



Policy Brief

BUILDING RESILIENCE

**Adaptive strategies for coastal livelihoods
most at risk to climate change impacts in
Central Viet Nam**



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ACRONYMS

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|--------|--|
| CBCNRM | Community-Based Coastal Natural Resources Management |
| CBCRM | Community-Based Coastal Resources Management |
| CCFSC | Central Committee for Flood and Storm Control |
| CIDA | Canadian International Development Agency |
| DFIF | Department for International Development of the United Kingdom |
| DONRE | Department of Natural Resources and Environment |
| FGD | Focus Group Discussion |
| HVCA | Hazard vulnerability and capacity assessments |
| IMHEN | Viet Nam Institute of Meteorology, Hydrology and Environment |
| IMOLA | Integrated Management of Lagoon Activities |
| ICZM | Integrated Coastal Zone Management |
| MARD | Ministry of Agriculture and Rural Development |
| MOIT | Ministry of Industry and Trade |
| MONRE | Ministry of Natural Resources and Environment |
| MOLISA | Ministry of Labour, Invalids, and Social Affairs |
| MPI | Ministry of Planning and Investment |
| NCAP | Netherlands Climate Assistance Programme |
| NTP | National Target Programme |
| PEP | Poverty and Environment Project |
| SEA | Strategic Environmental Assessment |
| SEDP | Socio-Economic Development Plans |
| UNDP | United Nations Development Programme |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNIFEM | United Nations Development Fund for Women |
| VNRC | Vietnamese Red Cross |

INTRODUCTION

This report summarises key findings and recommendations of a study undertaken by the MONRE Poverty Environment Project (*Harmonizing Poverty Reduction and Environmental Goals in Policy and Planning for Sustainable Development 2005 – 2009*) funded by the DFIF and UNDP. PEP aims at strengthening Government capacity to integrate environment and poverty reduction goals into policy frameworks for sustainable development.

The report explores potential paths of resilience in relation to future climate change for the most at-risk coastal livelihood systems in the central region of Viet Nam. It identifies measures for formulating adaptive strategies to:

- Reduce coastal livelihood vulnerability and build resilience to climatic shocks and stress.
- Build the resilience of social and ecological systems, on which these livelihoods depend, to the effects of climate change and strengthen their capacity to deliver quality services.

METHODOLOGICAL APPROACH

The three-month study was undertaken in an iterative manner, and included:

- Preliminary data collection and literature review: including specially commissioned maps and charts from IMHEN of down-scaled climate change baseline data and A2 and B2 scenarios up to 2100. These maps and charts formed the basis for discussions at Provincial, District and Commune levels.
- GIS desk-top analysis: using satellite imaging, maps and charts to show such data as land use, population distribution, infrastructure, and downscaled IMHEN projected inundation impacts of a 1-metre sea-level rise for the four study communes.
- Site selection:
 - o Two Provinces were chosen: Ha Tinh, which has a PEP Provincial Project Unit based in Ha Tinh DONRE, and Thua Thien Hue
 - o Two Communes in each Province were selected as representative of archetypical coastal livelihood zones, with rural livelihoods most at risk to climate change hazards as well as opportunities that might be offered by positive impacts of climate change.
 - o Three villages in each Commune were suggested by Commune People's Committees on the basis of their representativeness of main Commune livelihoods.
- Training and fieldwork:

- o Field researchers attended a two-day workshop in analytical frameworks and qualitative research methodology. They selected the fieldwork methodology to be followed, drawing upon PRA tools and HVCA.
 - o Following the training, meetings were with Provincial, District and Commune authorities and mass organizations' representatives to discuss study objectives, and to share and exchange data.
 - o Fieldwork was then undertaken, and included separate meetings with women and men.
- Focus Group Discussions: were held with local authorities and mass organizations' representatives; firstly at the Commune, then at the District and then at the Provincial level.
 - A youth meeting: facilitated by the local DONRE and Youth Union representatives, held with around three hundred teenage students from Viet-Duc Vocational College in Ha Tinh.
 - A workshop was held in each Province and a National Workshop was held in Ha Noi to discuss the draft Final Report.

Coastal rural livelihood systems most at risk to effects of climate change are those directly dependent on natural resources. Building resilience of coastal livelihoods most at risk to climate change thus requires measures to ensure the resilience of linked ecosystems. This study has sought to capture this linkage through adoption of a social ecology approach, involving use of the Sustainable Livelihood Framework (SLF), Hazard Capacity Vulnerability Assessment (HCVA), and eco-resilience analysis.

CLIMATIC SHOCKS AND STRESS

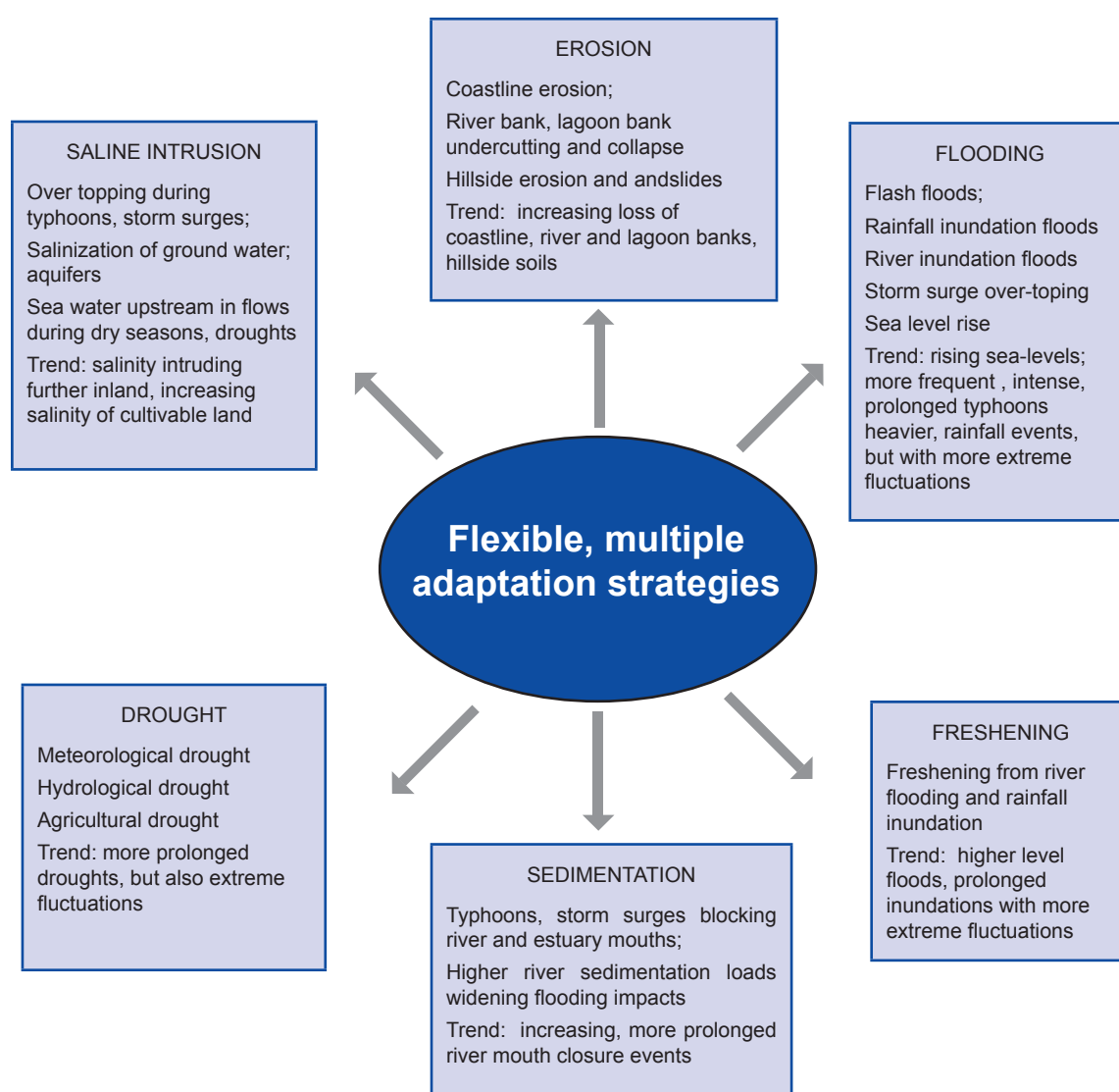
Using the SLF lens, climate change can be seen as a key element of the vulnerability context which defines local livelihoods, through its transformation of familiar seasonal climatic conditions. The study revealed that coastal communities are already experiencing the effects of climate change through shocks, such as increasingly unpredictable flood and storm patterns damaging livelihood assets and affecting many livelihood activities. These extreme events dominate the public perception of emerging climate change, as evidenced by severe 'natural disasters'. However effects of climate change can also be seen in less-newsworthy events such as prolonged drought. Gradual trends in increasing sea-water intrusion and salinization of estuaries can also result in severe livelihood stress in coastal areas.

This stress on coastal livelihoods is expected to intensify with more sudden and increased climatic fluctuations, accompanied by a gradual rise in annual average temperature and rainfall. Ocean warming may result in mass coral bleaching leaving coastal tourism resort destinations less attractive. Near-shore fishing livelihoods may also be affected as larger, higher-value fish move further off-shore to cooler, deeper waters. The aquaculture sector also remains high risk, due to the catastrophic impact of floods, increasing temperatures, and impact of pollution on product yields. At the same time, intensive aquaculture has been contributing to the degradation

of natural capital. There is evidence that the scale of aquaculture on the Tam Giang Lagoon far exceeds the lagoon's 'carrying capacity', for example. In terms of livelihood security, there is still a significant risk that further households will be forced to abandon aquaculture, suffering significant financial losses and being burdened with massive debt. Effects of climate change will continue to exacerbate and add to existing pressures on coastal livelihood systems, such as increasing population, over-exploitation of land, forests and aquatic products, low education and skill levels, widespread pollution of water sources, market vagaries and underlying poverty.

Different livelihoods in the same region can experience contrasting effects of climatic shocks and stresses as shown in Figure 1. Consequently there is a need to avoid a one-size-fits-all approach to adaptation, and design and implement flexible strategies.

FIGURE 1: CROSS-FLUCTUATING CLIMATIC HAZARDS



IV. KEY ISSUES

Improving environmental governance

For building climate-resilient livelihoods, a twinned approach involving improved regional environmental governance and livelihood strengthening will need to be adopted. While hierarchical government structures and top-down planning processes have been developed to ensure consistency in implementation of national objectives in Provinces, there are few governance mechanisms able to ensure consistency of local planning and local approaches to implementation across neighbouring Provinces and within eco-regions. Along Viet Nam's coastal belt, this inadequacy could inhibit effective development implementation of long-term adaptation strategies to climate change, such as sea-level rise. Adaptive strategies involving conservation of natural resources utilised by poor rural livelihoods could be affected.

The current national structure and system of local government has enabled achievement of a high rate of poverty reduction. However, there has been no similar success in the reduction of environmental degradation and resource depletion. Part of the failure may be attributed to the lack of environmental governance mechanisms able to effectively enforce environmental regulations across Provinces and within eco-regions, for example along areas of coastline or in major watersheds. Provinces will be keen to attract new investment to implement adaptive strategies to minimise negative effects and capture new opportunities provided by climate change. However for building ecological resilience Provincial Governments will need to think, and to act, laterally. Appropriate focal scales for action for many of these adaptive strategies will require Governments at Provincial level to focus more strongly on cooperation and collaboration rather than competition for new climate change investment. This will require effective mechanisms for joint implementation.

Appropriate time-scales will also need to be assessed for each adaptation measure and strategy. Effects of long-term climate change trends may require a response that does not fit entirely within one single Five Year Plan period. An appropriate time-scale of decades for some strategies will require targets to be set for staged implementation within each plan period. The challenge for local government, and governance, is to match time scales with focal scales to ensure longer-term adaptation strategies are successful, and that financial commitments are benchmarked, and tied to progressive achievement of milestones.

Right sequencing of adaptation measures and strategies also needs to be considered. The effectiveness of some strategies will be improved or lessened if undertaken before, after, or in combination with others. The planting of mangroves as support for new dyke construction is an example. In Quang Dien District, it was also recommended that climate change awareness-raising precede the conducting of training courses to diversify local livelihoods. Right sequencing requires multi-stakeholder commitment to a critical path for implementing climate change adaptation investment.

Supporting equitable adaptation

Government will need to be a strong player in ensuring equitable outcomes of climate change adaptation strategies. Coping strategies focus on what to do when things go bad. Adaptation strategies focus on what makes things go well. Past resource use has demonstrated that there could

be a sharp difference between winners and losers from climate change adaptation, independent of coping strategies. Lesson need to be learned, and applied, from the expansion of commercial aquaculture in Tam Giang lagoon following the 1999 flood. Thus occurred through privatising former commonly-held fishing grounds. It made the better-off wealthy, and increased exports, but at the expense of the livelihood of mobile fishers, and those with little capital to invest. An extensive intervention by local authorities, institutions, international agencies and other external actors was required to ensure more equitable access to aquatic livelihood resources.

Fieldwork research revealed that with the support of local institutions, such as rural extension services, and interventions of international agencies, coastal communities are adapting livelihood strategies in response to climatic trends. Certain livelihood activities are now carefully timed in order to minimise overall vulnerability to climatic hazards. However, some of these adaptation strategies are less accessible to poor households, given the higher cost of inputs. In the future, Government will have to ensure intra-generational and inter-generational equity in how it strengthens its support processes for successful livelihood adaptation to gradual climate change. At village level, tailored adaptive strategies will be needed for different livelihoods in the one area, and identical livelihoods in different areas. Differing vulnerabilities to hazards according to age, gender, infirmity and other variables will also need to be taken into account. At higher levels, trade-offs for short-term advantage must not overwhelm long-term livelihood sustainability. Government will need to pay heed to regulating and monitoring of sustainability of livelihood resources bases to ensure necessary delivery of ecosystem resources and provisioning services are sustained.

Most critical, given the projected drier dry season, is ensuring adequate environmental flows and supply of good quality water for consumption and production. Despite some recent positive developments, such as enhanced water source protection and local irrigation systems, a sound water management policy and strategy is needed for effective water use allocation among all sectors and regions in the river catchment areas to meet growing water demand, protect against hazards, while also maintaining ecological requirements. Improved water storage will be critical for agriculture in drought-prone coastal areas, and may be best achieved through artificial re-charge of aquifers.

Supporting the shift from coping to adaptation will require a collaborative, participatory effort. A prime future focus for climate change investment (as against disaster risk management) may be to enhance the resilience of social and ecological systems to deliver quality services to support coastal rural livelihoods. But this will only be achieved through the active participation of those engaged in these livelihoods, to better manage their resources and to improve the sustainability of their livelihood practices. A top-down/bottom-up collaborative effort is needed to break the terminal cycle of ever-increasing exploitation of an ever-diminishing and degrading resource.

At a higher level, these local efforts can be further supported through mainstreaming of climate change into development planning. But this is currently impeded by a lack of a spatial dimension in planning processes. GPS/GIS hazard mapping down to Commune level is required to better inform future Provincial, District and Commune development planning decisions. Hotspot areas of 'livelihood-ecosystem' dysfunction can also be identified and targeted through a participatory approach to hazard mapping. This can then form a core part of ICZM, and brought into SEA and SEDP formulation. The challenge will be to avoid maladaptation, when faced with a choice between development in hazard-prone coastal areas offering short-term benefits but at high risk, and development more likely to deliver lower-risk, long-term gains.

Migration and relocation as livelihood diversification

Experience in other countries has shown that the ability to cope with increasing climatic hazards is highly dependent on the ability to diversify income sources. In the study sites paid employment options remain limited in coastal areas and migration to cities presents an important opportunity for some households to improve their conditions through remittances. Fieldwork undertaken in this study supports the view of migration as a household livelihood diversification strategy, rather than a strategy undertaken by individuals. Younger male household members are often encouraged to seek outside employment. Remittances are used mainly to meet daily household expenses. In this way, aged and female household members may enjoy reduced financial vulnerability as a result of key male members of the household becoming seasonal or long-term migrants. However, they may be left more physically exposed during typhoons and floods, if they are unable to call upon male support while trying to care for young children and elderly household members, as well as safeguard their personal possessions. With more extreme events being expected to result from climate change, support will need to be enhanced for these vulnerable groups.

As the rural-urban migration rate increases, competition for better-paying jobs will become more intense. Vocational and skills training needs to be provided for migrants to obtain quality employment to increase remittance payment levels. In areas where resettlement away from traditional livelihood resource-bases is deemed necessary an integrated relocation package should be offered. This package would involve matching existing core competencies with alternative occupations, tailoring current and acquiring new competencies through formal course training and re-skilling; assistance in migration and resettlement; and facilitating acquisition of social capital to help in job-placement and retention.

Hard and soft infrastructure

International experience has shown that considering hazard risks when addressing basic development needs, such as the provision of housing, water supplies and the planning of infrastructure, is essential in order to build resilience. This was found to be the case in the study locations. Housing was found to be poorly adapted to intensifying hazards. The poor were particularly vulnerable, but much of the more costly, 'modernised' housing enjoyed by wealthier households was also found to be highly vulnerable to typhoons and floods.

Sea level rise is seen as an emergent climate change threat, but from the viewpoint of Commune and village leaders observing it first-hand as sea incursion, it is not new. While a threat of a one-metre rise in sea-level by 2100 may be adequately dealt with in the future, though at some cost, by dikes, there is a need to act more quickly to halt salinization of land through hydraulic effects in aquifers, and in rivers during dry seasons. While marine shore Communes were shown as most affected, this study showed unequal impacts of a projected one metre sea level rise in the various sites.

The question of whether or not to build barriers to counter seawater intrusion, was seen as less relevant than how and how not build. Strategies combining hard with soft infrastructure will most likely be required to manage this hazard, though a strategic withdrawal, or 'managed retreat' is another option that could be explored, given an assessment of a gain in livelihood opportunities. A centralised approach to both dike construction and management will be required, with a centralised authority to oversee both construction and maintenance. Upgrading skills may allow local labour and quality local materials to be utilised in construction contracts.

Sectoral climate-resilient approaches

Adaptive strategies for agriculture will require support for existing adaptation measures as well as changes in management and farming techniques to reduce risk of crop failure. This includes a recognition of the ‘feminisation’ of agriculture, with more women entering farming than men, in the delivery of extension services and the promotion of new investment in extensive export-oriented agro-industry. For fishing and aquaculture, strict enforcement of waste treatment regulations is vital. As with agriculture, new climate-resilient species may be introduced, but not without being carefully assessed for negative impacts on local biodiversity. Research on how to best manage high fluctuations in salinity will be needed.

Sectoral support will be needed to be delivered in a variety of ways. Improved access of the most at-risk to information on climate risks, adaptation measures, and market information can be provided through communication infrastructure. Better climate change awareness, including the need to diversify local skill bases, can be a by-product of participatory hazard mapping, if it involves the most vulnerable. Access to more effective credit, insurance and other financial services, particularly for the poor, including non-cash loans will be needed. Building financial incentive systems into loans could encourage a reduction in environmental impacts. There is potential for these to be linked to carbon market options, eg mangrove afforestation. Large livestock is often the poor’s most valuable income-earning asset. Accessible, secure, safe storage and protection from climatic hazards for livestock will need to be provided. This will also enable coastal primary producers to avoid selling when prices are least favourable.

A mechanism for sharing and exchanging information on adopted adaptation strategies is required. ‘Sister-Commune’ relationships could be established to enable Commune with shared characteristics leaders to exchange information on what works, what doesn’t and lessons learned. This could strengthen local adaptation practices for similar social ecologies, such as those found in Ky Ninh and Vinh Hien Communes. Government could assist by monitoring livelihood support, to track households assets and climate hazards over time, to provide insights into how successful current risk management options are in improving the resilience of communities.

Future climate change effects will generally add to and exacerbate present shocks and stress. While risks of losses of livestock and produce from cold temperatures will decrease, and salinity and coastal erosion rates could be reduced by sea-walls, increased temperature and rainfall coupled with more extreme weather events will add extra layers of shock and stress on livelihoods, and place increased pressure on the livelihood resource-base. The mix of adaptation and mitigation strategies will need to be further refined and developed to meet this threat. Such a mix can be expected to combine both reactive and anticipatory adaptation strategies, and feature autonomous responses and planned interventions that will need to be harmonised to be successful. From the point of this study, ‘success’ will be measured by increased climate-resilience of most at-risk coastal rural livelihoods and natural resources. While it is acknowledged that for Government, ‘success’ will be seen in broader terms, nevertheless, Government intervention, supportive of building local livelihood resilience will remain critical.

Additionality of climate change challenges

Climate change is an enormous challenge is emerging on top of other, costly challenges facing the Government in Viet Nam. Chief amongst these challenges is rapid urbanisation and associated rural-to-urban migration. They are key elements of Viet Nam’s rapid socio-economic growth and

poverty reduction, but they also main drivers of environmental degradation. Local authorities in our study areas foresee out-migration trends being intensified by effects of climate change.

Currently around 70% of Vietnam's population live in rural areas, and 30% live in urban areas. If the current rate of urban population growth was maintained, by 2047 this situation would be reversed. Around 70% of Viet Nam's population would live in urban areas, and 30% live in rural areas. On these projections, the answer to the question what is the future of rural livelihoods in Central Viet Nam is – urban livelihoods. In some ways this future has already arrived. Ha Noi and Ho Chi Minh City are expanding into rural areas, and in the future, regional cities could follow suit. Rural-urban household livelihood strategies strengthen the linkages. Remittances from urban and overseas family members are subsidising livelihoods of many households in the study sites. In some cases their earnings and social networks enable other family members to be launched into urban and overseas labour markets.

Continued coastal resort tourism strip development may add to the urbanisation of the countryside. However, higher temperatures and more frequent, longer lasting, erratic extreme weather events may ensure shortened seasons for coastal tourism as well as agriculture and aquaculture. This will impact on opportunities for local employment. In the longer-term, coastal tourism will have to meet the challenge posed by storms and sea-level rise on beach erosion and fragile corals, the latter also threatened by the possibility of coral bleaching due to ocean warming. However, opportunities provided by sea-level rise could be seized to expand aquatic recreational tourism in areas like Tam Giang lagoon, sheltered from the coast and closer to urban areas. Ironically, if all the detailed environmental and resource protection measures in current Provincial tourism plans are implemented, the resource-base for agriculture and fishing will be greatly enhanced. Such an increased environmental investment will be necessary to ensure the sustainable growth and increased climate-resilience of coastal resource-based livelihoods.

SUMMARY RECOMMENDATIONS

Building climate-resilient agriculture

Support and improve existing local adaptation measures, for example adjustment of when to plant and harvest (e.g. cropping calendars, local use of the Southern Oscillation Index); where to plant (cropping patterns) what to plant (switching to climate-resilient crop varieties); and how to plant (diversified farming; inter-cropping; crop, fish-rice rotation).

Building climate-resilient fishing and aquaculture

Improve planning and management of current aquaculture areas through enforcement of aquaculture waste-treatment regulations, introduction of aquaculture species adapted to high temperatures and changed salinities, promotion of polyculture and fish-rice rotation in relevant areas and integrated water management for rice agriculture and brackish water aquaculture, assessment of new species, tools and techniques needed to be adopted by fishers to adapt to changed aquatic habitats due to increases and fluctuations in salinity levels in estuaries.

General support for building climate-resilient livelihoods

Ensure access to more diverse and better targeted credit, insurance and other financial services, particularly for the poor, 'hazard-proofing' of residential housing, accessible, secure, safe storage and protection from climatic hazards to enable coastal primary producers to avoid selling when prices are least favourable. Improve access of the most at-risk to information on climate risks, adaptation measures, and market information by enabling timely access to communication infrastructure.

Build climate resilience of the livelihood resource-base

Incorporate social ecological perspectives into adaptive management strategy formulation by choosing appropriate focal scales for action and research, establishing and monitoring thresholds. Reduce erosion along estuary mouths to prevent increased sediment closing the sea entrances, and blocking fish migration, safe passage and mooring of vessels. Plant mangroves or coconuts as 'bio-shields' to stabilize shoreline areas. Combat deforestation in upland areas; re-forest in strategic areas. Train teams of local builders in 'hazard-proof' construction and adaptation measures. Establish incentive systems to build financial incentives into credit facilities for coastal farmers and fishers to encourage a reduction in environmental impacts. These could be linked to carbon market options, e.g. mangrove afforestation. Reserve elevated land in response to future inundation risks, ensure elevated land is kept secure for essential services and community purposes. Establish 'Sister-Commune' relationships to strengthen local adaptation practices for similar social ecologies. Promote CBCNRM to off-set climate change effects promoting unsustainable resource use.

Improving water storage and management

Harvest, store and manage fresh water resources better through more efficient groundwater recharge and the harvesting of rainwater. Assess the vulnerabilities to climate change of the water resources and water supply systems and determining the way they continue to meet future supply in the light of those vulnerability. Consider increasing water system reliability, diversity and flexibility through increased public awareness and participation in sustainable water use and management.

Mainstreaming emergency response planning

Involve those most at risk in participatory GPS/GIS mapping of coastal hazard-prone areas in Communes, (including those being affected by sea-level rise) and mainstream hazard maps into development planning. Adapt the disaster response system to monitor to shift from a seasonal alert to a year-round emergency response. Upgrade the operational capacity of the system in preparation for changes. In Provincial- and local-level emergency plans, include vulnerability targeting which identifies communities where are many female-headed households (e.g. where male migrants are absent) and more intense support is required.

Planning and managing early responses to sea-level rise

Construct flood-defence infrastructure, including hard flood defences (such as sea walls and embankments) and soft flood defences such as wetlands, coastal salt marshes. Where possible, support should be given to reinforcing hard infrastructure with soft infrastructure (e.g. 'green walls'). Construct and operate upstream dams, river mouth gates and pumping stations to control the increased water flow in the heavy rainfall season in order to manage in/out flow of water systems. This is important to minimize sudden shocks to commercial species of changes in salinity of the estuary ecosystem. Monitor over time, wetland and livelihood gains e.g. in aquaculture, or tourism, from alternative 'managed retreat' responses. Any assessment will need to include livelihood winners and losers, and flow-on impacts (e.g. pollution). Centralise dike construction and management to ensure seamlessness. Long dykes are difficult to build modularly by different local groups. They are only as effective as their weakest point, and strong junction points are problematic. This principle leads to a centralized approach to construction and maintenance, with an equivalent level of authority to oversee and maintain it. However, use of local labour in construction and supervision will be a key concern of Commune officials. Monitor both sea level rise and salinity intrusion at local level to inform decision-making on the extent of the problem and what is required, e.g. resettlement, expanses of agricultural land to be treated for salinity or crops modified/abandoned. A sea-level incursion monitoring network could link up coastline villages.

Improve resettlement processes for vulnerable households and communities

Address resettlement needs of households living close to river banks and shoreline; households living on boats and households currently close to and dependent on road networks, and other populations likely to be affected. Consider offering compensation, continuing access over the short-term to previously-used livelihood resources, support in exploring new livelihood options, and providing appropriate skills training prior to resettlement.

Building adaptive strategies for temporary migrants

There is a need for better education and job-related vocational training and re-skilling to strengthen the capacity of migrants to remit money. Incentives could be provided to encourage successful temporary migrants to invest in local enterprises generating employment. In areas where tourism potential can be exploited, skills-training for local workers could be an undertaken as an option, with labour needs identified in services, construction, operation and maintenance. As resort tourism is often seasonal, and does not appear to provide local labour-intensive employment, career training for youth will be needed to ensure this option is provided with a sustainable livelihood path. Overseas fisheries work is lucrative but reportedly is causing long-term damage to health – the Government needs to provide support by ensuring better labour protection for these workers, including safer working conditions, access to affordable health insurance, and adequate health care on their return.

Building adaptive strategies for permanent migrants

While whole household migration is not a mass livelihood strategy currently being followed, it may be a option chosen in future if resource-bases of families collapse. In such cases, early intervention will be required to ensure take-up of pre-departure vocational training enabling easier access to urban employment options. Future socio-economic research (beyond scientific research on adapted crop varieties, aquatic products etc) could focus on experiences of households which have shifted livelihoods (e.g. in the present study locations, farming to aquaculture) – how was it done; and what support was received/required; examination of experiences, and coping strategies of women left behind by male migrants in hazard-prone areas, strengths/weaknesses and vulnerabilities.

