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“Supporting tool to develop and implement resilience-strengthening strategies: Toolkit for the indicators of resilience in socio-ecological production landscapes and seascapes (SEPLS)”

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Abstract:

As a first step in strengthening resilience of communities, it is critical to understand status of community resilience and have common understanding of status of community resilience among community members. The “toolkit for indicators of resilience in socio-ecological production landscape and seascape (SEPLS)ⁱⁱ” is one of the tools to assess resilience of production landscapes and seascapes by communities themselves who used production landscapes and seascapes. Through assessment of resilience in SEPLS, communities would be able to share perception and have common understanding of the status of their landscapes and seascapes resilience among different stakeholders of the communities. This process of having common understanding on resilience of production landscapes and seascapes is one of the ways to consider the practical steps to strengthen resilience of communities and promote sustainability of the communities, since production landscapes and seascapes are units that communities identified as an area to support their livelihood activities.

The toolkit for indicators of resilience in SEPLS is developed based on field test in twenty six countries around the world including Bolivia, Cambodia, Fiji, Kenya, Mongolia, Nepal and Turkey. The indicators of resilience in SEPLS, which are strongly interrelated, can be grouped in five areas: 1) landscape/seascape diversity and ecosystem protection, 2) biodiversity including agricultural diversity, 3) knowledge and innovation, 4) governance and social equity and 5) livelihoods and well-being. The toolkit and indicators are applicable for both landscapes and seascapes. Identified benefits of using resilience indicators include: 1) understanding resilience of production landscapes and seascapes, 2) supporting development and implementation of resilience-strengthening strategies, 3) enhancing communication among stakeholders and 4) empowering communities to engage in decision-making process and adaptive management.

1. Background

With climate change and rapid and global level of economic development, communities need to

confront and cope with more extreme weather and natural and human-induced disaster such as flooding, landslide, typhoon, hurricane, draught and others. In order to accommodate these rapid changes, building resilience and developing sustainability in community to global level have been getting more critical. Considering connectivity of landscape and seascapes, it is important to consider landscape and seascape level of resilience and sustainability in a community. At the same time, resilience of landscape and seascape helps to support community's livelihoods and biodiversity conservation.

2. Toolkit for the indicators of resilience in socio-ecological production landscapes and seascapes (SEPLS)

As a first step of strengthening resilience of communities, it is critical to understand status of community resilience and have common understanding of status of community resilience among community members. The "toolkit for indicators of resilience in socio-ecological production landscape and seascape (SEPLS)" is one of the tools to assess resilience of production landscapes and seascapes by communities themselves who used production landscapes and seascapes. The indicators are also a tool for engaging local communities in adaptive management of the landscapes and seascapes in which they live.

The toolkit focuses on resilience of "socio-ecological production landscape and seascape (SEPLS)" which are areas that local communities' efforts over many years to adapt to the surrounding environment and enjoy its bounty for the long term have created unique and sustainable landscapes and seascapes. These landscapes and seascapes have also provided humans with goods such as food and fuel, and services such as water purification and rich soil, while hosting a diversity of animal and plant species.

Through assessment of resilience in SEPLS, communities would be able to share perception and have common understanding of the status of their landscapes and seascapes resilience among different stakeholders of the communities. This process of having common understanding on resilience of production landscapes and seascapes is one of the ways to consider the practical steps to strengthen resilience of communities and promote sustainability of the communities, since production landscapes and seascapes are units that communities identified as an area to support their livelihood activities.

To summarize, steps to build resilience in SEPLS, through community participation, suggested in the toolkit are: 1) assessing status of resilience in SEPLS utilizing the twenty indicators, 2) sharing status of resilience in SEPLS, 3) having common understanding of resilience in SEPLS, 4) considering ways to strengthen resilience in SEPLS and 5) building resilience in SEPLS.



Figure 1: Steps to build resilience in SEPLS by communities

3. Objective and benefits of using the toolkit

Main objective of the indicators toolkit is to assist communities in developing resilience-strengthening strategies that communities can increase their capacity: 1) to respond to social, economic, and environmental pressures and shocks; 2) to improve their environmental and economic conditions, and 3) to increase the social and ecological resilience of their landscapes and seascapes. Benefits of using the toolkit include: 1) understanding the resilience of SEPLS, 2) supporting development of resilience -strengthening strategies, 3) enhancing communication among relevant stakeholders, and 4) empowering local communities in decision-making and adaptive management.

4. Users and areas of the toolkit

Users of the indicators include local communities, NGOs, development agencies, project planners, policy makers and researchers. Applicability of areas are diverse types of socio-ecological production landscapes/seascapes (SEPLS), which includes agriculture land, watershed, costal area, inland water bodies, mountain, forest, river or lake basins, pastoral land, glass land etc.

5. Indicators for resilience in SEPLS

The toolkit for indicators of resilience in SEPLS is developed based on field test in twenty six countries around the world including Bolivia, Cambodia, Fiji, Kenya, Mongolia, Nepal and Turkey. The indicators of resilience in SEPLS, which are strongly interrelated, can be grouped in five areas: 1) landscape/seascape diversity and ecosystem protection, 2) biodiversity including agricultural diversity, 3) knowledge and innovation, 4) governance and social equity and 5) livelihoods and well-being. Following table shows twenty indicators for resilience in SEPLS grouped in five areas.ⁱⁱⁱ

Scores for each indicator are: very high (5), high (4), medium (3), low (2) and very low (1). The indicators are developed to capture perception of resilience in SEPLS among community members. Facilitated by local coordinators, community members provide individual and group scores for each indicator. The toolkit for indicators of resilience in SEPLS provides more detailed guidance of how to use the indicators.

Table: Indicators for resilience in SEPLS

	Group	Indicators	Scores
1	Landscape/sea scape diversity and ecosystem protection	1) Landscape/seascape diversity, 2) Ecosystem protection, 3) Ecological interactions between different components of the landscape/seascape, 4) Recovery and regeneration of landscape/seascape	5. Very high 4. High 3. Medium 2. Low 1. Very low
2	Biodiversity including agricultural biodiversity	5) Diversity of local food system, 6) Maintenance and use of local crop varieties and animal breeds, 7) Sustainable management of common resources	5. Very high 4. High 3. Medium 2. Low 1. Very low
3	Knowledge and innovation	8) Innovation in agriculture and conservation practices, 9) Traditional knowledge related to biodiversity, 10) Documentation of biodiversity-associated knowledge, 11) Women's knowledge	5. Very high 4. High 3. Medium 2. Low 1. Very low
4	Governance and social equity	12) Rights in relation to land/water and other natural resource management, 13) Community-based landscape/seascape governance, 14) Social capital in the form of cooperation across the landscape/seascape, 15) Social equity (including gender equity)	5. Very high 4. High 3. Medium 2. Low 1. Very low
5	Livelihoods and well-being	16) Socio-economic infrastructure, 17) Human health and environmental conditions, 18) Income diversity, 19) Biodiversity-based livelihoods,	5. Very high 4. High 3. Medium 2. Low

6. Toolkit: practical guidance for using the indicators

The toolkit is a practical guidance for using the indicators introducing a resilience assessment consisted of three main stages: 1) preparation, 2) assessment workshop and 3) follow up. The preparation stage contains planning and preparing a community-based resilience assessment workshop such as clarifying the purpose of the assessment, determining the assessment area, collecting information about landscapes/seascapes and resident communities, identifying stakeholders, boundary and style of workshops, and translating the indicators into the local language. In the assessment stage, it consists of: 1) introduction (participatory mapping, discussion of biodiversity and resilience, explanation of the indicators), 2) scoring (individual and group), and 3) discussion of the next steps. Follow up stage can vary widely depending on the purpose of the assessment, but in general is intended to use assessment results as a part of ongoing, participatory landscape/seascape management and planning process such as further analysis, sharing results, developing action plans, and repeated assessment for adaptive management, in order to strengthen resilience of SEPLS.

7. How to utilize the result of the resilience assessment

Results of the resilience assessment can be used in many different ways to strengthen resilience of SEPLS. For local communities and NGOs, they would be able to: have a common vision among communities, and between communities and policy makers; enhance communication among stakeholders; strengthen partnership among various actors; and develop resilience strengthening strategies. For policy makers, they would be able to promote participatory landscape/seascape management, and identify intervention priorities and develop strategies at the local and national level.

8. Assessment of resilience in SEPLS in Fiji

In Fiji, two assessment workshops were held in the villages of Lavena and Korovou, with participants from four villages in the Bouma National Heritage Park on Taveuni Island: Korovou, Lanvena, Vidawa and Waitabu. Through the workshops, local community members on Taveuni Island, Fiji, were able to identify possible actions to strengthen the resilience of their communities' landscapes and seascapes. The Bouma National Heritage Park covers about 15,000 hectares of rainforest including strict conservation areas known as the Nature Reserve (communities cannot take anything from this area), and the Forest Reserve (communities can take natural resources from this area only for their subsistence). All four villages are located along the coast, and most of the villagers are involved in both agriculture and fishing. Thus, villagers' awareness of connectivity

between different components of the landscape and seascape is relatively high. The four villages have been also involved in community-based ecotourism since 1990, with funding assistance from the New Zealand Aid Programme. Thus, the communities have been actively involved in natural resource management, particularly related to ecotourism.



Figure 2: Map of the Bouma National Heritage Park in Taveuni Island

Through discussions of the group scores for each indicator, the villagers were able to share their perceptions of the status of their landscapes and seascapes, and to reach common understanding among elders, youth, men and women. After finishing the group scoring, they discussed ways to strengthen landscape and seascape resilience based on this understanding, which allowed them to come up with concrete ideas for actions that could be implemented at the village level.

For example, after the individual score of indicators, participants from Waitabu village discussed the reasons for scoring and reached agreement on the group scores for each indicator^{iv} in the first day. In the second day, after reviewing the scores and common understanding of the status of the landscape/seascape, the group selected priority discussion topics to identify possible actions for the village. Then the villagers discussed each topic and came up with the ideas for concrete actions in the village at the end of the second day. Following are summary of discussion points in the first day and action plans in the Waitabu village as outcomes of resilience assessment workshop.

Landscape/seascape diversity and ecosystem protection

The group score of resilience of landscape/seascape diversity and ecosystem protection in the Waitabu village was 3. Some key discussion points in the group were following.

- After establishment of Marine Protected Area in the village fishing grounds, there are more benefits to the village.
- The Marine Protected Area as a part of the seascape is protected, but none of the

landscape is protected besides the Nature Reserve, where access to natural forest is restricted in the northern part of the village.

- The importance of connectivity is understood, but villagers are still poaching and using herbicides and pesticides for agriculture.
- After a hurricane, landscapes/seascapes will recover. However, it will take some time.

Based on these discussion in the first day, they group picked up one priority topic in the issues of landscape/seascape diversity and ecosystem protection, which was “reduction of using chemicals in agricultural activities”. Proposed activity that the group came up with was reviving traditional collective work (*balebale*) in the village to reduce use of chemicals in agricultural activities.

Biodiversity including agricultural biodiversity

In the Waitabu village, the group score of resilience of biodiversity including agricultural biodiversity was 3.6. Some key discussion points in the group were following.

- There is a high diversity of local foods.
- However, villagers’ diets and preferences have been changing and villagers have started buying food in stores, such as canned fish, flour, noodles etc.
- Local varieties still exist, but these are slowly being replaced by commercial ones (e.g. taro), and villagers are not interested in maintaining local varieties.
- Fishing practices are improving, but are still not sustainable.

Thus, the priority issue that the group chose was “reforestation in areas with heavy clearing for agroforestry”, and proposed activities from the group was that organizing village meetings where the village chief and elders can tell the community about the importance of reforestation in areas with heavy clearing for agroforestry.

Knowledge and innovation

The group score of resilience of knowledge and innovation in the village was 3.2. Key discussion points in the group during the workshop were following:

- Agroforestry practices, such as avoiding clear-cutting, help resilience in the face of hurricanes. However, these practices are not enough;
- Some knowledge is passed down through collective work on farms;
- Drinking *Kava* among villagers are occasions to share knowledge;
- Agricultural biodiversity and knowledge is accessed and exchanged among villagers, but no documentation exists;
- Documentation has been done by the government, but no access by villagers; and
- Understanding of social/gender equality between men and women is different.

On the second day, the group chose “revitalization of traditional knowledge including farming practices” as a priority issue to discuss, and proposed activities from the group were following:

- Revitalization of traditional knowledge including farming practices,
- More dialogue between elders and youth to share knowledge,

- Documentation of traditional knowledge, and
- Traditional farming: planting not only taro and cava, but also other products; planting taro every 4 months to harvest every 4 months; practice agroforestry to protect marine resources.

Governance and social equity

The group score of resilience of governance and social equity in the village was really high, 4.2. Key discussion points in the group during the workshop were following:

- Villagers feel that they have a certain freedom over land and water resources, although the system in place limits the allocation of farm land for each family;
- The fishing ground is common property among two other communities;
- There is a committee that looks after natural resources. The committee is supported by the national government and fisheries department;
- Cohesion within the community is good, but not between communities;
- Inequalities are only seen in decision-making processes in clan meetings. Women's position in decision-making is weak; and
- Each clan has an equal share of resources. However, depends on their population, some have more resources per person.

With strong tie with land and natural resources and their management through community based organization, most of the village in the Taveuni Island, Fiji scored very high in governance and social equity. Thus, this topic was not selected as priority discussion for the second day.

Livelihoods and well-being

The group score of resilience of livelihoods and well-being in the village was 4, and key discussion points in the group during the first day of the workshop were following:

- Improving road is one of the priorities in the village;
- The village is kept clean and tidy;
- Waste is separated, and plastic is burned;
- Every Monday, those that are sick are taken to the nurse;
- Bio-filters have been installed in two community water tanks for drinking water;
- Flush toilets are installed in every household;
- Reliance on agriculture (taro and cassava) is too high (60-70%);
- Tourism in the Marine Park and handicrafts (mats, fans, virgin coconuts oil) are potential other sources of income; and
- The Marine Park is attempting not only to improve the conservation of the coral reef, but also as a main tourist attraction.

Based on the discussion of the first day, the group chose “promotion of more income-generation activities” as a priority issue to discuss on the second day, and proposed activities from the group were following:

- Promotion of more income-generation activities;
- Plant taro in the off-season;
- Find good markets for local handicrafts (sewing, *tapa* cloth, mats and others), for example in a visitor centre or resort hotels; and
- Plant more “*pandanus*” to produce more mats.

9. Outcomes from resilience assessment

In the Taveuni Island, Fiji, the assessment of resilience in SEPLS with local communities helped to develop concrete action plans for priority areas in landscape/seascape diversity and ecosystem projection, biodiversity, knowledge and innovation, and livelihoods and well-being in order to strengthen resilience of these areas. Through the assessment workshops, the villagers in the Taveuni Island were also able to re-recognize and share their perception regarding values of natural resources, traditional and local knowledge, role of community organization, and challenges that they are facing right now. Having common understanding among key stakeholders in communities was the crucial first step to develop and implement further action plans in communities with participatory manner. Lessons learned from Fiji’s experience is that the resilience assessment workshop and discussion were great way to empower communities through recognizing what they have in a community, sharing challenges they are facing, and thinking about what they can do to improve the situation.

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Reference:

UNU-IAS, Bioversity International, IGES and UNDP (2014) Toolkit for the Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS)

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ⁱⁱ The term “socio-ecological production landscapes and seascapes” (SEPLS) is coined to highlight the important role that both social and ecological components play in shaping and sustaining areas where production activities are undertaken.

ⁱⁱⁱ Full description of each indicator and example is in the Toolkit for the Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS).

^{iv} The resilience Indicators used in the Fiji workshop were a previous version of the indicators, and slightly different from the set of indicators found in the toolkit.