



Ministry of Environment and Forestry  
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Provincial Government of  
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Republic of Indonesia



# A SPARC FOR ADAPTATION

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# 1. Painting The Picture

**Major climate risks and development issues – and how they play together. How people are aware of climate risks as it is part of their everyday lives. Livelihoods based on farming and fishing under water scarcity**



*Figure 1 The Dry and Arid Climate of NTT*

NTT, was nothing like the other part of Indonesia. Not the tropical, lush vegetation; not the hot, humid climate; not the urban landscape. It was obvious that NTT is different. Sparsely populated, a dry climate with a windy wet season (during the southern hemisphere's winter), culturally diverse and a melting pot of various languages.

One of the key features was that it is a lot drier – a different climate that surely must have consequences for the climate risks people are facing in the this region. Kupang receives around 1,400mm per year, which is not *very* dry but still dry enough. More extreme, however, is the fact that it received 90% of the yearly rainfall during 5 months from November to March, leaving the rest of the year pretty much barren.

Another factor, immediately evident, is that NTT is one of the economically more challenged provinces in Indonesia. High rates of poverty, a

widening rural-urban income gap, underdeveloped infrastructure and a dependence in agricultural sector, make it difficult for its residents to catch up with booming parts of Indonesia. One can expect adaptation to change to be a lot tougher when starting at a low level of prosperity.

Rural communities in NTT Province have been characterised by subsistence agricultural production and dependency on water resources. Ensuring food and water security is a major challenge mainly due to the difficult access to water as well as the state of economic development. More recently, climate variation has become a real issue: seasons are very unreliable in terms of timing and reliability. The rains often come early or late and the amounts fluctuate. Under these conditions, farming becomes a gamble – farmers are unable to plan ahead and react to the variable situation. Consequently, yields of rice and the traditional food staple, Taro, are dwindling. Combined with slow development progress, lack of water and climate variability become a planner's nightmare. No chance of planning ahead and preparing for things to come but rather a constant reaction to unexpected issues popping up across the board.

Most households conduct agriculture for their main source of food and income. Recent climate-related problems exceed the coping capacity of many rural communities, as experiential knowledge is lacking and education levels are low. This results in decreasing

livelihood, food and water security, which, in turn, affects rural development in NTT.

**Livelihoods based on farming and fishing under water scarcity**

Local governments are then asked to step in and provide solution. While trying their best, they do not avail of appropriate tools to adequately monitor climate risks and community shortfalls. Without information they cannot plan and without planning, their job

The road network in several islands of NTT is underdeveloped, creating issues for transport of goods and people. Similarly, the electricity grid is underdeveloped and power use per capita is far lower than the Indonesian average. Electrification ration is at around 40% of households. Grid and transport-independent livelihood alternatives are a major challenge for NTT's future development.

The immense challenges faced by rural people

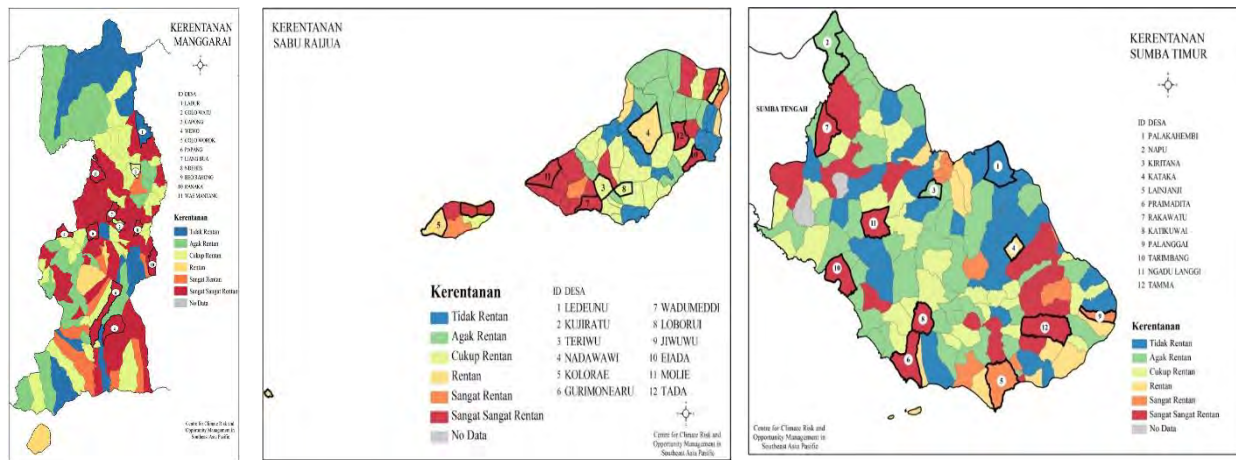


Figure 2The villages based vulnerability mapping for Manggarai district (left), Sabu Raijua district (middle), and Sumba Timur (right). Source: Perdinan et al (2015)

becomes an endless rat race with the planners following changing conditions, rather than pro-actively addressing them.

Vulnerable households reside in areas, which are sensitive to climate variation and change. Today, El Nino and La Nina massively affect NTT and the dependency on agriculture compounds this. Furthermore, NTT is ranked amongst the lowest provinces in terms of economic development, with a gross regional product (GRP) of slightly above 1,000 USD/cap.yr. The high reliance on climate-dependent livelihood activities as well as the lack of capital to cope with shocks and slow-onset impacts from the climate makes NTT the most vulnerable region in Indonesia today.

in NTT makes us wondering what the possible solutions could be. Is it even possible to continue to farm under such conditions? Do the people here need *big* changes (system transition) or many *little* changes (incremental transition)? There might not be *an* ultimate answer but the SPARC project, implemented jointly by the Ministry of Environment and Forestry, Planning Agency of NTT Province (Bappeda NTT) and UNDP Indonesia provided some of the answers. In terms of climate adaptation in rural development settings, had merely scratched the surface. Granted, the problems are new and climate adaptation (as opposed to climate mitigation) has entered the public consciousness only recently. Systematic studies, let alone development of solutions are relatively scarce and certainly not all-

encompassing. The game, was to figure it out on the go and to develop locally adapted and acceptable solutions. Paris Agreement approach for adaptation was not going to cut the mustard. It depends on the individual climate risks faced by the people and their respective economic, geographic and cultural environment as to how they will be able to adapt to them

## 2. Institutional Settings

**MoEF sets policy priority on climate adaptation and works with Bappenas, Ministry of Finance and UNDP to put project together; how involving the provincial BAPPEDA is key to the project; generating local-level ownership at provincial, district and village level; the participatory approach – involving the communities and listening to them before suggesting interventions; the interplay of government, academia, NGOs, private sector and community**

SPARC is a pioneer attempt to tackle Climate Adaptation. Across the globe, Climate Adaptation activities have surged since the last (5<sup>th</sup>) IPCC report's focus on adaptation. It is gradually dawning on government's, communities and individuals, that humanity needs to prepare itself for impending changes in ecosystems and natural resource availability. While all is not doom and gloom and there are plenty of opportunities in Climate Adaptation, vulnerable settlements and ecosystems will be hit the hardest: changed hydrological systems, negative impacts on crops and extreme weather are among the climate risks already visible. The IPCC has identified changes in the marine ecosystems as primarily attributable to climate change. In Indonesia, most coastal and dry areas are especially vulnerable due to their exposure to climate risk compounded by high levels of poverty and unequal access to natural resources.

It is important to note that climate adaptation is a relatively new activity field. Whereas mankind has proven successful in biological and cultural adaptation for 2.8 million years, the quality of adaptation expected from us now is different to past adaptations. While previous (successful) adaptation was retrospective, i.e., driven from experiences and learning, we are now faced

with a completely different set of cards: adapting to something that we expect in the future. While we may be able to adapt to variations and subtle change in climate now, we need to anticipate deep and enduring changes in the future. Because these future changes are more drastic than what we have ever experienced, a concerted effort in adaptation is necessary; applying technology, policy, planning, and brainpower to something that the average citizen may not be able to identify as real yet.

Nobody has, thus, developed the solution to adaptation. There is no recipe, there is no manual to follow. Adaptation needs to be multi-scale at the individual, community, government, and global levels, all at the same time) and it needs to be multi-sectoral (technology, governance, infrastructure, institutions) to work. This means, there is no magic bullet and, although it may seem that time is running out, adaptation needs to be figured out, one initiative at a time, to be successful.

NTT counts as one of the most vulnerable areas in Indonesia and therefore is most suited for a first venture into an effective adaptation activity. The pressure to adapt is relatively high. Many areas in NTT are experiencing climate change first hand – it is no longer a thing of the

future, but it is very present and action is required now. The also, because it is a relatively disadvantaged province of Indonesia, acting early on Climate Adaptation may just turn the disadvantages to an advantage. “First up, best dressed” as the idiom says, meaning that investing early into Climate Adaptation gives NTT a competitive advantage over other provinces who run the risk of overlooking the potential harm done by climate risks.



*Figure 3 Women farmers from East Sumba proudly stand before their vegetable patches which was initiated under SPARC as a choice of adaptation action*

Another advantage in carrying out an adaptation initiative in NTT is Indonesia’s policy of decentralisation. Since 2001 decision-making and fiscal sovereignty has been devolved to subnational governments, giving them more autonomy and higher flexibility in locally-relevant decisions over resources and planning. While Climate Adaptation policy has been adopted by the Ministry of Environment and Forestry and institutionally supported by the Directorate General of Climate Change, provincial governments adopt their own adaptation policies and allocate the appropriate financing. This gives NTT the chance to plan adaptation in way that makes it attuned to local climate risks, socially acceptable by local institutions and its population, a well as integrated with other planning issues, such as infrastructure and economic development. The model is perfect for climate adaptation planning because it responds to local climate issues while

being supported by national policy and institutional support.

When SPARC was conceptualised, multi-scale adaptation was made part of the design. With the Ministry of Environment and Forestry in the lead, the project was ensured the necessary support at the national level and the potential to scale out any innovations developed on the ground. The design, however, also included a strong involvement of the provincial government; therefore, the provincial planning agency (BAPPEDA) was given the co-lead, ensuring local ownership oversight. This required the national and provincial agencies to work together closely.

Another important element of the design was multi-sectorality. This was not going to be another government-only initiative that runs the risk of disappearing after the next election cycle ends. It was important to make sure that the project builds institutions and that any innovations developed in the initiative would remain in the community well beyond the government’s immediate responsibility. Therefore, its reach needed to extend beyond government institutions.

The inclusion of local non-government organisations as well as the private sector fulfils the multi-sectoral demands of successful climate adaptation. It ensures that Climate Adaptation becomes a task that concerns all sectors of society and cannot be solved by the Government alone. It also leads to possible uptake by various actors in order to normalise Climate Adaptation and create a sense of responsibility within society.

Finally, and likely most importantly, SPARC has involved the target communities from Day 1. Cognisant of the fact that the initiative cannot be successful if concrete demands and needs of communities are not met, communities were engaged in an elaborate dialogue on what there



needs are, how they perceive changes in climatic patterns, eliciting potential solutions to real-world problems affecting their livelihoods, and discussing ideas for sustainable climate action.

Involving the community is important for several reasons. First, there are no successful community-level initiatives if communities refuse to play along. This means that any actions need to be checked back with the community and their acceptance sought to implement them.

Second, any adaptation initiative thought out on the drawing board needs gradual testing and adaptations when applied to real conditions. The best experts cannot envision the conditions occurring when the plans are rolled out in different types of communities facing very different issues and environments. Communities, when engaged, are ready to provide feedback and report any faults or dead ends. This communication is invaluable when adapting initiative to locally specific conditions.

Third, adaptation is not only about rolling out plans. The idea of a successful climate adaptation initiative is to spark innovation. Possible solutions are offered and hopefully contribute to raising levels of resilience. For long-term adaptation, however, the goal is for the community to take matters in its own hands and become adaptive through internal innovation. Rather than waiting for external impetus to solve livelihood issues, the ultimate goal is to empower communities to become pro-active towards climate change and develop solutions to impending transitional speed bumps ahead.



*Figure 4 The Kemas Proklim community groups has been established in 21 villages within three Regencies in NTT. They will act as champions for climate adaptation actions in their communities such as promoting the usage of SRI technique in planting the rice which has proven to be more efficient and water conserving*

### 3. Living With Water Insecurity:

**Why it is hard/unsustainable to continue farming like before; when traditional knowledge does not suffice to enable adaptation to new phenomena; the specific issues and challenges farmers (including women) faced under conditions of climate variation**

The SPARC project currently covers three districts in NTT: Sabu-Raijua, Sumba Timur, and Manggarai. Both Sabu-Raijua and East Sumba are among the driest districts in Indonesia. While Manggarai has acceptable levels of precipitation, high levels of climate variability and extreme weather events affect all three districts.

The increase exposure to these risks is compounded by high levels of inequality, high levels of poverty, uneven access to resources and lack of basic needs, such as clean water and sufficient nutritious food. In other words, while it was hard enough for a farming family in NTT to get by in the past, we can expect it to be nearly impossible when the climate effects increase in frequency and intensity.

So what are farmers doing and what are they going through? Rural livelihoods in NTT are based around the production of rice. In dry areas, such as Sabu-Raijua and East Sumba, only one harvest per year is possible. With access to irrigation or higher levels of rainfall, two to three harvests are possible. Clearly, the wet season (November through March) is intense, with the bulk of the staple crop produced, but other times of the year are equally busy. Whether it is raising livestock (horses) in East Sumba, growing ancillary crops in Manggarai or planting vegetables, farmers make the most of their scarce natural resources to make a living.

Farming is small in scale and based on low levels of machinery and inputs. Whether using

traditional animal draft or a two-wheel tractor on limited patches of suitable land, the production method is labour intensive and requires the contribution of the entire family to farm successfully.



*Figure 5 A Women Goat Farmer. SPARC encourage and helps people to find alternate livelihoods which suits the condition of their villages as an adaptation actions*

Changing weather patterns, unfortunately, sometimes throws a spanner in the wheels. For farming families who are already barely coping, subtle changes in rainfall can mean a reduced amount of yield, which is just enough to make the operation uneconomical.

Naturally, farmers desire improvements to their farming and reliability of their resource base. A stable provision of irrigation water can change things drastically in terms of food and income security. An additional harvest can enable families to afford a better education for their children.

In Sabu-Raijua and East Sumba the main issue – existing before and compounded by climate variability – is water scarcity. An average rainfall

of around 1,000 mm in Sabu puts the island in the category of dryland agriculture; certainly not advisable for planting rice. The original tuber-based diet was more adapted to the environment but cannot sustain the current consumption requirements. Corn crops are more suitable to the dry conditions and rice can only be grown in places along riverbeds or close to water sources.



**Figure 7**  
*Villagers in Tarimbang Village, East Sumba are digging a new irrigation routes which will bring water closer to their villages*

Access to water is critical. During dry periods of the year (over 90% of the rainfall occurs during the wet season), when rainwater storage is not possible, household water is drawn from groundwater wells. Due to increased demand and prolonged periods of drought wells need to be dug deeper or given up and new locations for wells found, which are often further distant to the settlement. Traditionally, women are in charge of fetching water; carrying water over long distances puts an additional burden on their daily tasks in the household. Alternatively, borewells are drilled to reach underground aquifers, but these are expensive in both instalment and maintenance. Therefore, many households cannot afford this option.

Traditionally, people in the region were accustomed to spells of dry weather. These so-called “normal hunger” periods meant that the diets were altered according to seasonal food availability, e.g., switching to forest foods when



**Figure 6** *This sight of women carrying water for kilometers away from the springs to their villages were a common sights. SPARC had helped the community in bringing water closer thus establishing water security*

stocks were low or reducing the number of meals for able-bodied adults.

“Extreme hunger” occurs when traditional coping mechanisms fail or water becomes extremely scarce. Many residents of Sabu remember these instances from the past. Today, the government is able to react when drought sets in. Regularly, water needs to be transported to areas across the province. Food aid is also required when crops fail and farmers are left without any resort. Deforestation over the last decades has left only few patches of original forest cover, which, in turn, reduces the amount of emergency foods available. An average annual population growth of 1.7% further strains available resources. Add to this a requirement of economic growth to maintain levels of consumption it quickly becomes clear that rural families in NTT are struggling.

Not that the government is doing nothing. On the contrary, local governments have been active in promoting economic development,

such as salt production, seaweed production and bottling of commercial drinking water. While not all of these activities can be considered adaptive, they certainly are an attempt to jumpstart alternative production, and draw on locally available resources. Unfortunately, however, contribution to climate adaptation is not always considered when designing these economic development projects. Therefore, whether or not they increase the resilience of the rural population is left to a matter of chance. A concerted effort, which considers, both, development outcomes and adaptation to climate risks is required. This is the need that SPARC caters to and the design of this initiative includes focusing on relieving pressing economic issues in concert with the long-term view on addressing climate risks.

## 4. Devising Solutions

**what do communities aspire to? What do they need to help them survive over the long term? How can traditional forms of livelihood transition into adapted and sustainable livelihoods? The formation of Proklim groups. Communities working with local technical teams and with NGOs.**

Indonesia's economy has been growing between 5-6% every year for the past 5 years and is expected to continue at this rate for the foreseeable future. The country has made impressive progress in the fields of poverty alleviation, infrastructure development, as well as curbing inflation and unemployment. Naturally, the more disadvantaged provinces want to benefit from this successful development as much as the others. Rural communities can see progress but often they cannot see the effects of it in their own lives. While the urban hubs barge ahead, people in the country often feel excluded from tangible improvements.

Sometimes improvements can even be seen, but they are uneven. While, for example, mobile networks blanket the country, including the rural areas, access to clean water is still not a given everywhere. Access to critical resources and services (land, water, roads, markets) limit efforts to escape poverty, regardless of how innovative and entrepreneurial people may be.

For many farming households, the priority lies on providing food for the family, gaining an income for their children's education, and being able to afford the minimum provisions to live a decent life. They realise very well that pure subsistence economy cannot be sustained into the future, but that additional income must subsidise farming income to be able to afford a lifestyle on the other side of destitution. Most households do not want to, nor do they expect to leave farming any time soon, but they see non-farm work as a necessary ancillary activity.



*Figure 8 Proklim groups has been crucial in introducing choices of adaptive actions in term of alternative livelihoods, such as this new duck farmers in Rakawatu, East Sumba*

What became clear is that traditional subsistence farming will not remain in the same form. Farming households will have to change. It is not certain how they will change and what form their livelihoods will take. After all, who can predict the future? But in order to face incumbent climate risks and move towards more sustainable livelihoods, adaptations to current production systems are necessary. Some will remain in agriculture by fine-tuning their crops to new climatic conditions, perhaps switching to more resistant varieties or, e.g., from dryland crops to livestock rearing. Some will move further up the value chain and invest

in postharvest processing, packaging and value adding. More innovative households will search for entirely new products that rely on resources but without exploiting the local environment. Others, however, will move out of farming and establish rural businesses or find employment in urban centres.

Policy can support and steer this rural transition. If the society is aware of its priorities and anticipates change it can encourage certain adaptation while discouraging others. For example, policy could encourage climate-independent livelihoods by subsidising innovation, manufacturing, and local businesses. It could attempt preventing mal-adaptation by sanctioning overuse of scarce resources (like water) and focus on untapped resource potentials (like marine products).

While policy can help support sustainable adaptation, it needs a solid evidence base to be formulated in a way that promises a high likelihood of success. This is where SPARC comes in. While SPARC can help farmers in the communities it engages with, the ultimate success of this project will be measured by whether it can contribute to developing policy that supports a sustainable transition of climate-adapted livelihoods. The successes achieved at the community level must be translated into local, regional and national policy that can cover many more communities to support adaptation.

The SPARC approach is to start with the community. If any measure is to be successful, the community must be able to support it and eventually take ownership over it. The project started by working with communities to discuss possible changes to be made. This engagement led to the formation of community groups, in order to assemble the most active, engaged and concerned community members. From there,

for the entire duration of the project, these so-called “pro-climate groups” have been the primary target for all adaptation activities at community level. The Pro-climate Groups were asked to develop proposals on how to alleviate local climate-related problems the community is facing. They were not, however, left alone to devise their own measures. Project partners – NGOs, local government and research institutions – worked actively with the climate groups to design proposals in a way that measures would alleviate pressing issues as well as support long-term transition towards adaptation.



*Figure 9 SPARC leaves it to the community to choose and plan their own adaptive actions which was based from climate risk assesment of their villages and technical advice from local government agencies and local NGOs*

While it may have been difficult at first to convince climate groups that long-term adaptation was as important as short-term problem-solving, the interaction between community members, community facilitators, experts and government officials yielded robust proposals for activities that could be implemented by the project but offered tangible benefits to the community as well. The community facilitators from partner NGOs played an important role achieving this feat by considering what is doable, significant and make a marked difference to the community.

The result of this first step was a remarkable cooperation between government, community groups and NGOs, something that this region had not seen before. This was crucial for the success of the project as this basis of cross-sectoral and cross-level cooperation proved instrumental in making the project activities happen.

## 5. THE INTERVENTIONS:

Examples for what has been done in the project. Success stories that spark livelihood transition, support innovation, support climate independence. Use examples of solar water pump irrigation; seaweed production; canoe making. Text box: list of interventions in project villages

### -- Transforming agriculture --



Figure 10 A previously barren land in Manggarai, has been transformed into green patch of vegetables

The idea of making farming climate resilient draws on experiences with adapting farming systems to possible shocks, making climate information available to producers, and selecting crops, cultivars and varieties best adjusted to present and expected climatic conditions.

Adapting farming systems can include a variety of activities. In NTT, the SPARC project has focused on promoting high value crops, such as vegetables, reducing loss via improved crop management, and conserving resources by producing organic fertiliser. Producing vegetables can serve as a back-up to the production of bulk staple. While rice can only be harvested once every year, vegetables use less space, can be tended intensively and sold at a higher return on investment. Producing vegetables can reduce risk of crop loss and

inspire farming households to transition their farm towards catering to market demand.



Figure 11 A Rain Measurement devices installed in villages. This devices will help the community to had more information on climate



Providing producers with appropriate climate information improves farm resilience by enabling a pro-active approach to crop and variety selection. If farmers learn more about changing weather patterns in their immediate environment, they will be empowered to make autonomous decisions. For instance, climate data can provide farmers with the knowledge that seasons are shifting and new weather patterns are emerging. Sabu has experienced periods of prolonged drought during times there previously were sufficient rains. With this new knowledge, households can decide when it is worthwhile to start the cropping season or perhaps anticipate unseasonal weather events. Climate groups in SPARC communities have been provided with weather measurement tools, and with training on climate monitoring and information.

Today, crop varieties and seeds are available that are tailored to perform under various climatic conditions. Made available from research institutes and professional breeding centres, SPARC provides farming communities with seeds attuned to the specific climate prevalent in the area, e.g., drought resistant seed that perform relatively well, even when exposed to dry spells during the planting season. Farmers are also given advice on which crops to plant at which time and the optimal cropping sequence.

In total, farming households under SPARC have managed to improve their yields despite uncertain climatic conditions as they have optimised traditional farming systems under the supervision of expert teams from NGOs, government and research institutions. Overall, farmers feel empowered that, despite the harsh and uncertain conditions they are facing, there

is something they can do to improve their farming outputs and reduce risk. Expert teams have been very welcome in SPARC communities and stable bonds have been forged between farmers and experts. For example, it is not uncommon today that farmers will call an expert at a government research institute to get the latest information on crop varieties.

-- Water --



*Figure 12 A Solar Powerd water pump in SPARC Village*

Access to water is the most pressing issue in the dry regions of NTT, such as Sabu-Raijua and Sumba Timur. Additional water can give farming households a boost in terms of food security, income and risk mitigation. Food insecurity was determined as the major climate impacts at the start of the project and strategies to improve access to sufficient, healthy and safe food are the main priority of SPARC.

In a climate that is characterised by the absence of rainfall throughout most of the year, water necessarily must come from underground. Typically, however, water pumped from the ground is expensive in maintenance and extracted using fossil fuels. SPARC water pumps are more sustainable as they are powered by electricity from solar cells. During daytime, the electricity pumps water up to a container

placed on a tower, which makes it available whenever farmers need to irrigate. Whenever water is used, the pump automatically refills the container. The water is used to irrigate surrounding community vegetable gardens and cornfields.

**-- Using local natural resources --**



Figure 13 A Seaweed Farmer in Sabu Raijua Regency

SPARC supports the use of alternative resources. One successful activity is the production of seaweed for the food and cosmetic industry. Where flat beaches and shallow waters permit, rural residents are trained in seaweed production and provided with seeds and equipment. In order to secure an income (seaweed is not consumed by rural families), a guaranteed price is set for seaweed that meets the quality criteria. Families are able to feed lesser-quality seaweed to their livestock or sell at a lower price.

The advantages of this activity are manifold. First, this activity supports rural families, regardless of whether their livelihood is based on farming. In fact, in many cases farming is reduced to focus more on seaweed production. Seaweed provides a secure income and does not exhaust local resources. It can be produced year-round (although, its more difficult during stormy and very dry periods) and the families

can allocate their time whenever they are available, depending on how much labourers are available. Therefore, seaweed production gives them the flexibility to add this activity to their portfolio of livelihood activities without draining resources or attention from other activities.

Seaweed production is not easy - in fact it can be quite laborious – but it is suited especially for those coastal families used to draw a large part of their livelihoods from marine resources, such as fishing and collecting crab and molluscs. It is especially suited to families that do not centre on farming, due to lack of sufficient land.

**-- Creating jobs --**

An important mission of the SPARC project is to promote climate-independent livelihoods. This means primarily not to depend income on local weather. A particularly successful activity in SPARC has been to equip and train a community to produce typically locally-used canoes. The idea for this project activity came from the community that had a contact a producer who could provide them with the necessary knowledge to design the first prototype. SPARC staff acted as a facilitator, organised training, provided materials and tools and the prototype was born, proving even better than models otherwise used on Sabu Island.

A producer group was quickly assembled in the community who produced the first batch and the initiative proved successful – all models were sold out in a matter of weeks. Profits were not shared but re-invested into the purchase of new materials and tools in order to continue the production. Soon, fishermen and boatspeople from all over the island displayed interest in purchasing the superior models. Up until then, boats were always bought from another island, which made them costly and could take a long time for delivery.

In no time, the community had recouped their investments and had made a profit. Not only that, they have now managed to diversify their livelihoods out of farming and provide for additional income and risk insurance during hard times. Several community members are seriously considering moving into full-time boat manufacturing should the demand for boats – and the community’s success streak – continue into the future.

## 6. TRANSITIONING TOWARDS CLIMATE-ADAPTED LIVELIHOODS

### PRIVATE SECTOR IS PART OF THE ADAPTATION PROCESS :

As a result of the involvement of ntt bank in sparc, new initiatives have spawned, which had not been foreseen by the project designers. Initially, the bank had been involved to help manage the funds for communities in the project areas. Through their close cooperation with the project, ideas emerged that extended additional benefit to communities. Ntt bank is a local finance provider interested in spreading access to financial service throughout the province. Many communities, on the other hand, are in need of access to financial services.

Ntt bank decided to take a larger role in the project when they offered to provide usd 100.000 as a community loan for each project community to be able to pursue their initiatives towards climate adaptation. As part of ntt bank's csr strategy, the bank has now gained the trust of and access to many communities, which previously had not had any experience with professional financial services.

The community loans provided by bank ntt serves to expand sparc activities as well as build new initiatives in communities. In such a way, this unexpected outcome fits perfectly into the project's goal, which is to initiate a process towards rural innovation and proactive adaptation. Thus, sparc hopes to generate many new initiatives like this and involvement all parts of the society in this all-encompassing endeavour.

SPARC is not a project in the traditional sense, with a beginning and an end, which delimits the activities and puts a stop to engagement once the project is over. Rather, SPARC continues to spawn new ideas (see text box, side) and serves to initiate cooperation that might not have existed before. SPARC has started a much-needed conversation about the changing climate and how to go about it. This conversation involves new actors and crosses administrative and social lines. As such, this project has started a process that needs to continue on, well into the future.

*-- The end is not the goal --*

This project does not consider its outputs as the ultimate success. Even positive results cannot be considered an end point. Vegetable seed received by farmers may provide a good yield, which, in turn, may lead to a better income for the producers. This does not mean, however, that farmers have improved their resilience or have become better adapted to impending changes in climate patterns.

What it does mean is that it provides farmers with more options. It means that, the next time they are faced with a drought they may chose to continue the traditional way of cropping or plant high-value vegetables under more controlled conditions. It gives them a possibility to evaluate possible gains and risks and decide on which course to take. It gives them the flexibility to apply their local knowledge of the environment and weather patterns and merge it with new experiences gained from project

trainings and conversations with experts. In short, it allows their livelihoods to evolve and adapt to a world, to which traditional livelihoods are not longer suited.

*-- Kick-starting the adaptation process --*

Globally, the need or Climate Adaptation has been recognised relatively recently. While the science for climate change and mitigation are relatively advanced, there are no clear rules, guidelines, recommendations or fixes for climate adaptation. Solutions for climate adaptation need to evolve, need to be attuned to the local conditions, and need to pass through a phase of trial and error to prove successful. Nobody has ready answers, only the need to adapt is recognised. How to go about climate adaptation is uncertain; therefore, any exploration into this field is treading pioneer ground.

Even if some of the solutions introduced by SPARC do not turn out to be sustainable, the true impact of the project will be that of supporting and encouraging innovation, as well as starting a conversation about adaptation that extends from the local level up to the national level about which solutions work best. In addition, the involvement of private sector and NGOs ensure that innovations are developed with and disseminated through non-government actors to gain widespread traction.

*--Encouraging innovation --*

“Cross-level” and “cross-sector” are not just buzzwords here. Developments at the community level need to be spread to other communities to achieve widespread impact. There are two ways to do this: replication and policy. A single canoe-manufacturing workshop does not constitute climate adaptation – but what can be learned from this example? If you believe that every community has or can acquire special skills, these can be exploited to allow farmers diversify into businesses they had

not dreamt about before. For the community the newfound skill of boat-making is critical. For the broader picture, however, the lesson is how skills can be harnessed to allow for new opportunities; how farmers can use their resources and labour when farming does not suffice to provide an adequate livelihood.



*Figure 14 Fiber boat produced by the Proklim of Sabu Raiju Villages. This is an alternate livelihood which was chosen by the proklim groups*

Regional agencies can develop policies based on the evidence generated in SPARC to support rural innovation and, thus, adaptation. Diversification beyond farming seems warranted in order to base at least part of rural livelihoods on climate-independent activities.

The question is how government can devise policies that support communities in the adaptation process. One way is to support rural businesses – through skills development, institutional support and infrastructure. Another way is to learn from success stories – extract what can be replicated and apply these insights to policy. The idea for policy is to avoid spoon-feeding rural communities in the adaptation process, but rather to create an enabling environment that allows for innovation, supports rural transformation, and connects farmers to information sources and communication networks

## 7. Everyone learns from SPARC

-- *Beyond the community* --

Climate adaptation is not something that can be achieved at the ground level alone. While communities adapt to their local circumstances there is a similar need for institutional adaptation at higher levels. SPARC enables learning and innovation in communities but also in government offices. Not all government offices are well-trained in matters of climate change. While the effects are visible in changing environmental patterns, not always are policies, measures, protocols and finance ready to support communities and institutions in their transformation process.

The benefits of SPARC for climate adaptation do not stop at the community level; all involved partners benefit from the project. Government agencies hone their skills in a new subject matter and learn new form of communication across departments, with communities and with the civil society. NGOs, such as *CIS Timor*, receive a chance to focus on community facilitation and thereby contribute greatly in bridging the flow of information between government and climate groups. The private sector receives an opportunity to assume their responsibility within society by facilitating village funds and financing new initiatives; at the same time they can reach out to remote communities and provide access to finance for the poorest citizens.

-- *Institutional development* --

As government, civil society and the private sector communicate with communities and learn from new initiatives, they realise the need to respond to the climate challenge.

Institutionally, adaptation requires new approaches, which cannot be dealt with through a traditional departmental structure. For example, climate adaptation requires the response of the departments of environment, planning, agriculture, business development and finance. Such a cross-cutting issue requires a flexible and responsive institutional setup that goes beyond the departmental structure.

In East Sumba, the provincial office coordinates climate adaptation among the departments, making sure each sector plays its role. It becomes a responsibility of the government as a whole and every department must chip in. This is what is commonly called “mainstreaming” – essentially a task of everyone, rather than a single sector.



*Figure 15 Climate Field School, Education on Climate Adaptive Farming techniques to Proklim Groups conducted jointly by the relevant offices of the local government, academics and local NGOs*

-- *Capacity building* --

One of the highly relevant activities in SPARC is cooperation with the local University in Kupang. Through training and the provision of experts the project team was able to initiate a graduate course on

climate adaptation, which will train local students on the relevance and best practices of responding to climate challenges well into the future.

The establishment of the graduate course in climate adaptation ensures that NTT receives a consistent supply of experts in the field. As mentioned, the project is not a one-off, but aims at establishing longer-lasting structures, which enable NTT to deal with climate risks on their own. Over the long run, NTT does not want to be dependent on donor-sponsored adaptation projects but will include adaptation as part of their government administration and policy development.

The academic embedding also ensures that success stories are documented, best practice established and learnings passed on so that community-level adaptations become replicable at scale. It makes sure that a wealth of knowledge on climate adaptation is amassed and available to future researchers and administrators. As such, the university fulfils its role as a regional knowledge provider and training hub and will perform its role in the development of climate-adapted and resilient communities.

*-- The first step of a long journey --*

NTT is feeling hopeful. Climate adaptation cannot be fixed easily like a flat tyre. But there has been drastic changes in villages, which previously were struggling and now have gained a sense of hope that the future might lie in their hands, rather than dominated by external influences. While many of the measures provided by SPARC were positive, it was clear - not only to me but, I hope, to the community members as well - that they are merely a trigger for more to come. This *more*, however, would

come from the communities themselves rather from projects by the government. The climate groups felt empowered that their ideas were taken seriously and could be implemented with success. To get these creative juices flowing is, I felt, the ultimate success of SPARC.

The success achieved by SPARC also hinges on the team, which was put together for the purpose. Working across geographical boundaries and administrative levels can be difficult, especially with the distances involved in Indonesia. The leadership in the Climate Adaptation Department of the Ministry of Environment and Forestry (KLHK) in Jakarta as well as the project office in Kupang and the district coordinators in the project sites (Manggarai, East Sumba, Sabu-Raijua) with the support of UNDP have established excellent relations with the concerned government offices. The atmosphere is amicable and the spirit of mutual learning and the will to make this project a success is important to make this project work. So while I felt that SPARC was merely the first step in a long process of living up to new challenges, I knew it was an important step and it was a good one to witness.

