

Freshwater Resources Management Project (FW)

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1. Theme of the Project

Strategies for sustainable freshwater resources management

2. Background

(1) Water Crisis Threatening Sustainable Development

The twenty-first century is often called the “Century of Water.” Water, in particular freshwater is one of the integral resources for realising sustainable development. Indeed, freshwater is an essential resource for economic activities, our daily life and sound ecosystem. The Asian-Pacific region has witnessed significant degradation of such freshwater resources both in quantity and quality over the past decades, which constitutes one of the major threats to future sustainable development in the region.

(2) The Assets of the Second Strategic Research Phase of IGES

During the Second Strategic Research Phase (FY2001 -2003), knowledge and information base for conducting a new research activity on freshwater in IGES has been developed. For example, in FY 2001, a preliminary survey on status of freshwater management was carried out in selected countries in the region. In the FY2002, the interim report of an expert group¹ established in IGES was presented at the Third World Water Forum (WWF3) held in March 2003. The report was welcomed as an attempt to overview the status and discuss future challenges and opportunities of freshwater issues in the region. Regarding WWF3, IGES’s network of relevant experts and organisations was developed and various information was accumulated through the co-organisation of a session on water monitoring in Asia with the Japan Ministry of the Environment, Japan Association of Water Environment and United Nations University. There was also our involvement in drafting the chair’s summary of a sub-group meeting of the International Ministerial Conference held on the occasion of WWF3. In a session on IWRM (Integrated Water Resource Management) at WWF3, the basic idea of the research plan for the Third Strategic Research Phase was presented and welcomed by the session participants. In FY2003, the project has been accumulating more specific information to be used as a basis of the research activities for the Third Phase.

Freshwater issues are cross-sectoral issues. Therefore, a research network for collaborating activities is indispensable for creating fruitful outcomes and has been greatly developed. Through the activities in the Second Phase, a network of experts, relevant institutions and international organisations of freshwater policy was created. In particular, our active participation in WWF3 and commitment to its preparation process enabled IGES to strengthen the network. In FY 2003, this network will be further strengthened, providing a firm foundation of future collaboration in the region, including international dialogues, and ensuring policy relevance of the proposed activities to the actual needs of countries in the region.

¹ Study Group on Freshwater Resource Management in Asia

IGES is not just a research institute. The mission of IGES goes beyond a mere think-tank. It is a vital role of IGES to propose a set of policy recommendations and translate them into practice. To this end, research activities of the FW Project should be policy-relevant and the research outputs should be incorporated in the political process. On this point, FW Project has great advantages. For example, the freshwater issue is one of the vital sectoral components in the deliberations of the Asia-Pacific Forum for Environment and Development (APFED)², which is a non-governmental but very influential political process in developing an environmental agenda in the region. Even in the preparatory process of the FW, IGES contributed to APFED in formulation of recommendations of freshwater issues in its Message to the World Summit on Sustainable Development (WSSD) in 2002. In the Third Phase, the expertise and outcomes of the project will be utilised in the drafting process of the APFED Final Report to be completed by the end of 2004 and also for post-APFED activities. As for the next World Water Forum (WWF4) to be held in March 2006, FW project will provide inputs to WWF4, fully utilising the network developed in WWF3.

3. Necessity of Integrated Policy Design for Sustainable Freshwater Resources Management

Nature of freshwater resources are characterised as follows:

- (a) Freshwater resource constitutes an important element to sustain natural ecosystems. That means that how to use and manage freshwater resource has direct impacts to the state of natural ecosystems.
- (b) Water resource development is directly linked to the quality of water resource itself. For example, water quality becomes deteriorated by losing natural purification functions when water flow remarkably decreases by dam construction, and eutrophication loses sound water quality in the reservoir.
- (c) Water on earth moves in a continuous cycle. Wastewater generated from use of surface water and groundwater also returns to rivers, aquifers, and seas.
- (d) Freshwater is a resource that has close relation with local geographical and climatic conditions.
- (e) There are various different water beneficial uses such as water for drinking; domestic, industrial, agricultural use; navigation; recreation use; maintenance of landscape and others. Freshwater resource provides wide range of services to human society and has economic value.

Policies on management of freshwater resources with such complex characteristics are inevitably related to three aspects, namely natural resources (environment), social infrastructure (e.g. dams, dykes, water supply and sanitation systems, wastewater treatment facility), and institutional arrangement (e.g. laws, regulations, financial mechanisms, organisational arrangement). The state of freshwater as a natural resource is largely linked with social infrastructure development. For instance, groundwater development for industrial and/or agricultural production caused land subsidence, which also resulted in decline of productivity. Construction of water supply facility intended to increase of population with access of water supply facility likely increases emission of wastewater, and it causes water pollution without proper institutional arrangement such as water quality regulatory measures; empowerment of line authorities; and capacity building of human resources. On the other hand, how to develop and manage social infrastructure and institutional arrangement greatly depends on the environmental conditions of water resources.

² APFED is an eminent persons' forum in the Asia-Pacific region that was established in 2001 with approval of ECO ASIA 2001. IGES was designated as the Secretariat of APFED and has been contributed to APFED deliberation.

Thus, three aspects of water management policy are closely interlinked with each other, and integration of the three aspects is of vital importance in realisation of sustainable water resources management (Fig.1).

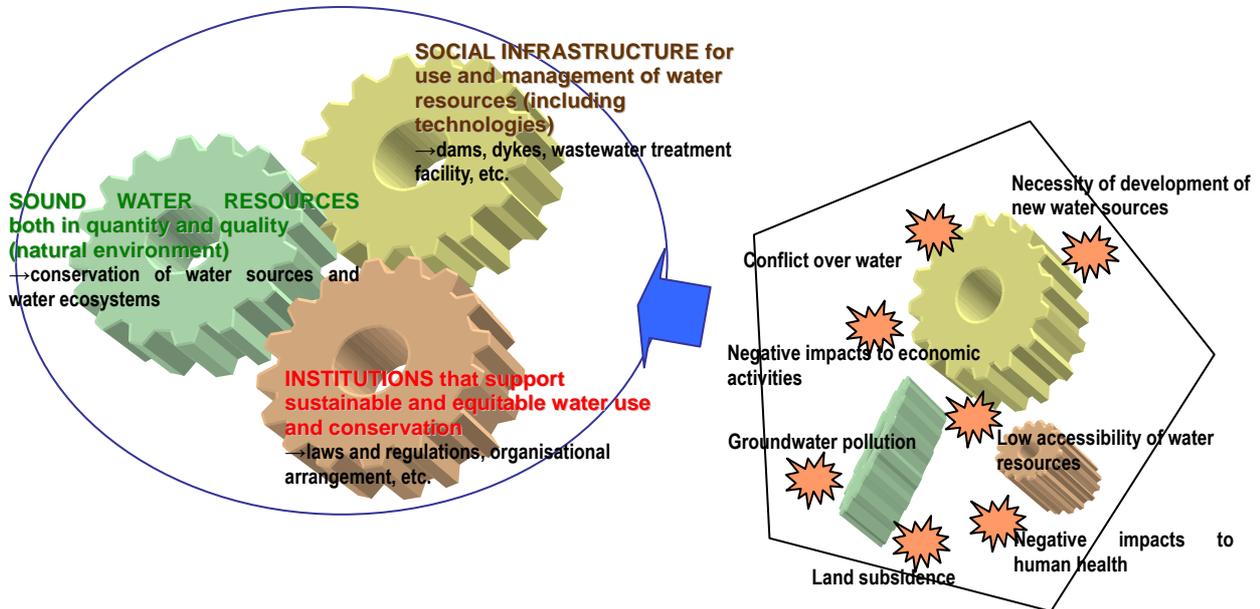


Fig. 1: Integrated Policy Design for Sustainable Water Resources Management

4. Objectives

Continuous growth in population and economy is predicted to exert more pressures on water resources in Asian countries. In light of a brief overview of on-going research activities, emerging policy needs, and comparative advantage of IGES, FW will conduct research to contribute to making the existing water resources management policy more sustainable. Specifically, there are two research objectives of the project:

(Objective-1)

To propose integrated policy designs for sustainable water resources management in urban and peri-urban areas in Asia with consideration of current socio-economic status and its changes of future in next decade.

(Objective-2)

To develop a knowledge platform (databases) to support policymaking and implementation.

5. Expected Outcomes

(1) A report on sustainable groundwater resources management in urban and peri-urban area in Asia

The report could include the following components:

- overall analysis of current management of groundwater resource
- a list of possible policy measures for groundwater resources management
- proposals for integration of available policy measures for sustainable groundwater

management

(2) A report on sustainable surface water resource (rivers and lakes) in urban and peri-urban area in Asia.

The report could include the following components:

- (a) overall analysis of current management of surface water resource
- (b) a list of possible policy measures for surface water resources management
- (c) proposals for integration of available policy measures for sustainable surface water management
- (d) analysis of impact of socio-economic changes to development of water management

(3) A set of databases to support actions for sustainable water environment management

Four kinds of databases will be developed, namely database on policy; database on technologies for water environment conservation; database on activities by NGOs and communities; database on information sources.

(4) Input to international/regional policy dialogues

The outcomes of the project will be presented through the regional and international channels that IGES has been developed such as the APFED/post-APFED process. The preparation and follow-up process of the 4th World Water Forum to be held in March 2006 also provide a lot of opportunities to disseminate the outcomes of the project. IGES will play a leading role to implement an initiative named “Water Environment Partnership in Asia (WEPA)” that was launched by the Japan Ministry of the Environment as described below. The initiative will be implemented under the collaboration with related organisations and experts in Asia. Through the activities of WEPA, the research outcomes will be directly input to policy makers in Asia.

6. Project Design

FW will be made up two components, namely strategic research named “Research on Sustainable Water Management Policy” (SWMP) and a knowledge platform development programme named “Water Environment Partnership in Asia (WEPA).” SWMP and WEPA is designed for Objective-1 and Objective-2 respectively.

6-1. Research on Sustainable Water Management Policy (SWMP)

SWMP aims to propose integrated policy design for sustainable water resources management. Considering that water use and management in rapidly growing cities is a key for sustainable future of water resources in the region, SWMP targets at urban and peri-urban areas of Asian countries, in particular countries under the influence of the Monsoon climate. Because the research cannot cover all forms of water resources at a same time with the limited human resources and budget, SWMP will focus on groundwater resources in the first stage, and then extended its coverage to surface water resources³.

(1) Methodologies

- (a) Review of the development of water management in selected countries in Asia, including Japan mainly through literature review and interviews. For example, evolution of water

³ The main reasons of having groundwater as the first focus are: (1) Groundwater resources can be utilised as a main source of water from the beginning till the period of maturity of economic development because of its high accessibility and stability; (2) The high accessibility likely leads overexploitation of the resources; (3) On the other hand, the deterioration of quality and depletion of quantity of groundwater is irreversible (or the restoration is extremely difficult); and (4) relevant information on groundwater has not yet been systematically available.

management policy in Japan for past 50 years (before and after the era of severe pollution that emerged during the postwar years of steep economic growth) will be analysed. In addition to data and information related to water management, data on some key factors that could affect the direction of water policies will be collected. Such key factors include basic social and economic data (GDP, change in industrial structure, population, infant mortality rate, etc.).

- (b) Development of a list of possible policy measures of water management with full consideration of feasibility of the policy measures in different socio-economic background. Such policy measures include institutional measures (e.g. laws and standards, organizational arrangement, capacity building), economic measures (e.g. charging systems, tax, subsidies), technical measures (from conventional water conservation technology to a new technology such as wastewater recycling).
- (c) Case studies of selected areas will be conducted for more concrete and precise study of development and current situation of water management. The potential case study areas are: Bangkok (Thailand), Ho Chi Min City (Viet Nam), Bandung (Indonesia), and Tianjin (People's Republic of China). Case study sites would be changed or added when necessary.
- (d) Analysis on policy measures such as institutional, economic and technical measures to cope with the problems in water management, based on the result of activities above. Based on the analysis, options of policy integration will be proposed. Such options will be designed with consideration of current and future local socio-economic conditions.
- (e) Identification of universal and area-specific characteristics on water resources management.

(2) Implementation Arrangement

- (a) The research will be led by full-time research staff of the FW project and a visiting researcher.
- (b) The study will be conducted in close collaboration with the following research partners.
Asian Institute of Technologies (Thailand);
Ho Chi Min City University of Technology (Viet Nam);
West Java Environmental Protection Agency (Indonesia);
Institute of Environmental Science and Engineering, Nankai University (People's Republic of China).
- (c) A study group will be set up with the participation of local counterparts above and IGES research staff, when necessary.
- (d) Collaboration with other IGES research project, in particular with the Urban Environmental Management Project will be sought.

6-2. Water Environment Partnership in Asia (WEPA)

(1) Background

“Water Environment Partnership in Asia (WEPA)” Programme is a new initiative committed by the Ministry of the Environment of Japan at WWF3. WEPA aims to develop a platform for strengthening water environmental governance and capacity building in the region. WEPA will be composed of several activities under the objective of development of knowledge base and promotion of capacity development. More specifically, a set of databases will be developed under the WEPA programme to support actions for water environmental conservation in partnership with other Asian countries. In FY2003, IGES is participating in the planning of the initiative as a key organisation. The initiative will be officially launched in FY2004, and FW project will be expected to act as a key organisation in implementing and coordinating the

WEPA activities.

As shown in Fig. 2, the WEPA programme is composed of the development of four databases (database on policy; database on activities by NGOs and communities; database on technologies for water environment conservation, and database on information sources). The databases will be opened to the public through the WEPA web page. The prototype of the database will be developed for the 4th World Water Forum which will be held in Mexico in March, 2006. The contents of the databases will be determined at an working group meetings that are composed of experts of related countries. The WEPA Programme will continue for five years from 2004 to 2008, the year in which 5th World Water Forum will be organised.

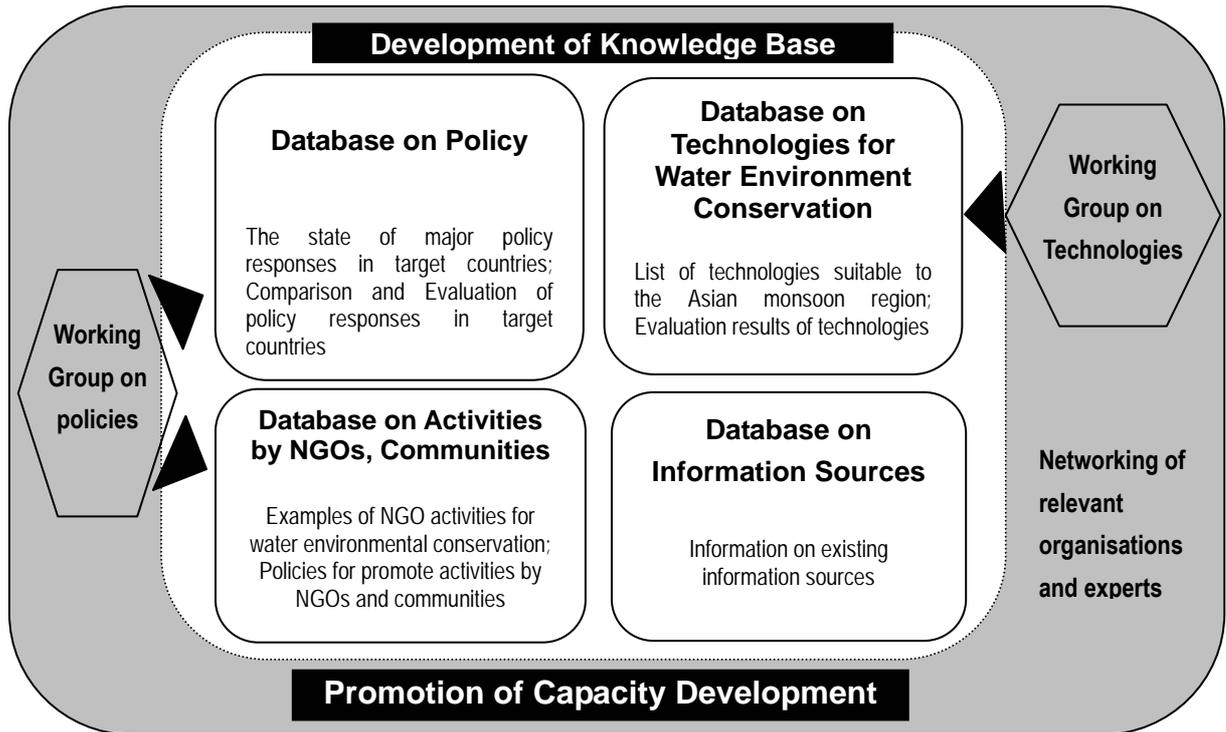


Fig.2: Activities of WEPA Programme

(2) Methodologies

(a) WEPA workshop

WEPA workshop will be held once in each fiscal year with the participation of government officials of target countries and relevant experts. The progress of the WEPA programme will be reported for review by the participants.

(b) Working group meetings

Working groups will be formulated for development of contents of the database on policy and on technologies respectively. The working group on policies will be formulated by representatives of government of each target country. The working group on technologies will be also formulated by four to five experts on water environment conservation technologies. The working groups will meet once or twice in each fiscal year.

(c) Survey on the existing information on NGO/community activities

(d) Survey on information sources

(3) Implementation Arrangement

- (a) A full-time research staff will lead the WEPA programme.
- (b) A programme officer will be in charge of coordination of overall activities of WEPA Programme.
- (c) A steering committee that consists of domestic experts will be established for a review of the overall design of WEPA programme. (IGES will act as the secretariat of the committee.)
- (d) Database design will be developed by a consulting company on a contract basis with IGES.
- (e) Contents development of the database on water environmental technologies will be implemented by collaborative organisations on a contract basis with IGES. Contents development will included the organisation of a working group on technologies that will be consist of some experts in Asia.
- (f) Contents development of the database on policy will be developed through working group activities. Data collection will be implemented by working group members with financial support of IGES.
- (g) Outputs of the studies under SWMP will be provided as inputs to WEPA databases, in particular the database on policy.

(4) Expected User Groups

- (a) Primary expected user group of WEPA is national policy makers in Asian countries.
- (b) Secondary expected user groups include local policy makers and NGOs.

6-3. Synergies of the Two Components

The findings of SWMP will be used as inputs to the databases that will be developed under WEPA, which means that the research findings of SWMP will be distributed to policy makers in Asia under the WEPA scheme. Data and human networks accumulated under WEPA will be fully utilised in conducting research under SWMP. (please refer to Fig.3)

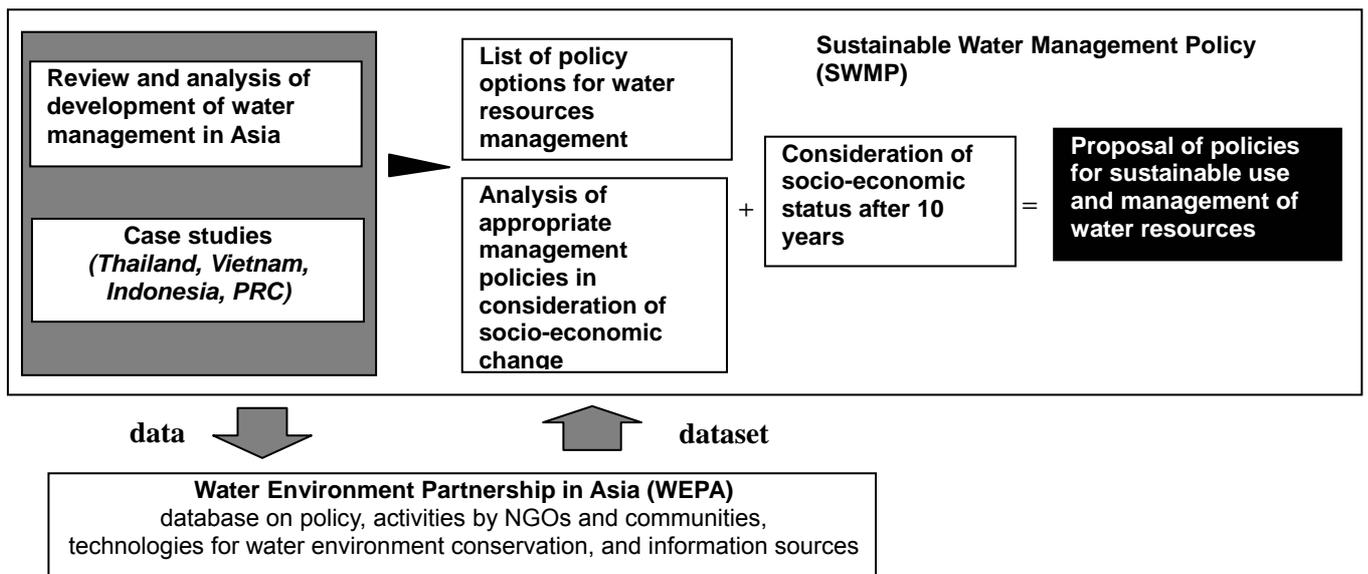


Fig.3: FW Project Design

7. Schedule of SWMP and WEPA

7-1 Research on Sustainable Water Management Policy (SWMP)

(1) First Year: April 2004 – March 2005

The first half of the first year

- a) Inception Workshop with participation of research collaborators and partners from China, Thailand, Viet Nam and Indonesia (at the Headquarters of IGES, 12 June 2004)
- b) The placement of groundwater within freshwater resources, verification of the usage reality and challenges in both quality and quantity of groundwater issues.
- c) Examination and analysis of the Asian experience on the development of the groundwater resources (quantity and quality) management (measurement for subsidence caused by over-exploitation of groundwater, ground water quality management, etc).
- d) Start of case studies on groundwater usage and its management in the cities in Asia (socio-economic fluctuations and changes in the groundwater usage patterns and problems bearing from changes in the groundwater usage patterns and the measurements. The target case study countries: Thailand, Vietnam, Northern China, and Indonesia)
- e) Field survey of the case study sites by IGES researcher.

The latter half of the first year

- f) Continuation of case studies. Field survey will be conducted when appropriate.
- g) Analysis of data collected through case studies and field surveys.
- h) Sum-up of the basic analysis of the first year (Conduct a research meeting with participation of local counterparts in each country).
- i) Selection of the focus over river management, a topic of the fiscal year 2005, and decisions made based on the results from the discussion among the collaborative research group
- j) Start conducting the basic study on future projections of the socio-economic external factors affecting water management in the Asian countries (collaborations with other projects such as National Institute for Environmental Studies, NIES).

(2) Second Year: April 2005 – March 2006

- a) Study of policy options on groundwater usage and management, and their priorities (based on the outputs of the first year)
- b) Summary and outreach of the issues on groundwater usage and management (publication of IRES special edition, presentation at the 4th World Water Forum, etc.)
- c) Study and analysis of the development of river management in Asian countries (how social institutions, policy trends, and technologies of river management had changed according to the change of socio-economic demands)
- d) Study on the current situation and challenges of the issues in river management (implementation of case studies)
- e) Interim summary of analysis on river management
- f) Basic study on future projections of the socio-economic external factors affecting water management in the Asian countries
- g) Report on the outcome of research for the interim assessment
- h) Presentations at the societies

(3) Third Year: April 2006 – March 2007

- a) Follow up of the presentation at the Forth World Water Forum (as necessary)
- b) Careful examination of the policy options for river management and their priorities
- c) Careful examination of the policy options and their priorities having socio-economic fluctuations affecting groundwater and river water (surface water) into consideration
- d) Final report of management policy options and their priorities for water resources (groundwater and surface water)
- e) Indication of the options for freshwater resources management appropriate to each region (city) to the policy makers in each city, by linking the research results and the WEPA databases

7-2 Water Environment Partnership in Asia (WEPA)

(1) First Year: April 2004 – March 2005

- a) Formulation of domestic steering committee, working groups for contents development.
- b) Collecting, rearranging, and analyzing information of the contents of the four databases namely “Water Environment Policy (laws and regulations),” “Water environment conservation activities by NGOs and communities,” “Water environment conservation technology,” and “Information sources on water environment conservation” in cooperation with the counterparts from the Asian countries.
- c) Study of the design (including functions) of each database.
- d) Building provisional databases, examining contents at the international workshop.

(2) Second Year: April 2005 – March 2006

- a) Additional collection of information for each database and its rearrangement based on the examinations gained from the international workshop in the first year.
- b) Building of database prototype, inputs of contents.
- c) Presentation of results (prototype) at the Forth World Water Forum (March 2006 in Mexico).

(3) Third Year: April 2006 – March 2007

- a) Comprehensive evaluation of the project activities during FY 2004 – FY2005 (including that of prototype database).
- b) Information collection, rearrangement, and analysis necessary for the increase and improvement of the contents of each database, reflecting the evaluation results.
- c) Indication of policy options in close linkage with the research results from the SWMP.

** WEPA programme is expected to continue until FY 2008, thus FY 2006 will be the year for interim evaluation*

8. Monitoring Schedule

In principle, a review of the researches will be conducted internally.

On the occasion of a series of workshops and expert group meetings of each sub-component of SWMP and WEPA programme, however, policy relevance will be examined by experts outside IGES.

9. Financial Aspect and Human Resources of the Project

(1) Finance of the Project

The project is financed by IGES with extra-budgetary arrangement by the Japan Ministry of the Environment to WEPA programme. To fully implement the research, it is necessary to obtain other external funds including in-kind contributions from collaborative organisations.

(2) Human Resources

The arrangement of the research staff for the FW project is as follows.

Project Leader (1)

Senior Research Fellow (1)

Research Fellow (1)

Research Associates (2)

Visiting Researcher(1)

Programme Officer in charge of WEPA programme (1)

Research Secretary (1)