Coastal and Marine Ecosystem Services and Poverty Alleviation: A Case Study of Vietnam

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EXTENDED ABSTRACT

I. BACKGROUND

The linkages between ecosystems and human well-being have been the focus of a global scale study - the Millennium Ecosystem Assessment (MEA). The MEA deals with the full range of ecosystems—from those relatively undisturbed, such as primary forests, to landscapes with mixed patterns of human use, to ecosystems intensively managed and modified by humans such as agricultural land and urban areas. Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling. The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services (MEA, 2005).

Coastal ecosystems—coastal lands, areas where fresh water and salt water mix, and nearshore marine areas—are among the most productive yet highly threatened systems in the world. These ecosystems produce disproportionately more services relating to human well-being than most other systems, even those covering larger total areas (MEA, 2005). At the same time, these ecosystems experience the heaviest impacts from human uses and environmental changes. These pose critical challenges for the maintenance of ecosystem services and poverty alleviation.

As part of the South East Asia regional efforts, this national analysis for Vietnam aims to assess the state and trends in ecosystem services associated with marine and coastal systems; driven factors; how they support the livelihoods and well-being of human societies and particularly poor communities in Vietnam; and the threats, opportunities and constraints to these. It will also identify the key challenges for research, as well as current gaps in knowledge and capacity in order to inform the development of a research strategy to support the maintenance of ecosystem services explicitly for poverty alleviation (ODG, 2007). The research was carried out by the Centre for Marinelife Conservation and Community Development (MCD) in collaboration with external research agencies in Vietnam. The research team consists of multidisciplinary experts including marine biologist, human ecologists, coastal resources managers and climate change professionals.

II. CURRENT SITUATION OF THE COASTAL AND MARINE ECOSYSTEM SERVICES AND MANAGEMENT APPROACHES

Coastal and marine ecosystems in Vietnam (including coral reefs, seagrass bed, lagoons, mangroves and tidal flats) provide a wide range of economic benefits (food, income, employment) and many social values (such as sight-seeing, entertainment, culture) to human well being and the poor through its important functions and services of regulating, provisioning, cultural and supporting.

There is an increasing demand for ecosystem services due to a high population growth and economic development in the coastal areas (such as aquaculture, tourism, industry).However, there is trend of decrease in ecosystem services, especially provisioning and regulating, due to the reduced ecosystem area, decreased productivity and less resilience, caused by anthropogenic and natural factors. This has directly negatively affected the lives of humans, especially the poor who have fewer opportunities to get access and benefits from ecosystem services.

The key issues identified by the national assessment about the linkages between ecosystems services and poverty are i) climate change effects on coastal communities; ii) nearshorenear shore over-exploitation and destructive exploitation iii) reduction and degradation of habitat, iv) low livelihood resilience and poor coastal zone management.

As part of the research assessment results, it is identified that a number of critical challenges exist in relation to knowledge and capacity to address ecosystem services and poverty alleviation issues. While data and information about the ecosystems are largely available, the understanding about services and values they provide for human being is very limited. In addition, there is an inadequacy of public knowledge about the poverty in the coastal zone. Therefore, the knowledge about the linkages between ecosystem services and poverty alleviation is also limited. This has led to uncertainty and is a dilemma for the government's decision making and policy development for possible interventions at the national level. Studies of the root cause and problems of poverty in the coastal areas and linkages of ecosystems and poverty alleviation are rare and are usually limited in scope. Research tends to be focused on ecosystem services or poverty alleviation separately and more often conducted at the local level (coastal province/district) rather than national level.

Coastal and marine ecosystem services are important for millions of people in Vietnam, especially for the small scale fishers and the poor who are highly dependant on the coastal resources for their livelihood. Their economic and social benefits and costs should be valuated properly, for awareness raising, actions and policy development to sustain the ecosystem services for the purpose of poverty alleviation and sustainable development.

Several trade-offs are considered in linking ecosystem services and poverty alleviation. It seems that the key practical trade-off is found in long-term economic development and ecosystem conservation versus the short-term goals. In addition, there are conflicts between different resources users (such as aquaculture vs. capture fisheries, tourism vs. conservation), between the poor and the rich, women and men. How to address this problem would be a question for the government in terms of political, socio-economic development and conservation of ecosystems should be in the way that can be supported to the poor.

To address ecosystem services and poverty alleviation in coastal areas in the long term, it is suggested relevant national policies and strategies are formulated and enacted. Several possible policy options could be:

i) Co-management is applied in fisheries management, with enforcement and support from both the government and community;

ii) Ecosystem based management approach is introduced and applied widely to improve the rehabilitation and productivity of the ecosystems to sustain their services for the benefits of the human-being;

iii) Integrated coastal zone management (ICZM) to enhance the planning of coastal zone and coastal resources uses, the cooperation of responsibilities between different stakeholders and the coordination of actions related to coastal areas;

iv) Private-public partnership would be studied and examined as to better manage and sustain the resources to allocate the user rights and ownership of the resources.

The following sections further summarie and analyse specific aspects and issues of ecosystem services and poverty alleviation linkages (see also table 1, below).

2.1 General national trends in supporting, regulating, provisioning and cultural Ecosystem Services

Vietnam currently has a diverse marine and coastal ecosystems - including more than 155,000 ha of mangrove forests, about 1300 km^2 of coral reef, nearly 500 km^2 of lagoons, about 16,000 ha of seagrass and many tidal flats and estuaries. These ecosystems have long provided important services to Vietnamese people, including supporting, regulating, provisioning and cultural services.

Among a total population of approximately 85 million people, it is estimated that 20 million people are indirectly affected by marine and coastal services while 8 million poor people are directly dependant on such services.

Provisioning services:

The value for the annual production of goods and services of the coral reefs in Vietnam is estimated about USD 100 million. One square km of coral reef can provide a total of fish an equivalent to USD 10,000. One ha of mangrove reforest supports a marine catch of about 450 kg in the Mekong Delta. Vietnam seagrass support both commercial fisheries and services value at over USD 20 million per year. The total economic value of lagoon in Vietnam is estimated at more than USD 2000 per ha.

Regulating services:

The value of shoreline protection of the coral reefs can easily be seen in some marine area in the central provinces of Vietnam like Bai Tien and Hon Khoi, Khanh Hoa province. Mangrove forests significantly reduce coastal erosion and may provide protection from tropical cyclones and tidal waves. Mangrove roots, especially where vegetative communities grow densely, help sediment to accumulate more rapidly. Natural hazards, such as typhoons and storm surges, are not uncommon in coastal communities, particularly in the North-Central and Central Coastal macroregions. Thus, the protection role of mangrove should be increased to ensure the security for local people. Each square meter of sea-grass can generate ten liters of dissolved oxygen that contributes to balancing O_2 and CO_2 in the water environment, and assists to mitigate the greenhouse effects due to efficient absorption of the CO_2 in the water.

Supporting services:

A single square meter of seagrass can product over 25 tons of leaves per year. This vast biomass provides food, habitat, and nursery areas for myriad of adult and juvenile vertebrates and invertebrates. Seagrass epiphytes also contribute to food webs - either directly via organisms grazing on seagrass, or indirectly following the deaths of epiphytes which then enter the food web as a detritus carbon source. Seagrass beds serve as a favourable breeding and hatching ground for numerous marine species, and are important nearshore fishing grounds. Several offshore islands such as Hoang Sa and Truong Sa archipelago were created by the build up of dead coral skeleton. Many beautiful swimming beaches found in Ha Long and Cat Ba are related to the marine depositional regimes associated with the coral reef production.

Cultural services:

Coral reefs play a central role in Vietnam's marine tourism industry. The major recreation activities on reefs are snorkeling and scuba diving. Nha Trang City, for example, is one of the first marine tourism centers in Viet Nam, showcasing its very diverse and abundant coral reefs surrounding the nearby islands. The number of visitors to Nha Trang is increasing (30,000 people in 1995 and 400,000 people in 2003). About ten percent of these visitors participated in diving and snorkeling on the reefs of Hon Mun MPA. These services brought a benefit about US$400,000 and accounted for approximately 2% of the total revenue from the tourist sector in Khanh Hoa province. Mangrove areas has the potential to eco-tourism, which contribute to local livelihoods, especially in cases where the natural environment is the main attraction. Protected areas are a major existing and potential tourist attraction. There are a number of ongoing community-based tourism initiatives in Vietnam like Can Gio and Giao Thuy.

General trends

The ecosystems are degrading in term of both quantity and quality over the last decades.

Among 1300km^2 of coral reefs distributed along the coast of Vietnam only 1% are in good condition. Coral coverage has declined down to 30% in some areas since 1993-2004. General trend is towards wide scale coral reef degradation.

Mangrove ecosystems have shown a trend of increasing degradation during the period from the early 20th century to the 1990s – however, they appear to have stabilized in the last ten years.

Fish caught per ha per year from lagoon reduced by nearly half over the last decade.

Significant reduction of seagrass beds in recent years with the averages rate of 80ha loss per year from 1997-2002 (Khanh Hoa province).

The demands for ecosystem services are increasing, driven largely by population growth.

Policy makers and coastal managers have paid more attention to provisioning and cultural services while the importance of regulating and supporting services remains at a basic level of awareness and academic knowledge. For example, a total area for shrimp aquaculture has increased from 250,000 ha in 2000 to 478,000ha in 2001 and 530,000 ha in 2003. Today, Vietnam probably has the largest total area for shrimp aquaculture in the world.

However, the capacity of ecosystem services to respond to such high demand remains low due to general trends toward reduced ecosystem area and productivity caused by anthropogenic and natural factors.

There are a number of key factors driving the above mentioned trends.

Direct factors include: nearshore overfishing and destructive fishing, unsustainable aquaculture, industrial and land based activities, and the effects of climate change.

Indirect factors include: poor coastal resources management and enforcement, increasing market demand for marine products and low livelihood resilience.

These direct and indirect driven factors are described below.

- Population increase: The population in Vietnam has doubled over the past 60 years (approximately 85 million in 2008). The population density of Vietnam is more than 200 people per 1 km2. Vietnam has become one of the countries that have the highest population density in the world. This has drastically reduced the rate of available agricultural land per person. Population increase has placed a large burden on the natural resources in a few ways. The need to find extra cash income for the food demand and it led to the over-exploited natural resources
- Over and destructive exploitation: After the war, the demands for building timber, firewood and charcoal, and the increasing exploitation by forestry agencies lead to resources becoming exhausted. Overfishing caused break down of the coral community

structures (fishing down marine food web phenomenon). Destructive fishing practices - bad habits and short-term thinking are reducing diversity in habitats and species of mangrove, destroying the coral structure and causing mass mortality of the coral colonies.

- Unplanned Aquaculture: Due to the big benefits from shrimp exports and because the fish catch yield has decreased, shrimp farming has been encouraged by the government and many local authorities. Therefore, both local people and state bodies have felled lush mangrove forests to make natural extensive shrimp ponds over all coastal mangrove areas of Vietnam. Since 1980s, this happened on a large scale in Ca Mau, Minh Hai, and a large number of mangrove areas were destroyed. In the end of 1980s, shrimp practice has developed strongly in the central and northern region of Vietnam and also cause the reduction of mangrove forests.
- Impact of the urbanization and industrial production: The construction of towns, ports and factories has many other bad effects on the environment as a result of discarding solid domestic and industrial waste into water; by gathering ships, motor boats which discharge oil and other substances, thus polluting the mangrove environment as well as adjacent areas and killing many animals or forcing them to move away
- Ineffective coastal management: The management of the coastal areas shows the weakness of law enforcement and the conflicts in exploitation of the natural resources. The coordination and co-management among the economic sectors/stakeholder areas are not close enough (Hue, 2004; Dao et al., 2007).
- Increasing demand from the domestic and international market: Ever since shrimps, crabs, and other marine animal products became valuable, the consumption markets have also extended. As of today, marine-products are consumed throughout cities of Vietnam and other countries. The main export product is shrimp and clam. As the markets become more and more extensive, the fishery production has been also become more extensive. As a consequence of such actions, the pressure on natural marine resources as well as ecosystem has been increasing
- Climate change effect: There are many environmental factors that affect these ecosystems as a whole, but climate change plays an important role as it not only influences the biodiversity directly but also has indirect impacts through factors such as the environmental hydrology and edaphon. Frost caused by low temperature damages the mangroves in the north of Vietnam. Inundation is one of the effects generated by sea level rise
- Poverty is also one of the causes of overexploitation by poor people. Poverty has been studied at the district level of most coastal areas where the main ecosystems services are provided. In general, the poverty rate in coastal regions is lower than that in Vietnam's mountainous interior. However, in terms of density, the two deltas (Red river and Mekong river) and the Central Coast are the regions with highest absolute numbers of poor

  Poor people in our analysis are typified as artisanal fishermen, often have small landholdings or are landless, and with very limited financial capital. Their livelihoods are strongly dependent on access to "common resources". Over the last two decades, the 'enclosure of the commons' and the privatization open-access resources have excluded many poor artisanal fishermen from their own livelihoods. Low resilience of livelihoods has exacerbated the situation of the poor people.

  The Vietnamese government is now trying to apply the co-management concept in terms of the sustainable utilization of ecosystem services. In addition to the traditional agricultural sector, aquaculture development is being promoted. For example, marine and brackish water aquaculture is developing rapidly in Khanh Hoa and coastal region. Total area for shrimp aquaculture has increased from 250,000 ha in 2000 to 478,000ha in 2001

and 530,000 ha in 2003. Today Viet Nam probably has the largest total area for shrimp aquaculture in the world.

Poor people can apply to get funding through the credit schemes at the women's association that are active in every village. Farmers can also get a land registration card for their own aquaculture area in the long term. However, the long-term positive and negative impacts of current aquaculture practices are not fully assessed yet and further promotion of aquaculture should be carefully thought out. Environmentally, expansion of aquaculture ponds and sea water channels creates groundwater salinization. Waste water from those ponds which is not treated is a source of pollution for the surrounding sea water. In truth, aquaculture can bring in high turnover, but maintaining such profit requires a certain level of skills, capital, technology, infrastructure and land which are often less accessible to the poor.

2.2 Key national trade-offs

The most critical national trade-off appears to be short term interests driving policies towards the exploitation of provisioning services rather than long term interests that might best be protected by conserving or enhancing regulating and supporting services. Cutting of mangrove forest for shrimp aquaculture or using coral reef for decoration or construction materials are typical examples of this conflict.

Conflicts also occur in the competing use of coastal resources by various user groups, such as small scale fisheries vs. aquaculture. Untreated waste from aquaculture ponds creates pollution in surrounding waters. Industrial vs. artisanal fisheries contributed by case of oil spills and environmental pollutions is severe in many areas. Examples of such conflicts can be taken from Halong bay in the north or Van Phong Bay in the central of Vietnam.

Other conflicts regarding the provisioning of benefits from ecosystem services are fuelled by the increasing gap between the rich and the poor. Aquaculture development makes the rich become richer and the poor become relatively poorer. When people with available funds participate in such marine-product rearing, the area utilized by low-income individuals to catch such products becomes limited. Therefore, their low-income becomes even lower. As a result, the boundary line between rich and poor becomes even wider.

There is also a gender issue in some cases in the coastal areas between women and men in access to the ecosystem services benefits (such as mangroves, coral reefs and lagoons). In the traditional fishing communities, women have more working hours than men, and they have less opportunities to training, education activities because of spending more time on reproductive work such as taking care of the children and thus this has limited their opportunities for income generation and their participation and roles in the social and community development.

The reduction of ecosystems (such as mangroves) has significantly socially impacts to the poor people and especially women, who collect the fish and resources in the nearshore coastal areas. The privatization of the land resources for aquaculture industry activities in the coastal areas has led to the fact that more power to the rich and poor people (including women) seem to have more challenges in finding other livelihoods due to their limited access to capital, technology and other resources (land) in the coastal areas.

There is a conflict between national and local interest as well. Overlapping in function of various agencies involving in marine and coastal resources management, poor coordination among them and weak enforcement of law and regulations have all contributed to this conflict. The case of Xuan Thuy national park, a RAMSAR site in Nam Dinh province best illustrates this conflict.

2.3 National state of knowledge

There is a well developed body of knowledge about ecosystems and their services in Vietnam, compiled primarily by research institutions and individuals. The information about these

services is usually broken down to the regional and local levels. Updated information is available in hard copy and Vietnamese languages. Only limited number of information are ready in English language and in a soft version.

More than 200 coral sites have been surveyed along Vietnam's coast over the last 10 years. Some research organisations are devoted to wetlands and mangrove research, such as MERC.

Both the scientific and local communities are aware of the changes to mangrove ecosystems. However, the studies on the processes underlying these changes are limited and tend to focus on the reduction of fishery production and the change of soil.

There have been reports of large-scale seagrass decline at 17 locations in Vietnam, almost all of which were attributable to human-induced disturbance. Trends for recovery remain unknown

Most of the research was done within a scope of a project or a certain area, thus, it is not possible at the moment to know about all services at national level. Most of the information about these services remain at researchers level, not yet available to policy makers and general managers.

Poverty has also been studied in coastal areas - mainly at the district level; however, the data and information has been no longer updated. There is limited analysis regarding the linkage between ecosystems services and poverty in coastal areas. General information about the access by the poor to various ecosystem services is available at the case specific level, creating an incomplete national picture.

2.4 Key knowledge gaps

Information available on the ecosystems services have been remained at research and academic level, not yet updated or interpreted for other important stakeholders such as managers, policy makers and community members.

Policy makers at various levels, from national to provincial and local levels all need to first understand the ecosystems services, how they work, how they link with poverty and factors that influence their functioning. Many decisions relating to natural resources managements are made based on administrative or political aspects without a sound scientific justifications. Partly it was due to lack of up to date information.

Coastal managers also need to see the linkage between the ecosystems services and poverty so that their work can be well harmonised. Sometime their management is based on the research results. But researchers have different focuses when studying coastal ecosystems. They do not often integrated natural and social sciences perspectives nor expound on the relationship between the two. While other indirect factors come from ecosystem services such as mitigation of climate change through absorption of CO_2 in the seawater or shoreline protection values are overlooked.

The poor coastal people themselves also need to see the linkage between their livelihoods and the services that ecosystem services provided. This awareness will help them to see other longer benefit of ecosystems such as regulating and supporting rather than just a short term and visible services like provisioning. Local people will only committed to protect the ecosystems once they well understand that they link to their own livelihoods and that all the community is also committing to management.

Any intermediate agents such as NGO or community based organisations who work in the coastal areas also need to fully understand such linkages.

Knowledge of the poverty in the coastal zone is limiting and outdated

The poverty in coastal areas in broader context of social development and justice needs to be studied thoroughly. Specifically, what factors facilitate or prevent the poor to accessing

ecosystem services, how to promote/limit these factors? From the sectoral and intersectoral points of view?

Furthermore, the adaptive capacity of key stakeholders to address the issue mentioned above needs to be elucidated.

Knowledge of the linkages between ecosystems services and poverty in the coastal areas of Vietnam is limiting

The quantitative data to demonstrate the linkages between ecosystems services and poverty is still limited and a major study on increasing the access of poor people to benefits from ecosystem services should be conducted.

Future research needs to analyse in depth other aspects of ES and poverty alleviation within the context of specific provinces and in particular address the question of how people employ ecosystem services aside from the capture fishery? (For example: fishers may use coral reefs for supporting eco-tourism; aquaculture as an alternative to capture fishery…).

Furthermore, other factors should be incorporated into the assessment of poverty alleviation such as distance from main land (offshore islands), distance between the fishing communities and the city/town, infrastructure influencing the transportation of goods, etc.

Very few previous studies deal with the linkages between the reduction of ecosystem services (eg. typhoons,– floods) and the poverty conditions of fisher communities in the coastal lagoons of Vietnam. Since 80% of the population depends on wetlands where lagoon system provides most services, it is need to conduct such studies.

All these needs of understanding of the ecosystem services and their linkage with poverty in coastal areas of Vietnam are not met at the moment.

2.5 Key policy options

Ecosystem based management approach to the use and management of natural resources need to be promoted in Vietnam. Most of management decisions are made based on administrative or political aspects which are not good for natural resources management. Any province or district when making decision on developing certain economies need to base on the services that the ecosystems existing in their location could provide and respect the rule of nature.

Co-management in the fisheries sector should be strengthened by institutionalizing the models from pilot activities at the national level. Since most of the poor identified in the coastal areas of Vietnam are engaged with fisheries, the way fisheries are managed need to be improved. The top down and central management does not work well and only community participation also is not enough. Thus, co-management of fisheries resources need to be promoted and leveraged to policy level.

Non fisheries options should be sought when confronted with low livelihood resilience. Near shore resources are recorded to be depleted and fishing efforts are encouraged to be reduced in Vietnam. Thus, options to alternative livelihoods are encouraged to seek, However, other options outside fisheries need to be found. The adoption of other sectors like IT, tourism or services should be studied to help the future generation of fishers to convert their way of making living.

Integrated coastal zone management (ICZM) should be promoted at both policy and practical levels. Sectoral management sometimes creates severe conflicts in the coastal areas as interests differ. A mechanism supported by a sound scientific justifications and a balance of economic and conservation purposes should be in place to ensure a sustainable development of the vulnerable coasts. ICZM was piloted in some provinces of Vietnam and need to further promoted at national level and concretized at local levels.

A Public Private Partnership model should be promoted to invest in further studies of the linkages between ecosystems services and poverty. Burden to government need to be reduced by promoting the investment from private sector. Business taken services from ecosystems need to pay back to those who are dependant on these resources. This philosophy works in many places and need to be promoted in coastal areas of Vietnam. The government encourages the development of marine and coastal economies. It needs to create policy to engage others stakeholders to invest and benefit from their investment in a sustainable way.

III. MATRIX OF ECOSYTEM SERVICES, TRENDS AND INTERACTIONS

1	2	3	4	5	6	7
Ecosystems status and geographical coverage	**ES**	**Issues Relevant to poverty alleviation**	**General national trends and driven factors linked to poverty**	**Key national trade off**	**National state of knowledge/gap**	**Key policy options**
Mangrove • Distributed in the north and south of Vietnam • Total area of 155,290ha, • 21% of which is natural forest and 79% is planted. **Coral reef** • Distributed widely in central Vietnam • Total area is about 1300 km2. • More than 300 coral species • 1 ha of coral reef can harverst fish = 10,000 USD	**(A). REGULATING** • Protection: beaches/coastlines from storm surges, floods, and waves • Reduction of beach and soil erosion • Formation of beaches and islands • Land stabilization: trapping sediments • Water quality maintenance • Climate regulation	Climate Change • Coastal flooding • Coastal erosion • Changes in ecosystem productivity • Sea level rise	• Reduced ecosystem area leading to reduced protection function, affecting the poor strongly. • Demand for regulating services increased **Direct:** • Human activities- convert mangrove and lagoon area into aquaculture • Human activities destroy, reduce and weeken coral reefs • Climate change **Indirect:** • Lack/Low awareness • poor planning • weak enforcement	• Economic development vs ecosystem protection • Use conflicts between aquaculture and other uses (mangrove removal), destruction of coral reef)	• Limited information available on regulating services of ecosystems • Total Economic Value is available at regional and local levels.	• Increased awareness of protection function • Valuation in monetary terms • Integrated Planning
	(B). PROVISIONING • Fisheries for food • Fisheries for aquarium trade • Aquaculture for food and aquarium	Near shore overfishing and destructive fishing Low resilience of livelihoods Poor management of resources	• Nearshore fishstock reduced significantly and low resilience in short term • Increasing demand, mainly for capture – small scale fishery and	• Capture fishery vs aquaculture • Offshore exploitation vs nearshore • Rich vs poor	• Availability of information about provisioning services - but only at regional and local levels. • Available info on poverty conditions in areas where	• Integrated coastal planning • Co-management of fisheries • Ecosystem based approach - Restoration of

1	2	3	4	5	6	7
Ecosystems status and geographical coverage	**ES**	**Issues Relevant to poverty alleviation**	**General national trends and driven factors linked to poverty**	**Key national trade off**	**National state of knowledge/gap**	**Key policy options**
Lagoon • Concentrated in central part of VN • Total area of 447.7 km2 • **Sea Grass** • 8,940 ha of seagrass supports both commercial fisheries and services valued at over 20 million USD per year	• Pharmaceutical products • Building materials • Jewelry and other decorations • Fuel-wood • Traditional medicines		aquaculture • Used extensively by the poor: 28 coastal provinces, 20 million people directly and indirectly dependant • Food security • Directly affecting the jobs and income of 8 million people	• Long term vs short term goals • Industrial vs artisanal fisheries	provisioning services are provided, but the linkage between the two is not analysed • Poverty status data is not updated (dated back nearly a decade) • Mainly on fisheries aspects	habitat • Fair and Sustainable trading • Non-fisheries options.
	(C). CULTURAL • Tourism and recreation • Spiritual, aesthetic appreciation	Marine and coastal ecotourism Marine tourism 2% of total income from tourism (Khanh Hoa province) Low access by the poor	**Direct:** • Demand increasing • Limited capacity and skills • Poor support services **Indirect**: • Poor planning • Improper investment	• Economic interests vs, conservationio n • Social status of the poor	Limited information and understanding of status, trend and dynamics	• Community based ecotourism • Public - Private Partnerships • Education
Tidal flat Including estuaries and coastal tidal flat areas.	**(D). SUPPORTING** • Cycling of nutrients • Nursery habitats	Climate change • Change in types of species • Change in capacity of nursery habitats Destructive human activities • Reduction of nursery habitat coverage	Maintenance and restoration **Direct:** • Climate conditions **Indirect:** • Lack of awareness • Week enforcement	Short term vs long term goals Rich vs Poor	• Basic biophysical info available at regional levels. • Limited link to whole ecosystems and their services	• Awareness raising on interactions between ES and poverty alleviation • Public Private Partnership

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