

8 **Features of Successful Syndrome Mitigation: Enhancing Resilience and Empowering the Vulnerable in East Africa**

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Abstract

This paper examines how knowledge-based interventions improve the quality of life in communities where they are implemented. It draws on case studies of three interventions implemented as Partnership Actions to Mitigate Syndromes (PAMS) within the Swiss National Centre of Competence in Research (NCCR) North-South programme. The case studies consist of a qualitative evaluation based on experience, knowledge and expertise gained through participants' observations, as well as relevant documents and reports. The concepts of 1) syndrome mitigation; 2) participation and empowerment; and 3) vulnerability and resilience are used as assessment indicators to demonstrate the levels of and differences in contributions by and among the respective interventions. The assessment reveals that although each of the three projects contributed to syndrome mitigation in its respective context, there are marked disparities in the level of individual achievement that are influenced by the nature of problems of unsustainability, technological requirements, and the implementation costs of the preferred intervention.

Keywords: Syndrome mitigation; participation; empowerment; vulnerability; resilience; East Africa.

8.1 Background

Syndromes are a combination of problems of unsustainability that occur in a given context (WBGU 1997). The Swiss National Centre of Competence in Research (NCCR) North-South supports societies in partner countries in their efforts to address syndromes in their regions and find strategies to mitigate them (Hurni et al 2004). The Partnership Actions to Mitigate Syndromes (PAMS) constitute one of the programme strategies designed to achieve this goal by making it possible to implement, test and validate research outcomes through short-term partnership actions involving researchers and the societies concerned. PAMS focus on problems of unsustainable development, as well as the potentials and societal processes that support sustainable development (Messerli et al 2007). Although PAMS are not designed as pure development projects, they constitute NCCR North-South development interventions in the areas where they are implemented.

PAMS are unique in their innovative, real-time knowledge-based approach combining research and development, but like with any development intervention the aim of PAMS is to help improve the quality of life among their target populations. Between 2003 and 2007, the NCCR North-South implemented five PAMS in East Africa focusing on 1) low-cost renewable fuel production on small-scale farms; 2) participatory urban planning and management; 3) community-based HIV/AIDS control through voluntary counselling and testing; 4) capacity development for local governance of common pool resources; and 5) river water resources management and conflict resolution, respectively. In addition, the NCCR North-South collaborated with associated programmes such as the Eastern and Southern Africa Partnership Programme (ESAPP) to implement other similar interventions in the region.

Using three interventions as a basis, this article examines whether the PAMS approach, through the respective interventions, made a measurable contribution to the goal of improving the quality of life in target communities. It discusses the assessment methodology and assessment indicators, and then describes the three case studies, examining how they helped to reduce problems of unsustainability. A comparative assessment of individual projects is then made with respect to their levels of contribution and possible explanatory factors. The article concludes by drawing four key lessons from the assessment process.

8.2 Approach and methodology

The present synthesis article uses *syndrome mitigation*, *participation and empowerment*, and *vulnerability and resilience* as assessment indicators to examine how the three interventions enhanced sustainability and improved the quality of life in the target communities. *Syndrome mitigation* is used because the PAMS were grounded in the basic assumption that sustainability problems occur in clusters and should be addressed with this in mind when mitigation approaches are sought (Messerli et al 2007). Secondly, *participation and empowerment* allow us to examine whether the interventions helped the communities to attain greater freedom for and extended their margins or spheres of action in negotiations and decision-making processes. Thirdly, *vulnerability and resilience* point to whether the interventions helped to improve livelihoods at household or community levels, not in terms of levels of income, but in terms of greater ability not only to cope with and adjust to adverse conditions but also to create sustainable options and responses that open new pathways for living with change (Obrist et al 2009).

Two PAMS projects focusing on local governance capacity for common pool resources and on river water resources management and conflict resolution, respectively, and a project by a NCCR North-South associate on wheat production in Kenya's semi-arid districts of Makueni and Machakos serve as case studies (see Figure 1). Their assessment is based on experience, knowledge and expertise gained through participants' observations during implementation, as well as available documents, including baseline survey reports. A matrix is used for comparative assessment with a view to detecting any differences in the level of success of the projects.

8.3 Conceptual considerations concerning assessment indicators

Syndrome mitigation consists of measures taken by individuals or institutions in one or more areas of intervention that help to reduce the effects of single or combinations of several core problems, thereby actually or potentially reducing negative impacts of global change and contributing to sustainable development (Hurni et al 2004).

Participation refers generally to the active involvement of the public or stakeholders concerned in decision-making and actions (Arnstein 1969; Connor

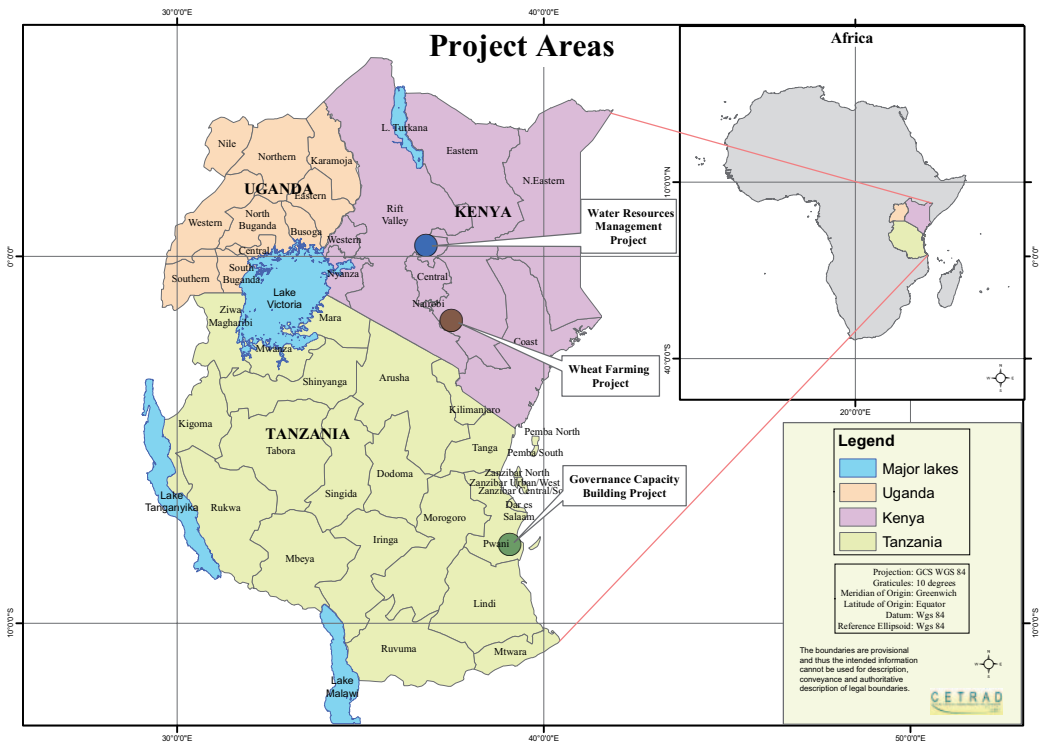


Fig. 1 Map showing the project areas of the three Partnership Actions for Mitigating Syndromes (PAMS) examined in this study.

1988; Chambers 1989; Wiedemann and Femers 1993; Dorcey et al 1994; World Bank 1996). Participation can take different forms (Arnstein 1969; Collier 2002) and may involve different stakeholder groups at different levels depending on need (Collier 2002; Kiteme and Wiesmann 2008). If properly managed, a participatory process can promote sustainability by building on existing potentials and capacities, and by enhancing ownership and increasing commitment on the part of the stakeholders, among other things.

Empowerment as defined in different socio-cultural and political contexts (Cheater 1999) is more than simply opening up space for decision-making: It entails understanding the dynamics of oppression and internalised oppression, since these affect the ability of less powerful groups to participate in decision-making and influence the world around them (Mosse 1994). Empowerment should help vulnerable populations gain power to negotiate and build capacity for active involvement in decision-making and implementation.

In the social sciences, *resilience* refers to the ability of social actors not only to cope with and adjust to adverse conditions (reactive), but also to create sustainable options and responses (proactive) that open new pathways for living with change (Obrist et al 2009). *Vulnerability*, on the other hand, is the likelihood of being harmed by a given adverse event, and has an external side consisting of risks, shocks and stress to which individuals or households are subjected, and an internal defenceless side characterised by a lack of means to cope without a damaging loss (Chambers 1989). Both concepts have been linked with ‘sustainable livelihoods’ to underscore their interrelation with livelihood assets and the institutions that mediate access to these assets, which together shape the way in which people build ‘layers of resilience’ to cope with various disturbances (Glavovic et al 2003).

Syndrome mitigation, participation and empowerment can help to reduce vulnerability and enhance resilience. By learning from those who manage certain risks and hazards better, we can identify processes and principles of resilience-building that can be strengthened and applied through empowerment and participation.

8.4 Selected case studies

8.4.1 River water resources management and conflict resolution in the upper Ewaso Ng’iro North River Basin

Long-term studies in the upper Ewaso Ng’iro catchment revealed increased overuse of low-flow water for irrigation (Aeschbacher et al 2005; Liniger et al 2005; MacMillan and Liniger 2005; Notter et al 2007), leading to reduced dry-season flow and user conflicts (Wiesmann et al 2000; Kiteme and Gikonyo 2002; Notter 2003; Ehrensperger and Kiteme 2005; Kiteme 2006; Kiteme and Wiesmann 2008). Water users continue to take advantage of institutional weaknesses in law enforcement and manipulate individual abstraction works and control devices in order to maximise off-take during prolonged dry periods. This problem has persisted despite sustained corrective efforts by the government as well as water users’ associations, which have gained some legislative backing through recent water-sector reforms (GoK 2002; Liniger et al 2005).

These findings informed the decision to develop the technology of a self-regulating weir (SRW) and test its potential contribution to guaranteeing

secure low flow for downstream water users in the catchment. This was further justified through a feedback process between researchers and key stakeholders during a series of water awareness campaigns, as well as the desire expressed by the Burguret River Water Users' Association to strengthen its regulatory role pertaining to river water use in its area of jurisdiction.

An engineering firm was commissioned to design the project and provide technical supervisory support. Subsequently, the different stakeholder groups, including relevant government departments, large-scale commercial farmers, smallholder farmers, and local administration and leadership, were mobilised for necessary negotiations and implementation of the project. After approval and acceptance by all stakeholders was secured, construction work was carried out over about 18 months, at a total cost of around USD 40,000 (2004/2005 factor prices).

The preceding discussions underline that systems knowledge was critical to triggering and sustaining successful negotiation and implementation of the innovative idea of a SRW. The SRW abstracts only the flood flow and cannot be manipulated by the water user(s), thus guaranteeing a secure low flow for downstream users. To this extent, the device has the potential to effectively address the problem of over-abstraction of river water and related user conflicts. Availability of river water to downstream users during the dry season increases their spheres of action (in crop production) and enhances their livelihood systems, thereby increasing their layers of resilience to future threats. The inclusive negotiation process helped to create a sense of ownership and commitment among the different stakeholder groups – an important element in social sustainability.

The technology became popular with the government, and the Ministry of Water approved the device for replication in areas faced with similar problems. However, the prohibitive costs and the inability of stakeholders concerned to mobilise the required resources have hindered replication plans. This limits the overall potential of the technology to contribute to sustainable management of river water in the basin and elsewhere in the country.

8.4.2 Wheat production for improved food security in the semi-arid districts of Makueni and Machakos in Kenya

A NCCR North-South study revealed that despite high rainfall variability and recurrent droughts, maize remains the dominant crop in the semi-arid

districts of Makueni and Machakos in Kenya. It is grown by all households and accounts for about 82% of the area under crop production. The reason for this is that maize doubles as a subsistence crop and a commercial crop. However, this practice constrains crop diversification as a strategy to minimise risks of crop failure associated with moisture stress (Ifejika Speranza 2006; Ifejika Speranza et al 2007). Despite the availability of alternative crops, such as the recently developed wheat varieties (*Duma* and *Njoro 1*) that were recommended for smallholder production in areas like the one examined in the above-mentioned study, uptake was hindered by a lack of seed to supply to the farmers. Based on these findings, the “Smallholder Wheat Production in Arid and Semi-arid Lands” project was developed to promote wheat farming in the semi-arid districts of Kenya through community-based seed bulking and distribution in selected areas of Makueni and Machakos districts.

Before seed bulking, selected farmers and the facilitating organisations were trained in the basics of wheat farming, harvesting and primary processing, as well as packaging and utilisation of wheat and wheat products. The training benefited over 160 farmers drawn from 13 villages in the two test areas. The facilitating community-based organisations (CBOs) were provided with 50 kg of wheat seed and basic farm inputs for initial multiplication. After the first season, the seed generated by the CBOs was distributed to 100 farmers for further multiplication. In the two subsequent seasons, enough seed was accumulated to supply over 600 farmers, increasing the initial area under production from about 6.5 acres to over 600 acres in 13 villages.

This intervention was based on knowledge derived from research that helped to understand the agronomic and socio-economic factors contributing to food insecurity in the areas concerned. This knowledge informed the design of targeted campaigns for crop diversification and suitable alternative crop varieties that meet farmers’ subsistence and commercial expectations, on the one hand, and are adapted to ecological conditions in the test areas, on the other hand. Compared with maize, the two wheat varieties *Duma* and *Njoro 1* have higher yields, fetch better prices, require less moisture and mature early, thus guaranteeing successful harvests and improved income. This broadened the spheres of action for smallholder farmers and provided them with an additional layer of resilience, greatly influencing uptake and the success of the innovation.

The intervention has a high degree of replicability, as already evidenced by the rapid increase in the number of farmers growing wheat after the initial

seed-bulking process. Due to its availability from CBOs and participating farmers, wheat seed became affordable even for poor farmers. This was a boost to upscaling efforts, as more farmers went into wheat farming beyond the initial test areas.

8.4.3 Local governance capacity development for common pool resources in the Rufiji floodplain, Tanzania

The Rufiji floodplain has very high biodiversity and provides a livelihood for more than 150,000 people. However, it is threatened by unsustainable exploitation of its natural resources by a rapidly growing population, and due to poor management and inadequate resource governance capacity at the local level (Durand 2003; Milledge and Kaale 2005). Initial field campaigns by the NCCR North-South research team identified this as a critical area of ecological unsustainability, and a PAMS project was then designed to address this. The project aimed to improve the capacity for local governance in order to enhance ownership and control of natural resources, increase the technical ability to manage physical production sustainably, and augment financial returns from common pool resources (Mottier 2005).

The project built on five years of pre-investments by the IUCN, through the Rufiji Environment Management Programme, and involved communities in seven villages in Ngumburuni Forest and three villages on Lake Zumbi, as well as IUCN Tanzania, the Rufiji District Council, specialists, and local leaders and administration. A NCCR North-South research team provided backstopping for the process. This case study focuses on interventions in Ngumburuni Forest.

Before the PAMS was launched, a stakeholders' workshop was organised in order to create awareness and analyse the situation. The project was endorsed during this workshop, and a work programme was agreed upon. The awareness campaigns aimed to educate stakeholders with regard to the status, threats and consequences of prevailing user practices, as well as potential pathways for addressing the problems observed. An integrated campaign team was formed and appropriate dissemination materials were developed to support the campaigns. A series of workshops and other events, such as screening of environmental management documentaries, role-playing and concerts, were held. Moreover, an award scheme was set up to promote active involvement by the participating villages and collaboration among local organisations. The capacity-building process involved a series of train-

ing and educational events at different levels. Two grassroots institutions (the Village Environment Management Committees and the Village Natural Resources Scouts Committees) were formed and used as entry points for capacity-building interventions. Key areas of focus included legislative and policy instruments governing natural resource management, good governance, drafting of by-laws, preparation of Village Environment Management Plans, and participatory approaches to natural resource governance, among other things.

The main outcomes of the capacity-building process and resultant institutions were the following: 1) Village Environment Management Plans for the seven villages were formulated and implemented, with the respective by-laws providing the principal instruments for enforcement; 2) the communities negotiated and gazetted boundaries for the Ngumburuni Forest Reserve (see Tanzania's Forest Act [URT 2002]); and 3) management responsibilities were transferred to the Village Natural Resources Scouts Committees.

This intervention built on pre-investments made by the IUCN in Rufiji and derived its integrative approach from knowledge innovation in NCCR North-South research (Meroka 2006). This approach led to success in empowering the communities and enhancing stakeholder participation. And although it may take more time for impacts on biodiversity conservation to manifest, a monitoring and evaluation workshop at the end of the project (i.e. after two years) reported remarkable reduction of the main threats to the Ngumburuni Forest Reserve as a result of increased surveillance by forest scouts.

The training process, together with the new governance institutions, empowered the local communities to participate actively in the management of the forest reserve, particularly in negotiating and delineating forest boundaries, setting revenue targets and making investment plans, and defining incentive and disincentive measures to curb misuse. The project interventions did not, however, create immediate resilience-building elements, especially at the household level. This can be justified by the fact that it was not one of the initial project objectives to do so. Still, it is expected that the intervention's contribution to resilience-building will become evident in the medium to long term, when degraded ecosystems services are restored and assume their optimal functions.

8.5 Comparative assessment

This section presents a comparative assessment of the three selected projects to highlight their levels of success and provide explanations for similarities and differences. The results are presented in a matrix (Table 1): the project focus and the nature of knowledge innovation, as well as the key elements of preferred interventions, are summarised in the first column; the level of the contributions made by each project, based on four assessment indicators, is summarised in the other columns, ranging from strong (+++) to medium (++) and weak (+).

The comparative assessment reveals that all three pilot projects were based on knowledge innovation that made targeting easy and effective. Each project contributed significantly at different levels to mitigating (a) problem(s) of unsustainability. There follows a brief discussion of the factors that explain these differences, based on the four assessment indicators.

Potential for syndrome mitigation: Although all three interventions have the potential to address problem(s) of unsustainability, the SRW is considerably limited because it is only effective if the technology is adapted for a majority of water abstractions in the catchment. Wheat production has the greatest potential because the technology is easily adopted and the direct benefits to the participating households motivate widespread application. The Rufiji intervention also has potential, provided that adequate awareness creation and training are conducted and appropriate grassroots institutions are created and legitimately embedded in existing structures.

Participation and empowerment: The SRW contributed little to participation and empowerment compared to the other two projects because the technological preconditions of the project limited the extent to which some stakeholder groups, especially poor and semi-literate smallholder farmers, were able to participate in making key decisions or in influencing the implementation process.

Resilience and vulnerability: None of the three projects revealed a strong impact on building resilience and reducing vulnerability. This situation can be explained by the fact that each of these interventions is subject to a multitude of preconditions for optimal performance. The contributions of both the wheat production and the local governance capacity development projects were moderate because the success of the former was also subject to a given

Table 1

	Syndrome mitigation	Participation and empowerment	Vulnerability and resilience	Replicability
<p>1. River water resources management and conflict resolution in the upper Ewaso Ng'iro North River Basin</p> <p><i>Knowledge innovation:</i> Long-term hydrological monitoring (declining dry-season flows) and socio-economic studies (increasing water abstractions for irrigation)</p> <p><i>Intervention:</i> Installation of self-regulating flood flow abstraction device</p>	++	++	+	+
<p>2. Wheat production for improved food security in semi-arid districts of eastern Kenya</p> <p><i>Knowledge innovation:</i> Agronomic and socio-economic factors contributing to food insecurity; dominance of maize in agro-ecologically marginal areas</p> <p><i>Intervention:</i> Community-based seed bulking and smallholder wheat farming</p>	+++	+++	++	+++
<p>3. Local governance capacity development for common pool resources (CPRs) in the Rufiji floodplain</p> <p><i>Knowledge innovation:</i> Stakeholder analysis in traditional and modern institutional arrangements for management of CPRs</p> <p><i>Intervention:</i> Capacity development through training, awareness creation and formation of grassroots institutions and support instruments</p>	+++	++	++	++

level of rainfall, while the latter required more time for impacts on livelihoods to manifest. By contrast, the SRW was assessed as weak because it broadened spheres of action only for a small segment of the local population. The limited scale of application of this technology downstream limits its potential to help reduce vulnerability and enhance resilience at household and community levels.

Replicability: The high costs of installing the SRW in terms of technical expertise and inputs make this technology unfeasible for individual smallholder water users; hence it has very limited replicability. Although dupli-

Summarised results of the comparative assessment of the three projects.

cation of the grassroots structures for local governance of common pool resources elsewhere is possible, the potential is curtailed by the costs of providing the required professional expertise for the training process. In this sense, these two interventions were assessed as having made weak and moderate contributions, respectively. On the other hand, the wheat production intervention was rapidly adopted due to its technological simplicity and comparatively low costs of implementation.

8.6 Conclusion

The three projects followed different paths of intervention depending on the nature of the problem(s) of unsustainability on which they focused. The river water resources management and conflict resolution project installed a self-regulating device to regulate water abstraction and guarantee a secure low flow for downstream users. The wheat production project focused on community-based seed bulking to promote smallholder wheat farming in semi-arid areas, while the project concerned with capacity development for common pool resources emphasised training, awareness creation, formation of grassroots institutions and support for legislative instruments. Overall, the wheat and governance capacity development projects performed better than the SRW project. Compared to the other two projects, the SRW project was limited by its technological preconditions and high cost of implementation. Therefore, the extent to which a given type of intervention will succeed in addressing problem(s) of unsustainability and contributing to the overall quality of life of beneficiaries is greatly influenced by its technological requirements, implementation costs, and level of integration in existing institutional structures. Based on the results of the comparative assessment and these conclusions, we derive the following key lessons:

Integrative knowledge matters: Knowledge innovation, i.e. the approach of combining research and development interventions, helps to design more effective interventions.

Grassroots structures are indispensable: Appropriate grassroots institutional structures and support instruments are necessary to promote legitimate and effective stakeholder participation and empowerment.

Costs and technologies are a very sensitive issue: Technological complexity or simplicity and project implementation costs play an important role in

hindering or promoting the rate of adoption and replicability of any given innovation.

Short-term stand-alone interventions are shaky: PAMS and associated projects are pilot actions, and their 12–24-month timeframe for implementation is not adequate to trigger and sustain the social processes associated with vulnerability and resilience. However, this can be effectively addressed if interventions are embedded in existing structures or ongoing long-term interventions.

Endnotes

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