

# Summary Report

## Sub-global Assessment (SGA) for Nan, Thailand

The Millennium Ecosystem Assessment Report (MA) issued its report in 2005 describing the relationship and interconnectivity between human wellbeing and various components of the earth's ecosystems. The assessment was designed to be multi-level with global, regional and local assessment activities. This was important to capture different processes, situations and trends of ecosystem change that occur consequence of human interaction at different levels. Sub-Global Assessments (SGA) were initiated around a framework similar to the global assessment. The SGAs also aimed to instigate effective communication with the local stakeholders to inform decision-making processes and mobilize development policies that took into consideration the enhancement of both environmental (ecosystem health) and social (well-being of society) aspects simultaneously.

The SGA process was launched in Thailand's Nan province as part of the activities of the Poverty and Environment Initiative (PEI) – a joint program of the United Nations Development Programme and United Nations Environment Programme – which focused on the integration of poverty and environmental issues into various levels of development policy.

### ►► Policy questions, processes and methodologies

The SGA in Nan province collected data, assessed ecosystem services, built scenarios and explored policy options. After a study of preliminary data and discussions with stakeholders, the SGA focused on the following policy question; “How can the Nan Provincial Development Policy better integrate agricultural development, which is centered on the growth of commercial crops, with conservation efforts for the enhancement of human well-being and the maintenance of ecosystem services?”

The SGA provided information and alternatives for Nan Province which also linked up to the national key requirement of environmental-friendly economic development, a direction set by the 11<sup>th</sup> National Economic and Social Development Plan (2012-2016). The vision statement contained in the provincial development plan also mentions that agricultural activities will be carried out with the incorporation of natural resource management, environmental conservation, maintenance of ecosystem services and taking into account the well-being of the local community. The statement also mentions the need to finding a solution for sub-watershed management on land that has been transformed for the cultivation of maize.

The Yao-2 watershed, which is a tributary of the Nan watershed and covers approximately 600 square kilometers, was selected for the assessment. Three sub-districts within the Yao-2 watershed were selected as representative areas for detailed socio-economic study. The study was managed and coordinated through the formation of a working group and study team including members of three local organizations and the Thailand Environment Institute. Regular meetings for information exchanges and a variety of activities to strengthen local capacity in conducting the SGA were organized.

The SGA in Nan has followed the framework of linkages between ecosystem services and human well-being. The MA report, which provides the guideline for analysis and assessment emphasizes on the need to focus on the social process when assessing ecosystem impacts. Technical data analyses to evaluate social processes have been conducted in close consultation with the PEI team and other local partnerships. In the analyses, both economic and non-economic techniques were used for identifying tacit knowledge present in each individual, which was further used to support explicit knowledge that had already been recorded from previous studies conducted by involved agencies.

## ►► Nan's Situations and Trends

Nan is a province situated on the northern border of Thailand, adjoining Lao PDR. The province's topography consists of mostly highlands and mountainous areas. Due to these features, a number of watersheds have been formed due to the flow of several rivers in the region. The longest watershed is of the Nan River which runs through the province. The river bank has become a fertile ground for farming and has become a settlement ground of the 'Tai Yuan' – a major ethnic group in the province. Other ethnic groups have also settled on highlands and have engaged in highland rice farming, forest products production and handicrafts.

Agriculture has been the main economic activity of the province. Cash crops play a prominent role in contributing towards economic development, especially maize which has been booming rapidly since 2007 (B.E. 2550). Success in the agricultural sector has also been due to support provided in the form of private investments for the supply of seeds, fertilizers and pesticides. In addition to this, rubber plantations have also become an attractive option and have gradually expanded in area, comparable to that of maize cultivated areas. The increase of rubber plantations has also been due to subsidies provided to local farmers and landholders by the Rubber Plantation Supporting Fund. These subsidies were first promoted in the province in 2005 (B.E. 2548).

There are two types of maize crops which are grown in Nan province. The first one is "flood plain maize" or "plateau maize", which can be cultivated few times a year, depending on water availability from natural sources such as aquifers. The second type is called "mountain maize", which is cultivated usually once a year (depending on rainfall). This type of maize is grown on high slope or highland areas. The disadvantage to growing this crop is that it requires the maximum use of chemicals for its growth. Furthermore, the slash and burn practice used to eradicate weeds before cultivation has evidently caused air pollution in the form of smoke and dust. Air quality monitoring reports which were carried out during growing periods found that there were higher than standard concentrations of fine dust particles in the air. These reddish coloured dust particles were also found in the water bodies of major rivers and their tributaries during the rainy season. To date, no monitoring activities for testing chemical contamination in water resources have been carried out.

Areas for growing maize and other cash crops have been expanding in the province, causing a major decline in natural forest areas. The remaining natural forest is mostly found within conservation areas, which are currently popular and well-known tourist attractions. Other patterns of land use have not changed much. However, there has been a noticeable increase in community forests. As of now, there are about 600 community forests in the province (definitive measurements of total area have not yet been taken).

In response to unsustainable land use patterns, Nan province has adjusted its policies towards adopting the sufficiency economy principle. A strategic plan for the province has been developed which embraces the province's new vision of achieving 'green growth', where economic advancement is achieved through the sustainable consumption of natural resources. Following this change in policy, rubber trees and other cash crop plantations have been promoted over maize as an effort to establish those crops which have comparatively lesser negative impacts on the environment. However, the suitability of such a promotion has been questioned, stirring up controversy amongst involved stakeholders in the province.

## ►► Assessment findings of the study area

An assessment study of the area has found that most of the local inhabitants are concerned about arising problems of unsustainable natural resource management and land use. They have realized that changes in land use patterns can lead to various kinds of problems, particularly when having to manage the consequent problems of natural disasters and disease outbreaks.. Furthermore, it has been found that some farmers have become aware of the negative impacts to the environment and are looking for an alternative source of income for their living. However, a majority of the farmers don't take alternate steps and continue to unsustainably expand their cultivation area to increase production and earn higher income. The direction of changes found in each factor does not differ from public understanding. The ecosystem services show declining trends in almost all categories, which possibly explain the decreasing trends for factors indicating human well-being, with an exception of one indicator that shows rising levels of possessed basic resources for sustaining livelihoods.

Results of the analysis of the correlative factors of socio-economic change (as tested by statistical correlation) reveal the following: the relationship between regulating ecosystem services and human well-being in regards to security, and the relationship between provisioning ecosystem services and well-being in regards to social relations show a positive correlation. However, the opposite occurs in the case of the relationship between cultural ecosystem services and human well-being in regards to possession of basic materials and security and the relationship between regulating ecosystem services and human well-being in regards to possession of basic material. A negative correlation can be seen where the increase in the ecosystem services leads to a decrease in the state of human well-being. Moreover, it is found that a significant positive correlation can be seen in the relationship between regulating ecosystem services and human well-being in regards to security.

The assessment of ecosystem services as presented in this report is a Participatory Environmental Evaluation or PEV. It measures the values that local communities believe that they can obtain from the utilization of in-situ ecosystem services. Differences in topographic features in the region also lead to differences in how local communities can benefit from ecosystem services; the advantages reaped by communities in flat plain and on high grounds are different from the benefits reaped by the communities residing on plateaus. Communities residing on flat plains and high grounds benefit from the availability of water resources and higher maize outputs, however they don't benefit as much from community forestry initiatives. However,. It has been found that maize cultivation greatly impacts surrounding ecosystems in the region in terms of negatively affecting their integrity, maintenance and security.

## ►► Drivers of changes

The analysis of factors responsible for bringing about socio-economic changes in Nan Province was conducted through the STEEP Framework, which is an instrumental tool in generating a holistic view of the situation in the region in terms of its S–Social, T–Technology, E–Economy, E–Environment and P–Politics. The key findings of each factor are as follows:

- **Social:** The people of Nan province have taken efforts to change themselves in response to dynamic external influences. The young generation is getting opportunities to pursue higher education, as a result of which teenagers and youth are migrating to live outside the province. The proportion of elderly folk involved in agricultural practices is increasing. There is also a lack of inheritance between generations of the traditional culture.
- **Technology:** These factors have evidently affected agricultural land. Drivers of change in production are the advent of irrigation technologies, access to transportation routes, and the use of chemicals. In addition, advanced communication technologies have kept farmers informed with the latest knowledge and information about agriculture and farming. This learning has empowered farmers with capabilities and adaptive abilities for responding to any challenging situation.
- **Economic situation:** The key causal factor that is affecting the economic situation of Nan Province is raising costs of production, mainly due to the dependence on external production inputs. Furthermore, households dependent on agricultural produce are having to incur higher expenses for amenities, leading to endless debts, despite the sources of credit financing that is widely available in the locality.

- **Environment:** There are case studies that provide evidence of environmental management efforts taken in the province. In addition, a number of learning centers are situated in the province which provides resources to educate and make aware local communities of the need for environmental management. These are positive indications for the province, indicating an increasing level of awareness within the local people and therefore possible increases in environmental management initiatives in the province. However despite these improvements, local communities have to frequently face the drastic consequences of natural disasters, especially the flash floods which incur loss and damages to agricultural land.
- **Politics and policies:** These are key driving factors that significantly affect changes in land use patterns in Nan Province. The policies contained in the national master plan of development show alignment between agricultural and natural resources management. However, the agricultural policies initiated by each government administrations have overstretched the limit of natural resources.

The aforementioned driving factors have caused significant land use changes in Nan Province and the Yao-2 watershed. According to reliable satellite data in 2007 (B.E. 2550) and 2009 (B.E. 2552), there has been a considerable replacement between forest areas and agricultural land. The changes have been evident around the rims of the northern and western part of the basin and along the roads connecting different districts in the northern part of the province.

## ►► Scenario building

As of now, there is no definite direction for the future of Nan Province, so it is very much possible to develop various scenarios. Each scenario for the province could either be desirable or undesirable.

Future scenarios for agricultural development in Nan Province for the next 10 years (2012–2022) have been formulated. The process involved brainstorming sessions amongst various groups at provincial and local levels. Key ‘change’ factors such as influence of policies, marketing and adaptation of the farmers were considered that could bring about the conversion from commercial agriculture to the practice of sustainable agriculture. Four main scenarios were devised; each scenario presents the opportunity to the agriculture sector to tap into the domestic and overseas market.

When formulating future scenarios, a key point to take into account is the naming of each scenario. This is an essential requirement which can ease in the identification and remembrance of each scenario in terms of its key driving factors applied and its overall strategy



THINK BIG

**THINK BIG Scenario** is driven by the growth of large-scale farmers who are boosted by policies that support investments in agriculture. This results in export-oriented production.



THINK FAR

**THINK FAR Scenario** is developed through the cooperation between small-scale farmers, large-scale farmers and other relevant agencies. The cooperation is forged under the agreement of fair and standard goods production for the overseas market.



THINK INTENSIVE

**THINK INTENSIVE Scenario** is derived from the assembly of small-scale farmers who are supported in the practice of sustainable agriculture that supplies food and farm produce to the domestic niche market.



THINK TOGETHER

**THINK TOGETHER Scenario** is projected through the expansion of new generation farmers who apply knowledge and technologies to boost their output for the domestic market.

## ►► Policy options

Each scenario produces potential benefits and has inadvertent adverse consequences. Therefore, it is essential that any policy set must minimize negative impacts and capitalize on potential benefits.

- *Development approach for the THINK BIG Scenario:* The outcomes of this scenario are large agricultural land that can be well managed, and where production costs can be lowered when the output increases. In this scenario, due to possibilities of high outputs, the economy can potentially grow significantly, however it can lead to the encroachment of watershed areas due to agricultural land expansion. As a result of this, ecosystems may become deteriorated, affecting small-scale farmers and local communities.

To address the possible problems, development should be geared towards land management, enhanced security of small-scale farmers, as well as conservation and restoration of watershed areas, which should be undertaken through the mechanism of seeking support from the tributary area committee in order to mitigate the problem in each locality.

- *Development approach for the THINK FAR Scenario:* The possible outcomes of this scenario are that the production process and output will meet standard requirements. Watershed areas and water bodies will be restored, reducing vulnerability to natural disasters.

Since agricultural production costs will rise, good agricultural practice should be promoted and competitiveness should be enhanced. Environmental networks should be developed for each watershed area at regional level so that the systematic management of resources can be achieved. Environmental monitoring should be undertaken and the use of traditional culture practices should be continued.

- *Development approach for the THINK TOGETHER Scenario:* The outcomes of this scenario are increases in the diversity and quality of agricultural output. The environment is well protected and the agricultural society becomes strong. However, the output is limited and expensive.

Therefore, for this scenario to work successfully, local brands must be promoted. The value and quality of local products must be publicized and consumer confidence in the products must be created. In addition, marketing opportunities should be made available for the farmers and the 'Payment for Ecosystem Services' (PES) approach should be applied to guarantee the sustainable management of ecosystems.

- *Development of the THINK INTENSIVE Scenario:* The outcomes of this scenario are outputs per each farming area will increase. Production resources will be optimized. However, this will result in the greater independence of local communities, where the inheritance of local wisdom and tradition amongst communities may come to a halt. Exposure to natural disasters may also become frequent.

To make this scenario work, a learning society should be initiated and promoted, where knowledge management processes should be developed amongst the elderly and young generation. Capacity building for personnel in the agricultural field should be undertaken, and comprehensive area-based research should be conducted. Cooperation with neighboring countries should also be fostered. In addition, preparedness initiatives for natural disasters should be organized and implemented to increase the resilience of local communities.

In conclusion, the formulation of agricultural development policy in Nan which promotes production efficiency while maintaining ecosystem services and local well-being need to take into considerations of different scenarios likely to occur at different periods of time. It is essential that all responsible government agencies collectively discuss and agree on appropriate policies and measures, based on information gathered and the likelihood of each scenario that would occur in the near future.