Adaptation financing and practice: observations from community-based projects in India

Abstract

Adaptation financing entails a multitude of challenges when it comes to selecting and implementing measures that are to be sustainable. This article depicts general difficulties with respect to adaptation financing. It also describes an approach developed and tested in two coastal states of India to promote community-based climate change adaptation (CCA) linked to disaster risk reduction (DRR) and climate change mitigation (CCM). It summarises lessons learned from the bottom-up perspective as well as details of good practice in the context of climate change.

Key Words

Climate change adaptation, financing, community-based adaptation, India, coastal zones

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The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of their organizations.

January 2012

1 Introduction

The year 2010 was the year with highest carbon emissions output recorded in history (GlobalCarbonProject 2011). While some countries are taking action to reduce their greenhouse gas emissions, reaching global and binding agreements for emission reduction targets seems unlikely to take place before 2020. Under these conditions, reaching the goal of limiting the temperature increase to 2°C and thereby avoiding dangerous climate change seems almost impossible. In the meantime, the impacts of climate change are becoming increasingly pressing in some regions and adapting to them more urgent than ever before.

At the latest United Nations Climate Change Conference in Durban, one of the result streams focused on operationalising the Cancún decisions, i.e. through a new Green Climate Fund to support climate protection and adaptation to climate change in developing countries, a Standing Committee on finance, and detailing of work programmes for climate change adaptation amongst others. Things are beginning to move but mobilising and allocating the promised $100 billion annually by 2020 remains a challenge (UNFCCC 2011; Germanwatch 2011).

Vulnerable Coastal Communities in India

India has a 7,500 km long, densely populated coast line, which is vulnerable to coastal floods, erosion and cyclones. The coastal states of India are increasingly facing environmental and socio-economic pressures exacerbated by global climate change and resulting climate variability. Small rural communities along the coast of India are highly vulnerable to climate change impacts mainly due to three reasons. First of all, there is a strong resource dependency. India is an economy based on its natural resources. The projected climate variability in climate-sensitive regions and livelihoods will therefore impact both population and economy. For rural areas this dependency is particularly strong. Second, the exposure to climate change is very high. India is the most flood-affected nation in the world after Bangladesh. Rural communities in coastal areas are often situated in low-lying exposed locations close to the shore or surrounded by wetlands. The villages are prone to flooding and periodically suffer from cyclones, coastal erosion and droughts. Finally, small rural communities have a very limited adaptive capacity. Rural communities often lack the infrastructure, resources and knowledge to deal with the above mentioned climate related challenges and the additional stress put on their livelihoods by climate change.

In the face of these challenges, significant adaptation efforts are required to reduce the vulnerability of such communities to climate change and to, ultimately, ensure sustainable development.

Climate change adaptation is defined as the “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC 2001, Annex B). Adaptation activities do not come as a one-size-fits-all solution but require location-specific adaptation approaches. Adaptation to climate change calls for community-based, integrated and innovative solutions that

simultaneously address climate impacts, livelihood improvements and environmental sustainability.

Two other, complementary concepts need to be considered when approaching adaptation: climate change mitigation and disaster risk reduction. According to the IPCC, climate change mitigation is defined as an anthropogenic intervention to reduce the anthropogenic forcing of the climate system. It includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks (IPCC 2001). When adaptation measures are planned the mitigation perspective needs to be taken into account in order to not counteract efforts to reduce greenhouse gas emissions. As pointed out in this article, a number of concepts exist to combine climate change mitigation and adaptation.

Second, adaptation efforts need to be aware of existing disaster management approaches – especially when looking at coastal areas. Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters. This includes reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR). According to the United Nations, 9 out of 10 disasters are now climate related (Wiggins/Wiggins 2009). Natural hazards by themselves do not cause disasters. It is the combination of an exposed, vulnerable and ill-prepared population with a hazard event that results in a disaster. Climate change increases disaster risks in two ways. First, climate change will likely increase the frequency and/or severity of weather and climate hazards (IPCC 2007). Second, climate change will simultaneously increase communities' vulnerability to natural hazards due to the combined effects of ecosystem degradation, reduced availability of water for ecosystems and agriculture, and changes in peoples' livelihoods.

2 Part I: The Adaptation Financing Dilemma

The Big Picture

Adaptation activities such as those drafted above will require substantial financial resources. The Human Development Report 2011 estimates that financing additional adaptation needs will amount to US$105 billion annually by 2015 (UNDP 2011). In a 2010 report, the World Bank expects costs of adaptation to an average global temperature rise of 2°C between 2010 and 2050 to be in the range of $75 - $100 billion per year (World Bank 2011). Accordingly, the Copenhagen Accord pledged US$100 billion per year by 2020 to assist poor countries to mitigate and adapt to climate change (UNFCCC 2009). It is envisaged that most of the resources will flow to developing countries that have the maximal needs to adapt. In addition to the need-based criteria for resource flow, crucial questions emerge with regard to the effective service delivery mechanisms. How will the target countries manage this increased flow of funds? How would the project be designed ensuring that adaptation projects are selectively funded? Who would be involved in the implementation of these adaptation projects?

Example Funding Constellation

Let us begin with an illustrative example. Country X has been adversely affected by climate change in the last 20 years. Country X also has received resources under the Adaptation Fund[1] of the multilateral institute Y. The decision within X now is to allocate these resources to the various adaptation projects which are potentially going to benefit the target areas. However, the administration in the country has not yet developed stringent criteria for the selection of adaptation relevance of these projects. At the same time, since the funds are being sourced from a multilateral agency, the administration of course wants to showcase the results of the project. As a result, one of the major criteria is the impact such a project will have on the target communities. The local administration in X has a long experience of implementing development projects and works very closely with the community-based organizations for the implementation of such initiatives. To be effective, it is widely recognized in X that the partnership with civil society is going to be beneficial to the outreach and impacts of the project. In one of the landmark projects of the adaptation fund, country X implements a project in community Z, a project on piped drinking water supply through a community-based organization. The community leaders are invited to the next Conference of the Parties (COP) to present the results of their project. The event is highly successful in achieving the aims it set out to achieve. But were they the right aims?

[1] The Adaptation Fund: established by UNFCCC to finance adaptation projects in developing countries http://www.adaptation-fund.org/

Adaptation and "Development Plus"

That adaptation is easier to understand than mitigation is precisely the reason why it is much more difficult to finance. Most implementing agencies think of adaptation as something which is regular "development plus". However, when it comes down to implementing the projects, there is a quiet return to the regular development without the plus. This is not by accident or design.

The reason for the return to regular development is not difficult to understand. Some of the most innovative and impactful initiatives have been implemented by community-based organizations. There has been a slow but steady increase in the level of capacities of these organizations over a period of time which has shown some remarkable results. However, the pace at which the funds for climate change have burgeoned in the last few years, and are expected to grow further, will test the speed at which the organizations learn about climate change as well as its various facets. Such learning would be the first step in defining interventions which have an adaptation focus.

The second reason is more practical. Given that there are substantial overlaps in regular development and adaptation projects, it is more pragmatic that community-based organizations which see equal need for regular development work and also have substantive capacities to implement these projects would propose that those projects also fulfil the additionality criteria of adaptation. The other side of the pragmatism would be that it is of course much more economical to showcase the good results of a regular development project than spend substantial resources on enhancing the capacities of the NGOs who are implementing projects under an adaptation fund. Needless to say, the argument above does not apply only to community-based organizations but also to government departments which have developed expertise over time in delivering certain projects.

Selecting Adaptation Projects

Once funding is made available, another key issue concerns setting up effective and accepted criteria for dispersing funds for adaptation projects. At the national level, the criteria of the Adaptation Fund provide an example. For projects that apply for funding at the Adaptation Fund, the following review criteria are applicable for projects once country eligibility, resource availability and National Implementing Agency issues are ensured (Adaptation Fund):

- Endorsement of the project by the relevant government authorities
- Support of concrete adaptation actions to assist the country in addressing the adverse effects of climate change
- Addressing sustainability aspects (economic, social and environmental benefits), and inclusion of the most vulnerable communities
- Cost-effectiveness; justification for the funding requested
- Consistency with other national plans and instruments
- Compliance with relevant national technical standards
- No duplication with other funding sources
- Project management issues such as learning and knowledge management, adequate arrangement for project management; measures for financial and project risk management; monitoring and evaluation, project results framework

This represents a good starting point. However, how are funds distributed beyond the national level? What criteria are required for the local context? How is acceptance of these criteria achieved?

Outlook

Of course, the challenges due to graft and corruption have been completely ignored in this discussion. The presumption is that even if there is a leaky bucket, the percentage of funds reaching the final beneficiary would take the form of a project which has both developmental and adaptation attributes.

Finally, how would government budgets respond to such inflow of adaptation financing? A clear implication of the discussion above is that, in the absence of clear cut criteria for adaptation financing, it is most likely that the flow of such funds could crowd out already dwindling development funding. Given that the amount of funding that can be realistically raised would most likely fall short of the amount of financing required for adaptation, it is even more imperative to ensure that investments in adaptation lead to the desired result in an effective manner. The first step in this direction would be a large scale capacity development initiative for various tiers of government and other agencies involved in service delivery. The resources for these capacity development initiatives should be made available by the developed countries before insisting on showcasing project based outputs.

3 PART II: An Adaptation Project Example

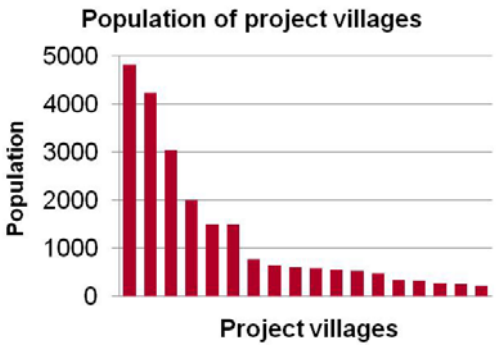
Graphic 1: Target region (in red)

At a smaller scale, one practical approach that intends to address development and the combination of community-based adaptation, disaster risk reduction and mitigation of climate change is the AdaptCap[2] project. Dealing with the diverse needs of coastal communities in Andhra Pradesh and Tamil Nadu and considering the existing urban-rural linkages, the AdaptCap project aims at reducing the vulnerabilities to climate change by interlinking adaptation, mitigation and disaster risk reduction activities. It follows an integrated approach that combines needs and vulnerability assessments, capacity building for the communities and local bodies as well as the implementation and monitoring of pilot measures.

Community Profiling

During the first project phase of the AdaptCap project, a community profiling has been conducted for each of the 18 rural communities that are part of the project. The general profiling was based on the participatory rural appraisal method, aiming to incorporate the knowledge and opinions of rural people in the planning and management of the project. The community profiling encompassed social and economic as well as geographic information and provided a dense description of the local context for the project.

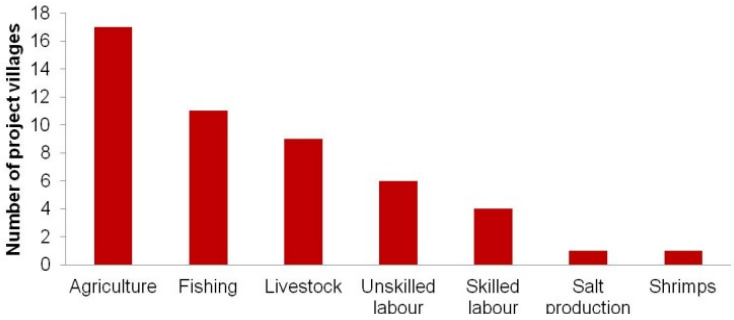
The project area stretches along the coast of the Bay of Bengal from Visakhapatnam in Andhra Pradesh in the north to Nagapattinam in Tamil Nadu more than 800km further south. The project area has a high population density. The majority of the villages are located within one kilometre distance to the Bay of Bengal. Most of the communities are situated in low-lying areas that are highly vulnerable to flooding and seawater invasion. This poses major risks to people and their livelihoods as almost 50 per cent of the storms in the Bay of Bengal become severe cyclones, often accompanied by storm surges.



Graphic 2: Population of rural project villages

As can be seen in graphic 2, the communities involved in the project have between 200 and 5000 inhabitants with more than half of the communities having less than 1000 inhabitants. The majority of communities are Hindu with a number of villages having also a large Christian population. Muslim families are a minority in the project area. In the villages a number of community-based organizations exist such as women self help groups and youth groups. In the aftermath of the Tsunami a large number of community-based organizations have been established. Today only very few of them are still active.

[2] Strengthening Adaptation Capacities and Minimizing Risks of Vulnerable Coastal Communities in India (AdaptCap), www.adaptcap.in



Graphic 3: Key livelihoods of project villages

Most of the people in the project villages depend on the sea for livelihood as the majority are fishermen communities. Taking into account that the frequency and intensity of storms is projected to increase for the target region, these communities are facing major risks. Furthermore, agriculture is also most relevant in nearly all communities, but compared to fishing, less people work in this sector. Shrimp farming and salt production plays a role in only one of the villages. Typically for the region, only very few families have their own land for agriculture. Unskilled labour work on building sites in the cities of the area is a common additional livelihood.

With regards to general needs of the communities, similarities as well as major differences were identified with infrastructure being one of the most important issues: whereas some villages are well connected to major roads others rely on gravel roads which are prone to flooding and heavy rainfall. Other needs of the coastal population are proper sanitation as well as a reliable drainage management and safe drinking water. Although it is a prevailing issue for the population, in many communities drainage facilities are missing or not operating properly due to maintenance problems. Furthermore, there is a lack of comprehensive coastal zone and delta management systems that protect the coastline, prevent erosion and consequently assure availability of important resources for the communities. Notwithstanding the high risks of flooding, oftentimes flood protection is not or only poorly maintained. During the rainy season villagers have to suffer a lot from stagnated water. The thrust of the state government is primarily on saving human lives and on restoring infrastructure, and less on disaster preparedness.

Identifying Climate Change Impacts

Following the general profiling for each of the project communities, local impacts of climate change on the most important livelihoods (e.g. agriculture and fishing for rural villages) have been assessed. As a result of this procedure, a variety of impacts has been specified among the 18 rural project communities. For the investigation of most beneficial measures for the specific cases it has been observed, however, that the prioritisation of experienced and potential future impacts is another crucial issue. In order to allow for proper evaluation and to ensure the reliability of the results, the amount of identified impacts and the affected livelihoods required a sequential analysis. In the first phase, the key livelihoods and a varying number of identified impacts of climate change were aggregated in each community. In parallel, each community selected the five most pressing impacts of climate change without allocation to a specific livelihood or climate threat. This approach allowed the validation of collected data during the second phase. For each community, the impacts on the main livelihoods were compared against

the “TOP 5” impacts. This comparison was carried out in order to prove that the collected data was consistent within every community. Moreover, by evaluating all communities against each other and compiling the results in one single analysis, errors and irregularities in the data of one of the villages were more visible and easier to identify. Subsequently, an overview of the most important impacts in all project villages has been generated. One part of these results is shown in table 1 which provides an overview of the assessment listing four climate threats and the five most frequently named climate impacts.

Cyclones	High temperatures
Occupation problems	Scarcity of water
Food problems	Health problems
Health problems	Occupation problems
Deterioration of soil quality	Food problems
Erosion of soil	Loss of livestock
Extreme / changing rainfall patterns	**Rising sea level**
Health problems	Problems with water quality
Occupation problems	Occupation problems
Loss of crop / stock	Salinisation of land
Deterioration of soil quality	Conversion of land into uncultivable fallow
Increased cost of production	Scarcity of water

Table 1: Climate change impacts onto rural villages in AP and TN (bottom-up from vulnerability & needs assessment)

As can be seen in the table, the four climate threats are affecting the most basic needs of the rural population resulting in problems with occupation and health. Fisheries are affected resulting in food problems and adding to losses of livestock. Severe impacts on agriculture have been detected such as deteriorating soil quality, salinisation of agricultural lands and scarcity of water for irrigation. On the other hand, it has been observed that a direct causal link between climatic threat and resulting impacts cannot be drawn in all the cases. The main reason is that the community profiling is based on direct impressions of the affected people rather than on strict scientific causalities under ideal conditions. As the purpose of the profiling is the identification of most suitable measures, the most pressing needs related to climate change that can be addressed with appropriate actions are the focus of this study.

Consequently, an initial list of possible climate change adaptation (linked to mitigation) pilot measures for each of the 18 project communities was elaborated and additionally, the local capacity needs were identified. By implementing pilot measures that address the most pressing needs and climate impacts, public acceptance and successful operation by the community will be favoured. During the AdaptCap project, the priorisation has been carried out directly by the communities as part of the participatory rural appraisals. In order to develop a common understanding of the major risks and the best suited options, the ranked list of the “TOP5” impacts of each community was used again. This step is a key element when it comes to the

discussion of different adaptation measures. Effective community-based adaptation needs to be clearly developed towards those risks ranked highest.

Graphic 4: Impressions from a participatory rural appraisal of local resources and potential climate impacts (source: adelphi)

Field experience

In order to gather local knowledge from the participating communities, the project team visited the rural villages in Tamil Nadu and Andhra Pradesh and carried out participatory rural appraisals (PRA). Depending on the available time, resources and information, different tools were made use of. Developing a community **time line** that shows the occurrence of major extreme weather events proofed useful for analysing certain changes and trends in the climate. Preparing a **seasonal calendar** which compiles information on the periods of sowing, harvesting, selling produce, etc. made it possible to identify vulnerabilities that result from changes in weather patterns, e.g. shifting start of the monsoon season. To gather information on the social and economic structure of the community and the resulting resources, project team members sat down with village representatives to prepare **social or resource maps** either on the ground or on posters. The maps depict where livelihood activities take place and where important assets are located. Drawing and then seeing the community on a detailed map made it possible to discuss climate impacts in a very vivid way, e.g. which assets could be affected when the sea level rises or what parts of the community would be affected most severely by floods after heavy rain events. In some communities, the project team embarked on **transect walks** with village representatives to systematically gather information on the area along a planned route.

Photos: PRA mapping exercise in TN (left; source: AVVAI) and AP (right; source AGS)

Non-climatic Drivers of Change

Climate change is a powerful factor of change that is foreseen to be of relevance for many decades to come. But there are many other drivers that are relevant to the communities and that might intensify or reduce the impacts of climate change. Collecting and discussing pieces of information on demographic and economic developments in the communities was therefore an integral part of the AdaptCap project. Changes reported by the communities in the project region mostly pertained to an increase in unemployment, selling of agricultural land and migration activities. For adaptation needs this meant that all adaption measures to be undertaken needed to take into account that there were hands for labour available and that diversifying income sources would be needed to deal with problems of city migration. Another impact observed in many communities was the decline in fish catch and fish variety. Non-climatic factors such as overfishing or pollution of sea water could have contributed to this situation. The discussion about climate change adaptation measures needs to be aware of the complexity of factors driving change in a specific local setting. Non-climatic factors that are influenced and potentially amplified by climate change or that can effect adaptation need to be communicated and taken into account for countermeasures.

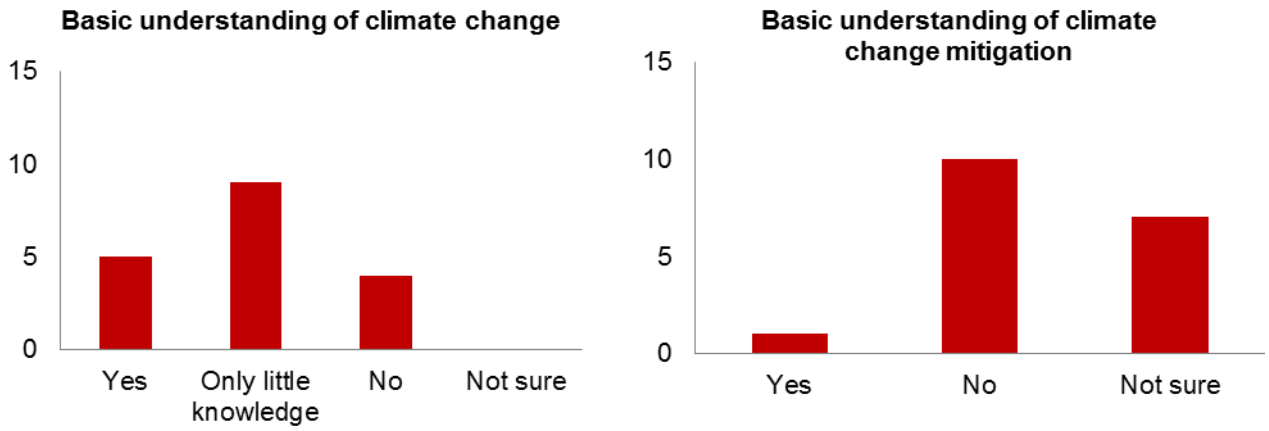
Capacity Building

The AdaptCap project aims at strengthening the capacities of local authorities and the population to cope with climate change and natural hazards. Therefore capacity building measures form one main pillar of the project encompassing elements at all four levels of capacity building: people, organizations, networks and the policy field.

Capacity building needs were initially assessed as part of the vulnerability and needs assessment during the first project stage revealing the following key topics:

- Awareness programme on climate change adaptation, mitigation and disaster risk reduction
- Assessment of knowledge on climate change, mitigation and adaptation
- Planning and implementation of climate change measures
- Technical knowledge
- Integration into planning

It has been observed early on, that a focus on the actual “impact chain” (Which climate variable has what impact on what livelihood? How can the impacts be ranked? What measures then address the most severe impacts?) needs to be emphasised continuously. In addition, clarifying the difference but complementarity between climate change adaptation and mitigation had to be addressed.



Graphic 5: Exemplary results from V&NA part on capacity building as conducted at 18 sites in AP/TN (source: adelphi)

Within the AdaptCap project, capacity building is then embedded into several project stages and work streams. Overall, the target groups for capacity building are local partners and partner NGOs, local task forces, rural and urban local authorities, rural and urban local constituents and regional authorities.

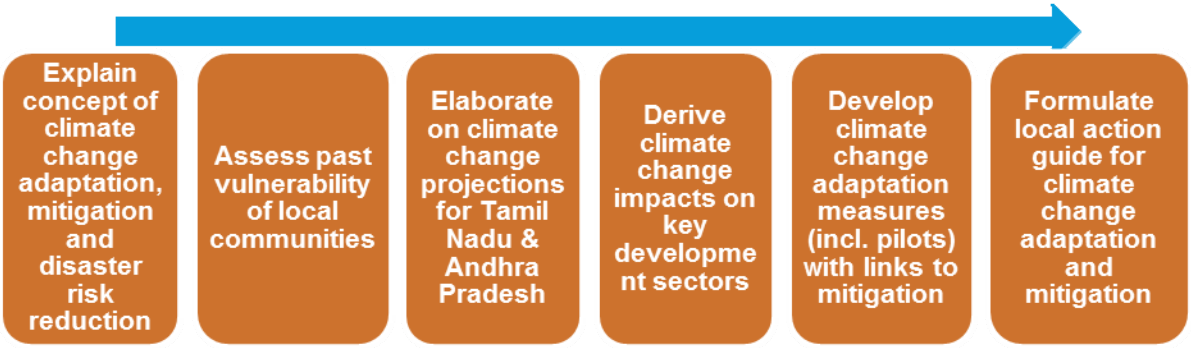
Capacity building is approached from two subsequent levels. First, local partners and partnering NGOs in Andhra Pradesh and Tamil Nadu are equipped with the required capacities (Training of Trainers –"ToT") to afterwards pass on their knowledge in the field and to carry out the activities of the other work streams. Topics covered during ToTs range from general awareness on climate change adaptation, mitigation and disaster risk reduction to specific technical and managerial trainings preparing for the implementation of pilot projects. Mutual knowledge exchange is also aimed at as part of the ToTs to transfer local knowledge in between Tamil Nadu, Andhra Pradesh and New Delhi. Second, the local task forces and authorities in the target locations are trained by the partners and partnering NGOs.

Within the two levels, there will be two complementary work streams: One for rural and one for urban locations; these will be joined eventually at a later project stage as part of urban-rural workshops. A "Local Adaptation and Mitigation Guide" (LAMG) is developed for each project village (18) and city (6). Assistance is being provided for integrating climate change adaptation and mitigation activities into local planning schemes. In addition, advisory services are provided on disaster risk reduction. Technical capacities are strengthened throughout the development of pilot projects. In particular, the continued operation and maintenance activities (O&M) of the pilots are addressed to ensure sustainability of the project.

The AdaptCap Training Course Toolbox

The AdaptCap project is based on existing methods and tools, local knowledge and scientific evidence. The "AdaptCap training course" toolbox that has recently been developed as part of the activities of the AdaptCap project links existing methods with innovative approaches and on a modular basis for building capacity among local stakeholders. It consists of five parts beginning

with an introduction about climate change and its diverse impacts and then in a distinct manner moves towards the development of a local adaptation and mitigation guide and its integration into local planning. The interim steps include the identification of climate induced or exacerbated risks as well as the development of particular potential measures to overcome them. The training toolbox aims to raise awareness for the impacts of climate change, provides material for local self- assessment on a basic level and guides adaptation and mitigation decisions. To inform the process, an overview of the relevant climate data as well as areas for potential measures have been specified with the focus on coastal communities in India.



Graphic 6: Flow of the capacity building approach (source: adelphi)

During the AdaptCap project, Training of Trainers (ToT) workshops were conducted according to the "Climate Navigator" methodology (BMU "Klimalotse" 2010) in order to provide the trainers with knowledge about climate change and adaptation strategies but also to improve the skills on transferring the acquired know-how to the communities.

Developing Pilot Measures

Having organizations in place which can judge on the relevance of a development project related to adaptation, the decision on the right measures at the right place has to be taken. Most suitably, the measures are not planned in a top down manner but developed together with the affected groups at the grassroots level.

After having identified geographical areas, vulnerability parameters, the basic needs and impacted livelihoods are elaborated in joint participatory rural appraisal workshops at community level. Important is the involvement of the most vulnerable community members who are directly affected by the impacts of climate change. For an objective judgement on the effect of a measure, past impacts of climate events and viable traditional solutions are studied and evaluated and the current state of social, economic and ecologic challenges is assessed. In general, a community will come up with a variety of ideas aiming at development and link its necessity to impacts caused by climate change parameters. It will be the task of the organization active in capacity development to support in the prioritisation of the activities and in finally taking a decision on the first projects.

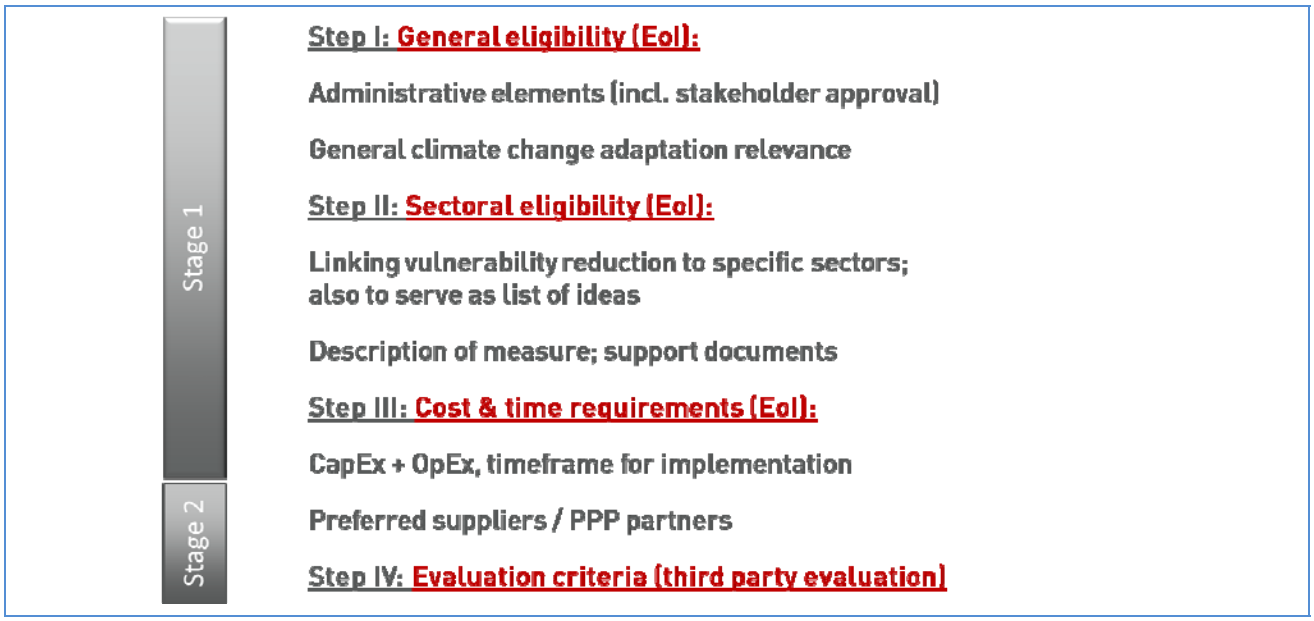
Graphic 7: Construction of a coastal bund and preparation of tree plantation in earlier project (source: AVVAI)

The criteria for taking decisions should follow a balanced approach, taking into account effectiveness of the adaptation measures in terms of reduction of climate risks or increased resilience but also address local acceptance and feasibility. Before addressing income enhancement, the basic human needs like access to affordable drinking water and provision of healthy diet are to be focussed on.

Field experience

Through previous projects, the project team developed an Excel spreadsheet that held all available information both on the community which wanted to implement an adaptation measure as well as on the proposed pilot project. For a pilot to be selected, a number of thresholds had to be taken (for details see figure below). First, only those communities were eligible on which enough background information regarding population, livelihoods, available infrastructure and climate impacts had been possible to gather. Second, the idea for the proposed pilot measure needed to be well documented: only those pilots whose suitability was demonstrated in supporting documents like photographs, site plans, social and resource maps and whose desirability by the community was proven in an approval later were considered in the final selection. Thirdly, the project cost and time requirements had to be met. The final selection was then done by the third party technical expert using the criteria and scoring system mentioned above. Of those project proposals that reached more than 50% of the possible scores, those with the highest scores and quotations within the budget were selected for implementation. It is important to note that the project criteria were jointly discussed by the project team to ensure local applicability and acceptance of the scoring results.

Photos: Community meetings to discuss possible adaption pilot measures (left: TN, source: AVVAI; right: AP, source: AGS)



As for the assessment of most important impacts from climate change, every measure has to be developed by the community itself and should be based on a demand, identified during the climate change related participatory rural appraisal. By forming commissions for the planning, implementation, operation and maintenance of the measure, the community decides on its delegates which take up the further elaboration of the activities in full confidence of the final beneficiaries they represent. The community and especially the commission should include members experienced in the implementation of technical measures and support the wider dissemination of climate change adaptation knowledge within the community.

A major challenge when deciding for a measure in consent with the community is taking a look at its long-term sustainability. For the affected local population in urgent need of relief, any solution providing direct relief with the shortest possible delay is welcome. Projects which require more preparatory work and approaches which need time for evaluation for the best possible option are not welcome at first. The experience has shown that communities can be convinced to look into long-term approaches if the disadvantages of short-term solutions are explained in detail. Reasons being accepted by communities were dependency on unreliable resources regarding water and energy, possible negative side effects like pollution or contamination and considerable additional future expenses for operation and maintenance. Reasons for opting for long-term solutions on the other hand were the provision of additional water resources and the improvement of the water quality, cross-sectoral benefits for a greater part of the community and affordable operation and maintenance expenses.

The sustainability of the operation and maintenance has to be assured already in the development phase. Commitments from the beneficiaries of the measure for contribution to the successful long-term performance are core criteria for the selection of a measure.

Preferably, local manpower is involved in the implementation phase and local resources should be used for the construction process. Independence from external suppliers contributes to the ability of the community to maintain the project in the long-run.

Graphic 8: Pond renovation and restoration of a well including fencing (source: AVVAI)

A typical example of a short-term approach found in India was the setup of a reverse osmosis plant for the treatment of saline groundwater. First, the groundwater source was not reliable as the borewell could dry up in the coming years. Second, the energy which is essential for the treatment process was not guaranteed for sufficient time. Third, the waste water from the plant was contaminating adjacent fresh water surface sources by salinating these. Additionally the exchange of microfilters, usage of antiscalent and regular repair of pipings, valves and pumps of the plant showed to be rather expensive compared to the initial planned fees which were collected by selling of the water. As per the example, the technology was provided by an external supplier from whom the community got dependent as only he had spare parts and had the knowledge to repair the plant in the case of a breakdown, although an in-depth capacity building of a local operator had taken place beforehand.

One of the long-term approaches developed in the course of the AdaptCap project as well as similar projects was the setup of a water supply scheme based on a perennial surface water source, working only on gravity. The project addressed the needs of the whole community which was struggling with varying availability of drinking water. When discussing possible solutions to these problems, a focus was put on measures that had proven successful in the region and were known to the community. Eventually, the three villages involved proposed installing a gravity-fed water supply system, partly because they knew such systems from other communities in the surrounding areas. This system of pipes, collection tanks and a two-chamber sand filter would tap perennial water springs, lead the water to a collection tank and then through a filter to public stand posts in the villages. The communities were involved in various aspects of the pilot projects from the start, e.g. prioritising issues to be addressed and seeking information on the utilisation of different water sources. The involvement took different forms starting with group discussions and village level meetings leading up to participatory rural appraisals and awareness campaigns. During these meetings, the village representative designed the gravity-fed water supply system together with the project team and agreed to carry out the implementation using local labour. This created additional ownership and also had mitigating effects on the projects' costs. Being involved in the planning, design and implementation of the project, the local

capacities were enabled to operate and maintain the system on their own. Independent from expensive spare parts, chemicals and any provision of energy the community needed to setup only very negligible fees.

Linking Adaptation, Mitigation and Disaster Risk Reduction

Within the AdaptCap project, pilot measures aim at linking climate change adaptation and mitigation. Acknowledging the fact that assessing a change in climate risks is difficult and the actual effectiveness of any related measure is therefore uncertain, following only mitigation or only adaptation seems to be an inappropriate approach (Kane, Shogren 2000). In fact, it is an "optimal combination" of the two approaches that the AdaptCap project aims to implement. Likewise, any measure implemented within the project has a higher probability to be effective in any way, despite of the uncertainties. A potential example for the implementation in coastal communities could be a photovoltaic-powered reverse-osmosis plant. This measure directly combines adaptation efforts (scarcity of drinking water) with mitigation (energy is supplied by a renewable source) and also addresses disaster risk reduction (the plant may provide drinking water even after a disaster).

The project target region is generally categorised as having moderate to high disaster risk. Approaches and measures for disaster risk reduction (DRR) were put in place after the tsunami in 2004. These include disaster preparedness and response, information systems and disaster-resistant construction amongst others (UNDP 2010). Building on the existing work done in this respect, the AdaptCap project aims at re-activating local disaster risk management units, at strengthening existing DRR networks and at linking DRR and adaptation where possible.

Planning Integration

Many of the communities participating in the project were already exposed or had been involved in other planning activities, e.g. on disaster risks reduction after the tsunami in 2004. Not only does this allow employing methods for participatory planning that the communities are familiar with already; in some cases it was also possible to use data as well as maps that were established for other plans, but are equally useful in this context. However, the most important integration of planning is forward-looking: it is the objective of the AdaptCap project to point to the usefulness of linking plans on adaptation with existing plans on disaster risks reduction as well as, in the long-run, link the local adaptation and mitigation guides with adaptation strategies that are being developed on state and district levels. As major decisions as well as budget allocation for local development projects are taken on district level, the project looks into further integration of the local adaptation and mitigation guides into the planning process of the Block Development Officer and District Collector. Especially funds like the rural employment guarantee scheme can be significantly tapped for

Graphic 9: Project within planning logic (source: GIZ)

adaptation activities by creating the necessary awareness on the district level while demanding support on the Panchayat level.

Exit Strategy

Developing an exit strategy before the phase-out of a project is crucial in order to sustain the outcomes triggered by the project and achieve the desired impact in the long-run. Such a strategy aims at continuing the activities and measures put in place once project funding stops. With respect to the AdaptCap project one essential element is the continued replication of pilot measures. Funding is available for an initial set of pilots, thereafter, the community measures need to be financed through other channels. The project partners are therefore exploring and testing different routes of funding for the replication of measures whilst the project is still ongoing. This includes looking at public, private and mixed sources of funding at regional, national and international level. The integration into planning is one avenue to explore in order to tap into local funding programmes. The local adaptation and mitigation guides developed will support in that respect. Another idea discussed in the project is to present selected measures on international websites, for example betterplace.org or globalgiving.org. This could raise private funding from several donating entities. Furthermore, sustainable entrepreneurship approaches could cover the operations and maintenance of certain measures – however, price sensitivities for basic needs (such as water) need to be taken into account. One example from other projects in the region is the renovation of community ponds, where the strengthening of pond bunds was supplemented by planting trees and vegetables around the pond. The earnings from selling fruits and vegetables will, in part, be used to pay for repairs and cleaning of the pond.

4 Conclusion

As the consequences of climate change are affecting more and more people around the globe, developing local strategies and implementing concrete adaptation measures to cope with the changes increasingly gains importance. This particularly applies for areas such as rural coastal regions in south-east India, which suffer from a high vulnerability to climate related hazards, already today. The communities are often situated in low-lying exposed locations close to the shore or surrounded by wetlands. The villages are prone to flooding and periodically suffer from cyclones, coastal erosion and droughts but only have a very limited capacity to adapt to those risks. Rural communities often lack the infrastructure, resources and knowledge to deal with the above mentioned climate related challenges and the additional stress put on their livelihoods by climate change.

Financing adaptation entails a multitude of challenges when it comes to selecting and implementing measures that are to be sustainable. Expectations regarding the “development plus” of adaptation projects need to be reconsidered. Community-based organizations have already implemented impactful and innovative initiatives – the pace at which adaptation funding is developing will test the speed at which the organizations can learn about climate change and

adaptation. Further capacity building in terms of a large-scale initiative is needed – for implementing agencies within and beyond government at all levels.

Climate change requires for community-based and integrated answers that simultaneously address climate impacts, livelihood improvements and environmental sustainability. In order to reach those most vulnerable, the project selection criteria need to be oriented towards vulnerabilities and local needs. Therefore, as demonstrated in the example of the AdaptCap project, approaches towards climate change adaptation should consider participatory rural appraisal methods, aiming to incorporate the knowledge and opinions of rural people in the planning and management of the project.

Effective community-based adaptation needs to be clearly developed towards the climate related risks identified and prioritized in cooperation with the communities. Other drivers that are relevant to the communities and that might intensify or reduce the impacts of climate change need to be taken into consideration. Non-climatic factors that are influenced and potentially amplified by climate change or that can affect adaptation need to be communicated and taken into account when developing adaptation measures.

To compensate the lack of capacities to deal with climate impacts at the local level, capacity building needs to be an integral part of any project approach towards adaptation. A capacity building needs assessment can be part of the initial vulnerability and needs assessment for a community. Finally, the example shows that adaptation activities do not come as one-size-fits-all solutions but require location-specific adaptation approaches that take into account local needs and circumstances.

Linking adaptation to mitigation to ensure low-carbon development and addressing of risks from different perspective as well as activating the channels in place for disaster risk reduction allows for an integrated approach.

For sustainability the approaches and measures developed need to be integrated into local planning. This would also ensure the long-term availability of financing through the relevant authorities and their respective programmes. With bottom-up activities as in this project approaching top-down activities like the development of adaptation plans on state level, efforts on both ends need to be coordinated to make use of synergies and reduce the risk of duplicating efforts. Synergies could also relate to issues such as collecting data or developing training materials. In addition, the criteria for selecting pilot projects that were developed and tested in community-based could be integrated into a top-down perspective when it comes to dispersing adaptation funds in the future.

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