training days): \_\_\_\_\_, list of curriculum, skill areas: \_\_\_\_\_, knowledge areas: \_\_\_\_\_

\_\_\_\_\_

8. Was the above training useful in helping your subordinates or farmers in addressing the climate change related issues in your region? Yes No

9. Was there evaluation of your performance after you received the above training? Yes No

#### b. On the job functions

10. Do you play a supervisory role? Yes No

11. If yes, what number of staff do you supervise? Number: \_\_\_\_\_, Their designation/titles: \_\_\_\_\_

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12. In what areas do you supervise the staff: \_\_\_\_\_

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### c. Self evaluation of knowledge and skill areas

13. How do you rate your knowledge and skills in climate change adaptation in your sector (1 is poor, 5 is very good):

**Knowledge:** Bad Poor Average Good Very good

**Skills:** Bad Poor Average Good Very good

14. What areas do you think you need training to do your job better?

Knowledge	Skill areas

### d. Self evaluation of the working environment:

15. How do you rate your working environment for delivering your job responsibilities? Bad Poor Average Good Very good

16. Reason for the above:

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17. What infrastructure related issues do you face (equipment, software etc including communication facilities) in delivering your job functions that you would like your supervisors to address: \_\_\_\_\_

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S No	Title	Overall duration	Implementing agency/ies	CCA course content (if any)		Other course content (list of sessions)		Important notes from M&E	Practically possible length of time this course can be extended*
				Knowledge areas (duration, hrs)	Skill areas (duration, hrs)	Knowledge (hrs)	Skill (hrs)		

\* this could be a guesstimate depending on the understanding/expertise of the pedagogic expert involved.

## A SIMPLE 2 STEP PROCESS FOR ARRIVING AT AN IDEAL CAPACITY PROFILE OF STAFF

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### Step 1:

Summarize all the job responsibilities that the staff has to perform on daily basis. This should also include 'needed changes to be made in their job profile' in order to help him perform his job better (this is a changed climate scenario).

-----This basically comes from Form II

### Step 2:

List all the knowledge and skills needed to perform each job to a satisfactory level (at this stage, there is no need to characterize what constitutes a satisfactory performance, most national governments may not have internal evaluation of staff. They can use those guidelines if they have).

-----This would come from the discussion among the three experts.

### Notes:

This profile should be made for each staff listed in Form I (both for trainers and trainees). While this discussion can happen in the module drafting workshop, it is better if the team discusses it in their respective countries and brings the output with them so that they will have more quality time to design the modules. The actual training module workshop involves going a step further from step 2 to step 3 involves comparing the ideal profile output of step 2 with the existing skill and knowledge areas of the staff (coming from the Form IV). These gaps would then be translated into learning objectives and course content and so on.

## Appendix 2c: Outline of a Generic Training Module

### OUTLINE OF A GENERIC TRAINING MODULE

#### 1. INTRODUCTION

>>A background to the training module

#### 2. TARGET GROUP

>>Name the specific trainer/staff level or group of trainer/staff

#### 3. ENTRY BEHAVIOUR

>> Age, Educational background, and level of knowledge and skill on the training module being conducted (e.g. Semi-skilled/skilled etc), expected skill and knowledge levels of the trainer/trainees before entering into the training module etc.

#### 4. GOAL AND LEARNING OBJECTIVES

#### 5. IMPLEMENTATION MODALITIES

>> Number of trainers and trainees per batch, duration of training, collaboration with other training institutions, facilities required etc.

#### 6. EXPECTED OUTCOMES

>>Mention what you expect to see the changes in trainees.

#### 7. EVALUATION

>>Mention how the trainees will be evaluated before and after the training module.

#### 8. SESSION DETAILS

<b>Title of the module</b>												
<b>Target trainees / participants</b>												
<b>Responsibility of the participants after training (they are expected to do what) -</b>												
<b>Duration of the module</b>												
SN.	Enabling objectives	Contents	Methods / Activities	Expected participants					Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
				1	2	3	4	5				

SN.	Enabling objectives	Contents	Methods / Activities	Expected participants					Duration (min./hr.)	Resources used	Methods of learning evaluation	Note by module designer
				1	2	3	4	5				

9. LIST OF TRAINING MATERIALS

Provide a list of references for trainers and trainees to refer for implementing this training module.

10. FEEDBACK FORM

11. SCHEDULE OF TRAINING PROGRAM

>>How this training module can be implemented at the institute and national level. Here, you may want to provide details on cost estimates, number of trainees need to be trained, number of trainers needed etc.

**Appendix 2d: Suggested Outline of Country Reports**

**OUTLINE OF COUNTRY REPORTS**

The country report is divided into two parts. Part I should ideally be compiled before arriving at the training module drafting workshop so that the information is used while drafting the modules. Part II can be finalized after the modules are finalized after the drafting workshop. This is an indicative outline and page number is no limitation. Emphasis is on providing suitable information rather than on quantity and hence some sections could be short while others could be longer.

**Part I**

**1. Introduction**

>> *Brief explanation on the background of the project and national circumstances that need this project.*

**2. Overall objectives and methodology**

>> *Much of the same that stands for the project with changes made if any.*

**3. Institutional arrangements and policy setup for training and capacity building in the country**

**a. National level**

>>*Some discussion on overall structure and more specific discussion at sectoral level.*

**b. Sub-national level**

>>*Some discussion on overall structure and more specific discussion at sectoral level.*



#### 4. Training needs assessment for agriculture sector

>>This part mainly comes from the questionnaire survey results.

##### a. Evaluation of training programs (curriculum)

>> From the content of training programs collected from various training institutions in the country. These training programs need not be adaptation training programs but generic sectoral training programs implemented. The main objective of this section is to identify what lessons these ongoing training programs provide and what opportunities do they provide to mainstream climate change and adaptation content in it. Please refer to page No 3 titled 'Evaluation of existing training programs' to prepare this section.

##### b. Evaluation of Training facilities (buildings, tools etc)

>> Evaluation from Form III

##### c. Evaluation of trainers and trainees

Derived from Form II (job description) and Form IV

- i. Education and training
- ii. On the job functions (Current duties and expected changes in roles for CCA)
- iii. Evaluation of skill and knowledge areas
- iv. Self evaluation of working environment (cross check with the above institutional evaluation)

#### 5. Establishing ideal scenario of knowledge and skills areas for agriculture sector

>>Should be done in consultation with CCA expert and departmental expert referring to the job description of the staff (Form I and II), national adaptation program of actions and other research and technical material related to adaptation options, needs assessments etc. Since not entire skill sets can be included in the training programs, only essential/priority areas need to go into this. Please refer to the page No 4 on A simple 2 step process for arriving at an ideal capacity profile of staff to prepare this section.

##### a. Identified priorities for knowledge and skills

- i. Basic knowledge and skills that need to be imparted to all the staff/trainers.

>> Is the basic knowledge and skills that go common to all trainers/staff.

- ii. Specific knowledge and skill areas need to be imparted to specific staff/trainer

>> Should be identified for each staff/trainer enumerated in Form I separately. It could be possible to group most staff into field staff/technical staff/administrative staff/executive staff and suitable knowledge and skill areas may be identified for them to deliver their duties effectively.

##### b. Needed institutional facilities for supporting above knowledge and skill areas.

>> Discuss among the national TNA team whether the above identified knowledge and skill areas require additional facilities to be introduced into the training institutions in your country where the training modules will be implemented. Compare this with what is already present in training facilities as obtained from Form III.

## Part II

Since this part comes after submission of the 'national report' this part can be treated as Part II of the national report.

### 1. Training modules

>>Comes from the training module drafting workshop to be conducted in Bangkok in August 2011. The outline of a generic module is presented in Page 5. This outline will be discussed on the first day of the training module drafting workshop incorporating suggestions from the group.

- a. Officer/Trainer I
  - i. Session outline
  - ii. Prerequisites for implementing training
    - 1. Number of additional trainers needed
    - 2. Additional financial resources needed
    - 3. Additional institutional facilities needed (class rooms/training tools etc)
    - 4. Implementation mechanisms (collaboration with other agencies if needed)
- b. Officer/Trainer II
- c. Officer/Trainer III

**2. Policy suggestions for promoting capacity building**

- a. E.g. how to secure resources for scaling up
- b. What institutional changes need to be implemented (if any)
- c. Implications/linkages in terms of education curriculum and developing expert base (if any)

### **APPENDIX 3: Article for APN Newsletter and Progress Report**

Appendix 3a: Article for APN Newsletter

Appendix 3b: Progress Report

### **A3a: Article for APN Newsletter**

#### **APN Funded Project CBA2010-09NSY-Okayama:**

#### **Scientific Capacity Development of the Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific**

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#### **Article for APN Newsletter**

Climate change has been projected to have critical impacts on socio-economic development and poverty reduction globally and in the Asia-Pacific region. Since 2008, United Nations Environment Programme (UNEP) in partnership with key UN agencies and international organizations has been facilitating the development of a Global Adaptation Network (GAN) which composes of four Regional Networks in developing regions: Africa, Asia-Pacific, West Asia, and Latin America and the Caribbean. Among the others, the Asia Pacific Adaptation Network (APAN) was launched in October 2009 and it aims to help countries in the region to build climate resilience of vulnerable human systems, ecosystems and economies through the mobilization and sharing of knowledge and technologies to support adaptation capacity building, policy-setting, planning and practices. One of its objectives is to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into development planning.

For this capacity building objective, the project entitled “Scientific capacity development of trainers and policy-makers for climate change adaptation planning in the Asia and Pacific” has been approved by the Asia-Pacific Network for Global Change Research (APN) for funding starting November 2010. The main objectives of this project are to (i) undertake training needs assessment (TNA) in terms of knowledge and skill areas for effective adaptation to climate change; and (ii) design training modules for imparting knowledge and skills for effective adaptation. As a pilot initiative, this APN project focuses on agriculture sector as the most vulnerable sector to climate change in the five targeted countries including Bangladesh, Cambodia, Lao PDR, Mongolia, and Nepal.

As TNA is the first step for the design and development of capacity-building programmes, the first TNA Meeting was organized on 31st January 2011 in Asian Institute of Technology to (i) introduce the partners to APAN and its capacity building agenda, (ii) reach a consensus on the modalities for implementing APN project, (iii) obtain preliminary information and discussion on national systems for capacity building, and (iv) agree to cooperate to develop national strategies for capacity building in the long-term. Participants were trainers of national training institutions, lectures of universities, and ministerial staff working on agriculture sector in five targeted countries of APN project. Colleagues from IGES, AIT, UNEP ROAP, AIT-UNEP RRC.AP, and USAID also attended.

Some key messages have emerged out of the presentations made and ensued discussions during the meeting. First, climate change adaptation is an issue of capacity building and capacity building of key stakeholders is of paramount importance for promoting climate change adaptation in some vulnerable sectors and countries in Asia-Pacific region. Awareness generation and capacity building of policy makers are crucial to bring change in various government related processes and the society at large. Second, there have already been several initiatives by various international and national agencies for training and capacity building of key stakeholders. Training and capacity building of various government staff and trainers have been facilitated by both formalized systems consisting of induction and on-the-job training programs and ad-hoc training programs that are conducted from time to time when resources are available. However, they are too few and inadequate in terms of design and implementation. Third, discussions revealed the presence of training and capacity needs assessment for adaptation for priority sectors in some of the project countries. However, the nature

and details of these training and capacity needs are not yet clear and have to be taken into consideration before making any further interventions. Fourth, formulation of training modules and pilot programs should not be seen as an end but as a beginning for creating enabling environment for engagement of different stakeholders. Active and coordinated engagement of national and local governments and other stakeholders is crucial to regularize training and capacity building programs in the region. Fifth, APAN is well placed to play an important role as a facilitator to bring various stakeholders together and to initiate training needs assessment as well as formulation of training modules and pilot training programs. However, piloting and scaling up of these initiatives require proactive participation of various stakeholders including the support from governments, NGOs, national and local institutions and donor agencies.

Since the first TNA Meeting already came up with certain agreements on the modalities for conducting TNA in targeted countries, the second TNA meeting will be organized on 11<sup>th</sup> March 2011 in Bangkok. It aims to (i) review the process of conducting TNA for agriculture sector in five countries by the national partners, (ii) discuss on the advantages, constraints, challenges and other issues practically faced by the national partners in conducting TNA, and (iii) find out the solutions to overcome and the ways forward to continue detailed TNA. Through this meeting, the APN project expects to get a preliminary report on TNA from five targeted countries in order to move towards more details of TNA and the design of training modules at the project end. Piloting and evaluation of training modules are planned to carry out in the next phases of the project in the following years.

## A3b: Progress Report submitted to APN

17 January 2011

Project title:

### **Scientific Capacity Development of the Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific**

*Reference:* CBA2010-09SNY-Okayama

*Proponent's name and title:*

Dr. Toshinao Okayama, Coordinator of the Regional Hub of Asia-Pacific Climate Change Adaptation Network (APAN)

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#### **PROGRESS REPORT TO APN**

This project aims at building capacity of key stakeholders such as trainers, policy-makers, development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into development planning in some of the targeted countries of the Asia Pacific Climate Change Adaptation Network. The main objectives are (1) to undertake appraisal of training needs in terms of knowledge and skill areas for effective adaptation and (2) to design training modules for imparting knowledge and skills for effective adaptation.

Starting from October 2010, the project has planned detailed activities and timeframe for its objectives. In order to develop the capacity of training institutes who are active in training the policy makers, the project has started to undertake training needs assessment (TNA) in terms of knowledge and skill areas for effective adaptation (objective 1). The training institutes in five targeted countries (including Cambodia, Lao PDR, Mongolia, Bangladesh and Nepal) have been identified and the detailed activities of TNA have been designed. The target sectors are kept on track of agriculture and water related to agriculture (i.e. irrigation). Based on TNA results, the project will support the targeted training institutes to develop training modules which then will be implemented for trainers in the key faculty of training institutes and for key policy-makers in the region (objective 2).

The planned activities for these two objectives can be seen in Part 1 below (time plan for the activities is in Annex 1 at the end of this report). For TNA, the project is going to organize one meeting entitled "Training Needs Assessment Meeting" on 31 January 2011 in Bangkok. Details of this TNA meeting can be seen in Part 2 below.

#### **PART 1: PLANNED ACTIVITIES FOR CAPACITY DEVELOPMENT**

##### **1.1 Training needs assessments (TNA):**

(a) Identify national partners:

National partners are the training institutes which provide training to policy makers and national or sub-national staff working in agriculture sector (and water related to agriculture, i.e., irrigation). The project already identified, contacted and received the confirmation from five national partners as follows:

- Cambodia: Faculty of Agricultural Technology and Management, Royal University of Agriculture.
- Lao PDR: Faculty of Agriculture, National University of Lao.
- Mongolia: School of Ecology and Technological Development, Mongolian State University of Agriculture.
- Bangladesh: Bangladesh Agricultural Research Council.
- Nepal: Centre for Organization Development, Nepal Administrative Staff College.

(b) Organize TNA Preliminary Meeting on 31 January 2011 in Bangkok:

- Participants include (1) representatives of national partners who have technical knowledge or background on agriculture sector and administrative responsibility in organizing training, (2) representatives of Ministry of Agriculture and Ministry of Environment of five targeted countries, (3) experts and researchers working on agriculture and climate change adaptation, and (4) project team.
- Purposes are to (1) introduce the partners to APAN and its capacity building agenda (APN project), (2) reach a consensus on the modalities for implementing APN project on training modules development, (3) obtain preliminary information and discussion on national systems for capacity building, and (4) agree to cooperate to develop national strategies for capacity building (long-term).

In addition, in this meeting the national partners will be assigned to conduct TNA in their own countries. The project team will (1) provide them the TNA questionnaire forms and guide how to conduct survey, (2) request them for taking stock of their existing training programs on agriculture and irrigation (with climate-change-adaptation-related contents, if available).

(For more details of this meeting, please see Part 2 below)

(c) Organize TNA Review Meeting (two days) in the last week of February 2011 in Bangkok:

- Participants include representatives of national partners and project team. For this meeting, the national partners are requested to (1) have presentation on their TNA findings, (2) submit TNA preliminary reports. The meeting is also aimed to have more in-depth discussion with the national partners on their TNA assignments.
- Based on the preliminary TNA reports submitted by five national partners, the project team will develop a synthesis report with lessons learned, process documentation and policy suggestions.

(d) Detailed TNA and monitoring:

From March to May 2011, the national partners will continue to conduct detailed TNA as requested by the project team. For monitoring, the representatives of project team will go to five countries to follow up TNA and continue to guide the partners accordingly. In parallel, during this period the team will also study and draft the training modules for agriculture sector and irrigation.

### **1.2. Support targeted training institutes in developing training modules**

(a) Organize Training Modules Drafting Workshop (TMDW) (2 days) in Bangkok by June 2011:

- Targeted participants include (1) representatives of national partners, (2) adaptation experts on agriculture/irrigation sectors, (3) pedagogy experts (who will help to prepare learning outputs, divide training modules into capsules on knowledge, skill, field work, etc.).
- Purposes are to discuss and draft the training modules for two sectors, agriculture and irrigation, in five countries based on their specific needs and contexts. The provisional training contents include (but are not limited to) economics of adaptation, vulnerability and risk assessments, adaptation planning and mainstreaming adaptation into national planning processes, development of information dissemination and awareness raising strategies.

(b) Organize one-day workshop in Bangkok to finalize training modules (July 2011):

- Targeted participants include (1) representatives of national partners, (2) adaptation experts on agriculture/irrigation sectors, (3) pedagogy experts (who will help to prepare learning outputs, divide training modules into capsules on knowledge, skill, field work, etc.).
- Purposes are to (1) finalize the training modules drafted in TMDW in June 2011 and (2) to discuss about the criteria for selecting the piloted countries.

### **1.3 Support the piloting of training modules**

The activities for this objective include (1) identifying countries for piloting the training modules, (2) providing training demonstration for trainers (by regional experts), (3) monitoring the implementation of training modules provided by the trainers in each piloted country, and (4) reporting on lessons learned. More details for piloting of training modules will be developed later.



## **PART 2: TRAINING NEEDS ASSESSMENT MEETING** (preliminary meeting)

Date: 31 January 2011

Venue: AIT Meeting Room B144B, Asian Institute of Technology, Thailand.

### **2.1 Concept Note**

Climate change has been projected to have critical impacts on socio-economic development and poverty reduction globally and in the Asia-Pacific region. The Asia-Pacific region, which accounts for two-thirds of the world's poor living on less than \$1 a day depending on primary sectors such as agriculture, is one of the most vulnerable regions to climate change. Thus, effective implementation of adaptation and capacity building actions is the key to reducing vulnerability of the Asia-Pacific countries to climate change.

Since 2008, United Nations Environment Programme (UNEP) in partnership with key UN agencies and international organizations has been facilitating the development of a Global Adaptation Network (GAN) which composes of four Regional Networks in developing regions: Africa, Asia-Pacific, West Asia, and Latin America and the Caribbean. The Asia Pacific Adaptation Network (APAN) was launched in Bangkok as a part of the GAN by Prime Minister of Thailand in October 2009 and began its implementation in March 2010. The APAN's Regional Hub is co-hosted by AIT-UNEP RRC.AP12 and IGES13 and currently located in AIT-UNEP RRC.AP, Bangkok, Thailand.

APAN aims to help countries in the region to build climate resilience of vulnerable human systems, ecosystems and economies through the mobilization and sharing of knowledge and technologies to support adaptation capacity building, policy-setting, planning and practices. One of its objectives is to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into developmental planning and programming in targeted countries, including Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal.

For this capacity building objective, the project entitled "Scientific capacity development of trainers and policy-makers for climate change adaptation planning in the Asia and Pacific" has been approved by the Asia-Pacific Network for Global Change Research (APN) for funding starting November 2010. The main objectives of this project are to:

- undertake appraisal of training needs (training needs assessment, TNA) in terms of knowledge and skill areas for effective adaptation; and
- design training modules for imparting knowledge and skills for effective adaptation.

As a pilot initiative, the APN project has aimed to focus on agriculture sector as the most vulnerable sector to climate change in the project countries. However, the extended objectives during and beyond this project duration that have direct connection to the continuity of the APN project are to:

- help create enabling environment in project countries for strengthening capacity building through interventions at the policy level,
- help deliver training programmes for trainers in key training institutions and for key policymakers in the region,
- enable training institutions and trainers to implement training programs to the ultimate beneficiary i.e. staff employed by agriculture sector, and

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<sup>12</sup> AIT-UNEP RRC.AP: Asian Institute of Technology-United Nations Environment Programmes Regional Resource Center for Asia and the Pacific

<sup>13</sup> IGES: Institute for Global Environmental Strategies

- institutionalize the modalities for assessing the impact of the above activities and provide policy feedback to the countries involved.

Therefore, as training needs assessment (TNA) is the first step for the design and development of capacity-building programmes, this meeting is organized to:

- introduce the partners to APAN and its capacity building agenda,
- reach a consensus on the modalities for implementing APN project on training modules development,
- obtain preliminary information and discussion on national systems for capacity building, and
- agree to cooperate to develop national strategies for capacity building (long-term).

For these purposes, key national level training institutions active in training policy makers and other government staff will be targeted to survey on their existing training programmes or modules for agriculture sector (and water sector related to agriculture) and to identify the specific needs and gaps of the trainers. The national or sub-national government staff working in these sectors will also be invited as they are the end-users of the training modules developed after TNA.

In addition, the national level training institutions, as national partners of APN project and beyond, through this meeting will provide an opportunity to discuss about the APN funded project and roadmap beyond along with some guidelines on how to conduct specific TNA. At the same time, by keeping the national and sub-national level staff informed about APAN, the meeting will also contribute to the expansion of the network to different departments, institutions, and organizations working on climate change adaptation.

### ***2.2 List of representatives of national partners***

- Cambodia: Dr. Kang Kroesna – Dean of Faculty of Agricultural Technology and Management, Royal University of Agriculture.
- Lao PDR: Dr. Silinthone Sacklokham (Ms.) - Vice Dean of Faculty of Agriculture, National University of Lao.
- Mongolia: Dr. Erdenetsogt Tumurtohtokh (Mr.) – Director of School of Ecology and Technological Development, Mongolian State University of Agriculture.
- Bangladesh: Dr. Abul Kalam Azad (Mr.), Chief Scientific Officer of Bangladesh Agricultural Research Council.
- Nepal: Mr. Ram Bhakta Shrestha - Director of Centre for Organization Development, Nepal Administrative Staff College.