Environmental Impact Assessment Report:

SEAFDEC Activities Related to Climate Change and Adaptation in Southeast Asia with special focus on the Andaman Sea

Southeast Asian Fisheries Development Center (SEAFDEC)
The Secretariat

Supported by
The Swedish International Development Cooperation Agency (Sida)

SEC/SP/104 **AUGUST 2009**

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List of Abbreviations

ASEAN	Association of Southeast Asian Nations
ASWGFi	ASEAN Sector Working Group on Fisheries
BOBLME	Bay of Bengal Large Marine Ecosystem
FAO	Food and Agriculture Organization of the United Nations
FAO/APFIC	Food and Agriculture Organization of the United Nations/Asia Pacific Fishery Commission
HIV/AIDS	Human Immunodeficiency Virus/Acquired
ICSF	International Collective in Support of Fish-workers
IUCN	World Conservation Union
MFF	Mangroves for the Future
NGO	Non Governmental Organization
RPOA	Regional Plan of Action
SEAFDEC	Southeast Asian Fisheries Development Center
Sida	Swedish International Development Cooperation Agency
UNEP/COBSEA	United Nation Environment Programme/Coordinating Body on the Seas of East Asia

Introduction

This Environmental Impact Assessment (EIA) is done in response to the requirements of the Agreement between SEAFDEC and Sida (30 April 2009). The Agreement states that SEAFDEC is obliged to produce an EIA based on Sida's "Guidelines for the Review of Environmental Impact Assessment". Furthermore, SEAFDEC is expected to "implement the recommendations in the EIA, in cooperation with its partners".

Points of departure – developing a brief EIA

The scope of this EIA is to provide a brief EIA in line with Sida's Guidelines that states that "for projects that are expected to have small or insignificant environmental impact, the EIA can be very brief". On the contrary the Project is expected to lead to positive responses to environmental concerns within an overarching aim to address climate changes and adaptation needs in areas such as habitat and fisheries management, monitoring and control of fishing efforts and improved regional cooperation. This is also highlighted in the project document. In section **12 Cross-cutting issues** it is stated:

> **Environment**
>
> The project will not cause any negative environmental impacts. On the contrary the project focus on integration of fisheries management and habitat management, the management of fishing capacity and the need to maintain and restore geographical features (such mangroves, sandy beaches, etc) is in support of good environmental management also in the perspective of responses to climate change impacts. Human capacity building and awareness-raising are important elements to make the results of the project sustainable.
>
> **Climate Change**
>
> The revision of this proposal have been made in the perspective of, and in the recognition of, the need to provide a focus on climate change – and adaptation – to proposals that address social well-being/poverty, marine and coastal natural resources and environmental management in Southeast Asia. Climate change and changes in the monsoon pattern can have far-reaching effects on coastal livelihoods and availability of fisheries resources. In the preparations for the proposal the need to maintain and restore important coastal geographical features has been well incorporated in the objectives and activity plan by aiming to build capacity for the management of fisheries and important coastal habitats and the protection against natural hazards in the Andaman Sea and within Southeast Asia as a whole. This includes efforts to build resilience, incorporate local knowledge and to restore important, and protective, coastal features and habitat. The tsunami in December 2004 and the cyclone in Myanmar, May

2008, and frequent hazards in Vietnam, Philippines and other places are signs on what might lie ahead for fisher-folks in coastal areas of the region.

A brief EIA based on the questions outlined in the Guidelines

The proposal has a clear focus on the promotion of environmentally sustainable development through the integration of fisheries management and habitat management. This includes a forward look to address capacity to adapt and mitigate as needed to impacts of climate change. The approach has four streams: **a)** on the ecosystem/fisheries integration - securing/restoring important habitats for reproduction and to establish conservation areas which will include mitigation of impacts of climate change; **b)** managing fishing capacity - to avoid depletion of stocks, biodiversity and degradation of environment health, and to adjust fishing capacity as needed to adapt to impacts of climate change, i.e. reduced fish stocks, changed seasonal fishing patterns, etc; **c)** cross-cutting issues such as traditional approaches to resources/fisheries and environmental management, including responses (adaptation) to change; and **d)** reaching for more sustained policy changes by promoting regional (ASEAN) and sub-regional (initially Andaman Sea) cooperation and the development of agreements and arrangements.

The four streams are clearly explained in the project document. Results are to be optimised through change/impact at regional, national and local level and uptake at “higher level” policy-making (such as ASEAN). Through the active cooperation with other organisations at various levels – results and outcomes should be “seen” (referred to in sources other than those prepared by the project) also “outside” of the project itself to ensure sustainability beyond the project. To achieve this the project builds on cooperation with other agencies, organisations, initiatives at regional, sub-regional, national and local level as required in the process of implementation to achieve desired results. This is also important to achieve a broad range of results with a limited amount of funds.

There is not expected to be any negative environmental impacts as the whole project design is focused on improving the environmental sustainability through the linking of habitat and fisheries management and to mitigating negative impacts through improved management (reduction) of fishing capacity. An important part in these ambitions is to work with policy making mechanism at ASEAN while at the same, with partners, address issues at local level.

There are not really any alternatives to achieve the project goals both in terms of environmental sustainability and mitigation and adaptation with respect to climate change. Institutions will have to cooperate on habitat and fisheries management (including the protection against natural hazards) and the fishing capacity will have to be managed and reduced. However, more things could have been added but with the available funds the focus needs to be defined.

Key to project achievement is the successful cooperation with other institutions and NGO's at various levels. This is central to the expectations of sustained results beyond the project period.

Strategic considerations made in the project design

Sida's Guidelines are not requiring any Strategic Environmental Assessment (SEA) of a project of this type – or size. However, it could be important to add a note on the strategic considerations that has been made in the formulation and design of suggested interventions – and to the strategic and environmental importance of the project in driving key processes forward.

SEAFDEC and SEAFDEC-Sida Project have actively been working with ASEAN and FAO/APFIC and this have opened avenues to influence the ASEAN and FAO/APFIC regional policy making mechanisms. Through the ASEAN-SEAFDEC Strategic Partnership (ASSP) SEAFDEC is the technical arm of ASEAN and the ASEAN Sector Working Group on Fisheries (ASWGFi). Within that cooperative context, Regional Consultations have been organised on habitat and fisheries management, fishing capacity, climate change, etc. At the same time work has, including on-site training with partners and villagers, been done at province and district level. These processes have been providing background and strategic recommendations on the environmental situation and priorities for the region including directions for the formulation of the project document. The present situation with regards to resources and aquatic environment is described in the project document.

The indications from regional, national and field level that there is a general wish to move towards environmental sustainability in the ASEAN region – and to be able to adapt to climate change – has provided the framework within which the project has been designed. The four areas, or streams mentioned above, are strategically selected based on present situation and the scenario for the coming years. Southeast Asia is the biggest production area of fisheries products and the dominating export region, with, at the same time, large population dependent on the production – and the products. To sustain the productive ecosystems of the region, environmental and fisheries agencies need to work together and in the process involve the civil society to provide a reasonable management framework by integrating habitat and fisheries management. Furthermore, it is critical that in the process the management of fishing capacity is addressed – including illegal fishing. The timing is strategic, as is the issue, as by the end of 2007 ASEAN Heads of State signed up to the need to combat illegal fishing. In the process it is strategically important to get some kind of record on the number of vessels that actually exist.

Environmental policies and a purpose to influence policy change within the ASEAN are high among priorities and during stages of preparation dialogue with ASEAN, FAO and others have been maintained. In response to this and to ensure that resources can be allocated to policy development one of the Immediate Objective

(number 3) aims towards “policy development and regional management arrangements”. This is also reflected among activities, such as 2.18 “inform the ASEAN-SEAFDEC Member Countries and provide inputs to ASEAN policy making mechanism” and the whole sub-component 4 on “policy development and promotion of regional cooperation”.

The cooperation with other partners and organisations will allow for more “independent” monitoring by stated references to the SEAFDEC-Sida inputs in reports by other organisations at regional and national levels in addition to the results-oriented monitoring and reporting that will be done annually.

Description of the “Project Area” and present situation

The “project area” indicated for the project is actually split into two levels, one sub-regional focusing on the Andaman Sea and the other the ASEAN region as a whole and targeted for policy development and regional and sub-regional management arrangements.

A description is provided on the Andaman Sea region that includes information on resources uses/fisheries and important geographical features/habitats. The description is not only done as mere description of the present situation but done in a way that reflects the impacts experienced after the tsunami and the cyclone Nargis. This provides, as indicated in the document, an indication on specifically important geographical features and/or habitats in terms of mitigating impacts of natural hazards, such as mangroves, coral, beaches/dunes, etc. These areas are not only important to protect against natural hazards – and impacts of climate change – but also important to spawning and reproduction of aquatic resources. Targeting these areas through the integration of habitat and fisheries management will benefit the sustainability of habitats and fisheries, while at the same provide responses to the perceived effects of climate change.

The vulnerability of coastal villagers is well documented and their right to maintain their traditional living and livelihood along the coasts of Andaman Sea is threatened in many ways apart from the threats posed by impacts by large fishing vessels fishing too close to shore. Clearance or encroachment into mangroves and beach landscapes, by urban and tourism development and shrimp-farms, often forces them to leave (to re-settle in more exposed locations) and/or leaves them more exposed to natural hazards (and poverty) – this was clearly shown by the impacts of the tsunami and the cyclone Nargis. This is described in the document. The description highlights the importance to build upon traditional knowledge together with the promotion of better organisation of the villagers to be more able to respond to natural hazards and to adapt to climate change. In the process their right to remain in their traditional settlements need to be secured. Two important focal areas, indicated in the document, of importance to the build up of resilience and adaptive capacity is the restoration and maintenance of important coastal geographical features (mangroves,

corals, beaches/dunes, etc) and the other is the organisation of the village and districts to have good records of their boats and gear (to respond to impacts of natural hazards and to adjust fishing effort due to impacts in resources availability due to climate change). The tsunami showed that villagers, well organised, with good records could much faster respond to the disaster.

International conventions and regional agreements are closely followed by the project and the project will “review international conventions and other agreements of relevance to the management of fisheries, fishing capacity, habitats and climate change” (Activity 4.7). Regularly, once year, the project would organise regional consultations/learning events “on the implications of international conventions and agreements of relevance to fisheries and habitat management and their implementation in ASEAN-SEAFDEC Member Countries” (Activity 4.8). As relevant this will be followed up during on-site training more locally around the Andaman Sea.

Responses provided to Appendix 1: Checklists Coastal Zone related activities

The following section is provided to give a picture of how the project relates, or responds to the checklist provided in Guidelines in Appendix 1 with a follow up on the questions provided in the section on "Coastal Zone related activities". It is acknowledged that it is not required, but could perhaps provide some useful perspectives on how the project "answers" to key questions.

General/overall questions:

- *Follow or contravene relevant international agreements and conventions such as the UN Convention on the Law of the Sea, and the agreements on trans-boundary fish stocks, and the Convention on Biological Diversity?*

The 1982 UN Convention of the Law of the Sea (UNCLOS) is a key to the environmental and natural resources/fisheries management in the Southeast Asian region. With a base in UNCLOS the project reviews other convention and their implications to fisheries and habitat management and uses that in the promotion of policy development and regional cooperation and management arrangements. So, yes, relevant international agreements and conventions are well recognised and used as "tools" in the process of implementation – see specifically Activity 4.7 and 4.8 and comments above.

- *Include components relating to coastal zone planning, legal issues connected with coastal zone planning, and/or more efficient execution of the laws that govern planning of this type?*

Spatial planning is part of the concept, especially with respect to the establishment of "fisheries resources conservation areas" or "*refugia*" in the process to integrate habitat and fisheries management. Even though the project as such will not be driving the broader process of coastal zone planning, it is considered vital that those responsible for physical planning in coastal zone recognise the conservation areas, recognise important coastal habitats – and the right of people to remain in their traditional settlements.

- *Include research and/or methods development related to the environment and sustainable development?*

The project itself do not have any defined research component (not enough funds for that) but have taken the approach to work with and link up with those making research at local and national level – with the intent to use the results and available resource persons for on-site training and awareness raising at various levels. At the sub-regional (Andaman Sea) level cooperation will be established with the BOBLME that have a research agenda but would benefit from SEAFDEC's access to policy making bodies, such as ASEAN. The databases being built up by the BOBLME will be an important source of reference. Experiences from other areas have shown that cooperation is much more productive than doing things in isolation.

- *Recommend the selection of material whose impacts on the environment are as small as possible?*

The question is not really applicable as the project will not provide much material as such. But, through consultations and on-site training recommendation on less damaging materials and methods could be promoted at various levels and different events– including ways to reduce contribution from fisheries to climate change, such as reduction in fishing capacity (especially trawling that consumes a lot of energy) and developments of gear that demands less energy.

- *Identify the groups of people and the ecosystems that are particularly vulnerable to the impacts of the project?*

The questions is not applicable to the project in the way it is put – rather the approach of the project is to identify groups and ecosystems that are vulnerable to impacts from other developments in coastal areas (be it from over-fishing (pressure/conflicts with larger boats), tourism development, urban development, coastal transport facilities, pollution, etc)

- *Contribute to ecological and social disruptive activities, such as shrimp farming or mass tourism, or will it contribute to the implementation of ecological and social activities in a manner that preserves resources and is not disruptive?*

The whole idea of promoting the integration of habitat and fisheries management is to "contribute to the implementation of ecological and social activities in a manner that preserves resources and is not disruptive". The management of fishing capacity is also an important step to reduce social tensions and conflicts between groups of fishermen. Both habitat/fisheries management and the management (reduction) of fishing capacity are tools in support of responses to impacts of climate change.

- *Have the impact that alternative and, in the long term, more profitable (economic social and/or environmental) methods of using the natural resources are developed and introduced?*

In a way that is central to the whole project and the notion of building up capacity to adapt to changes including those required through impacts of climate change. The integration of fisheries and habitat management is aiming towards a balanced development that should provide a framework for longer-term sustainability. Environmental profitability would come with the success of the approach and through addressing the rights of coastal villagers economic and social "profitability" will be sought. The process requires, apart from the coastal villagers, active involvement of environmental and fisheries agencies – and the departments/provincial units responsible for planning in coastal areas. The active involvement of coastal villagers will be developed through coordination with local NGO's that also could ensure that ideas and information provided through on-site training would be carried forward in the area(s).

- *Encourage and lead to more discussion, exchange of information, and coordination between the ministries and agencies responsible at both central and local level for the sustainable development of the sector?*

Sharing and disseminating information is one of key elements of the strategy both at local level and at the ASEAN level policy making arena. To be more pro-active in efforts to share and build upon available information the project ensures that it can build upon the knowledge base within other bodies and project, for example at on-site training at local level resource persons from NGO's, projects and local government agencies from relevant ministries will be invited. This has the benefit that the project can be able to provide training in the local languages – and information will also be shared among "actors" in the field. SEAFDEC, thus, gets a set of information that could be further shared at the regional policy level through regional consultations and as inputs to various regional events. At the regional level the project emphasises the importance of coordination between organisations, ministries, agencies and NGO's. Special effort is made to try to bridge and foster cooperation with environmental and fisheries agencies. Worth highlighting is the cooperation with ASEAN under the ASEAN-SEAFDEC Strategic Partnership (ASSP) as well as the good cooperation with FAO/APFIC. For the project implementation cooperation and coordination will be developed with BOBLME, Mangrove for the Future/IUCN, the International Collective in Support of Fishworkers (ICSF), World Fish Centre, UNEP/COBSEA in addition to key ministries and departments in each of the countries.

- *Give the local population the responsibility for managing the natural resources used locally?*

There will be a focus on certain specific areas around the Andaman Sea – especially those in border locations. To ensure broadest inputs and participation the project will not work with "traditional" pilot projects but the project will coordinate and involve already ongoing field activities of various types. The project will build upon those (NGO's and others) that have facilitated the involvement of local participation in activities related to fisheries, habitat management, alternative livelihoods, etc. This have the added benefit, apart from the documented local participation, of increased likelihood of results being sustained as there would be partners around to carry the results forward. Examples of local partners, west coast Thailand, include Yadfon Association (small scale fisheries), Save Andaman Sea (village organisation) and Mangrove Action Project (mangroves). The focus would include fisheries, natural resources, coastal environment, biodiversity, etc… as applicable from place to place.

- *Use environmental economic analysis for the calculation of project finances? Will the project, for example, internalise the costs of impacts on human beings and environment, such as loss of ecosystem services 28 (so-called externalities), in the total costs of the project?*

Not applicable as there are no expected "costs of impacts on human beings and the environment"

- *Contribute to activities that only provide short-term economic gains and that do not give consideration to long-term sustainable development and the livelihoods of future generations?*

No – the project have a clear focus on long-term sustainable development!

- *Contain a component for monitoring during the implementation of the project and for control after the project has been implemented?*

The project has a component on "project management and coordination". A continued monitoring is built in through the partnership and coordination with other organisations and projects. Results will be submitted for review and comments to SEAFDEC Council, ASEAN-SEAFDEC Fisheries Consultative Group, ASEAN Working Group of Fisheries and ASEAN Fisheries Consultative Forum as well as Sida. Specific activities will be reported to the Regional Plan of Action to Combat IUU Fisheries (RPOA) and the BOBLME and provided as inputs to their action plans. This is a cost effective way for a fairly small project with a regional and sub-regional scope to secure a continuous monitoring that will provide feedback on results and the status of processes to foster regional cooperation - while building up capacity to adapt to climate change within the framework of fisheries and habitat management.

Human Beings:

- *Include extensive, real participation of the local population affected by the project in all stages of selection and alternatives and in the planning, design, implementation of projects in the Coastal zone? This also includes the decision-making process that is expected to be based on local participation and in a transparent and just manner.*

There will be a focus on certain specific areas around the Andaman Sea – especially those in border locations. To ensure broadest inputs and participation the project will not work with "traditional" pilot projects but the project will coordinate and involve already ongoing field activities of various types. The project will build upon those (NGO's and others) that have facilitated the involvement of local participation in activities related to fisheries, habitat management, alternative livelihoods, etc. This have the added benefit, apart from the documented local participation, of increased likelihood of results being sustained as there would be partners around to carry the results forward. Examples of local partners, west coast Thailand, include Yadfon Association (small scale fisheries) and Mangrove Action Project (mangroves). The focus would include fisheries, natural resources, coastal environment, biodiversity, etc., as applicable from place to place.

- *Include training and/or contribute to greater understanding of preventing and solving problems related to the environment and promote sustainable development in a cross-sector perspective? If so, will both women and men be included in the training programmes?*

As indicated above and in different places there will be on-site training in selected areas (areas to be selected together with the countries) in follow up to earlier SEAFDEC involvement. The perspective is cross-sector based with inputs provided as suitable to the specific location. Yes, both men and women will be included.

- *Include other forms of human resource development, as well as methods development related to the environment and sustainable development?*

The innovative part of the project is the way to incorporate, not only "local knowledge" but also knowledge and results from projects and agencies in the area – be at national or local level. This ensures updated information, learning events in the local language – and that results and recommendations can be brought forward directly through participants and resource persons

The project could also facilitate the participation of people at various levels in training or learning events organised by others.

- *Change the health status of people living in the vicinity, who move into the area or must move away? Will there be an increase or decrease in, for example, cases of poisoning, and the spread of diseases such as HIV/Aids, typhus, cholera, dysentery, bilharzia, malaria and sleeping sickness as a result, for example, of pollution of sanitary conditions and/or patterns of behaviour?*

Section 12 "Cross-cutting" issues contain a section on HIV/AIDS that indicates the recognition of HIV/AIDS in fishing villages and among crew members that in cases are larger than average. It is also noted that above average incidences of HIV/AIDS exist among fishing crews and some fishing villages according to reports from FAO and others. The health aspects are not directly addressed but information on ways to improve health and well-being is part of the process to promote better organisation in fishing villages. An assumption is that a well organised village would be more receptive to information.

- *Affect the living conditions of the local population (settled and nomadic groups), for example their possibilities to move or use natural resources inside or outside the actual project area? Affect livelihoods or groups in society that are already threatened and/or under pressure?*

The problem is recognised by the project and the pressure from strong economic interests such as tourism, industrial development, etc leads to competition over land in coastal areas that is a serious threat to the rights of coastal villagers to maintain their livelihoods in their traditional settlements. The project will not provide additional burden, but will try, together with partner institutions and NGO's, to explore ways to get their right to "be" where they are more recognised in districts, provinces and capitals. The promotion of better organisation, including records of the number of vessels, gear and number of people involved in fishing, mangrove planting, etc. is a way to make the villagers more resilient and adaptive to climate change and natural hazards. In addition, if these records are also posted with the district and province it could be a way to strengthen their position and their rights – and if they would still be forced out that could be a basis to claim compensation more relevant to what they are losing.

- *Lead to migration into or from the project area, for example lead to increased urbanisation?*

No! Rather the contrary – as indicated above the project, with partners, will explore ways to strengthen the right to remain in the traditional settlements

- *Lead to the risk of accidents that can have consequences for people and the environment in the vicinity?*

Not applicable as no activities of that nature is included in the project document

- *Lead to conflicts resulting from the land's present use or ownership rights? Are there plans to minimise and resolve conflicts of this type in the best possible way? Use the knowledge possessed by the local population on the area in question to ensure that the project contributes to environmentally sustainable development?*

The project itself will not increase, or lead to conflict over land-use and ownership. The approach is to resolve conflicts, while trying to strengthen the rights of the traditional settlements. Similarly, the rules on fishing are quite straightforward (but not followed) – if large vessels are fishing to close to shore (in areas reserved for coastal fisheries) that is illegal and efforts should be made by governments to stop that. The project will support these efforts to increase sustainability, improve management and ability to adapt.

- *Include the development of tourism, which can have a negative or positive impact on the environment?*

Not applicable as no activities of that nature is included in the project document

Cultural environment

- *Extend the mapping of valuable cultural environments and plan for their use and preservation?*

The cultural importance of specific areas, scenic area and geographical features are well recognised. Within the ASEAN region there are a number of areas that are on the UNESCO World Heritage list or ASEAN Heritage List. In the mapping of MPA's, closed season areas, etc. due recognition and inclusion in the mapping will be done for areas designated as natural and/or cultural heritage sites, such as Tarutao in Southern Thailand.

- *Affect sites of archaeological interest and places of historic value?*

Not applicable as no activities of that nature is included in the project document

- *Affect cult centres or other places of religious and ethnic significance?*

In the reviews and studies of information on traditional knowledge a view will be made on information on places of religious and ethnic significance – in cases they would/could have a significant role in cycles of local management practices, protection of important habitats, etc.

- *Affect the preservation and sustainable use of old or valuable buildings as well as old structures such as roads, bridges, dams, terraces etc?*

Not applicable as no activities of that nature is included in the project document

- *Affect integrated environments of special value, including cultural landscapes?*

No negative effects are expected, rather such areas would be better protected through the integration of fisheries and habitat management and the reference to the cultural landscape would, likely, be important part of traditional management systems – and recognised as such by the project

- *Reduce accessibility to and make it difficult to use the cultural environment, or will it lead to improvements in these respects?*

Not applicable as no activities of that nature is included in the project document

- *Lead to irreversible consequences, for example demolishing buildings or building over archaeological discoveries or making other changes of this type?*

Not applicable as no activities of that nature is included in the project document

- *Document the original conditions before valuable cultural environments are obliterated changed in a decisive way?*

Not applicable as no activities of that nature is included in the project document

Biological diversity

- *Affect important or sensitive ecosystems (for example aquatic ecosystems and areas that are covered by natural vegetation), or will it restore ecosystems of this type? Impacts on ecosystems in naturally flooded areas (for example deltas), wetlands, mangrove forests and other coastal areas should be taken into consideration.*

Restoration, Yes, activities are included as follows: "…based on the inputs from national resource persons, provide capacity building on the importance to maintain coastal features (mangroves, sandy beaches, coral reefs, etc) to province and district fisheries and environmental offices…" (Activity 1.7) "Explore (with a view on climate change) the need to restore selected features (mangroves, etc) ….. and follow with some restoration measures" (Activity 1.8) – see also below "land, water, air"

- *Affect natural biological diversity (wild and cultivated) by threatening, promoting or protecting plant or animal species, races or strains? Will, for example, mangrove stands and coral reefs be affected negatively or positively? Will, for example, a red-listed/ threatened species or any other type*

of so-called key species be affected – or any commercially or culturally important species? Here consideration should also be given to whether diversity within a functional group (group of species with a similar role in the ecosystem such as grazing animals or nitrogen-fixing organisms) will be reduced drastically since it can mean that the ecosystem would become more vulnerable.

The project will not have any negative effects on "natural biological diversity". The project will not directly work with specific species or organisms – but rather work with those that are doing that. In the work to integrate fisheries and habitat management it is expected, as you can see elsewhere, that there would be some restoration, or replanting of mangroves and other important habitats with a view to improve and sustain reproduction of fisheries resources – and to build up/restore the protective functions against natural hazards (one of perceived effects from climate change is an increase and more unpredictability of natural hazards)

- *Affect the sustainable use of wild and cultivated biological diversity as well as the local improvement of species and local acquisition of knowledge? Will, for example the risk of over-fishing increase or decrease, i.e. will the extraction of fish exceed natural reproduction?*

The focus on the integration of fisheries and habitat management (Component 1) aims to improve the recruitment of wild fish stocks by management of important habitats, suggest closed seasons if/as needed and to initiate the development fisheries resources conservation areas (*refugia*) also in trans-boundary areas. This will also provide a framework for responses to climate change in the impacts on the habitat. Aquatic resources availability and species/stock composition can also be monitored through partners.

The integration of fisheries and habitat management should in this context be seen in conjunction with the efforts to manage fishing capacity (Component 2: Monitoring, record and control – large scale and small scale) aims to support the countries to reduce fishing capacity and thereby reducing over-fishing. In the management of fishing capacity there is also a recognised link to climate change and need to adapt – in that if there are reductions in that available amount of resources, or changes in stock composition, due to climate change that leads to a need further reduce, or adjust, the available fishing capacity. Keeping a good vessel record is also important to be able to follow up on natural disasters in that it is easier to track numbers of boats and the people lost.

- *Contribute to or counteract the introduction of new species in areas where they do not belong naturally?*

Not applicable as no activities of that nature is included in the project document

- *Create barriers and disturb natural migration routes for animals and the spread of plants? Will the project, for example, prevent or make it easier for migratory fish to reach their reproduction areas or migratory birds to find resting places or places where they can search for food?*

To maintain the inter-connectivity between spawning, nursing, feeding is important to the sustainability of fisheries and that is one of the important aspects behind the integration of fisheries and habitat management. The first component of the project is focused on this. The plans to initiate so called fisheries resources conservation areas, or *refugia*, aims to be able also to look at, or secure, the migration paths by making such an area quite large to be able to embrace not only the key habitat but also some of the important migration paths. It is envisaged that different management measures would be required at different stages of the life cycle – at different times of the year.

- *Involve an increase or reduction in the risk of plant or animal diseases being spread to cultivated or wild species (e.g. by shrimp farming or water regulation)?*

Not applicable as no activities of that nature is included in the project document

- *Make good use of and/or increase local and national knowledge of biological diversity? Is for example the knowledge of biological diversity possessed by the local population put to use in the EIA?*

There is knowledge among the local population – but they do not easily translate that knowledge into the "concept" of biodiversity. There is a component in the project (component 3) that addresses local knowledge to be able to build upon that in target areas.

- *Include local participation in the management of biological diversity?*

There will be a focus on certain specific areas around the Andaman Sea – especially those in border locations. To ensure broadest inputs and participation the project will not work with "traditional" pilot projects but the project will coordinate and involve already ongoing field activities of various types. The project will build upon those (NGO's and others) that have facilitated the involvement of local participation in activities related to fisheries, habitat management, alternative livelihoods, etc. This have the added benefit, apart from the documented local participation, of increased likelihood of results being sustained as there would be partners around to carry the results forward. Examples of local partners, west coast Thailand, include Yadfon Association (small scale fisheries), Save Andaman Sea (village organisation) and Mangrove Action Project (mangroves). The focus would include fisheries, natural resources, coastal environment, biodiversity, etc… as applicable from place to place.

- *Involve an increase or decrease in the risk that genetically modified organisms or genes from organisms of this type are spread?*

Not applicable as no activities of that nature is included in the project document

- *Affect productive ecosystems negatively, or will it contribute to maintaining the eco-systems' production?*

The responses above already indicate that there will not be any negative effects. The approach taken by the project to integrate fisheries and habitat management is a simplified way of indicating that an eco-systems approach will be applied. The production of important eco-systems is a key to fisheries reproduction and the project will address the productivity jointly with partners in the field. The project is referring to the "integration fisheries and habitat management" as a straightforward way to indicate that to maintain healthy eco-systems and to sustain fisheries production it is crucial that fisheries and environmental agencies cooperate.

Land, water and air

- *Affect the quality of land, for example lead to soil erosion, high levels of salinity in the soil or lead to areas being waterlogged, or will it lead to improvements in areas in this type?*

No, as the project is not including activities that would lead to those impacts. If anything, results would lead to improvements by the promotion of importance to restore and maintain critical habits – critical for reproduction of fish and critical to maintain geographical features that provides protection against perceived impacts of climate change (such as cyclones, storms, etc)

- *Contribute to reducing or increasing erosion in coastal areas, for example beaches, cliffs and coral reefs?*

Reduction, Yes, activities are included as follows: "…based on the inputs from national resource persons, provide capacity building on the importance to maintain coastal features (mangroves, sandy beaches, coral reefs, etc) to province and district fisheries and environmental offices…" (Activity 1.7) "Explore (with a view on climate change) the need to restore selected features (mangroves, etc) ….. and follow with some restoration measures" (Activity 1.8)

- *Lead to activities that can result, for example, in making the water turbid, in the destruction of coral reefs or mangrove forests, in the agitation of the bottom sediment, etc? Does the project include, for example, the extraction of lime (for example from coral reefs) or the extraction of sand and gravel in riparian and coastal zones?*

Not applicable as no activities of that nature is included in the project document

- *Divert water from natural water courses so that the water supplies that are important for fauna and flora are diminished considerably in the river's estuary?*

Not applicable as no activities of that nature is included in the project document

- *Have a negative impact on water quality, for example through discharges of cooling water or by the damming up of running water?*

Not applicable as no activities of that nature is included in the project document

- *Have the result that more or less material is transported to the sea via rivers and other water courses?*

Not applicable as no activities of that nature is included in the project document

- *Lead to emissions of such a type that the water at the bottom or near the bottom becomes deficient in oxygen, for example through the emission of nutritive salts that stimulate biological over-production which then consumes oxygen when being broken down, or through discharges of organic material such as fibres and suchlike?*

Not applicable as no activities of that nature is included in the project document

Chemicals and waste management

- *Contribute to increasing the use of chemicals that are toxic, not easily degradable and/or bio accumulating, such as antibiotics in shrimp farms?*

Not applicable: none of the project activities involve the handling of chemicals or hazardous waste – and the project will not work with shrimp farms (other than possibly to promote replanting of mangroves to replace shrimp ponds).

- *Involve a large or small risk that chemicals and/or hazardous waste can be spread unintentionally for example by air, water or food chains? This can occur through the use of, or on account of, poor storage facilities or inadequate facilities for the destruction of waste products.*

Not applicable: none of the project activities involve the handling of chemicals or hazardous waste

- *Contribute to a situation in which untrained personnel handle chemicals and/or hazardous waste, or will it contribute to training personnel in chemicals and/or waste management and providing them with protective equipment and suitable facilities for the storage of chemicals and waste?*

Not applicable: none of the project activities involve the handling of chemicals or hazardous waste

- *Involve acute and/or long-term health hazards for persons handling chemicals, for their families, or for the people living in the area, or reduce risks of this type?*

Not applicable: none of the project activities involve the handling of chemicals or hazardous waste

- *Develop measures to ensure that any sludge, nutritive salts, waste from latrines or other form of waste are returned to an eco-cycle or are taken care of in an environmentally acceptable manner?*

The project is not directly addressing waste management, but, similar to health aspects, waste management and solid waste management would be an integrated part of efforts to promote better organisation within fishing villages.