

The Rufford Small Grants Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Dok Doma
Project title	A Review of Mangrove Biodiversity Conservation and Management in Sre Ambel Bay, Cambodia toward Establishment of Code of Conduct for Sustainable Conservation
RSG reference	
Reporting period	November 1 st 2012 – November 1 st 2013
Amount of grant	£5000
Your email address	dokdoma@gmail.com
Date of this report	November 2013

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved
<p>Activity 1. Conduct Situation analysis of mangrove, assessment of resources, and community mobilization for mangrove conservation</p>			<p>Many indicators are available to identify the problem of overexploitation and threats to mangrove resources. These include increases in aquaculture effort, decreases in the conservation, changes in the socioeconomics figure, and increases in local population. Scientists know the causal relationships between these indicators and coal trade business; however, there remains a need to extend such information to the general community. Many local people in Sre Ambe do not realise that high levels of aquaculture effort can lead to negative outcomes of mangrove survive and fish resources depletion, including stock depletion, instead blaming such situations on mistakes made by government or managers. However, it is becoming clear that both local people and government officials have played important roles in the creation of fisheries and cutting mangrove problems. In Lagoon level, questions such as “<i>why is the area of mangrove decreasing?</i>” and “<i>how can we solve this problem?</i>” are frequently asked by fishers and members of the general community. Typical answers to these questions in the area have referred to local breaking state’s regulation and laws, and the illegal business such as coal and shrimp culture. However, changes in the distribution and abundance of natural resources, such as fisheries and mangrove, are often a result of natural variation in the environment, as well as the impacts of fishing and other human activities. Examples of phenomena driving this natural variation include climate change, global warming, El Niño, and sea level rise. According to Ibrahim (1999), human activities with potential to negatively affect fisheries and mangrove and other resources include:</p> <ol style="list-style-type: none"> a. destruction of habitats for spawning, nursing and feeding due to rapid development of coastal areas and development of new, efficient fishing technology and population growth; b. land encroachment and mangrove cutting of the people outsiders to enlarge create

			<p>shrimp farming</p> <p>c. Overcapitalisation and exploitation of coastal marine living resources.</p> <p>As highlighted previously, there is a paucity of information regarding the status of the Lagoon's marine resources. There are concerns about fish stock depletion in the marine fishery and mangrove destruction, although with no substantial stock assessments conducted, the status of the resource is largely unknown. Mangrove covers has strong related to the fish communities in the area. The depletion of mangrove lead to decrease of fish stock. Fish catch statistics have varied substantially, reporting 1,200 tonnes in 1980, 39,900 tonnes in 1990, and 29,800 tonnes in 1997. While the DoF collects harvest data from commercial fisheries, there are concerns relating to the accuracy of these figures, as they do not include catches from illegal fishing vessels, both foreign and domestic. Similarly, they do not include catches from fishing vessels that did not land their catches at Sre Ambel ports. Finally, there are no reports of the amounts caught by subsistence fishers.</p>
Activity 2. Dissemination of the assessment results			Findings have been disseminated to central government and local authority for their awareness and decision to make the conservation code to reserve mangrove areas.
Activity 3.			Mangrove conservation communities have been established as the structure and have their role to conserve marine resources.

Results of assessment

Recognition of the environmental, social and economic impacts associated with the decline and degradation of mangrove forest ecosystems are now being addressed through legislative, management, conservation and rehabilitation efforts aimed at mitigating the negative impacts of previous (and planned) coastal development. Examples of mangrove forest conservation are rather isolated, usually small areas not representative of how mangrove forests are managed overall. They do however; illustrate the problems and issues well and working remedies to solve them. An integrated approach to mangrove management through coherent policy development and concerted action is increasingly being regarded as the best way to achieve conservation and sustainable use of the coastal resources which mangrove ecosystems support.

In the Sre Ambel coast, because mangroves occupy the intertidal zone, they interact strongly with aquatic, inshore, upstream and terrestrial ecosystems and in this way mangroves help to support a diverse flora and fauna of marine, freshwater and terrestrial species. It is essential to regard biological diversity at three levels: genetic, species and ecosystem. The genetic diversity in mangroves is almost unknown. The movement of mangrove plant genetic material for reforestation

purposes, or other uses, must be controlled and recorded more carefully than at present. Genetic material should come from local sources wherever possible, using good quality mangrove forest stands as the source of the material. Mangrove species diversity is well known for the larger animals and plants, but poorly known for micro-organisms and insects. A crucial aspect of biodiversity for mangrove management is that many species use the mangrove forest ecosystem only part of the time (e.g. fish, birds, crustaceans, and shellfish). Thus, the mangrove habitat supports many more species as visitors, or indirectly, and these support functions must be taken into account as part of conservation management.

The many unique species of mangrove animals and plants and their morphological and specialisations to the diverse and dynamic habitat characteristics of mangroves make them extremely valuable for further research into biological adaptations. A number of mangrove plant and animal groups also provide valuable subjects for evolutionary studies. Mangrove systems are diverse at the ecosystem level because mangroves can grow in a wide range of geographical, climatic, hydrological and edaphic (soil) conditions. There are also many strong and unique human cultural associations with mangroves. Consequently the structure, productivity and functions of mangrove forest ecosystems are also highly variable in the studied area. Therefore, these characteristics at the ecosystem level must be considered as part of habitat and biodiversity assessment (in order to set conservation priorities area by area). At the species and ecosystem levels, the following are critical to the success of mangrove biodiversity conservation:

- Protection of mangrove forest habitat - especially mixed species forests.
- Preservation of the natural hydrological regime operating in the ecosystem

The mangrove ecosystem in the studied area has important direct and indirect economic, ecological and social values to man. Mangrove ecosystems have consistently been undervalued, usually because only their direct goods and services have been included in economic calculations (e.g. forestry resources), but this represents only a minor part of the total value of mangroves. By undervaluing mangrove ecosystems, "development" has too often favored their rapid conversion and loss. Mangrove conversion usually leads to short-term economic gain at the expense of greater, but longer-term, ecological benefits and off-site values. The non-market values, for example species biodiversity and off-site functions such as nutrient export are not easily quantified, but have been shown to be significant. The total economic value of mangroves must be calculated in order to provide decision-makers with the real cost of converting mangroves to other apparently more profitable uses. In particular, long-term ecological benefits and off-site values should be included in valuations for mangroves. Mangroves play an important role in the functioning of adjacent ecosystems, including terrestrial wetlands, peat swamps, saltmarshes, seagrass beds and coral reefs. There are harmful repercussions in these other ecosystems when common ecological processes are compromised through poor management decisions involving mangroves. There is a need for new research to develop stronger valuation techniques/models that adequately value all the functions, attributes and services of the mangrove ecosystem. In particular new techniques are required to better assess the value of mangrove biodiversity and ecosystem support.

Development of Conservation strategies Recommended to the Central Government

First priority should be given to conserving the remaining areas of natural mangrove forest, especially areas supporting mature, seedling-bearing trees. Even small patches of mature forest (e.g. a few hectares in size) may be invaluable for the natural propagation of mangroves, and as a source of seedlings for restoration planting. Core representative habitats of the region's biodiversity

should be protected and linked with corridors to permit migration, adaptation and protection of the ecological linkages. Particularly valuable wetland habitats from an ecological and biodiversity perspective, can be conserved most effectively by assigning to them special status which is clearly recognised nationally, or internationally. This would include a designation as e.g. a national park, nature reserve, gazetted forest at national level, or e.g. Biosphere Reserve, Ramsar site, or World Heritage Site at the international level. It is important to keep a protective zone of mangroves, not only in Sre Amebel area, but the whole of Cambodian coasts, particularly as a buffer against coastal erosion. Local guidelines must always be followed in this regard. The requirement is a minimum of 100 m, but preferably up to 500 m or 1 km (as advocated in the Mekong Delta, Vietnam, which is subject to typhoons) at the open coast, and 30-50 m along riverbanks. Activities in the upland water catchment area should also be taken in to consideration for conservation and management of mangroves and where possible the links between habitats should be maintained (e.g. water catchment area - mangroves - seagrasses - coral reefs).

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

Road access and raining was the most difficult for this project assessment and local mobilisation for workshop, especially during the mobilisation of the local people and local environmental authority and outsider people, from various region, for meetings and capacity building training programme for draft of mangrove conservation code. On the other hand, it was difficult also during the approach to government officials for discussion concerning policy development for mangrove resources management. Most of governmental official's at all levels were busy and they were sometimes reluctant to provide us information and data.

3. Briefly describe the three most important outcomes of your project.

- Explored the practical issues and management of mangrove resources in the area, which had particular differences from the other part of the country and even in the Southeast Asia countries. It had identified the potential factors that affecting the mangrove resources damages that mostly from the factor of management and capacity of the local people and the lacks of conservation codes to be effectively applied.
- Proposed a mangrove management and conservation codes which agreed by all stakeholders in the areas and their commitment for the marine resources conservation. But this code is being submitted to central government for approval.
- Provided capacity building to all stakeholders related to the conservation of mangrove resources.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Two communities were involved this mangrove project; Chroy Svay Fisheries Community and An Cha Eurt Community Fisheries. Each of community has its members' of 350 fishers. There had been eight workshops for this project to disseminate the concept of mangrove conservations and find out the consensus of local farmers on the development of mangrove conservation codes. Workshop 1 and 2 will conduct during the field investigation. It was 350 attendants for the capacity building for the

new policy instruments awareness. Each attendant was receiving £3 per workshop. Workshop 3 and 4 were conducted during the completion of field work, and proposed mechanism of local engagement in mangrove conservation. Workshop 5 and 6 were provided to local people for the capacity buildings on knowledge and actions of marine resources and mangrove conservation.

5. Are there any plans to continue this work?

The policy alternative for mangrove management is fully already being accepted by both local government and grassroots, it is important to the continuous stage of setting up institutional arrangement and provide more training programme of this policy alternative. Workshop at the national level is needed at the first instance.

6. How do you plan to share the results of your work with others?

This project was considered by the local government and local environmental authority to be an interesting results towards development of environmental codes for not only coastal lagoon management in the whole countryside or in the regions, but on the focus of mangrove conservation in the whole coastal line of Cambodia. It will be shared through real application and submit the report to governmental sectors. Especially, it will be shared through the national workshop and regional workshop for the next funded, if applicable.

7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

This project has been implemented for the full one year started from November 2012 – November 2013. The implementation had gone through the work plans.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Workshop 1	994 £	350 participant x 3GBP = 1050 GBP	(-56 GBP)	Workshop at the first time to introduce people about the objective of the project
Workshop 2	994 £	350 participant x 3GBP = 1050 GBP	(-56 GBP)	Explored the issue of current management style
Workshop 3	994 £	350 participant x 3GBP = 1050 GBP	(-56 GBP)	Join –governmental officials workshops about the conflict resolution for marine resources management
Workshop 4	994 £	350 participant x 3GBP = 1050 GBP	(-56 GBP)	Identified the factors affecting the decline of marine fishes catch

Workshop 5	994 £	350 participant x 3GBP = 1050 GBP	(-56 GBP)	Consensus on the effective policy alternative for lagoon management; first draft and submitted to the stakeholders for agreements / changed if possible.
1) Workshop 6 2) General Operation at fields during the last workshop (field trips of governmental officers)	994 £	1) 150 participants x 3GBP = 450 GBP 2) 259 GBP Total 709 GBP	285 GBP	Key –selected stakeholders for capacity building on new policy alternative for lagoon management. It included field trip of participants at the new coastal area.

9. Looking ahead, what do you feel are the important next steps?

Next steps are to bring all possible policies and regulation that related to environmental codes and mangrove conservation to those communities, and let's to guide local people engaged in applying more effectively in the context of mangrove conservation reserve.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes, I have informed all people for this project with the logo of Rufford Small Grant Foundation

11. Any other comments?

This project was very much required to have next steps of implementation because this proposed mangrove conservation code had strongly welcomed by both local people and local authority and local administrative officers.

After the project completion, it can find out any international conference for this project's outputs.