Climate Change

Vulnerability & Adaptation Experiences from Rajasthan & Andhra Pradesh

CI Community Based Institutions

Case Study

INDIA

inter cooperation
Natural Resource Management
Rural Economy
Local Governance and Civil Society

MSSRF

AFPRO
Action For Food Production

iNFRAS

Schweizerische Eidgenossenschaft
Confederation suisse
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Swiss Agency for Development and Cooperation SDC

The `Vulnerability Assessment and Enhancing Adaptive Capacity to Climate Change in Semi Arid Regions in India' (V&A) programme in brief

The Swiss Agency for Development and Cooperation (SDC), recognising the risks that climate variability and change pose to livelihoods of rural communities in semi-arid regions of India, supported a process-oriented pilot programme on '*Vulnerability Assessment and Enhancing Adaptive Capacity to Climate Change in Semi Arid Regions in India*' *(V&A)*. The programme was implemented in the period from 2005 to 2009 in two semi-arid regions in India, namely Udaipur district in Rajasthan, and Mahbubnagar district in Andhra Pradesh. The overall goal of the V&A Programme was to secure the livelihoods of rural poor and vulnerable communities by promoting adaptation measures that enhance their capacity to better cope with adverse impacts of climate change and by improving their disaster preparedness.

The programme had **three specific inter-linked objectives:**

- **Objective 1:** To build community level capacities with regard to best practices and technologies in the agriculture, water and energy sectors.
- **Objective 2:** To optimise the service delivery system and services at selected sites in semi-arid areas in India.
- **Objective 3:** To promote policy dialogue and advocacy at different levels.

A range of field activities, some of them building on and aligned to traditional local adaptation practices, were tested in the particularly climate sensitive sectors of water, agriculture, rural energy and livestock. The field interventions helped identify measures and mechanisms for reducing the vulnerability to climate hazards of the poorest social groups in these regions. The emerging lessons were analysed with a view to informing policy processes at state, national and international levels by demonstrating a way forward for integrating development strategies with climate change adaptation.

The programme built on the collaboration between various actors with complementary strengths. A National Consortium, for overall management of the programme, comprised three partners, namely **M.S. Swaminathan Research Foundation (MSSRF), Action For Food Production (AFPRO),** and the **National Institute of Agriculture Extension Management (MANAGE).** An International Consortium for backstopping, quality assurance and facilitation of continuous exchange with ongoing international policy processes was constituted by **INFRAS** and **Intercooperation (IC).**

Mahabubnagar district in Andhra Pradesh and Udaipur district in Rajasthan were selected for implementation of the programme, as rural communities in these districts are among those most vulnerable to climate variability and are likely to be highly impacted by climate change. A multi-stakeholder process and a set of pre-defined criteria, including manifestation of climate hazards and evidence of social organization at village level, helped identify two villages for programme implementation in each district, namely **Kothur** and **Srirangapur** in Mahbubnagar district of Andhra Pradesh and **Amda** and **Kundai** in Udaipur district of Rajasthan.

For further details on the V&A pilot programme and a detailed analysis of the vulnerability of the communities selected for implementation of the programme, see the '*Introduction*' or visit the V&A programme website www.climateadapt.net.

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Vulnerability reduction and adaptation to climate change in semi-arid India - Community Based Institutions

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CONTENTS

Acronyms

ANGRAU	Acharya NG Ranga Agricultural University, Hyderabad
APFMIS	Andhra Pradesh Farmer Management Irrigation Systems
BDO	Block Development Officer
CEO	Chief Executive Officer
EC	Executive Committee
MYRADA	Mysore Research and Development Agency
NPISH	Non-Profit Institution Serving Households
PMC	Pasture Management Committee
WOTR	Watershed Organisation Trust
WSC	Water User Committee
WUA	Water User Association
ZP	Zilla Parishad

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Executive Summary

Community-based institutions can be a core pillar of communities' capacities to adapt to changing conditions in their natural and physical environment, including a changing climate. In India, community organizations in particular have an important traditional role in the local governance and management of natural resources. In recognition of the importance of local institutions for communities' adaptive capacity and resilience to climate change, the strengthening of community organizations has been an integral element of various activities under the SDC supported *Vulnerability Assessment and Enhancing Adaptive Capacity to Climate Change in Semi Arid Regions in India (V&A)* pilot programme. Water user committees were formed or revived as part of interventions to rehabilitate tanks, upgrade a traditional harren system and establish a water bank for improved irrigation. A pasture management committee was established in order to ensure sustainable management of common land. Smart Farmers Clubs were formed in all programme villages as platforms for knowledge exchange and to facilitate the adoption of new farming practices.

The V&A experience has shown that local institutions determine adaptive capacity in two ways. Firstly, they help structure action between members and enable the community to take joint decisions. Well-organized communities will be in a better position to manage their natural resources in a sustainable way, and to take action in response to external shocks, including those related to climate. Secondly, local institutions are the foundation for local communities to voice and enforce their interests, to influence decisions taken at higher levels, and to hold policy makers accountable. Through strong local institutions, communities are more successful in seeking support for adaptation in the form of financial flows, information and capacity building support.

Therefore, empowerment through strengthened community-based organizations can contribute significantly to reducing the vulnerability of communities to various risks, including those related to climate variability and change.

1. Introduction

Local institutions are key to the capacities of communities to respond to various risks and adapt to changing conditions. Firstly, strong institutions at the local level help communities to coordinate action and take joint decisions. Well-organized communities will be in a better position to manage their natural resources in a sustainable way, and to take action in response to external shocks, including those related to climate. In addition, local institutions are the foundation that enables local communities to voice and enforce their interests, to influence decisions taken at higher levels, and to hold policy makers accountable. Through strong local institutions, communities are more successful in seeking support for adaptation in the form of financial flows, information and capacity building support.

Recognizing this vital role played by local institutions, the strengthening of local institutions has been an integral element of various activities under the 'Vulnerability Assessment and Enhancing Adaptive Capacity to Climate Change in Semi Arid Regions in India' (V&A) pilot programme. Particular attention has been given to local community organizations, recognizing their traditional role in the local governance and management of natural resources in semi-arid areas in India.

Within the frame of the working hypotheses developed to support monitoring of the V&A pilot interventions, local institutions play a key role in testing the hypotheses related to water, land-use and livestock/fodder[1]. **Water user committees** were formed or revived as part of interventions to rehabilitate tanks, upgrade a traditional harren system and establish a water bank for improved irrigation. **A pasture management committee** was established in order to ensure sustainable management of common land**. Smart Farmers Clubs** were formed in all programme villages as platforms for knowledge exchange and to facilitate the adaption of new farming practices.

These institutional components constituted core pillars of the V&A approach to enhancing the capacity of communities to manage their resources in a sustainable way, to identify risks resulting from climate variability and change, and to take autonomous decisions for adaptation.

This document first provides an overview of the various types of institutions at the local level in rural contexts with special reference to those existing in the villages selected for implementation of the V&A programme. It then analyses the potential role of local community organizations for reducing vulnerability to climate risks. Subsequently, the local community institutions formed under the V&A pilot programme, their structures and scope of operations are presented, followed by an analysis of how these institutions have helped to enhance adaptive capacity of the communities.

[1] **Hypothesis on water:** "Community's access to weather monitoring and prediction data combined with community managed water resource systems can lead to greater water use efficiencies and improved adaptive capacities."
Hypothesis on land use: "Village-level land use maps can provide a basket of options for different rainfall scenarios (drought, normal, excess). They can lead to stabilisation of yields from rain-fed farming, greater food and economic security."
Hypothesis on livestock: "Livestock rearing is an important coping strategy in the face of enhanced climate variability. Buffer stocks of fodder (including tree fodder) and good breeds of livestock can be important risk reduction strategies and can enhance adaptive capacities."

2. Typology of institutions at local level

There are many different definitions of local institutions and organizations, varying with the context and focus of the study for which they are employed. For the purpose of this paper, they are defined as those institutions or organizations whose operations are geographically confined to a village or to a contiguous group of villages.

A classification of local institutions can also be done along different lines, e.g. the degree to which institutions are formal or informal, the degree to which their operations are limited to a specific sector as opposed to a general purpose, or their hierarchical nature (IFAD 2003). In the context of rural institutions and their role for enhancing adaptive capacity to climate change in the area where the V&A pilot programme was implemented, it is most useful to differentiate broadly:

(i)local government institutions;

(ii)local community organizations; and

(iii)private or market-based organizations.

Regarding local government institutions, we must distinguish (a) local governments, which are legally recognized units of government accountable to a local constituency (in the case of India, the Gram Panchayats, Box 1); and (b) agencies or arms of higher level of government institutions operating at local level.

Local community organizations can take various forms and structures, and be concerned with different interests of all or only part of the members of a community. Typical examples from rural contexts in India are women self help groups, farmers groups, user groups around a resource or service, religious / spiritual groups, etc. (Box 2 provides brief generic descriptions of some important types of local community organizations in India). The different functions of community organizations in the context of climate change adaptation will be discussed in detail in Chapter 3.

Cooperatives are sometimes also classified as local community organizations, as they advance a group interest by helping members to pool resources for improved economic outcomes (Uphoff and Buck, 2006). However, considering their functions as producers and market actors they are better placed in an interspace between community and private institutions.

In principle, the private sector at the local level consists of those collectivities that are not owned or directly controlled by the local or central government (OECD, 2009). Examples can include local- and foreign-owned enterprises at different scales, whereby small businesses make up the majority of private sector enterprises in rural areas of India. Private enterprises typically produce goods or services for consumers, and their owners and operators have as one of their main objectives the receipt or generation of a financial return in exchange for work and acceptance of risk. However, private institutions also include non-profit institutions serving households (NPISHs), which provide goods or services to households free or at prices that are not economically significant with funding from government allocations, private funds or international donors.

Box 1: Local government institutions in India

The Gram Panchayat is the lowest unit of elected Government in rural India. It covers a population size of 500 to 25,000, depending on norms framed by State Governments. Gram Panchayats can be constituted for a single revenue village or for a group of contiguous villages. The number of members in a Gram Panchayat varies from 7 to 31 members, depending on the population and geographic area falling under the Gram Panchayat. It is constitutionally mandated that 33% of the Gram Panchayat members be women. Of the total membership, there are seats reserved for marginalized sections based on caste and tribe considerations.

The Gram Panchayats were granted constitutional status as units of local governance in 1993-94 based on the 73rd amendment to the Indian Constitution. Ever since, the Central and State Governments have taken steps to devolve funds, functions and functionaries to the Gram Panchayats. The scope of this devolution varies from state to state with Kerala devolving nearly 33% of the State Plan funds to Gram Panchayats. Today the Gram Panchayats receive significant grants, both programme related and "untied" from State and Central Governments.

Constitutionally, the Gram Panchayats are expected to form different standing committees, like production, social justice and amenities committees, for looking into issues of finance, infrastructure development, agriculture, women empowerment, education, etc.

Gram Panchayats constitute an important link between citizens and higher levels of government. Gram Panchayat are expected to approve participatory plans prepared in the Gram Sabhas (village assemblies) that reflect the needs of the local communities. These plans are prepared in line with the different rural development programmes and schemes of the government. Beneficiaries for different programmes like rural housing, handicapped and widow pensions, etc. are identified in Gram Sabhas. The Gram Panchayats are responsible for the development of important element of the physical infrastructure in the village, like the construction and repair of village roads, installation of street lighting, etc. They also play a key role in with the management of some natural resources, e.g. through restoration of small water bodies. Gram Panchayat members are also involved in the management of local schools as members of the school development and management committees. The Gram Panchayats are also mandated to collect certain taxes on their own - house tax, land tax, water tax, etc. However, the tax collection rate of most Gram Panchayats is poor.

In most states, Gram Panchayats are the implementing agencies for the National Rural Employment Guarantee Act (NREGA), which is intended to put into action the constitutionally guaranteed right to work. Under NREGA, any adult registered with the Gram Panchayat as a 'job card' holder can demand wage related work up to 100 days in a year. In case work is not provided, an honorarium needs to be paid to the job cardholder.

The funds at the disposal of the Gram Panchayats have undergone a huge change in the 2000s, especially after the NREGA was launched. Used to insufficient fund disbursals (vis a vis the plans submitted to the Government) at financial year end, the Gram Panchayats, post NREGA, get funds in tens of lakhs for implementing activities in line with their submitted plans.

In areas prone to natural disasters the Gram Panchayats are also being involved in preparing disaster preparedness and mitigation plans that are intended to aggregate to the district level disaster preparedness and mitigation plans.

Box 2: Important types of local community organizations in India

Self Help Groups (SHGs)

Women self help groups (SHGs) have been promoted strongly from 1990s onwards by various government and non-government institutions all over South Asia, and can now be found in most villages in India. SHGs are typically formed by 10-20 women who meet on a regular basis (weekly/fortnightly or monthly) for savings and credit activities. A common arrangement is that all members regularly contribute a fixed saving amount to a group account. Loans are provided to members from the group savings, either on a rotational basis or to all members at a time. Group savings can also facilitate linkages between SHGs and local commercial banks. Many SHGs receive bank loans which they distribute among the members, while the responsibility for the repayment lies with the group. Apart from these savings and credit functions, SHGs have provided platforms for women to discuss social issues. For example, some SHGs have initiated action against illicit liquor shops and domestic violence, and for drinking water provisions, etc. There are also instances of SHGs of landless women who have taken land on lease for farming, undertaken a community venture like marketing of agricultural and horticultural products, running a grocery shop, etc.

Today, many government programmes and schemes for rural development are harnessing SHGs for facilitating community organization and participation. For example, SHGs are functioning as milk collection agents in dairy programmes, tax collection agents for Gram Panchayats, implementers in tank rehabilitation and watershed programmes, social auditors for Gram Panchayats, etc.

User groups around resources or services

Users groups are often formed in villages for managing the sustainable use of a particular resource or service. Typical examples are water users groups for watershed structures, tank management groups for the restoration and maintenance of tanks, etc. There are many examples of traditional user groups around natural resources or infrastructure for agriculture in different parts of India. In addition, user groups are often revitalized or formed under projects for construction, repair or upgrading structures for natural resources or agricultural management. Most projects aim at balanced gender and caste representation in user groups, with reservations for marginalized and weaker sections and women.

Cooperatives

Cooperatives are organizations owned and operated by a group of individuals who pool resources to improve their economic outcomes. In rural India, there are many registered cooperatives in the area of agricultural and dairy products, like sugar, milk, etc. Another typical example are farmers credit cooperatives. SHGs may be regarded as a type of "informal cooperative". Some cooperatives in India have huge memberships and are highly influential in local and state level politics.

Religious/Spiritual Groups

In many villages, there are groups organized around a religious activity, like the *bhajan mandalis* or temple committees. The *bhajan mandalis* sing devotional songs during particulars days of the year. Temple committees are responsible for overseeing the management and maintenance of the temple.

3. The role of local community institutions in the context of climate change vulnerability

Local institutions play an important role in shaping the capacities of communities to respond to changes in natural and social systems driven by external factors, including changes in climatic conditions. In general, the higher the level of organization and history of collective action within a community, the higher the capacity of the community to respond to various risks posed to the community and its individual members. Hence, local institutions can be vital entry points for reducing vulnerability and enhancing resilience of communities to climate variability and change. From a short-term perspective, institutions mitigate vulnerability by facilitating communities' direct responses to extreme weather events or climate-related disasters. From a longer-term perspective, institutions shape community members' social capital and determine their overall social and economic development, their endowment with physical, natural, human, financial and political capital, and the allocation of these assets among community members. High endowment with these different types of resources, and equitable distribution of these resources, enhancing the adaptive capacity of communities and thereby reduce vulnerability to climate variability and change.

The ways in which local institutions function and determine vulnerability can broadly be divided into 2 dimensions:

a) Institutions structure action between members; and

b) Institutions facilitate interaction between the communities and outside actors and structures.

With regard to the first dimension, it must be noted that institutions are not only the physical structures and the social organizations that establish relationships between individuals, but also the norms, rules and regulations that guide interaction between individuals. Thus, the existence of institutions (and therefore norms) can help communities in dealing with scarcity, complex issues of negotiations and trade-offs, which are key functions in the face of the challenges posed by climate change.

The second dimension of institutional functions is relevant in the context of vulnerability as it is through organizing themselves and forming institutions that communities can influence decisions affecting their lives that are taken by governments and other actors within and beyond the local level. It is also through institutions that communities gain power for making governments accountable to them, and for taking more control over the benefits they draw from their economic activity. Such empowerment can contribute significantly to reducing the vulnerability of communities to various risks, including those related to climate variability and change.

Under the V&A pilot programme, particular attention has been given to local community organizations, recognizing their traditional role in the local governance and management of natural resources in the semi-arid areas of India where the V&A programme was implemented. Different activities under the programme have therefore included an element of strengthening local community organizations. These institutional components of the interventions at the local level were seen as core pillars for enhancing the capacity of the communities to manage their natural resources sustainably, to identify risks resulting from climate variability and change, and to take autonomous decisions on adaptation measures. As a first step in the implementation of the V&A pilot programme, intensive awareness campaigns were initiated in all the programme villages in order to mobilize the communities and lay the ground for local

institutional frameworks to be established, which would provide a vital basis for the implementation of next steps in the programme (Figures 1 and 2).

Figure 1: Awareness campaign in Kothur, Mahabubnagar District, Andhra Pradesh

Figure 2: Awareness campaign in Kundai, Udaipur District, Rajasthan

Similar approaches have been taken in other projects and programmes supported by SDC, for example in the projects implemented by Mysore Research and Development Agency (MYRADA), Water Organization Trust (WOTR) Etc. in various States in India. All such projects have put support for the mobilization and empowerment of community groups at the centre of the development proceses. NGOs see themselves as agents that sparks an initiative that is then carried forward by community groups and institutions. The experience gained suggests that encouraging individuals to actively participate in community-based institutions is a key to success and sustainability of development interventions[2].

This paper analyses how the community organizations that were formed under the V&A pilot programme have enhanced adaptive capacity by coordinating action between the community members and by facilitating interaction between the communities and external actors.

Key examples of how local community institutions can enhance adaptive capacity of communities by structuring internal interaction are:

[2] For further details on the WOTR approach, see www.wotr.org.

Local community institutions:

- facilitate common property regimes and determine the distribution of common resources;
- help groups coordinate action and organize joint efforts;
- support exchange of information and knowledge around risks posed by climate variability and change to livelihood resources;
- facilitate pooling of resources and mutual insurance; and
- help resolve conflicts, e.g. over the distribution of scarce resources or other issues.

Important aspects of how local community institutions facilitate or enable interaction between the communities and external actors in the context of reducing vulnerability include:

Local community organizations:

- shape access of communities to information that may be relevant for climate change adaptation;
- help communities to tap financial resources from government allocations;
- facilitate community initiatives to voice their interests and influence political decisions at local or higher levels of government.

The following section will briefly present the local community institutions that were formed under the V&A pilot programme and illustrate how they are structured and how they operate. Subsequently, Chapter 4 will analyze, along the structure outlined above, through which functions they have helped to enhance adaptive capacity of the communities.

4. Local community institutions formed under the V&A pilot programme

4.1 Water user group

A number of interventions were made under the V&A pilot programme pertaining to enhanced availability and distribution efficiency of irrigation water, including the restoration of tanks in Andhra Pradesh, upgrading of a harren system of irrigation channels, and the installation of a water bank for efficient irrigation of upland fields in Rajasthan. In economic terms, these interventions have generated / revitalized common property resources. In case of the harren system, for example, water distributed through the harren channels has features of a common property resource in the sense that no individual land holder in the command area of the structure can be excluded from using the harren, but there is rivalry in consumption of the resource provided by the harren, i.e. irrigation water is scarce.

Many common property resources at local level are managed successfully under common property regimes, through arrangements among the local community or a defined user group for sustainable levels of consumption of the resource to prevent overuse and destruction in the long run (Ostrom, 1990). Of the irrigation water systems that were treated under the V&A pilot programme, two types, namely the harren system in Rajasthan and the tanks in Andhra Pradesh, are long-established systems which were traditionally managed through community-based regimes. The revitalization of these traditional community-based management structures was considered a core part of the interventions piloted under the V&A programme, with a view to strengthening the local capacities to deal with increasing stresses on water resources. In case of the newly installed water bank in Kundai, Udaipur district, Rajasthan, a community-based water user committee was also considered the most appropriate entity to oversee equitable water distribution among the community members. The following sections will illustrate in detail the traditional management structures of the harren system and the tanks and how they were revived, and the formation of a water user committee in Kundai.

4.1.1 Harren user group

The harren system is a traditional irrigation structure in semi-arid areas in Rajasthan. It is a system of open diversion channels, which distribute water from a water storage area to lower lying fields by gravity flow.

In **Amda** (see map in introduction document, Figure 2), one of the two existing harren systems was upgraded in 2007 under the V&A pilot programme through cement lining of the earthen channels (Figure 3). As a result of the intervention, the water distribution efficiency could be enhanced significantly with lower seepage losses, increased water flow velocity and ultimately an extension of irrigated area. In addition, the time needed for maintenance of the harren was considerably reduced.

The group of beneficiaries of the Bhutiya harren comprises 41 farmers. Before the intervention, there was no formal harren user group, but a traditional management system was in place with strong informal arrangements among the users. Every year the group of beneficiaries would hold a meeting at the end of September, shortly before harvesting of the kharif crops, to discuss the required renovation and maintenance works, like repair of bunds and cleaning of the channels from sedimentation. The work was organized and carried out jointly by the group. Water distribution was overseen by a small number of senior community members.

Figure 3: The harren in Amda, Udaipur district, Rajasthan, before and after cement lining.

One element of the V&A pilot intervention on the harren was a reform of the management and maintenance system. An institution building process was initiated in 2006 among all 41 harren users in order to establish formal arrangements for sustainable management and equitable water distribution. In December 2008, training on various issues around water management and irrigation was organized for the harren user group, in which 12 community members participated, all of which were male (Figure 4).

Figure 4: Participatory planning of intervention in Amda village, Udaipur district, Rajasthan.

Through the lining of the harren, the annual cleaning and maintenance works required to keep the harren in operation have become much easier. They can now be undertaken by a single person and do not require a joint effort. The scope of responsibilities of the harren user group has therefore shifted to management and water distribution as priority issues. The principle of equitable water distribution as per unit of land has been reinforced by the user group. In addition, the group has come to the joint agreement that each farmer can start irrigating his/her land by the time the respective section of the

harren is cleaned and ready for operation. In addition, it was agreed that priority rights for irrigation will be granted to farmers whose crops are at a critical stage.

No conflicts over water distribution or maintenance have occurred among the harren user group ever since the upgrading. There has been one year (2007) in the period of monitoring when rainfall was considerably below average, which has not led to any tensions over water distribution. However, a valid conclusion with regard to the capacity of the harren user group to enforce rules of water distribution and resolve conflicts can only be drawn once the community has faced a year of serious water shortage.

4.1.2 Tank Management Committees

In many semi-arid areas in South India tanks are an important traditional system of harvesting rainwater runoff and storing it for multiple purposes. Tanks used to sustain various rural livelihood activities, like agriculture, fisheries and livestock rearing. Traditionally, community-based institutions took an active role in the management of the tanks. They ensured adequate maintenance, oversaw the distribution of the tank water, and provided a forum for all stakeholders to express their interests with regard to the tanks (Narsimah Reddy and Murali, 2006).

Until the late 1990s, the government allocated only very limited funds for tank operation and maintenance, and there was little support for the community-based tank management institutions. The importance of tanks as irrigation sources declined drastically over the last decades, in particular in the course of the rapid spread of private ground water irrigation systems. One implication of this transition was the disintegration of the traditional institutions for tank management and maintenance.

Of late, however, it has become apparent that the current levels of groundwater use are unsustainable in many areas, and that revitalization of the existing tanks can help in decreasing pressures on the limited groundwater resources. At the same time, it has been widely recognized that operation and maintenance of minor irrigation tanks will be efficient only in the hands of the primary stakeholders. The Andhra Pradesh Farmer Management of Irrigation Systems Act (1997) accordingly has a frame for the creation of Water Users Associations (WUA) to manage village tanks of a command area of more than 100 acres. Some of the activities that can be taken up by these WUAs include facilitating silt removal from the tank beds for application on dry land fields, treatment of catchment areas and command areas, etc. WUAs can also source government funds for the renovation of up to two tanks per village, and for increasing the capacity of up to four tanks. In Srirangapur, a WUA was set up under the APFMIS Act. However, at the time of the V&A baseline survey in 2005, this WUA was not active. There were also no traditional tank management structures in place in Kothur and Srirangapur.

The revitalization of community-based management structures for the tanks was considered a core part of the tank restoration intervention under the V&A pilot programme. It was seen as an important element of strengthening the local capacities to deal with the increasing stresses on water resources in the light of climate variability and change.

With the initiation of the tank renovation works in 2007, committees for water management were formed as sub-committees under the Smart Farmers Clubs (SFCs). In both **Kothur and Srirangapur** (see map in introduction document, Figure 1), water user groups for each of the treated tanks are now in place, with a membership of around 5 farmers who own land in the command areas of the tanks. The groups do not hold frequent meetings, but rather come together on specific occasions to discuss issues pertaining to tank and water management. Usually the groups meet once at the onset of the Kharif season.

In Srirangapur, one important decision taken by a water management committee was to avoid additional borewells in a half-kilometer periphery around the tank and rather optimize the use of water available in the tank and from the existing borewells for irrigation. The groups have also met whenever the communities faced situations of water scarcity due to less than normal rainfall to discuss how the tank water should be best utilized.

4.1.3 Water user committee for water bank in Kundai

In Darjia Talai hamlet of **Kundai** village (see map in introduction document, Figure 2) an improved irrigation system in the form of a water bank was introduced to bring a higher share of the cultivable land of the community of 12 tribal small and marginal households under irrigation. Only one open dug well exists in Darjia Talai to meet the irrigation and drinking water requirements of the community**.** The physical interventions included the renovation and upgrading of the open dug well which is situated at a low-lying point in the valley, the installation of two water reservoirs, one of them on top of a small hill to enable irrigation of elevated fields through gravity flow, and a system of pipes.

To ensure adequate management of the water distribution and maintenance of the infrastructure, a water user committee was formed. Twenty community members (8 female, 12 male) participated in training on Water Bank Management in October 2008, organized by the local V&A partners.

Ever since the installation of the water bank and the improvement of water availability, no tensions in relation to water issues have occurred among the community. The farmers reported that earlier conflicts used to come up occasionally over water use and water distribution across the households, and external mediators had to be called to resolve the conflicts. However, the effectiveness of the new management system and the work of the water user committee can only be validated once the community has faced a situation of water scarcity.

4.2 Management committee for a village pasture

Another intervention on a common property resource under the V&A pilot programme was the development of a common pasture site in **Kundai** in Udaipur district, Rajasthan. Pastures are exemplary of common pool resources, which tend to suffer from overuse when kept under open access in absence of appropriate common property regimes (e.g. Runge, 1981). However, Rajasthan has a long history of well-designed management systems for pasturelands, which have emerged in light of the key role that livestock plays in people's livelihoods and for the local economy. Before independence, community pasture land management in Rajasthan was entrusted to '*thikandedars*' or 'caretakers', appointed by the Princely States, who were responsible for ensuring the productivity of the pastures. To this end, they adopted soil and water conservation measures, facilitated the growth of vegetation, and controlled livestock rearing. The caretakers were also responsible for preventing misuse and encroachment by individual villagers (Hedge et al., 2003). After independence, with the transfer of power from the Princely States to the State Government of Rajasthan, the management of village community pastures was handed over to the village Gram Panchayats. Lack of resources and accountability on the part of the Gram Panchayats resulted in large-scale mismanagement of common lands in many places. Only very few communities took autonomous initiatives to develop their common pastures. Overgrazing and excessive cutting of bushes and trees for fodder and fuel are widespread, which in turn facilitates soil erosion, leaving large areas of common pastures in poor conditions.

Figure 5: Treatment of community pastureland in Kundai, Udaipur district, Rajasthan

The development of the highly degraded *Sand Magra* common pasture site was initiated under the V&A pilot programme in 2007 (Figure 5). Considerable efforts by the local NGO partners were needed for community mobilisation, as the villagers had been highly discouraged by the experiences with an earlier initiative for the development of a village pasture under a State Government Watershed Development Programme, where community ownership of the programme activities had been strongly neglected. However, the local NGO partner placed a lot of emphasis on a clear commitment from the community for the common land intervention. After encroachments on the common land by a few households had been vacated, the land was protected from free grazing through continuous trenches along the borders and plantation of Jatropha saplings. Physical works were taken up for soil and water conservation on the hillside pastureland, which showed good results in terms of regeneration of vegetation after some months.

Drawing upon long-standing experience with common pasture development in the area, it was decided that the responsibility for sustainable management of the pasture should be entrusted to a community-based committee. A village level committee of 12 active villagers was constituted accordingly for the management and maintenance of the *Sand Magra* common pastureland. So far, the main decision taken by the committee was that the vegetation should be left untouched for sufficient regeneration for one full year before the first fodder harvesting should be undertaken. The advise was readily accepted by the community.

Other experiences with common pasture land development in Udaipur district have shown that community-based institutions set up for the management of village pastures have developed the capacities to take judicious decisions with regard to the protection and maintenance of the common resources (e.g. Hedge and Sharma, 2003).

4.3 Smart Farmers Clubs

Another core institutional element of the V&A pilot programme activities at the local level was the formation of Smart Farmers Clubs (SFCs) in each of the 4 programme villages. The idea of setting up SFCs emerged from the recognition that farming communities are at the front lines of observing climate variability and change and how they impact agricultural production. Farmers' adaptive capacity will depend on their ability to translate these observations into action, to draw from their experiences to inform future actions, and to take up continuous 'learning by doing'. In order to facilitate this process of autonomous adaptation, the SFCs were intended as dynamic community-based institutions with the following functions:

- to provide a platform for exchange of knowledge and experiences around hydro-meteorological patterns and how they determine agricultural production, options for farming inputs and practices, including innovative practices promoted under the V&A pilot programme like the System of Rice Intensification (SRI), and any other concerns pertaining to agricultural management;

- to take an active role in the implementation of the various farm related interventions under the V&A pilot programme; and
- ultimately, to identify adaptation strategies that are needed and suitable to the local conditions, and initiate and coordinate appropriate actions by the farming community.

An institution building process was initiated accordingly in all villages under the V&A pilot programme. While mobilization for membership in the SFCs was addressed to the entire communities, the formation of Executive Committees (EC) was encouraged, which would consist of a group of approx. 20 progressive farmers who would hold regular meetings and initiate action. Membership in the ECs was not intended to be representative of the farming community. Rather, it was intended to create vibrant committees of particularly pro-active farmers who were ready to absorb new knowledge and experiment with innovative practices. It was envisaged that activities piloted by a group of farmers in the village could help to spark innovative thinking and the willingness to take up new practices among a wider group of farmers.

In the villages selected for implementation of the V&A pilot programme in Mahabubnagar district, Andhra Pradesh, SFCs were formed in 2006. In both villages, the large majority of farmers of the communities joined the SFC as regular members. The SFC of Kothur is led by an EC of 21 members (7 female, 15 male). In Srirangapur, the EC consists of 20 members (5 female, 15 male). In 2007, the SFCs of Kothur and Srirangapur were registered as societies under the Andhra Pradesh Societies Registration Act of 2001. Bank accounts were opened in the names of the SFCs and money transactions are in operation.

In both villages, the Executive Committees of the SFCs hold monthly meetings. Topics discussed include for example:

- application of fertilizers and pesticides: advantages of organic fertilizers and pesticides, like neem extracts (reduced costs in comparison to agro-chemicals, lower impact on plant growth in the short term, but higher yields in the long term);
- groundwater scarcity and irrigation requirements in periods of low rainfall;
- issues around seeds: the poor quality of available seeds, options for seed treatments;
- village-level weather data (temperatures, relative humidity, wind speed and rainfall) from the agro-meteorological labs installed under the V&A pilot programme and recorded by local weather managers who were trained to interpret the data to inform farm decision-making;
- pooling of money and joint purchasing of inputs (money to be collected from all farmers, 2 farmers to be appointed to buy seeds and fertilizers from the Department of Agriculture; the group can save considerable time and travel cost if farmers do not have to go and buy inputs individually; the 'delegates' are to be compensated for their efforts).

In 2008, the EC of the Kothur SFC took the initiative to write a letter of complaint to a key functionary in the Department of Agriculture, when the department failed to provide seeds in due time for sowing. The Department reacted and provided the seeds promptly. This experience gave the farmers a strong sense of achievement and empowerment through joint action. They also realized that the formal structures had made their community organization more powerful in interactions with outside actors like

government functionaries.

In addition, EC members of the SFCs of Kothur and Srirangapur are in regular contact with agriculture experts from Acharya NG Ranga Agriculture University in Hyderabad (ANGRAU), who provide on-the spot advice on best farming options under different weather conditions.

In the villages selected for implementation of the V&A pilot programme in Udaipur district, SFCs were formed in 2008 with similar structures like in Andhra Pradesh. The Executive Committees held meetings on a less regular basis, and the organizations have not been registered as societies but remained informal institutions, with no execution of money transactions. Topics discussed in the meetings are broadly along the same lines like in the case of the SFCs in Andhra Pradesh, but the institutions have been less pro-active. Only recently have participants in SFC meetings expressed a growing interest and discussed possibilities of broadening the scope of their activities to overall village development.

In the course of the V&A pilot programme implementation it was established that overall, the SFCs had a potential to emerge as vibrant community organizations that help farmers to coordinate action, vocalize joint interests in front of government agencies, and function as a forum for knowledge sharing. It was however noted that the SFCs required further strengthening so that they could remain active beyond the closure of the programme. It was also realized that there was a lack of linkages and collaboration between SFCs and the local government institutions. The SFCs had not established any basis on which they could take action for adaptation through the government system, or tap government funds for adaptation activities.

5. Convergence between community organizations and local government institutions

Convergence and alignment between Panchayats and community groups has been widely recognized as an eminent strategy for local level development action. Linkages have been established, e.g., between SHGs and Gram Panchayats for credit, income generating activities and for health related issues. Gram Panchayats and farmer groups are being linked for agricultural services like loans, input supply, etc.

It has also been realized that in many cases where community organizations were formed for a project specific purpose, often for enhancing community participation in the project activities, these organizations gain a lot of vibrancy and visibility during the project period, but find it difficult to sustain the same level of interest and vibrancy once the project is over. Hence, building linkages with the Gram Panchayats and other government agencies are often considered a prudent strategy to ensure post project sustainability of the institutions.

Under the V&A pilot programme, as indicated above, similar thinking was underlying the initiative to strengthen collaboration between SFCs and Gram Panchayats. In particular, the idea to set up an "adaptation fund" in each village was discussed among the programme implementing partners and the communities, to be overseen by the Gram Panchayats of each village, and with the SFCs taking an active role in identifying adaptation needs and tapping the fund for appropriate action. This local level **adaptation fund** was intended to equip the communities with resources to take the activities tested under the V&A pilot programme forward, including for the maintenance of adaptation specific resources set up under the V&A programme. In addition, the adaptation fund was seen as a resource to enable communities to take autonomous action for adaptation after the closure of the programme, like e.g. the creation of a seed bank or land rehabilitation measures. In the programme villages in Andhra Pradesh, the formal institutional arrangements for establishment of this resource were in process at the time of the finalization of this case study.

Various initiatives were undertaken by the communities and the local V&A programme partners for creating links between the community-based SFCs and the local government institutions. The idea of the adaptation fund was presented to key government functionaries at village, block and district level. However, it emerged as a major challenge, particularly in Udaipur district in Rajasthan, to raise interest for this initiative among the local governments given the plethora of projects and programmes the Panchayati Raj institutions are responsible for and the persistence of hierarchical decision making processes in many states (see details on respective efforts and outcomes in Udaipur district in Rajasthan in Box 3).

Box 3: Initiatives towards linking up V&A pilot programme activities with the local government institutions in Udaipur district, Rajasthan

In the villages selected for implementation of the V&A pilot programme in Udaipur district, Rajasthan, the programme partners took many initiatives in both villages to introduce the issue to the Gram Panchayats, and suggest their involvement in the initiative of setting up an adaptation fund, including written requests. However, even Gram Panchayat members who had attended SFC meetings or were members of the SFC Executive Committee, did not respond to the requests to look into options for collaboration between the two institutions.

When the local V&A programme partners approached the block development officer (BDO) of Jadhol

block, to which Amda belongs, with the proposal to integrate the V&A pilot activities with the local government institutions, he showed no interest in such an integration. He explained that resources in his agency were limited, and did not allow for assumption of any responsibility for the assets created under the V&A pilot programme. The proposed adaptation fund seemed to him rather like "a drop in the ocean" given the multitude of funds that he was overseeing. Another concern for him was that for any decision with regard to the adaptation fund, he would have to seek written approval from the Chief Executive Officer (CEO) of Zilla Parishad. The BDO considered it as the most viable option that the SFC should take full responsibility for the management of these assets and collect regular fees from members for this purpose.

A similar approach was taken to suggest collaboration on the adaptation fund to the Sarpanch of Dharavan Panchayat, under which Amda village falls. She indicated that she was fully aware of the V&A pilot programme. She also explained that she had responded to an earlier request from the SFC to support the mobilization of funds for cement lining of one of the harren systems in the village, and had taken the request forward to the block level functionaries. A harren system had been upgraded under the V&A programme, with good results in terms of increased irrigation water distribution efficiency and an expansion of area under harren irrigation. However, the Sarpanch explained that with regard to the proposed adaptation fund, she was unwilling to take any pro-active steps and would only react if a decision was made at a higher level.

A similar initiative to request support from the Gram Panchayat was taken in Kundai, but the same reaction was received from Gram Panchayat members. They explained that the management of the wide range of schemes and programmes kept them fully engaged and that they would perceive any responsibility for overseeing the adaptation fund as an additional burden.

It was decided that the next option that should be explored will be to directly approach the District Collector of Udaipur district to seek his support for building linkages between the SFC and local government institutions.

6. Conclusions

As regards the formation of water user groups for the harren system in Amda and the water bank in Kundai village, Udaipur district, Rajasthan, and the tanks in Mahabubnagar district, Andhra Pradesh, evidence so far supports the hypothesis that these community-based institutions have strengthened the local capacities to manage their resources in a sustainable way. The groups have set up regulations for the use of the water resources, and no conflicts over water distribution or maintenance of the structures have occurred among the user groups since the interventions. However, it remains to be validated whether the groups will manage to enforce the established common property regimes in the face of increasing stresses on water resources due to climate change.

The village level committee that was formed for the management of the protected and developed common pasture land in Kundai, Udaipur district, Rajasthan, has similarly taken first steps which indicate its capability to manage the pasture in a sustainable way. The effectiveness of the institution in ensuring long-term productivity of the pasture, however, will have to be established over a longer time horizon.

The primary function of the water user groups and the pasture management committee in terms of enhancing adaptive capacity is clearly their coordinating role for action by the community, or more precisely, the group of consumers of a common property resource. These institutions have helped the formulation or reconfirmation of common property regimes which determine the distribution of common resources among the groups. They will be in charge of the resolution of any conflicts arising over the distribution of scarce resources. So far, no evidence can be drawn from the V&A experience with regard to this function. However, as per reports by the communities, the traditional community-based committees that act as models for the newly formed institutions had remarkable capacities for governing the distribution of scarce resources and averting major conflicts in times of stress.

The second important objective of the formation of all community-based organizations under the V&A pilot programme was to strengthen communities' capacities to bring forward their common interests in decision-making processes with external actors involved. It was also intended to put communities in a better position to seek information on and leverage funding from existing government programmes and schemes for improving infrastructure around natural resources and agricultural activities. It is still to be validated whether this objective has been reached and whether the user groups and committees will really help communities to mobilize resources for improving and upgrading infrastructure for enhanced resilience against climate risks.

As regards the Smart Farmers Clubs (SFCs), a preliminary conclusion to be drawn is that formal committees of farmers have a great potential of enhancing the adaptive capacity of communities. They can provide a forum for exchange of knowledge and experiences, but also an entity that absorbs information e.g. on weather projections and on best farming practices, from outside sources as well as from local weather stations. Hence, they can facilitate the distribution of relevant information for farm decision making among the community and the up-taking of new farming techniques that are more adequate in the face of changed climatic conditions. They have helped the communities both to coordinate action internally, and to voice and enforce their interests with external actors.

However, it was established that for the SFCs to sustain after the closure of the programme and to extend their activities, they need to be linked to the local government institutions and line departments. Strong efforts towards this objective by the communities and the local V&A programme partners have encountered various challenges. It was concluded that more time and efforts will be needed to achieve a convergence between the SFC activities and the local government institutions.

Annexure -I

Operational guidelines on utilisation of Adaptation Fund at SFC level.

Methodology followed:

Group discussion with village Gram panchayat, Smart farmers club and community based organisation, interaction with the local NGO and internal discussions in the team

- Adaptation fund is made available to the village community through SFC
- Fund will be transferred to the SFC by ECO Club after detailed discussion with the village community in the general body meeting
- The gramasabha must be organized in the village and it must consist of village Sarpanch, members and mandal parishad member of the village
- Representatives from other village institutions like as milk dairy society and CBO s be invited
- The Gramasabha must agree for the management of fund in the village. Resolution has to be made and they must record in gram Panchayat resolution book and inviting the secretary of gramsabha to participate in the process
- SFC should have a proper memorandum of understanding with ECO Club to manage adaptation fund with appropriate norms
- Advisory group is formed to monitor the utilization of the adaptation fund
- This advisory group would meet once in three months and they will guide the SFCs for proper utilization of adaptation fund
- Grama Sarpanch and members of the gram Panchayat shall be consulted before the adaptation fund drawn from the bank and they inform all the villagers about the activities carried out by SFC in the village
- SFC is registered under society act and bank account in nationalized bank in their neighboring town and mandal for transfer of fund. This account will be jointly operated by president, secretary and treasurer
- SFC shall use fund for the specific purpose like maintenance of mini Agro metrological station, honorarium to weather manager, maintenance of village knowledge centre
- Management of seed bank, agricultural inputs like fertilizers, agricultural implements, in emergency situation like drought in the village
- Fund should not be used for the domestic purpose like festivals, cultural ceremony or any village infrastructure development such as construction of school building, anganvadi, roads etc
- SFC shall pass resolution which should be recorded in the minute's book and copy of the minutes needed to the attached to withdraw the amount from bank
- Eco Club will receive the quality work plan from SFC and discuss it in the advisory committee meeting for its appropriateness and approval. Based on the approval the fund can be disbursed by ECO Club to SFC for its utilization
- Eco Club would ensure that Funds will be utilized only for the purpose for which it is created

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