Internationales Asienforum, Vol. 43 (2012), No. 3–4, pp. 199–221

Social Vulnerability in Sindh
Recent Floods as Amplifiers of Social Crisis in Pakistan

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Catastrophes such as natural disasters and hazards draw attention to the affected regions when they occur, but awareness often fades after a short while. The impression persists that it is these events themselves that are mainly responsible for detrimental effects on people's livelihoods and vulnerability. However, the theoretical scope of social vulnerability embraces enduring social, economic and political processes and ways to manage risk exposure in marginal and peripheral regions. In particular, these peripheries are often neglected and excluded from mainstream administrative attention, regional development programmes and research efforts, as becomes evident when disasters strike, resulting in loss of life and widespread devastation. Immediate action is called for, but very often aid organisations face multiple challenges in the form of neglected infrastructure and lack of knowledge about the socio-economic conditions, socio-political structures and power relations in the area of concern. Poor governance structures, including relief mechanisms, may hinder a straight-forward approach to dealing with destruction, homelessness and a breakdown in the supply of basic goods.

The southern province of Sindh in Pakistan is a case in point, but the question remains of how to support relief and development planning through assessments of the disaster record of the affected regions and comprehensive vulnerability profiles of the populations. The recent flood crisis in rural Sindh is taken as the starting point to discuss a metholodology that enables an assessment of environmental and man-made hazards at short notice in order to inform development practice in the aftermath of disaster. In order to do so, the rationale of a vulnerability assessment in rural Sindh and the anomalies of Sindh within Pakistan are introduced. Subsequently, a tested tool for quick vulnerability assessments is presented (Mustafa et al. 2011) and the empirical results of the assessment in rural Sindh after the flood are discussed in terms of their implications for development practice.

1 Assessing vulnerability in rural Sindh after the Indus floods

Sindh, the home of downstream riparian communities, was severely affected by the disastrous Indus flood of 2010. The crisis was still not over a year later, when it was aggravated by a subsequent flood that was largely confined to the eastern District of Badin (cf. Fig. 1). Most of the affected Sindhi populations had returned to their villages by spring 2011 and started to reoccupy their lands and rebuild their homes and villages. However, little was known about the actual challenges people had to face after they went back to their settlements. External institutions and organisations had little knowledge of human-environmental relations and socio-economic properties in the opaque Sindh microcosm within the Pakistan context.

The lack of more recent information on Sindh compounds the problem of the knowledge gap[1]. To address this gap, a fieldwork-based research project on the basic socio-economic properties of rural settings in Sindh and on intra-community and exchange relations was carried out in eight rural villages of Sindh Province by a team of graduate students specialising in geographical development research at the Centre for Development Studies, Freie Universität Berlin. This research was facilitated by the German Red Cross (GRC) and the Pakistan Red Crescent Society (PRCS). Both organisations sought to gather knowledge in order to better implement a long-term livelihoods programme after immediate relief activities were phased out in March 2011 (Kreutzmann and Schütte 2011).

As such, the socio-economic vulnerability assessment aimed to prepare the shift of the two organisations from relief to development activities and to lay the groundwork for appropriate project measures to improve the livelihoods of affected populations. In order to achieve this goal, the assessment team of 12 students and two supervisors was divided into six smaller teams that were complemented by local research assistants who provided logistics and translation. The teams visited each of the eight selected villages for three to five days between 14 February and 1 March and carried out a total of 37 discussions with village focus groups, 296 questionnaire-based interviews with individual households and 16 interviews with experts.

The research method adopted encompassed a holistic, twofold approach. First, social vulnerability was perceived as a central element in a

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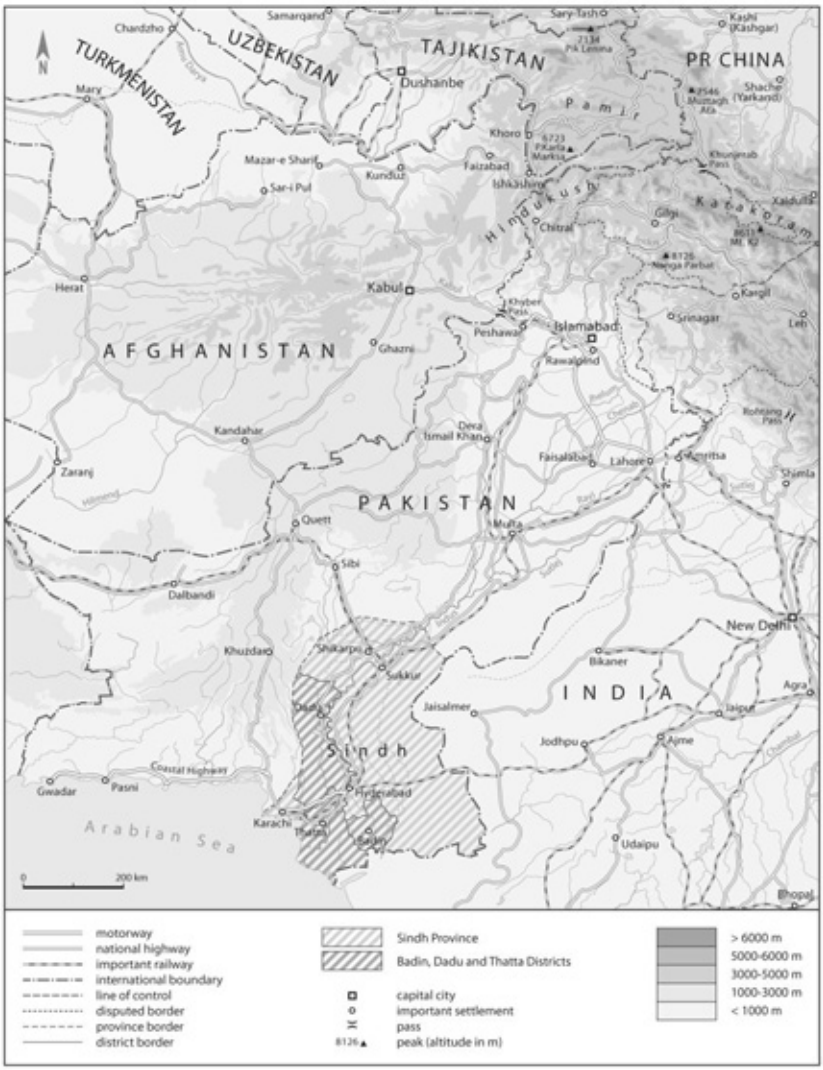
[1] There is a dearth of current data on the economy, environment, and society of Sindh province. Colonial literature is however extensive, e.g. Postans 1843, Hughes 1876, Burton 1851, Ross 1883 and Khera 1941. For some recently published introductory material, bibliography and comments cf. Eisenreich 1990, Khuro 1999, Zaidi 2005, Boivin 2008, Hasan 2009, Khan 2009, ADB 2010 and Boivin and Cook 2010.

FIGURE 1: Pakistan, showing Sindh province and Badin, Dadu and Thatta Districts



(Design: H. Kreutzmann)

system that is markedly affected by (i) environmental properties characterised by a risk-prone ecology in which human activities take place, (ii) economic chances and constraints that provide the arena for local enterprises, current revenue generation and value creation, and (iii) societal and political challenges that influence person-to-person relations and give rise to specific dependency systems and the interrelated duties and contributions of local populations.

Second, the assessment is based on the consideration that local phenomena are the result of multiple factors that are not necessarily or solely generated locally. The particular socio-economic situation in rural Sindh is influenced by provincial legislation, power relations and market forces as much as by rural-urban exchanges, interprovincial mobility and opportunities.

2 Spatial setting of the assessment

The villages assessed during the mission are located in the Districts of Badin, Thatta and Dadu (cf. Fig. 1). These districts differ quite substantially in terms of environmental conditions and village structures. Badin was not directly affected by the flood in 2010, but was one of the districts hardest hit by monsoon rains in 2011. The district is a disaster prone area that is subject to very regular and often severe flooding on account of its proximity to the sea and the Rann of Kutch. These amphibian situations were exacerbated by the construction of the Left Bank Outfall Drain (LBOD) and the tidal link of the Kadhan Pateji Outfall Drain (KPOD) in 1986. These major infrastructure projects financed by the World Bank drain surplus water from the fertile regions of upper Sindh to increase agricultural production there, which negatively affects those areas that are located close to the Indus delta (cf. Kreutzmann 2006, 2011; Sikander Brohi 2003).

Here, land and livestock were lost, agriculture has become virtually impossible, and water-logging and salinisation remain serious problems everywhere close to the Indus banks and the Delta. The natural tidal ranges recurrently cause inundation by ocean water, and the effects of major cyclones that occurred in 1999 and 2003 are still felt by the populations of the surveyed villages today.

Thatta and Dadu were both severely affected by the flood of 2010. All surveyed villages were evacuated, and people returned to the ruins of their houses; most people are still living in tents or makeshift constructions. In contrast to Badin, however, both districts are characterised by the presence of large landowners who exercise control over agricultural production and define rural land and labour relations.

All three districts covered by the assessment feature a population of fisherfolk from different social groups that face social exclusion and are subject to particular systems of exploitation.

3 Sindh – living in a hazardous environment

Sindh has always played a specific role within Pakistan. In terms of regionalism, Sindhi nationalism has found its expression in political striving for more participation and/or autonomy. This constellation needs to be viewed against the background of constant tension between upstream and downstream provinces. On the one hand, the perceived domination of the Punjab is based on demography, as it is home to more than half of Pakistan's population. In addition, the Punjab dominates access to fertile lands and water. In terms of population, Sindh province with its fertile river oases on both banks of the Indus contains less than a quarter of the country's people, who have always felt they are in an inferior position when it comes to political influence and the distribution of Indus waters (Kreutzmann 2006). The tail-enders' problem is a constant presence in Sindh, as is the large rural-urban divide in the province. The most significant share in Sindh's economic performance is contributed by the megacity Karachi, which dominates not only Sindh's economy but also that of the entire country. The contrast between rural and urban Sindh is particularly significant and characterised by a huge gap as the rural areas of Sindh are dominated by feudal dependency relationships. Large landlords (*wadera*) and share-croppers (*hari*), who are often entrapped in relations of exploitative bonded labour (ADB 2010, Bales 2004, Khan 1979, Khan 2009: 300), represent the two extremes of the socio-economic spectrum.

At the lowest level of society widespread social vulnerability is reflected in statistical evidence such as a poverty level of 53% among the rural population in Sindh (ADB 2010: 1, Jamali et al. 2011). The literacy level is characterised by deep gender-based inequality. While roughly every third man is literate, the figure is just above every tenth among the female population. Only every tenth person in rural areas has access to safe drinking water. Tenancy and share-cropping are the dominant features of rural Sindh, where nearly half of the farmers belong to that group, while most agricultural land is held by the land-owning class. In the 1950s, less than one percent of the landowners controlled 29.1% of the land and eight percent of the landowners controlled more than 54% of all available agricultural land in farms above 100 acres (approx. 40 ha, Zaidi 2005: 19). The same author remarks "in the category of extra-large farms, 150 acres and above, there

was a sharp increase in both the number of farms and their area in Sindh, between 1980 and 1990..." (Zaidi 2005: 49). Two land reforms and the introduction of the "green revolution" have not significantly changed the agrarian social structures in the interior of Sindh.

This set-up needs to be understood as in pre- and post-flood periods the levels of indebtedness, deficiency of cash availability and personal dependency have been vital factors in assessing the securing of livelihoods. A huge share of the tenant farmers and landless labourers are heavily indebted and often will never be able to repay loans they have taken out. Consequently, a former tenancy relationship gradually evolves into a kind of bonded labour[2] that binds the *hari* to a certain landlord, shop-owner or businessman, thereby eventually binding the household to a certain location without the option of moving out. "In terms of severity and expanse, it seems that landless sharecroppers, particularly in southern Sindh and to a degree in southern Punjab, are the largest category and suffer the most, followed by agricultural wage workers in these two regions ..." (Zaidi 2005: 447). Mahmood Hasan Khan (2009: 300) summarises: "Land concentration tends to dominate the rural economic and social structure, and relationships ... [in Sindh]".

A similar practice of bond and dependency can be observed in the fisherfolk communities. Share-cropping among crop farmers is replaced here by different forms of what can be termed 'share-fishing'. The fishing communities depend for their productive assets and tools on borrowed money and on licences that they often do not own themselves (PFF 2008). These dependency structures aggravate the already fragile socio-economic situation, which comes under further stress in times of catastrophe and crisis. In the coastal and delta districts of Badin and Thatta the fisherfolk are exposed to societal hazards such as indebtedness, restricted access to low-interest loans, and dominance by influential classes. In addition, natural hazards such as recurring cyclones have destroyed fishing equipment, boats and houses, and flooded and salinated agricultural lands, resulting in the substantial loss of basic means of production.

4 Measuring vulnerability: the Vulnerability Capacity Index as analytical tool

Vulnerability has become a major catchword in the NGO-world over the past two decades. The concept provides important analytical insights that help to better understand local situations, especially with respect to hazards

[2] The term bonded labour has to be used with precaution and consideration as there are few hard data available. According to the 'State of Human Rights Report' "... over 1.7 million haris remained in bondage across Sindh" (HRCP 2006: 231).

research. However, attempts to provide a measure of vulnerability have so far been rather patchy and mostly have not influenced policy or informed development practice (van Dillen 2002, Mustafa et al. 2011). The problem seems to be a lack of applicability of vulnerability categories for practitioners and policy makers. Thus far, few efforts have been made to substantially reduce complexity so that the realities behind the problem of social vulnerability become more obvious and possibly easier to manage in terms of livelihood packages that aim to address those problems. While condensing and quantifying complex realities into index values is always problematic, the benefit of endeavours to pin down vulnerability for development practitioners with limited time at their disposal seems obvious. Such values reflect different levels and different shades and nuances of vulnerability and capture the material and institutional realities of vulnerable places (Mustafa et al. 2011), while at the same time providing aid agencies with an overview of a situation at one glance. From a research perspective, a vulnerability index provides a potent analytical tool that helps to organise the numeric and narrative data gathered through a combination of different methodological approaches, as described above for the assessment of vulnerability in rural Sindh after the flood. For practitioners it might represent a useful tool in assessing disaster vulnerability.

The field team constructed such a systematic tool for each of the project villages by building on an approach that had been applied in comparable rural settings in Western India and that presented a "… theoretically informed, empirically tested, quantitative vulnerability and capacities index (VCI)" (Mustafa et al. 2011: 62). The VCI and its various elements were, however, modified by the field team to adequately reflect the situation in rural Sindh. The set consists of 11 domains that represent the drivers of material and institutional vulnerability as well as the capacities of different households (cf. Table 1).

The elements are weighted differently in accordance with their overall impact on the vulnerability conditions of a household. For instance, it is asserted in the index that the quality of income sources assumes greater importance than educational attainments, or that immersion in exploitative dependency relationships, as prevalent in the persistent bonded labour conditions of the *hari* system in rural Sindh, contributes significantly to the overall vulnerability of households and is therefore weighted accordingly. While the establishment of such weighting systems is necessarily contentious as complex realities need to be expressed by a single unit, the construction of the VCI as implemented in Sindh and the relative weights given to different indicators largely follows the rationale elaborated upon in detail by Mustafa et al. (2011). The 11 categories in the adapted model and the

weight scores that were applied to adequately reflect the situation in rural Sindh can be briefly explained as follows.

TABLE 1: Elements of the Vulnerability and Capacities Index for rural Sindh

	A composite vulnerabilities and capacities index for the household level in rural Sindh	**Vulnerability**	**Capacity**
	Material vulnerability	**50**	
1	**Income source:** start value	12	
	• Start value represents 100% dependency on a local level productive asset (for example, fisheries, land, small shops).		
	• Add 2 to the score if the income sources are unstable or have been lost during flood (for example, daily labour).	+2	
	• Subtract 2 if the local income sources are stable and insensitive to local hazard.		-2
	• Lower score by 1 for each additional income source reported.		-1 per
2	**Educational attainment:** start value	5	
	• Start value represents no member of the household being literate.		
	• Lower score by 1 for every 5 years of schooling of the two most educated male household members.		-1 per
	• Lower score by 2 for each female member's 5 years of schooling.		-2 per
3	**Assets:** start value	8	
	• Start value represents no immediately fungible assets (e.g. farm implements, livestock, jewellery, savings, household items).		
	• Lower score by 1 for possession of pukka house, income-generating tools, and small livestock, boat/fishing net, by 3 for cow, buffalo		-1, or-2, or-3 per
	• Add 2 for loss of income-generating tools, livestock, boat/fishing net, house	+2	
	• Add 2 for lack of fresh water supply	+2	
4	**Exposure:** start value	4	
	• Start value represents location in high likelihood impact area relative to the prime hazard (i.e. flood/drought area)		
	• Lower the score by 1 for every level of decreased impact likelihood between household location and high impact likelihood area		-1 per
	• Lower score by 1 for each instance of hazard mitigation (e.g. building of a house on higher plinth for floods).		-1 per
5	**Dependency relationships**	12	
	• Start value represents conditions of bonded labour/immersion in exploitative sharecropping systems		
	• Add 3 when enduringly indebted to wholesalers for agricultural inputs or to shopkeepers for basic foodstuffs, without capacity to repay	+3	
	• Lower by 12 for those who are not in bonded labour relations		-12
	Institutional vulnerability	**50**	
6	**Social networks:** start value	10	
	• Start value represents no memberships in ethnic, caste, professional, or religious organisations.		
	• Lower score by 1 for each organisation a household member belongs to		-1 per
	• Lower score by 1 for immersion in neighbourhood self-help networks		-1 per
	• For each CBO that has provided assistance in the past, lower the score by 1		-1 per
7	**Extra-local kinship ties:** start value	5	
	• Start value represents no extra local kinship ties.		
	• Lower score by 2 for instance when extra-local family member provided refuge		-2 per
	• Lower score by 2 for instance when extra-local family member provided material assistance		-1 per
8	**Infrastructure:** start value	16	
	• Start value represents lack of access to electricity, roads and healthcare.		
	• Lower score by 4 if household located near access to a sealed, all-weather road		-4 or
	• Lower score by 2 if household located near a seasonal road.		-2
	• Lower score by 4 if household can access a local medical facility.		-4
	• Lower score by 2 if household has access to electricity.		-2
9	**Warning systems:** start value	4	
	• Start value represents lack of a warning system, or warning system that the household is not aware of or does not trust.		
	• Lower score by 4 if warning system exists and is trusted.		-4
10	**Earning members in a household:** start value	5	
	• Start value represents a household consisting of only one earning member.		
	• Add 5 to score if single-parent-headed household.	+5	
	• Lower score by 1 for every additional earning member.		-1 per
	• Lower score by 1 for household dependency rate higher than 20%		-1
11	**Membership of disadvantaged lower caste, religious or ethnic minority**	+5	
	Total vulnerability score - Total capacity score	-------	-------
	Combined vulnerability and capacity score		
	Highest possible vulnerability and capacity score	100	

Source: Modified for rural Sindh by the assessment team after Mustafa et al., 2011

Diversity, stability and quality of income sources have been established as major contributors to vulnerability and capacity in response to natural hazards (cf. Moench and Dixit 2004) and accordingly have a higher weight in the VCI. The levels of education present in a household potentially contribute to increased capacities in rural households, as was shown in the context of Northern Pakistan (Benz 2012). However, scores assigned in the index are weighted lower than income sources reflecting the relative importance of education in rural livelihoods. By contrast, the possession of household assets such as livestock or agricultural machinery has been weighted slightly higher, which emphasises the crucial role of livestock in risk management strategies and the overall importance of dairy farming in rural Sindh. Exposure to hazards has long been seen as an important trigger for material vulnerability (cf. Cutter 1996), but in the context of the villages in the study represents a ubiquitous phenomenon affecting the vast majority of households. Given the prevailing conditions in the study areas, where exposure to hazards tends to be uniform, this indicator has a relatively moderate weight. More importantly, as a number of studies show (e.g. Ercelawn and Nauman 2001, Hussein et al. 2004), the exploitative structure of debt bondage through sharecropping agreements is seen as a decisive category for vulnerability in rural Sindh. The conditions and explicit terms of such sharecropping agreements have been laid out in detail (Hussein et al. 2004) and empirical evidence was collected by the field teams, especially in the villages of Dadu and Thatta. While it is true that the structure of bonded labour in agriculture is not uniform all over Sindh, and other less exploitative debt relations also exist, the realities described under the *hari* system prevail in certain areas and have been empirically observed by the field teams. In such cases, the high weight score has been applied.

In terms of institutional vulnerability and capacity, the VCI emphasises the importance of social networks and access to infrastructure. Social relations, e.g. in terms of functioning community organisations or rotating saving groups, potentially contribute to increased capacities (cf. Schütte 2003) and form an essential ingredient in vulnerability research (Bohle 2005). In rural Sindh social networks include community-based organisations and village councils, but essentially refer to caste and kinship groups. Caste groups in Pakistan are hierarchically ordered and always carry specific names that also advertise rank and attribute status. Groups with inherited charisma (e.g. Syed, Qureshi), those in control of agricultural cultivation (e.g. Jats, Rajput), of dubious religion (e.g. gypsies) and service castes (e.g. ironsmith, barber) are positioned along a line of social inequality

that has been examined in some detail for Pakistani Punjab (Pfeffer 2012).[3] In rural Sindh, similar categories can be adopted too and in the lowest rank also include the vast number of agricultural castes, landless farmers and brick-kiln workers (Ercelawn and Nauman 2004). These groups are further subdivided into what may be called clans and lineages, which form the effective solidarity group in a village setting and also establish what in the VCI terminology has been termed extra-local kinship ties. Infrastructure in the VCI refers to the quality of governance and institutions in their capacity to foster access to livelihood opportunities and general well-being, the facilitation of relief and recovery, and access to services as a crucial element of vulnerability (cf. Mustafa et al. 2011). It has been weighted comparatively high to signify the importance of infrastructural measures especially in remote village areas. The existence of warning systems to avoid disaster has been given a uniform score, and the number of gainfully employed household members is seen as important for diversifying income sources and weighted accordingly. Finally, affiliation with a disadvantaged lower caste or a religious or ethnic minority takes note of the societal hierarchy as evident in the caste order of rural Sindh.

The index is designed in such a way that the highest possible index value is 100, representing maximum vulnerability. This value can be reduced by subtracting the values for household capacities, such as endowment with productive assets, levels of income diversification, or membership in social networks. This implies that given sufficient capacities, an index value can be reached that holds a negative value. In fact, those households that possess a negative VCI value are those that enjoy relatively high levels of livelihood security, whereas all others have to be seen as belonging to the vulnerable, albeit to differing degrees.

In order to illustrate the life-realities hidden behind different index values the examples of three households studied by the research team are provided in Box 1 below.

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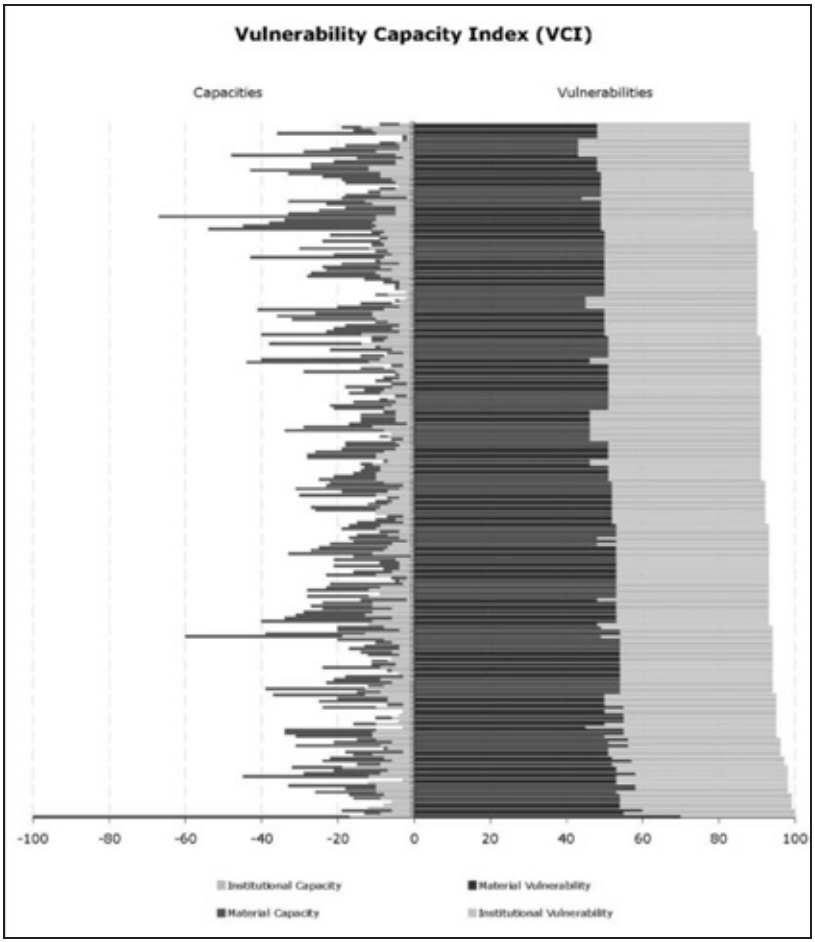
[3] Historical evidence is mainly provided for the Punjab, e.g. by Crooke 1907, Ibbetson 1916. Some attributions of ordering and distinguishing have been applied by the colonial administration to the population of Sindh in a similar manner; cf. Cheesman 1997, Haines 2011.

FIGURE 2: VCI values for the household sample derived from eight villages in three districts of Sindh (n = 296 households)



Source: data recorded by ZELF team; Freie Universität Berlin, February–March 2011
Design: Elias Michaels

BOX 1: Realities behind numbers. Three representations of different VCI values for selected households

VCI value -4: Household security through regularity of income

M. Khan is retired from the army and has multiple sources of income in Ahmed Raju, Badin District. The most important is his regular pension, which has allowed him to invest in a flock of goats and to purchase agricultural land. His possessions make him an influential person, a fact reflected by his position as vice-president of the village council.

VCI value 53: Animal husbandry keeps the household afloat

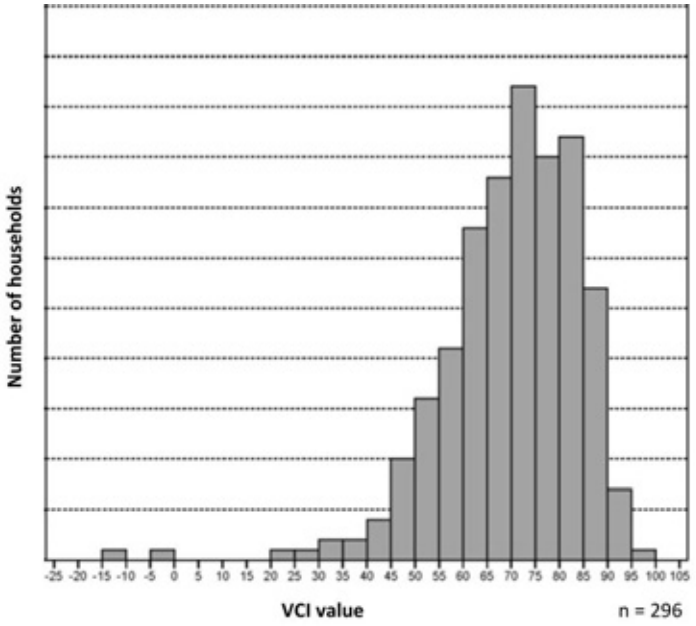
M. Varoo is a sharecropper without land of his own in Ahmed Sorjho, Thatta District. All household members help with the manual labour, and women contribute to the household income through tailoring. During the flood they lost their house, two cows and buffaloes plus a wooden cart, but they managed to save three buffaloes and two cows. Today, these animals represent their major assets and keep the household afloat. However, having missed the autumn season and been unable to start cultivation in the spring season, they were forced to take on larger debts, which has increased dependency on their landlord. Also, M. Varoo still worries about how he will be able to rebuild a shelter for his household of eight persons.

VCI value 91: The fate of the most vulnerable

Didar Q. is a bonded labourer on two acres in the village of Mehrab Qambrani in Dadu District. Before the flood he was able to manage his livelihood by virtue of his one buffalo and five goats and his donkey and wooden cart, which compensated for his meagre share of the harvest in his sharecropping arrangement. However, in the flood he lost all of his productive assets and went into high debt to both his landlord and the donkey cart seller, to whom he still owed money for the wooden cart that he used as a means of transport. Now he has found shelter in a tent with his wife and three children, and the only income he is able to generate comes from occasional wage labour in the bazaar in the nearby town of Kakar. This case reveals the stark reality of bonded labour relations. Before the flood a 50% share of harvest yields had to be delivered to the landowner, in addition to providing farming inputs such as fertilizer or ploughing oxen. However, the lost harvest has not been remitted, and the entire spring harvest was taken by the landowner, forcing household members to literally work for free. The example is also a blunt illustration of how the economic costs of the flood are passed on by the landed classes to sharecroppers, further perpetuating conditions of vulnerability.

Looking at the index values for the entire household sample (Fig. 2) it becomes obvious what problems have been encountered by most. Levels of vulnerability are consistently high throughout the sample, and of all interviewees in the eight villages only four showed negative VCI values and can be categorised as secure. Capacities fluctuate enormously, but tend to remain very low. Negative VCI values mostly relate to households that managed to maintain larger numbers of livestock, a finding that corresponds to earlier research on flood hazard in Pakistan, where it was found that livestock represents a key asset for recovery in the aftermath of disaster (Mustafa 1998; Schütte and Kreutzmann 2011). Overall, the values for most of the sample fluctuate between 60 and 85; thus indicating consistently high levels of vulnerability and a serious lack of sufficient capacities (Fig. 3).

FIGURE 3: Distribution of VCI values in the household sample of eight villages (n=296)*



* The two most secure households with negative values of -66 and -266 respectively have been omitted in the illustration to facilitate readability.

Source: Data recorded by ZELF team, Freie Universität Berlin. February–March 2011

A major finding of the assessment thus clearly points to the fact that the vast majority of households across villages and districts have to endure very high degrees of livelihood insecurity that have increased significantly after the flood. Small farmers and landless sharecroppers who lost their livestock and the summer crop were identified as particularly vulnerable and represent an important beneficiary group for targeted livelihood interventions.

Explanations for the differences encountered at the household and village levels can be found when looking at the composition of each individual index value, which also points to the virtues of working with a quantified vulnerability index to inform development practice (cf. Mustafa et al. 2011):

- The vulnerability dimensions of the VCI give direction for interventions aimed at strengthening household capacities.
- The VCI represents a tool for comparative analysis and makes households and villages comparable.
- The VCI provides a measure of inter- and intra-village differences and could provide direction for targeting households.
- The VCI can increase the efficiency and accuracy of risk analysis in the context of disaster risk reduction.

The vulnerability assessment in rural Sindh after the flood of 2010 identified major drivers of vulnerability and livelihood insecurity that determine people's lives and livelihoods. These essentially refer to the prevalence of exploitative dependency systems of bonded labour in which many poor farmers are enmeshed, and their lack of productive assets and access to social and physical infrastructure. These are further compounded by a lack of alternative income opportunities and high levels of debt. While the conditions differ to some degree between districts and villages (Kreutzmann and Schütte 2011), some general conclusions and their relevance for development practice can be inferred.

5 Vulnerability assessments informing development practice

How can development practice benefit from the systematic assessment of rural vulnerability in interior Sindh after the flood in 2010? Mustafa et al. (2011: 65) hint at an answer: "Vulnerability research has added nuance to our understanding of the linkages between everyday life and hazards, and of the parallels between geographies of injustice, poverty and exclusion and the geographies of damage from hazard events". The truth of this becomes clear when looking at the major findings of the research in Sindh, which highlighted the need for people to engage in permanent adaptation to hazard

and the high degree of social inequality that contributes to heightened vulnerability. Translating this better understanding of reality into concrete livelihood packages with the aim of contributing to Disaster Risk Reduction (DRR) and improving capacities for adaptation may build on the VCI for targeted intervention at the local scale.

The index and its focus on the different dimensions of vulnerability clearly point out the adversities faced by rural residents after the flood and facilitate the identification of gaps that need to be addressed to support people in their endeavours to recover from the disaster. The major areas for livelihood intervention as derived from the VCI results are establishing access to infrastructure, supporting people in restocking their productive assets and diversifying their income, thinking about measures to increase capacities for debt relief and building capacities and enabling social organisations to support rural communities in coping better with hazards.

5.1 Access to infrastructure

The need to help in the reconstruction of housing in the flood areas (Thatta and Dadu) and to establish access to safe drinking water (in all three districts) is obvious. In all villages strong deficiencies in access to services contribute to heightened vulnerability. Repair and reconstruction of houses is an urgent priority as the current shelter situation in the flood-affected areas is not sufficient and will lead to many avoidable health problems if nothing is done. For the construction of shelter it is important to assess local priorities and use locally available and adapted materials and not reproduce the mistakes that were made in designing government-agency model villages that did not find local acceptance (Kreutzmann and Schütte 2011: 25). In addition, the reconstruction programme should be designed in the form of cash-for-work initiatives, where local labour is used to work on housing in their own villages to generate some monetary income at the same time. The use of middlemen should be kept to a minimum in order to ensure financial efficiency and to avoid corruption.

Local handpumps, which are available at very reasonable rates in local markets, should be supplied quickly. Those simple constructions reach a depth of 35 feet and provide quick solutions to the emerging water crisis in the villages studied, where most existing handpumps have ceased to work after the flood. This would improve drinking water quality immediately.

Arrangements should be made to rebuild infrastructure for disaster risk reduction. This essentially refers to the construction of protective bunds in Badin to protect villages and their agricultural fields from intruding ocean waters, seasonal flooding, and water spillage from drainage canals. As a major infrastructural initiative, such programming would not only increase

agricultural productivity and avoid loss of arable land, but also generate jobs and income when locally available labour is used on cash for work terms.

In terms of accessing healthcare most villages face problems, which are also evidenced by the high levels of bad health encountered during the assessment. Vaccination campaigns to combat water-borne diseases and high incidences of hepatitis are needed to protect children.

5.2 The critical importance of productive assets

The flood caused widespread loss of productive assets, especially livestock and agricultural machinery and agricultural inputs, but also tools for fishing and home-based industries. Owing to the critical lack of cash resources, people are not in a position to replace those assets on their own. In fact, those assets that were saved during the flood in most cases had to be disposed of at prices way below market value in order to manage basic household survival. The loss of such key assets for recovery in the aftermath of disaster (cf. Mustafa 1998) is a major contributing factor to the high vulnerabilities encountered in the sample and, if nothing is done, is likely to further threaten rural livelihood systems in Sindh.

Hence, supporting people to procure productive assets is essential. This is an urgent matter, as currently most people are not in a position to practise their occupations for lack of cash or materials. Initially, this could be effected through the provision of conditional cash transfers, a practice that has recently gained some popularity in development cooperation when dealing with the effects of disaster. Evaluations of the implementation and effects of such cash transfer programmes are largely positive (Rawlings and Rubio 2005, De Janvry and Sadoulet 2006, Gore and Patel 2006) and would represent a suitable strategy in the context of recovery from flood-induced losses in Sindh. Support in providing the means for people to reacquire livestock and engage in animal husbandry as an important livelihood activity in the context of rural Sindh would be a further option (Schütte and Kreutzmann 2011). If a restocking programme is perceived to be unfeasible, conditional cash transfers aimed at increasing livestock numbers and especially water buffaloes would be an alternative.

As part of a longer term strategy, establishing access to non-exploitative credit facilities that would enable access to cash resources should be considered. Lessons learnt from the many experiences made through the Aga Khan Rural Support Programme (AKRSP) and National Rural Support Programmes (NRSP) in Pakistan could be integrated into such an endeavour (Khan 2008).

Thinking further along those lines, the facilitation of production co-operatives could provide a longer term option to enhance rural livelihood

security. Keeping in mind the possible contradiction between the ideology and practice of cooperatives and the challenges they pose in effectively reaching the rural poor (Mustafa and Gill 1998 on experiences in the Punjab), supporting self-help and grassroots participation could be developed into a feasible strategy for rural development in Sindh. Possible fields refer to the provision of equipment for the marginalised fisherfolk in Sindh, e.g. by means of cooperative workshops, and facilitating the inclusion of women in agricultural cooperatives (Prakash 2003).

5.3 Income diversification

Diversity and regularity of income represent important elements of rural livelihood security, and the shape of income sources are a major element of rural vulnerability in Sindh. Immersion in bonding share-cropping arrangements and the insecurity of erratic incomes generated by rural wage labour or through fishing contribute to the high VCI values of most households. This insecurity of income and high degrees of dependency also contribute to the enormous cash deficit that hinders investments in agricultural production, animal husbandry and home-based industries. Significantly, those few households in the sample with access to a regular income source (e.g. teachers, army personnel) are also those that show lower or even negative index values.

It follows that measures for income security are mandatory to facilitate rural development and recovery from the flood. The recommended focus on cash-for-work initiatives already mentioned in the context of infrastructural activities thus becomes doubly important: as a means to reconstruct housing and infrastructure needed for Disaster Risk Reduction, and to provide households with a regular income source for a period of time and with access to cash resources. Even if such programmes do not run indefinitely they would generate predictable incomes for a time and could be used for productive investments or debt relief. Evidence from other contexts indicates that even some predictability of income represents a major means of enabling vulnerable households to cope better with conditions of livelihood insecurity (Schütte 2006).

Again, a focus on livestock restocking would provide another source of household income. Milk products, for instance, are used to improve household food security, while at the same time providing a marketable resource. The viable local milk market that existed before the flood in Ahmed Sorjho, for instance, provides a perfect example of how animal husbandry functions as an important element in rural livelihood strategies (Kreutzmann and Schütte 2011: 44–45).

The fisherfolk (Mallah, Dhandel, Pareli, Mohana) deserve special attention to enable them to return to work after the flood. However, in addition to supporting these communities replace lost fishing equipment, they should also be encouraged to use their experience in agriculture and animal husbandry to access supplementary sources of income and diversify their livelihoods. This could also include programmes that aim at professional fish-breeding in village-based ponds, in which many, especially among the Mallah in Dadu, have shown considerable expertise.

5.4 Debt relief

Immersions in bonded labour arrangements that are almost impossible to escape from abound in the household sample and contribute to high VCI values, most notably in Dadu. This is especially true for share-croppers (*hari*), but also for the fisherfolk from the Mallah community in Thatta. There is an urgent need for an improvement in the conditions for debt relief, not only to address the shortage of cash, but also to loosen the high dependence of vulnerable villagers on influential landlords. It can be assumed, too, that in order to cope with the effects of the flood many households will be driven into conditions of bonded labour as a strategy to cope with adversity. Evidence of this fact, among other livelihood shocks, has been reported (Heltberg and Lund 2009).

Now, addressing the problem of bonded labour is a difficult issue given the power relations that prevail in the interior of Sindh, which are closely intertwined with provincial and national politics. A livelihood programme will not solve the issue, but may incorporate elements that improve the situation of the *hari*. It is important to target affected households, as those are amongst the most vulnerable and without support will hardly find a way out of their situation. The extensive report on bonded labour from Hussein et al. (2004) provides an overview for Sindh and Balochistan, and some of their suggested actions may prove feasible in the context of supporting rural livelihoods. One way would be to "… improve the negotiating position of the *hari* vis à vis the landlord. Improvement in record-keeping and a mechanism for oversight by a third party would be some protection against the arbitrary record-keeping of the *zamindar*. Most *haris* claim that inaccurate record-keeping is the major culprit in the high debt that they accumulate. However, in view of the low rates of literacy among the *haris* and the intricacy of the *hari* landlord relationship, it will not be easy to identify who would exercise such oversight" (Hussein et al. 2004: 31). This suggestion might be translated into action through community-based organisations, but would require capacity building. The problem is widespread and was witnessed by the assessment team, too, when envoys

of a landlord entered the village of Mehrab Qambrani, Dadu, during the assessment and merely notified households about the levels of debt they accumulated after the flood, without providing any proof or records. Most strikingly, all the economic costs of the flood have been transferred to share-croppers, without any debt relief being granted to the community after the disaster. This particular village is also deeply immersed in such power relations; a mere five individual landlords control all agricultural activities in the settlement and act as creditors for the entire village population, all of whom belong to the Qambrani caste group.

The problem could be most effectively addressed by widening livelihood opportunities to enable improved debt relief, as suggested above. However, the problem remains that any sort of asset-building or provision of additional income sources might be siphoned off by the landlords. A larger programme of debt conversion in villages where livelihood packages are to be implemented could provide solutions, either on terms of provision of institutional credit for debt conversion, or through cash grants that are conditional upon debt relief. A renewed focus on rural Sindh in the context of disaster recovery and facilitation of rural development could probably provide the needed impetus to commence what Hussein et al. stated by way of conclusion: "… without fundamental changes in the macro-economic situation, improvement in the social indicators of development and the implementation of existing legislation, the impact on the *hari* landlord dynamic will be limited" (Hussein et al. 2004, 32).

It should be noted, however, that not all debt relations involve conditions of bonded labour. There are hardly any households in the sample that are not indebted to some degree, and access to credit can serve as an important livelihood ingredient to bridge times of difficulties or to engage in productive activities. This is why it remains important to widen the credit schemes available to farmers and fisherfolk on fair terms, and to make sure that packages are designed that build on the substantial experience that exists in Pakistan with micro-finance schemes in rural areas including Sindh, e.g. provided by the Aga Khan Development Network (AKDN).

6 Shared disaster – capacity building and social organisation

The importance of capacity building for improved social organisation represents a cross-cutting issue touching all areas. Established forms of civil society and social organisation exist in the villages of Sindh, and the assessment team found that in most locations there is already some sort of village council. These bodies need to be made a partner for generating pro-

ject ownership and to channel the selection of beneficiaries for any form of activity. The establishment of community organisations that can represent a whole village would give people a shared voice when cooperating with the government or dealing with the landlord, and would make representation of interests, practices of local disaster management and access to common goods easier. In practical terms, development cooperation can be facilitated more easily through such village institutions and the feeling of project ownership would heighten the chances for a successful implementation of project packages.

While building inclusive community organisations with sufficient capacity to represent the interests of all groups in a village is not an easy task, the wide experience of the Aga Khan Rural Support Programme and National Rural Support Programme in Pakistan provides an important foundation in this regard. In terms of facilitation of agricultural or productive cooperatives, the existence of functioning community organisations is a precondition. Furthermore, to oversee and record debt owed to landlords it may be possible to build on the capacity of those bodies in a way that improves the negotiating position vis-à-vis the land-owning classes.

In terms of preparedness and Disaster Risk Reduction the facilitation of acknowledging and coping with a 'shared disaster' assumes critical importance and involves community representation. The lessons learnt refer to the collection and recording of local knowledge in coping with disaster and communities' present strategies in the search for security. The experiences of local communities such as those of a fisherfolk community in Dadu that practised their own early warning system and escaped the flood almost unscathed (cf. Kreutzmann and Schütte 2011) could provide a roadmap for engagement in flood protection and designing the required displays of information and suggestions of how to reach safe havens. They also refer to combining this knowledge with governmental approaches and procedures to establish coherent and shared disaster management systems that can be accessed at trustworthy focal points. In practical terms, this would mean furnishing, for instance, poster campaigns that provide information through simple illustrations that show where to go when disaster strikes, which escape routes should be followed, and how household assets such as livestock can be saved. Such endeavours can be supported externally by providing the needed infrastructure, e.g. constructing solid village-based buildings that could serve a multipurpose function as information centres for DRR, shelters in times of disaster, and venues for community meetings and discussions with external agents from government, NGOs and others.

All the points mentioned relate to complex social realities and are embedded in diverse social inequalities and power relations. Under the con-

ditions that prevail in rural Sindh, efforts to establish transparency and close monitoring of activities by able and experienced community mobilisers are of critical importance. This is also true with respect to controlling middlemen who are often used to procure goods and services for vulnerable populations and exploit this position for personal gain. Evidence points to enormous waste of development resources through using such intermediaries. The somewhat more strenuous road of procurement using community organisation rather than businessmen could lead to more effective implementation of livelihood packages that reach a wider population. Village-based monitoring of all kinds of package implementation and a better understanding of local and regional market structures and power relations would be a major asset for tackling the substantial challenges people face when environmental disasters aggravate livelihood insecurity.

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