Disaster Risk Management as an Integrated Tool for Sustainable Ressource Management in Rural Areas – Experiences from Peru

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Abstract: The countries of Latin America and the Caribbean often suffer under the devastation caused by hurricanes, floods, earthquakes, droughts, landslides and volcanic eruptions. In the last ten years, natural disasters killed more than 45,000 people, affected 40 million people and caused over 20 billion US$ in direct damages. With a few notable exceptions, the region has not implemented sustainable strategies that reflect an understanding of its vulnerabilities and that identify actions to overcome them. A detailed analysis of what transforms a natural event into a human and economical disaster reveals that this is closely related to the measures of a regions development approach. Especially in rural areas and drylands threatened by desertification and soil degradation, the vulnerability to natural disasters and risks are increased by the lack of a sustainable natural ressource management that considers the complexity of demographical, economical, ecological, political and cultural factors. Disaster risk management as an integrated instrument for regional and national development strategies has to analyze these factors as well as to focus on the special needs of the rural poor and the collaboration with administration and organisations at different political levels. By explaining the experiences from rural development activities in Peru, it can be illustrated, that development cooperation must contribute to offer instruments and methodologies tested sucessfully on the local or regional level to transfer them into a wider national context.

1 Poverty, environmental degradation and natural disasters in rural areas

Disaster risk management is a growing challenge for mankind. During the past decade, the disaster aspect has only marginally been considered by sustainable ressource management. As single events, although very important where they occur, disasters did not play an important role in the concepts and strategies of sustainable ressource management.

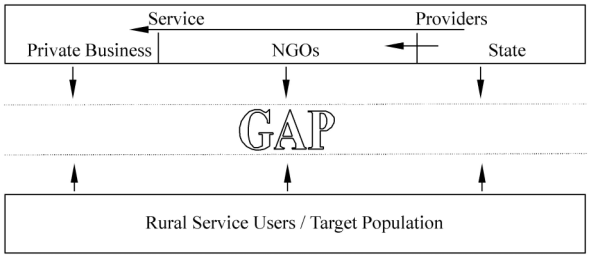
Disasters are shown to disrupt a continuous development process significantly. In many circumstances this inhibits the population of a whole region to defeat poverty and reach a sustainable development part.

In the past, poverty was seen and treated as income poverty and disasters were regarded as extreme events caused by natural forces (cf. Yodmani, p.3). Environmental degradation due to natural factors like droughts and floods and human factors like deficient land management exacerbated the situation. Disaster prevention strategies consisted mainly of top down approaches leaving the rural population with an ever increasing gap between themselves and the service system on local and regional level, which makes development disparities difficult to bridge (see Fig. 1).

Non-existent land management guidelines and in some cases the ignorance of existing ones, the super positioning of activities and little inter-institutional coordination have worsened the situation in many rural areas.

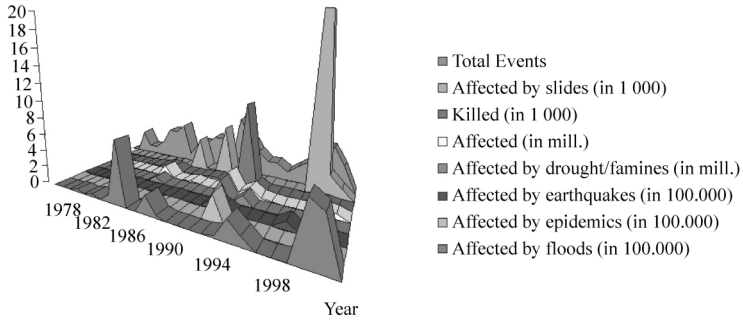
This has not only resulted in serious land degradation problems, but natural events such as earthquakes and floods - particularly in the Andean mountain range and the coastal plains - also cause severe damage to people’s livelihoods. At the same time the severity, but not necessarily the frequency of

these natural events has increased considerably over the last couple of decades as the country example Peru shows in Fig. 2.



Source: Rauch *et al.*, p. 15

Fig. 1 The gap between the rural poor and the service system



Source: OFDA/CRED International Disaster Database - own calculations

Fig. 2 Selected events and killed/affected population in Peru 1975—2000

This has made it obvious that a link between the negative impacts of disasters and the vulnerability of the rural poor exists, where the majority of the population depends on subsistence agriculture which itself tends to deteriorate the problem since small farmers there have neither the means nor the incentive to make investments in proper land and water management methods. By degrading formerly productive farm and pastoral lands, desertification creates and accelerates a downward spiral of poverty and rural-out migration because arid and semi-arid regions are no longer able to sustain crops or other vegetation (cf. Moody). In this context desertification can be considered as a "silent" and "creeping" disaster which according to its magnitude is a global threat to mankind, i.e. worldwide more than 3,600,000,000 hectars of dryland are threatened by desertification.

In recent years, hence poverty has been analyzed in terms of human poverty indicators, like the lack of access to ressources necessary to sustain basic human capabilities (cf. Yodmani, p.3). The focus has consequently been shifted from relief to disaster prevention management strategies. The failures of previous development policies became apparent i.e. the lack of crisis prevention schemes that include the increasingly severe impacts of natural events.

According to the recent state of the art, disaster risk management has three components:

- Hazard assessment
- Vulnerability analysis and
- Improvement of management capacities

Risk in this context is considered as the product of hazard and vulnerability divided by recovery capacity (Risk = Hazard x Vulnerability/Recovery Capacity) (cf. Pohl, p. 7). That means that risk can be diminished by the capacity of the population to recover from this adverse incidence.

In the case of floods and earthquakes, the risk implied can be defined rather clearly. The analysis of slowly advancing hazards like desertification is much more complex which implies that implementing risk management strategies is not an easy task. In summary, the most important factors which determine disaster risk are:

- Demographical factors: population increase, population distribution, etc.
- Economical factors: agricultural production, poverty parameters, etc.
- Ecological factors: erosion, watermanagement, climate, deforestation etc.
- Political factors: political instability, dezentralization, etc.
- Cultural factors: weakening of traditional safety networks, etc.

The following examples of Peruvian-German cooperation activities may illustrate how to integrate the variety of these factors in sustainable rural development approaches.

2 The challenge of disaster risk management: experiences from peru

For different reasons, the population of Peru is very vulnerable to natural disasters and risks. In addition to single events, natural ressources management has to deal with soil degradation and desertification, the expansion of settlements and agriculture in traditional flood areas, poorly equipped and poorly coordinated disaster preparedness procedures, insufficient or inaccurate risk analyses and a lack of strategies and instruments for a sustainable rural development.

In the field of combating desertification, the vulnerabilities of the rural poor in Peru lie in the combination of factors within the natural ressources, socio-economic and political-institutional context, which are:

- The economical and demographical pressure to carry out agriculture on steep slopes
- Destructive “burning” of grass-, shrub- and forestland
- Extension of agricultural activities with erosive methods and crops
- Limited land use planning, no long term strategies
- Watershed approach often not applied
- Little concertation on local level and between sectors
- Convention to Combat Desertification (CCD) has been signed by the Peruvian government, but not implemented in the local context

In general the population of dry areas is extremely vulnerable to disasters due to the fact, that large areas of these zones suffer from the slow onset disaster of desertification.

To broadscale the implementation of the CCD in several Latinamerican countries and the Caribbean in a coherent and dezentralized manner, the “CCD-Initiative LAC” was founded. The approaches used in combating desertification can be located on two levels: The project or local/regional level and the national one. The aim is to bundle previous single activities in the field of natural ressource management, dryland managament and rural development projects as well as to create new synergies between other environmental conventions.

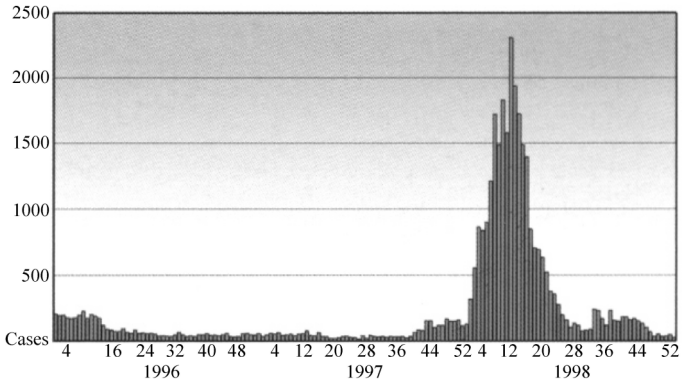
Another important challenge is the “Mainstreaming” of the CCD on the local/regional and the national level in Peru and other Latinamerican countries. This is realized through a wide cooperation between all partners involved in the development process. Experiences from connecting disaster risk management strategies with economical aspects of natural ressource management and innovative approaches in watershed management will be diffused through a participatory knowledge-management system into a network consisting of federal and private institutions, international donors and NGOs working on the national, regional or local level.

By broadscaling the CCD, it is posible to sensitize the rural population and the authorities in order to enable them to apply concrete measures for disaster prevention in the context of natural ressource management and desertification:

- Soil and water conservation measures
- Use of drout resistent crops
- Site spezific land use planning
- Dezentralization and organizational development on local level
- Participatory risk analysis

Experiences from Peru illustrate as well, that even when reliable and cost effective technologies are available for early warning, disaster prevention and mitigation, many governments lack an adequate institutional framework in which to apply them (cf. World Institute for Disaster Risk Management, p. 4).

Concerning El Niño and disaster risk management (cf. Schaef, p. 1), the climate-phenomenon is periodically causing tremendous hazards in the North of Peru: torrential rainfalls, floods, post - rainfall seed scarcity and s etc.. In the Piura region, the direct damages in the El Niño year 1998 were about 2.3 billion US$ and the destruction caused by flooding was so immense that the consequences will continue to show their influence for years to come. The effect of El Niño can also easily be seen in the disease incidents as with disproportionaly cases of Cholera (Fig. 3).



Source: OFDA/CRED International Disaster Database – own calculations

Fig. 3 Weekely evaluation of Cholera incidents in Peru (1996—1998)

Since 1999 a Peruvian-German cooperation project is trying to overcome the socio-economical and political-institutional vulnerability, which results in high social costs for the affected population, as well as high economic losses for the country on a macro-level.

The projects disaster risk management strategy is using a dual strategy:

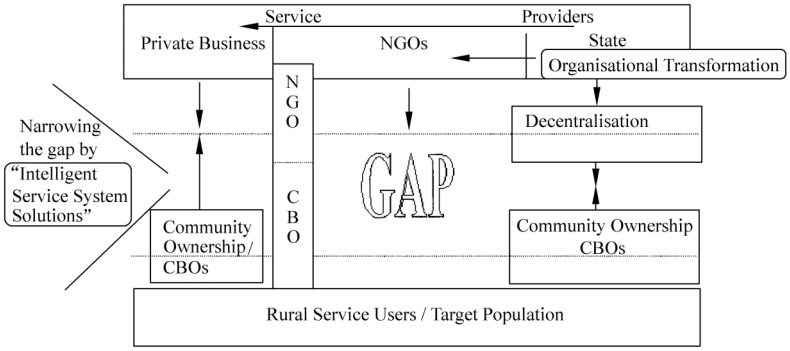
- Watershed management and flood protection measures (participatory risk analysis, adaptation of the agricultural sector, elaboration of a flood protection concept using a Geographical Information System - GIS) and
- Institutional capacity-building measures for disaster risk management (prevention plans for communities and the health and agricultural sector, setting up an early warning system and improving land use planning, training and organizational consultancy).

Before implementing measures in watershed management and flood protection in the catchment area, an integrated socio-economical analysis and risk zonation was conducted in two selected watersheds with the population and local actors. Building up on that, together with the relevant partners at the local, municipal and regional level (administrations and representatives of the state, NGOs and grassroots organisations), a prioritization of different measures have been realized in order to adopt the exisiting agro-silvo-pastoral production systems. The measures had to combine an increase of family income with the improvement of the soils and vegetations capacity to store water. This could be achieved by introducing adopted traditional and innovative cultivation techniques together with integrated finance solutions and advisory services on a broad level. Supported by the Universities of Piura and Braunschweig (Germany), a GIS was combined with computer based modelling software for watershed management to calculate and simulate various scenarios of disaster risk zones and land use management. The results of the simulations were discussed with the population and the partner organisations as a basline for planning an effective flood protection system.

Concerning the approach in capacity building for disaster risk management, the project advises many institutions in the development and implementation of prevention measures. Toghether with the Ministry of Health a GIS has been established to calculate the outposts demand of medicaments in case of an emergency and to monitore the distribution of diseases as Malaria, Cholera or dengue-fever.

Local authorities are enabled to work on their own prevention planning including communication infrastructures and responsibilities. All these activities are accompanied by a sensitization through formal and informal training and instruction. Federal institutions, NGOs and schools participate in training courses on disaster risk management and receive additional learning materials.

Summarizing the strategy of the El Niño project, it tries to minimize the mentioned gap between the rural poor and the service system by the introduction of more appropriate, pluralistic and diversified service provisions in a decentralized manner. Building a stronger community ownership for tackling the development challenge in a participatory way helped as well to bring both sides of the gap closer together and to identify solutions for intelligent service systems in disaster risk management and land use planning (see Fig. 4).



Source: Rauch *et al.*, p. 60

Fig. 4 Closing the gap between the rual poor and the service system

Resuming the descripted development approach, the El Niño project has shown that it is possible to reach a higher level and awareness in prevention culture. The experiences from the North of Peru have to be transferred now into other networks and national planning strategies in the region.

3 Networking with other strategies – disaster risk management as a policy planning instrument

The greatest challenge faced in the context of the implementation of integrated approaches in natural ressource management, disaster risk management and environmental conventions is coherency and coordination with other key development strategies. They must include issues like social investments and urban planning, urban living conditions, social safety networks, modernization of the state to improve good governance and decentralization, financial and infrastructure systems, promotion of private sector involvement, environmental and natural ressource management and the establishment of consultation and coordination mechanisms.

Desertification, El Niño and "Mitch" are phenomena which concern large zones beyond single country boundaries. Disaster prevention and mitigation in this context can only be effective, if we work in the regional and integral approach. In the national context to date, only modest success has been achieved in integrating these aspects into the wider development agenda and in generating thematic networking and synergies in the implementation of measures. Rural development is still seen from a one-sided sectoral perspective, which does not respond to the real needs of rural people. Development cooperation must contribute to offer instruments and methodologies, which have been successfully tested on the local or regional level.

A pro - active stance to reduce the vulnerability of people living in disaster-prone areas requires a more comprehensive approach that encompasses both disaster risk management and natural ressources management in an integrated planning approach in rural development. It must be framed by new bordercrossing policies and institutional arrangements that support effective action. Locally developed and effective concepts now have to be transferred to the national level, also fostering strategic alliances among state, civil society and private enterprises and new regional cooperation initiatives in planning and investments – in advance and not only once a disaster has already occurred. This process has only just begun and must be consistently pursued by the sensitization of national, regional and local decision makers to combine measures of natural ressource management and disaster risk prevention and their better integration into different sector policies. Analyzing cost-benefits of disaster risk prevention

approaches may help in the integration of knowledge, policy and finance to meet the challenge of natural and technological hazards (cf. World Institute for Disaster Risk Management, p. 5).

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