



Extreme Risks, Vulnerabilities and Community- Based Adaptation in India (EVA)

A PILOT STUDY

Final Report on WP3.2

Governing Climate Extremes in Maharashtra

Authors: Trond Vedeld, S. G. Salunke, Guro Aandahl, PruthaLanjekar

Research partners



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1.ABSTRACT

The manifestation of climate change in the form of extreme weather conditions is not a new challenge to India. On the contrary, high climate variability and drought have always been endemic to the monsoon belt. Hence, over time, local societies have evolved to adopt many ingenious mechanisms to tackle drought risks and adjust livelihood practices to contingent circumstances, as has been evident in our research in Maharashtra. Moreover, the government of Maharashtra has, in this regard, been considered a forerunner in managing droughts and related climate risks in India, and has responded to past instances of extreme droughts with important transitions in policies, programmes and governance. Hence, there are general lessons to be drawn from Maharashtra.

Based on interviews at the local and district levels and analyses of institutions and policy implementation, the report reviews how the government and non-governmental agencies at state and district levels have responded to extreme weather and climate events ('climate extremes'), and how the governance system works to coordinate a variety of state, local government, private business and civil society actors in disaster risk management and climate change adaptation. The specific focus of the report is on how multi-level governance enables and constrains Community-based Adaptation (CBA) to extreme drought risks, including how government policies match local rural dynamics and demands in relation to existing weather events and future climate changes. Important changes have taken place over time in local livelihoods and farming systems that work in different directions regarding the strengthening of adaptive capacity. Field work for the study was conducted in nine local villages in the drought-prone Jalna District in the dry land region of Marathwada of Maharashtra related to farming and non-farm livelihood activities. In particular, the report reveals limitations in policy and practice at community and district/central government when society is confronted with extreme weather events, such as the 2012/13 drought. This was the worst drought in 40 years, and local crop yields and annual income dropped to close to 60% among the surveyed farmers. As the rain failed severely, the local communities quickly became dependent on external assistance in the form of water supply, fodder and other emergency relief measures.

The report is based on outcomes from a two-year Indo-Norwegian research and capacity development project, 'Extreme Risks, Vulnerabilities and Community-Based Adaptation in India (EVA)'. The research meets an expressed demand among local and district and state level authorities in Maharashtra for policy relevant knowledge about pertinent adaptation strategies to address future climate extremes, and what considerations and challenges these raise for coordination and convergence in the governance system at local, district and state levels. The report is intended for development practitioners, researchers and policy makers interested in climate change and rural development challenges in Maharashtra.

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3. INTRODUCTION

The Marathwada region is just coming out of the worst drought in 40 years. While a drought of the magnitude observed in 2012 will always bring hardship to local people, such as it did to the rural villagers of the District of Jalna, it also exposes systemic and institutional strengths and weaknesses, and thus offers opportunities to investigate the event and possibly initiate changes towards a more resilient society. To this end, our research has provided an opportunity to explore the effects of extreme weather on local livelihoods and better understand community- and district-level capacity to respond and withstand such impacts.

This report is prepared within the research project ‘Extreme Risks, Vulnerabilities, and Community-based Adaptation in India (EVA)’ (www.teriin.org/projects/eva/index.php). This is a two-year pilot project under an Indo-Norwegian collaborative programme funded by the Norwegian Embassy, New Delhi. The EVA project aims to (i) understand the enabling and constraining conditions for CBA to climate change and extreme weather events (‘climate extremes’); and (ii) develop pilot approaches to research on and capacity-building for CBA. The report is based on findings from policy and institutional analysis combined with extensive interviews with key representatives of the government, private sector and civil society at district level and below (about 30 in-depth interviews). It involved field work at village and district levels (Jalna District in north-central Maharashtra). It employed a set of innovative participatory methods, non-structured interviews, household surveys and participatory workshops. The extensive dialogue with community groups and decision makers, and other professionals brought out an *understanding of local perspectives on adaptation*. Field work was carried out in nine villages in three blocks in the District of Jalna, which were all severely affected by the 2012 drought.

The core research question we address in this report is—

How did government and private/civil society institutions at different levels and scale enable or constrain CBA to extreme drought and water stress in relation to agriculture and watershed development?

More specifically we ask—

- What policy and institutional arrangements are in place to address climate risks and underlying vulnerabilities to drought/extreme weather given local rural dynamics?
- What opportunities exist for improved governance towards more effective adaptation and climate risk management at different levels and scales in agriculture and watershed development and social security (MNREGS)?

In particular, we consider what recent social changes have taken place in local livelihoods and institutions—in response to climate extreme events and other drivers—that impact upon adaptive capacity in positive or negative manners. We ask if such adaptive changes move beyond small or incremental changes (‘incremental adaptation’). Are there (also) signs of more profound policy and governance, i.e., ‘transitional adaptation’? Do we even observe changes that point towards ‘social

transformation' in relation to climate risk management, i.e., deeper or more radical changes in institutional and technical structures or values that are geared to address extreme climate risks (Pelling 2011, O'Brien 2012)?

In this regard, the report brings out how the state—with support of centrally sponsored schemes—mobilizes and coordinates relief efforts, and how the drought emergency system is linked to more long-term risk management and development programmes. To this end, the project provides some insight into how India operationalizes climate risk management policies from central via state to the local levels.

We propose that institutional barriers are critical to understanding human behaviour in formal and informal social structures with a bearing on climate adaptation as they interact with other constraints, such as available financial resources, technologies, ecology, infrastructure and market forces. More broadly, the policy sectors that interface with drought risk management in the district context of Jalna, would be, e.g., climate change, disaster risk management, agriculture, small-scale irrigation, water resources management and environment management.

The research combines the theoretical frames of multi-level governance and CBA (related to collective action) in order to explore the institutional arrangements, partnerships and networks that have developed within or between villages, and between villages and outside institutions of relevance to drought risk management (Ostrom 2005, Osborne 2010, Sorensen and Torfing 2009, Peters 2008, Platteau and Abraham 2002, Reid et. al. 2010, IISD 2011, Baas and Ramasamy 2008).

The block and district levels form the nexus through which coordination arrangements were explored in more detail. The district was found to be the key level for driving policy processes and schemes with relevance for farming, watershed development and climate adaptation. Invariable, district level agencies and actors constituted knowledge and service centres for climate knowledge with a bearing on actors at village and sub-district levels.

The findings from our research suggest that climate change has started to add new and uncertain risks to the ongoing dynamics of the rural livelihoods and political economy of the drylands of Marathwada. The monsoon has in the recent past often been delayed and is at present perceived by farmers as less reliable and more erratic than before. Our analysis of historical rainfall data suggests a slight decline in average rainfall over the last two decades. However, the analysis of future climate change suggests that the Marathwada region will receive more rainfall not less in the future (possibly up to 20% more annual rainfall). But climate change will likely also lead to more erratic and variable rainfall across space and increase in temperature, and, thus, greater risks and uncertainties. If properly managed, more rainfall might serve local agriculture well. But given the likelihood of greater climate variability in the future, climate change will serve as both a barrier to—and a potential driver of—change. It will bring new risks to an already complex rural dynamics and new challenges for local as well as district and central governments and private business and civil society. Hence, it becomes important to understand how weather extremes and climate changes—as they impact across sectors and places and interface with other driving factors of change—are governed at different levels and scales. The report reveals some of these challenges that climate change raises for future governance and rural dryland policies in the state of Maharashtra.

The key theme of this report relates to how policy and governance enable and constrain the management of extreme drought and CBA. The focus is on agriculture, watershed development and rural livelihoods (IISD 2011, Reid et. al. 2010, Baas and Ramasamy 2008). The report raises important policy and governance questions and issues that the state, local government, private business, civil society and local people should discuss, research and act upon as the rural areas of Maharashtra are confronted with new climate risks, more complex rural dynamics and new opportunities.

The report looks in particular at the movement towards political and administrative decentralization, and how this enables village and community level capacity for management of climate risks and related natural resources. Maharashtra is perceived as one of the best performing states in India in this regard (IDRC 2013: 219). Moreover, we review the operations and outcomes of some of the Centrally Sponsored Schemes (CSS) and how they are coordinated, including the National Rural Livelihoods Mission (NRLM), which is aimed to establish local groups with a bearing on climate risk management, such as local Self-Help Groups (SHGs). We also assess the performance of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) within the broader context of drought risk management, which among others promote various watershed development activities through the employment schemes for individual farmers and groups of farmers. Watershed development, which constitutes the main approach to dryland farming, is implemented by several departments, especially agriculture, social forestry and rural development (through the panchayat raj institutions or PRI system) and involves the establishment of village-based watershed development committees (WDCs) and user groups (UGs) which are supposed to take on a key role in management of local water and agriculture.

We find that there are many implementation issues that reduce the effectiveness and efficiency of these schemes and thus the capability of the central and state government in translating the rights-based approach that the Indian government has adopted to local development into improved outcomes and empowerment of people on the ground.¹ The recent launch of the Adaptation Fund in Maharashtra within the framework of the government's new climate change policy makes the lessons on CBA approaches, presented in this report, particularly relevant, provided funding is adequate and the project is established.

As a particular governance challenge, the reports refer to the need for coordination among the more than 50 or so government agencies and related schemes operating in the rural areas of Jalna with a bearing on agricultural and water resources development and rural development. At the same time, there is an increasing number of private business and civil society actors emerging to provide inputs, advice and marketing services for the farmers, which have become increasingly market oriented in the last few decades. The demand for better weather services, for example, has led to yet a greater number of new local service providers, e.g., Nokia, Reuters.

Based on local interviews and perceptions from field work in Jalna, we find that in response to the 2012 drought, the district and state government initiated a set of appropriate emergency and more long-term measures to provide drinking water, fodder camps, crop-loss compensation, watershed development,

¹ The central government has increasingly adopted a rights-based approach to developing, initially guaranteeing five critical rights to the poor—right to information, work, education, forest rights to tribal groups and most recently food (IDFC 2013:11).

and local employment. However, the scope and outreach of the relief was not adequate to meet local demands given the magnitude of impacts. The measures pursued were sometimes unevenly distributed. The emergency programmes also carried heavy costs on the part of the government. Village communities were at the same time not able to cope with the severity of this disaster in a satisfactory manner. They suffered great economic and social losses, although most households had savings that enabled them to buy food and necessities. Our research suggests that improved community resilience and transformation towards sustainable rural livelihoods require continuous efforts by the government and non-government actors. There has to be a shift in the focus from relief to long-term CBA. There is also a need to coordinate better between the state, local government and private business and civil society, in particular given the strong market forces that are likely to be key drivers of change. This has implications for policies and governance related to decentralization, agriculture, watershed development, disaster risk management and climate change adaptation.

The findings underscore the policies of the Government of Maharashtra for strengthening decentralization and local capacity and coordination and convergence of policies and schemes (World Bank 2008, Purandare 2013). This will facilitate enhanced capacity for early response, adaptation and long-term resilience at village and block levels. While recognized in various policies, the operationalization of policies in effective governance requires greater transfer of powers and resources through decentralization and devolution to the Gram Panchayats and promotion of the Gram Sabha as a representative forum. It also presupposes a more systematic engagement by government officials with local people, community groups, non-governmental organizations (NGOs) and the private sector, and stronger cooperation across sector silos and the public–private divide.

The report proposes various drought risk management measures that might be considered related to local farming and watershed development, water resources, climate services and improved policy and institutional coordination. A community-based approach to adaptation needs to address dilemmas of promoting policies and programmes towards water-intensive cash crop systems for large- and medium-scale farmers versus more integrated watershed development/dryland farming for small-scale farmers versus employment or education for the landless. More innovative climate and weather forecasting services have a key role to play for all types of farmers.

4. THE RURAL DYNAMICS IN THE DRYLANDS

4.1 Variation in exposure, impacts and responses to the drought

The stories we bring to the table from the rural drylands of Marathwada suggest important ongoing dynamics in local farming systems, degree of commercialization, rural livelihoods and consumption patterns (cf. Purandare 2013). A total of nine villages were surveyed in the District of Jalna in cluster of three villages in the blocks of Badnapur, Bhokardan and Jafrabad (Figure 1).² Jalna District lies in a semi-arid climate zone (drylands) with an average rainfall of 725 mm per year which can go down to 400–450 mm per year. Less land 10% of the land is irrigated and about 43% of the arable land invariable covered by watershed development (Purandare 2013, ref. also interview with DSAO office). The main crops cultivate in the nine villages surveyed were subsistence crops (like maize and sorghum), while the main cash crop was cotton. Soyabean has become increasingly common and sweet lime is an important crop in villages like those in Badnapur. The villages in Badnapur was considered to have the highest agricultural potential of the three blocks due to the soil, natural resources endowments, and larger farms (ref. interview with DSAO office). Cotton, maize and soyabean are key crops during the monsoon/kharif season, while sorghum and wheat were main winter/rabi crops. Except for some of the farmers in Badnapur, the size of most farms are relatively small, reflecting a combination of fragmentation of land holdings over time and historically marginal farm areas. About 50% of the surveyed 450 farmers had below 1 hectare; and 80% below 2 hectares. Less than 1% of the farms were of a size 10 ha or above. While most farms were small, and thus farming mainly subsistence oriented, there were still considerable differences in land size and land quality, both in relation to access to good soil and water sources for irrigation (wells, checkdams, sprinkler or drip irrigation, farm ponds) (see Aandahl et. al. 2014, Vedeld et. al. 2014).

The exposure to risks and the vulnerabilities to the drought varied quite a bit from one village to another depending among others on the location and resource endowments. For example, when we did our first major round of field work in September 2012, the DSAO reported rainfall levels at 44% of average rainfall. But rainfall varied across the blocks, Bhokardan having received only 37% of average rainfall (Interview 1. 19.9.2012, DSAO Office). Moreover, the impacts on livelihoods and cropping systems also varied (Aandahl et. al. 2014).

These nine case studies provide in-depth insights into the relationships between everyday experiences of different social groups in their coping with drought and their interactions with local officials and representatives of local NGOs and private businesses. The analysis reveals how these local encounters shape both the actions of local groups and institutions and those of external government agencies. The socio-economic analysis of these villages reflects also on the differential response and outcomes of the government services and schemes between the villages, before during and after the 2012 drought (Aandahl et. al. 2014, Vedeld et al. 2014). Early in September 2012, Jalna District was declared a 'drought affected area', which meant that a set of state and central government schemes would gradually become mobilized and launch in villages. These schemes involved support for drinking water

²The nine villages chosen in the three blocks of Jalna are Asarkheda, Nivdunga, Dongaon, Kadegaon, Malegaon, Warudi, Palaskheda Pimple, Thote Pimpalgaon and Barav Pimpalgaon.

through tankers; fodder/fodder camps for livestock; and later, employment through various employment schemes.

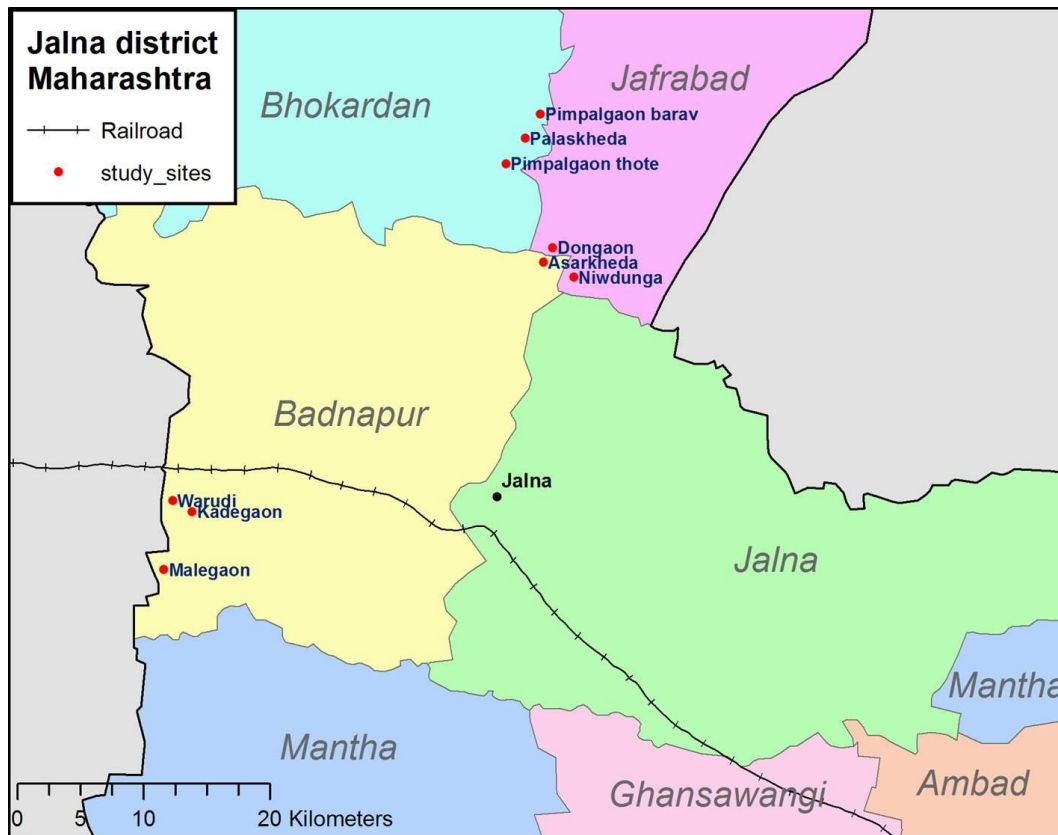


Fig. 4.1 Map of Jalna District, Maharashtra

4.2 Variation in local rural dynamics

Our observations from these nine villages bring different kinds of stories about social and institutional changes. They include observations about the relative successful spread of dug wells for irrigation, increased adoption of drip and sprinkler irrigation over the last decade, local successes in watershed development, including rapid spread of farm ponds and increase in rural consumption among small-scale farmers. But there are also stories about massive crop failures due to lack of rainfall and drought in 2012/13, as well as crop losses due to severe hailstorms over a week in 2014. Farmers also complain about other issues, such as the fragmentation of farmland and, more generally, about distress with agricultural policies and agriculture. Many farmers and young rural men are in search of off-farm/non-farm employment, frequently to combine with farming or local agricultural labouring. Many young rural men of Jalna say they are not ready to take up farming and pursue their parents' livelihoods and lifestyles.

Yearly income for all categories of farmers in the drought year dropped to close to 60% of an average year among the surveyed farmers, ranging from 35% income drop in Asarkheda village (Jafrabad block); which is one of the better endowed villages in terms of watershed development and other

factors, to 73% income drop in Thote Pimpalgaon (Bhokardan block). Among all farmers, it seems that the medium/small categories had the greatest income losses, although the findings are not clear cut (cf Aandahl et. al. 2014).

The nine village cases illustrate a great diversity in the impacts of and responses to drought across villages, which depended on a set of local circumstances, such as the local farming system, developed watershed, access to water resources and land, eco-landscape, market access, local village leadership, and access to external institutions. We also observed great variation in local as well as public agency responses to the drought across social groups and villages. Hence, it is hard to single out the most important single factor.

Even within the relatively small district of Jalna we found great variations from one village to another and one social group to another in terms of how people construct their livelihoods and build capacity to respond and adapt to climate extremes, or other hazards/shocks. Many of the rural changes have led to further marginalization of small-scale farmers and traditionally socially excluded communities. But there are also many positive changes at farm and village levels that have provided new opportunities for agricultural growth and development and adaptation to greater climate variability. An indication of this is that despite high crop and income losses among many farmers during the 2012 drought, the social impacts in terms of water and food scarcity were not as severe as during similar drought conditions in the early 1970s, as many farmers were partly better off in terms of food and fodder storage, economic well-being and water availability at village level.

There are different drivers and barriers to the transformation that takes place in the nine rural villages we studied, as suggested in the EVA report on the rural livelihoods (Aandahl et. al. 2014). Many of these transformations confirm trends observed in other parts of rural India, and, obviously, relate to a set of contributing factors (IDFC 2013). In addition to the climate drivers, there are a set of institutional, social, economic, political and environmental factors that in different manners drive such changes. We suggest that ‘agrarian’ transformation is driven largely by market forces in combination with government and private sector schemes (World Bank 2008, Sivaramakrishnan 2012, IDFC 2013). According to one agricultural officer, key overall constraints on local farming relate to a combination of factors—rainfall variability, access to labour and credit and finance and markets (Interview 8, 26.9. 2012 Block level). We also found that local resource endowments and access to water/good quality land were important constraints, but also such as village leadership related to local capacity to coordinate socially differentiated groups and to attract external funding (Vedeld et al. 2014, Aandahl et al. 2014). We observed increased commercialization of agriculture and mono-cropping, although subsistence farming is still dominating. There were also many recent changes in cropping patterns, for example, away from water demanding sugarcane to less water demanding crops. There had been a rapid growth in dug-wells-based irrigation and drip/sprinkler irrigation systems with implications for ground water and soil fertility, but with various adoption rates across villages and groups of farmers.³ Farm ponds were becoming increasingly popular. Off-farm and non-farm rural employment in nearby towns or factories was also common, probably on the increase, and not prevalent only among the landless.

³ These are general observations from our village-level social and political analysis; not subject to rigid ‘market’ analysis.

Local interviews and own observations from analysis local data confirmed that natural resources and common-pool pasture resources were subject to processes of degradation with implications for livestock and integrated livestock-cropping systems and soil and water conservation (Barkved et. al. 2014). Natural resources, including access to scarce water resources, are thus increasingly the subject of local conflict. Conflicts regarding access to water are observed to arise within and between villages when new watershed development projects are being planned (Aandahl et al. 2014, Vedeld et al. 2014). The local reliance on fertilizers, water for irrigation and other inputs and input/output markets have increased, raising concern regarding the climate resilience of the farming system. But there are also large-scale ‘experiments’ among farmers, with support of external private actors, in integrated pest management and lower input agriculture that might reduce upfront investments, and, hence, the risks of economic losses if the monsoon, and thus crop harvest, should happen to fail. Moreover, the provision of rural infrastructure, such as water supply and wells and watershed development structures, but also road networks linking the nine villages we studied to local towns and markets, might well be as vital for rural livelihoods as the systems for management of water and other natural resources and climate risks. None of the villages were properly served with good quality rural roads and water supply was only partially supplied throughout the villages. In particular, several of the outskirt hamlets in the villages had inferior access to water supply.

4.3 The village case studies

The villages we investigated were chosen as highly exposed and vulnerable communities to drought and water scarcity given their location in the monsoon shadow belt and drylands of Marathwada, relatively distant from markets and dominated by small farmers (74% with less than 2 hectare and 7% landless). These villages were located in a fairly similar social and farming system context, and included from 3000 to 5000 people.

The local farmers are basically ‘cotton’ farmers. The cropping pattern involves cotton as the main kharif (monsoon) crop and sorghum in the rabi (winter season). About 52% of the district arable land is planted with cotton (Interview 10, KVK, 18.10.2012). Most of the produce is for subsistence. Many farmers also grow cotton or vegetable seeds for local seed companies under contract farming. In some of the villages, sweet lime has come in more recently as a perennial cash crop. Other important crops involve maize, pearl millet, soybean, green gram, wheat and vegetables. Most crops are under dryland farming but a majority of the farmers have wells for some irrigation (during the winter season) and an increasing amount of the slightly larger farmers (1/3 of all farmers) have invested in drip irrigation and/or sprinkler irrigation. However, according to the DSAO office, 83% of the arable land in the District of Jalna is under rain-fed farming and only about 42% of the micro-watersheds covered by ridge to valley watershed development (Interview 1, DSAO, 19.9. 2012). Only three of our nine villages had extensive watershed development coverage (Asarkheda, Pimpealgaon Thote and Malegaon) (AFPRO 2008) (Vedeld et. al. 2014, Aandahl et. al. 2014).

Livestock is not widespread, reflecting also dwindling common-pool pastures. Dairy farming is little developed, except in a couple of the villages. Land holdings are generally small. Farms have gradually become fragmented. Off-farm and non-farm employment is increasingly common. Many of the landless and very-small farmers are agricultural labourers or engage in wage labour, e.g., in local sugar

factories. The recent drought revealed that many farmers stored food stocks and fodder as a risk management measure in view of drought years or crop failure from pest or other factors.

5. METHODOLOGY

5.1 Concepts— incremental adaptation, transition, transformation

The EVA project studies the enabling conditions for and barriers from CBA to climate change. CBA is already a known concept in the decentralized natural resources literature, and has subsequently been adopted in the climate change literature, including IPCC in the Fifth Assessment Report (IPCC 2014).

CBA is defined as responses to climate change that ‘provide increased participation by locals and recognition of the local context and the access to adaptation resources to promote adaptive capacity within communities’ (inspired by e.g., IISD 2011, Reid et. al. 2010, Baas and Ramasamy 2008). A critical factor in community-based actions is that community members are empowered to take control of the processes involved (Platteau and Abraham 2002, IPCC 2012: 300, IPCC 2014). A core element of CBA is to further the resilience of the world’s poorest communities to the impacts of climate change by incorporating in policies and practice the potential impacts of climate change on local livelihoods and vulnerability.

In this report we are particularly interested in how policies and governance constrain communities in local efforts to prepare for, respond to or withstand extreme climate events, such as droughts, and what sort of incremental changes or transitions and transformations have taken place to facilitate CBA as well as what adaptation options might be required to enable communities to manage such extreme climate risks in the future. A wide range of complementary adaptation and disaster risk management approaches that can enhance drought risk management would be considered, including to reduce risk and exposure; reduce vulnerability; share risks; and prepare, respond and recover from floods (Pelling 2011, O’Brien 2012, IPCC 2012, IPCC 2013, IPCC 2014).

The climate change policy debate has resulted in a set of interrelated concepts that underpin the definition of adaptation, such as (climate) risks, exposure and vulnerability.⁴ A climate extreme (extreme weather or climate event) is in this context the occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable (IPCC 2012: 3). In our report, ‘climate extremes’ is utilized to refer to both extreme weather events and extreme climate events (along with IPCC 2012).

In the IPCC literature, vulnerability to climate risks is perceived as a function of the character of climate risks to which a system is exposed, its sensitivity and its adaptive capacity (IPCC 2012). The Fifth Assessment report by IPCC notes that climate change adaptation options ‘continue to emphasize incremental change to reduce impacts while achieving co-benefits’ (IPCC 2014a: 2). The focus has been on ‘low-cost’, ‘no regrets’-measures and ‘win-win’ adaptive solutions. Such ‘incremental adaptation’ is typically perceived as useful for (sustainable) development even if actual climate change impacts will eventually become less dramatic than originally projected.

⁴ See for instance IPCC 2012, 2014 for a convenient summary of definitions.

However, in view of the rising certainty and severity of projected climate change risks, these presumptions are increasingly being subjected to critical consideration.

Pelling (2011) to this end identified three ‘levels’ of adaptation and made a distinction between (incremental) adaptation, ‘transitional adaptation’ and ‘transformation’. Pelling (ibid.) suggests that ‘transitional adaptation’ and transformation represent forms of adaptation that go beyond simple coping and responses or interventions that essentially serve to sustain existing systems and practices, i.e., incremental adaptation (captured in the narrow definition of resilience). These two forms of adaptation address the more structural causes of exposure and vulnerability. While ‘transition’ refers to realizing full potential through the exercise of rights within the established regime, ‘transformation’ refers to reconfiguring the structures of development. ‘Transitional adaptation’ ‘is targeted at reform in the application of governance’ (ibid.: 69), which recognizes the fundamental role that different forms of governance have in structuring the ways in which problems are framed and solutions found and implemented and rights and responsibilities shared (Bulkeley 2013: 148). Pelling suggests that ‘opportunities for transition arise when adaptations, or efforts to build adaptive capacity, intervene in relationships between individual political actors and the institutional architecture that structures governance regimes’ (Pelling 2011: 82, cf. also O’Brien 2012).

These concepts all have a normative touch them. Transformation refers to how to tackle the issue at its roots or in fundamental ways; in manners that potentially raise deeper political and value-based issues or structural societal challenges. Incremental adaptation can be criticized for being insufficient and piecemeal. In most instances, both incremental and more fundamental transformations might be required to tackle relevant climate change issues in a sustainable manner.

The good news is that there is often substantial complementarity between sustainable development efforts in for example dryland agriculture, watershed development and social programmes, and enhancement of CBA. For example, critical work in agricultural extension, watershed development, infrastructure, food and nutrition management, education and job creation is typically supportive of good local adaptation. However, given the great risk of higher climate variability, more uncertain monsoons and more frequent droughts (as well as floods), the promotion of climate resilience requires a combination of specific adaptation and risk reduction measures; e.g., climate services and social protection, combined with more significant integration of climate policies across key sectors and agencies. There are also risks of maladaptation; for instance, the promotion of sugarcane or other water demanding crops (sweet lime, cotton) may come into conflict with water conservation needs.

5.2 Analytical framework—drivers and barriers

We utilize a multilevel governance framework to systematically analyse the integration of climate adaptation and drought risk management across sectors, actors and levels (Osborne 2010; Pelling 2011; Bulkeley 2013, Sorensen and Torfing 2009).

We give priority to analysis of the *vertical* steering and policy integration issues within and across key climate risk-relevant sectors, and how coordination and cooperation is enabled at two levels—*i*) district level (district and block level); and *ii*) local community level (village and sub-village level). We argue that in situations where the local governments are not really autonomous and state agencies exert strong

influence in terms of powers and finances and direct involvement in local service delivery, vertical linkages are likely to be both strong drivers and barriers in terms of capacities for climate adaptation at both district and local/community levels.

Moreover, given that climate change will impact differently across space, even from one local neighbourhood to another as it interacts with ecological and social factors, a significant share of climate risk governance needs to take place at the *local or community levels*, i.e., as close as possible to the scene of events of those that are potentially impacted and need to act upon or manage an extreme risk. Some argue that it is the local government, and ultimately the local communities that need to bring coherence to agendas that have previously been addressed in uncoordinated manners, e.g., climate change adaptation, disaster risk management and sustainable rural development (Satterthwaite 2011, Satterthwaite and Dodman 2013). Since vulnerability and the capacity to respond and adapt will vary greatly across social and spatial boundaries, it is important that drivers and barriers towards building resilience are understood at this level.

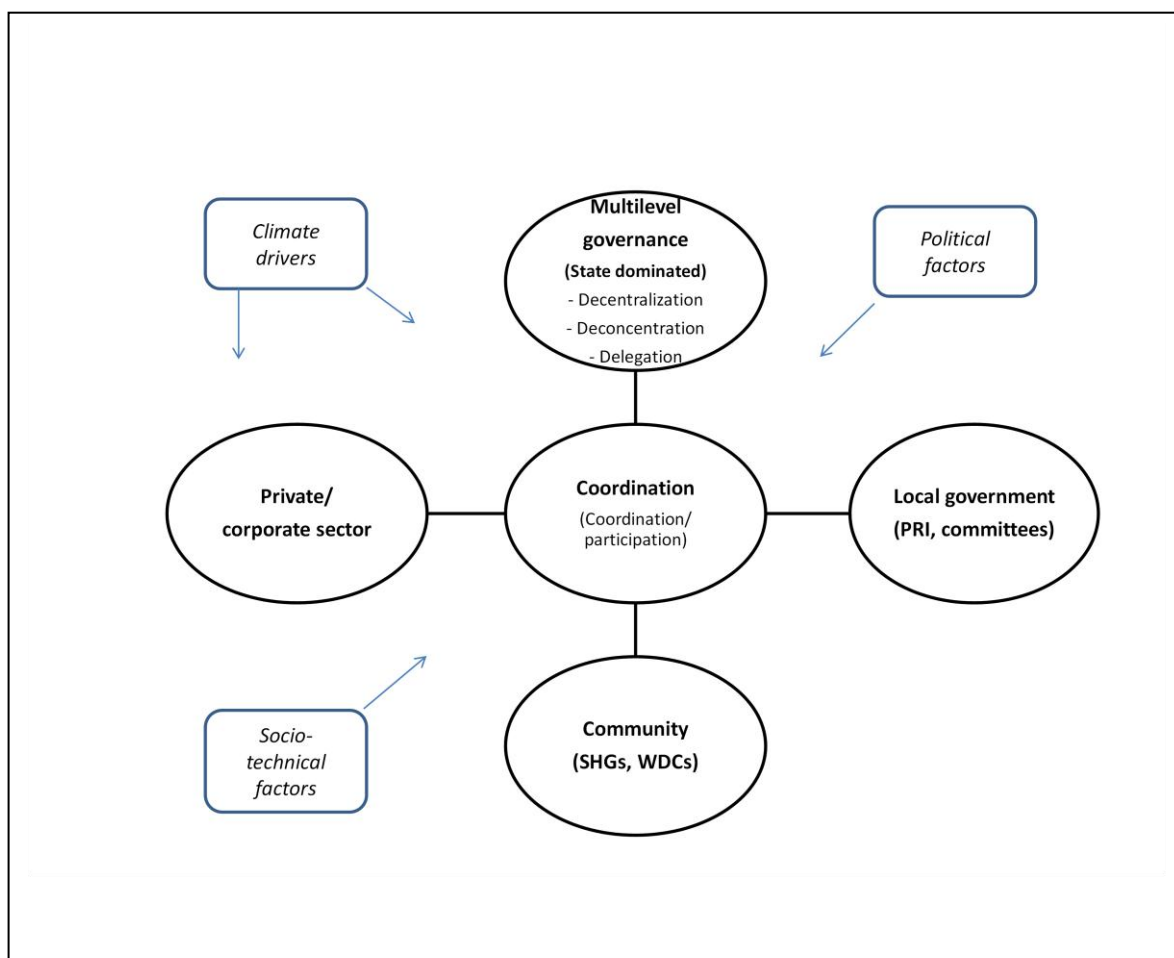


Fig. 5.1. Governance and coordination in climate risk management (authors' own construct; inspired by Bulkeley 2013 and Ostrom 2005)

The extent to which different modes of governance are actually deployed at different levels and have been successful is the result of different factors that act as both drivers and barriers to the cooperation

or coproduction of knowledge and action between state, municipal and non-state actors. We distinguished three sets of factors; *institutional*, *political* and *socio-technical and ecological* (inspired by Bulkeley 2013), in addition to *climate drivers* (cf. Fig. 1).

Institutional factors in our study related particularly to governance as the institutional arrangement shape the conditions for coordination at different levels. In particular, we are interested in how multilevel governance (dominated by the state) and local government (PRI system) build capacity of community-based institutions—both formal and informal—to respond, withstand or improve the systems adaptive capacity and climate action. From an adaptation perspective, we need to understand what and who needs to become more robust in tackling drought. In our case we are particularly concerned with individual citizens and their assets in local villages that are exposed and vulnerable to droughts. They need support from services and governance systems at both state, local government (Zilla, Block, Village) and community levels. We focused on institutional factors related to the *multilevel governance* context within which CBA is enabled and the capacity to act and respond to climate risks at local or village levels largely determined.

Regarding the *state level* and state–locality interactions within the broader institutional arrangements, we investigated how the state, at national, district and local levels, works through different governance modes in vertical (and horizontal) coordination in the selected sectors to balance powers and resources and enable or constrain adaptation of city and sub-city level actors. This concerns processes related to (Vedeld 2003; Peters 2008; Manor 2011)—*i*) *Decentralization* and *devolution* of key functions and resources of the public sector to the PRI system; *ii*) *Delegation* of public authority, e.g., to civil society or private market actors; and, *iii*) *Deconcentration* of public authority and tasks to regional, district or local state bodies or to a variety of (semi-) autonomous corporations or agencies. In all villages, the state engages directly in local development with consequence for the local economy or territory, e.g., through various centrally sponsored schemes related to land management, service provision and infrastructure. Hence, there are parallel structures of local governance which create particular challenges to coordination and convergence.

In this regard, we were also interested in how the state makes available powers, mandates and *financial and other resources* for the PRI system. Financial resources from the state are critical for the operation of local government within which generated funding by the village PRI is minimal and dependence on the state is high.

At the *district and block levels*, we analysed organizational arrangements and operations of different services in relation to governing capacity or powers, mandates, knowledge of climate risks and flood risks, availability of financial resources, and the ways in which responsibilities for adaptive action are allocated and shared between the municipal agencies and community actors. We focused mostly on the capability of the different government actors to facilitate, coordinate and encourage actions at community levels, as well as how other private or civil society actors were enabled to take part in forms of coproduction or forms of networks and partnerships for climate risk management or development.

At *community, neighbourhood or sub-city levels*, community groups, such as SHGs or WDCs or external civil society actors or private business would be involved or interact and condition actions from above and from below, or engage in voluntary or community-based governance.

Political factors were not central to the governance analysis, since the study focused more on institutional and policy related factors, but they were a particular objective of the studies at the village-level studies. We were, however, interested in the degree to which government and governance approaches are genuinely responsive to the priorities and needs of all categories of residents, including poor people in vulnerable informal settlements. Political factors can obviously be critical for processes and outcomes in relation to achieving transitional (or transformative) changes at both village level or in government services and coordination. Political factors relate to the attention to adaptation (risks and vulnerabilities) given by the local political leadership at different levels (e.g., sarpanches and local councillors) within the political-economic context as well as the role of specific economic and political interests and actors that shape pathways of local development (Bulkeley 2013: 102).

Socio-ecological or *socio-technical factors* related to the farming system, water resources and ecosystem context, social and demographic conditions, including changes in farming systems and other social and technical conditions.

5.3 Methods and approach

The research focused on drivers and barriers to enabling CBA. This led to a case study approach with a mix of research methods; policy and planning reviews, institutional analysis, in-depth interviews (planners, officials, village leaders), and focus group interviews with local people in the concerned villages. The interviews and institutional analysis were combined with a variety of participatory methods in the villages (participatory mapping with geo-images, institutional venn-diagrams, historical time-lines, transect walks and observations). We also held validation workshops at various stages of the work, presenting local people to ‘what if’ scenarios of future climate variability and meetings with local officials, civil society members and academia. Altogether we conducted about 30 semi-structured interviews with senior officials at district level and below, allowing for a variety of topics to be addressed. Interviews were done with officials in key sectors (agriculture, livestock, water resources, disaster risk management), district administration and representatives of NGOs and private business/rural banks. These interviews were combined with more unstructured interviews of individual farmers and informants (sarpanches) at the village level. Each interview lasted from 1½ to 2 hours, and was conducted in the office of the interviewee by a lead interviewer and 1–3 team members.

We first explored which institutions and policy sectors were involved and relevant for ‘climate adaptation policies at district and community levels’ and for CBA. The empirical data collection focused on the integration of climate risks/adaptation in four key sectors and related public agencies and actors—*i) agriculture* (crops, land, livestock/pastures); *ii) integrated watershed development*; *iii) water resources management* (wells and related drip/sprinkler irrigation systems, water supply); and *iv) disaster risk management*. In concrete terms, we looked for actions considered critical to promote adaptation at the level of the local communities, including, *inter alia*, if there had been established organizational mandates and homes for understanding and addressing key climate risk issues; functioning coordination mechanisms; assigning staff and budgets and resources at local levels; and if planning, extension and development happened through participatory approaches. We were also concerned about the way climate risks in policies and operations were integrated into these sectors and implemented jointly in order to address potential underlying vulnerabilities. Potential gaps in policies and practice were

considered in relation to how adaptation and related development services were approached in ways responsive to community-based demands and needs for adaptation.

We carried out field-work in *nine village locations* in order to understand local perspectives and variability across rather short geographic distances. This would help us understand how village-level institutions interact with external institutions in local governance and how local community groups are enabled or constrained in climate change adaptation and drought risk management, within the encounters with government officials and agencies.

6.COMMUNITY AND GOVERNMENT RESPONSES TO THE DROUGHT

6.1 Community impacts and responses

A key finding from research in the nine villages is that local communities were basically not prepared to tackle the severe impacts of such an extreme drought as the one in 2012, which lasted well into 2013, and thus revealed limitations in adaptive capacity at local level. Even so, most people seemed to be able to cope much better than what has been described as massive hardships in the drought of 1972 (Subramanian 1975, Dreze 1994, Attwood 2007), reflecting improvements in resilience along several dimensions (Aandahl et al. 2014). Hardships at the local level were dampened due to many farmers having stored grains or possessed other income sources from earlier good years (2011 was a good rainfall year). Negative local impacts were also alleviated due to the government's response system being relatively better prepared and responsive to local needs and demands (compared to the situation in the 1970s) (Purandare 2013, Vedeld et. al. 2014).

There were, however, several governance issues that arose due to the way the 2012 monsoon rainfall evolved (timing, intensity, patterns) and the lack of rainfall made its impact across the landscape. Overall, rainfall varied a lot, even from one block and village to the next, revealing great diversity in exposure to the hazard. Rainfall varied between 25%–50% of normal rainfall across the district. Moreover, while the monsoon rainfall started in a relatively normal manner and was forecasted by the India Meteorological Department (IMD) to be 'normal', a long dry spell came after the initial rain. Many farmers had by then prepared their fields. The initial drought spell fairly quickly affected the crops and access to water to irrigation, as the dug wells utilized for irrigation went dry. The drought manifested itself first of all in water scarcity. Drinking water and water for livestock quickly became a key concern as the rains failed. Fodder for animals became scarce as the animals depended mainly on open grazing on communal land during the monsoon season. Stall feeding is locally not much developed. Water for irrigation was prioritized for the cash crops. However, irrigation water in the local wells was grossly inadequate across all villages and most farmers, both for the monsoon cash crops (kharif season) and later for the winter food/fodder crops (rabi season). Crop and income losses of 50%–60% were experienced by most farmers, although losses varied a lot; the largest farmers losing on average more than the smaller in absolute terms (Aandahl et. al. 2014).

Even the better endowed village communities in terms of developed watersheds, agricultural land and access to water from local wells and related drip/sprinkler irrigation, such as Asarkheda, PimpalgaonThote and Malegaon, faced hardships.

The impacts and responses varied a lot, however, from one social group and one village to another, reflecting variation in exposure to erratic rainfall, vulnerability and impacts, as well as in adaptive capacity (e.g., developed watersheds and access to water) and local institutions.

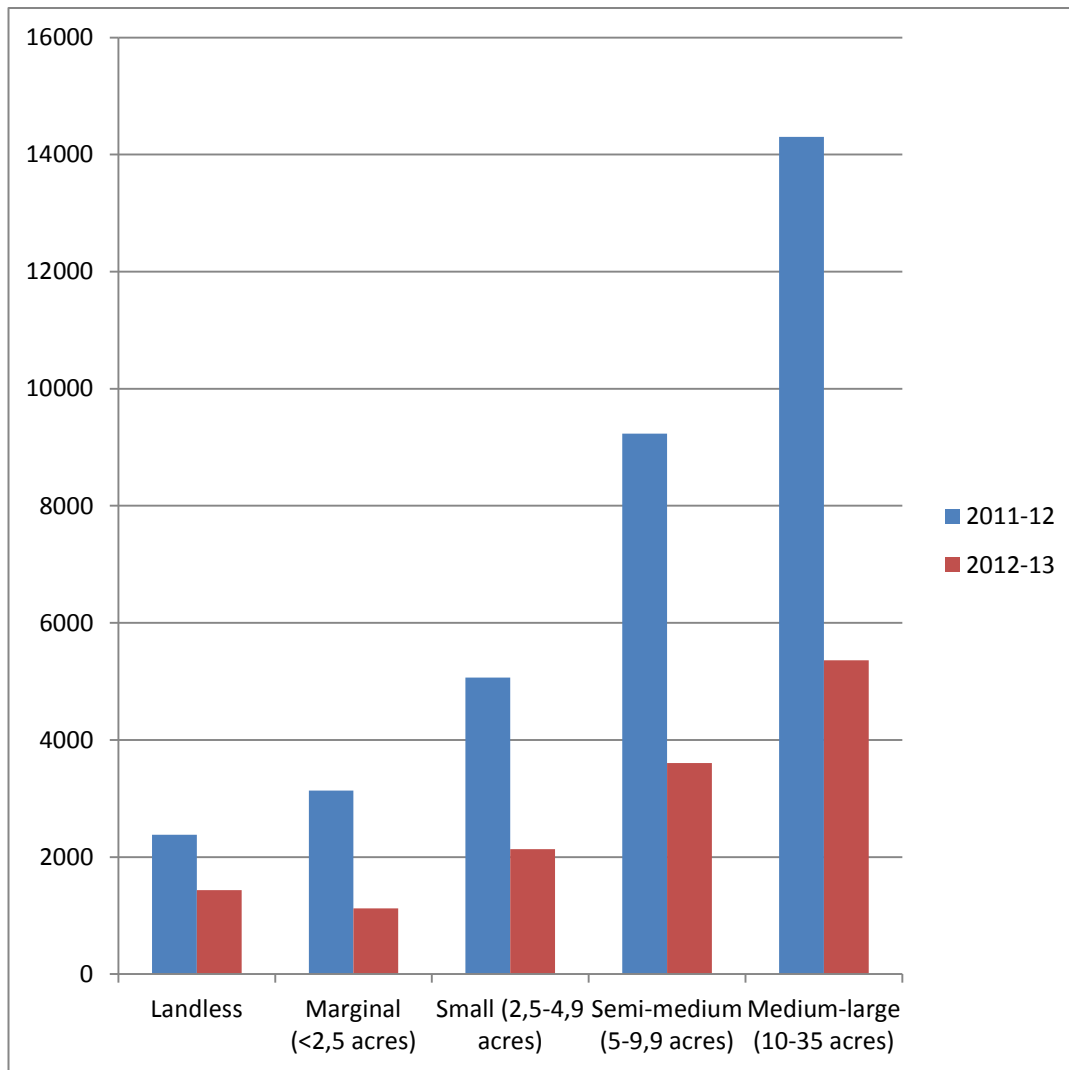


Fig 6.1. Average monthly income and landholding (source: Aandahl et al. 2014).

At least two striking observations can be made from Fig.6.1. First, there are large income inequalities between landholding classes. Average monthly income for semi-medium farming households is **almost 4 times larger** than of landless households. Second, the absolute losses during the drought year are higher for larger landowners. Here we should add however that the landless and marginal farmers have much less to lose (in terms of overall farm/crop investments and in assets).

By the time we did our field-work in September 2012, village sarpanches in each of the nine villages were busy organizing people and writing official requests for emergency assistance, based on guidance from above (District Collector and Block Development Officers). The capacity of the village leadership, including the sarpanches, also seemed to vary, however, and made a difference regarding ability of the village community to attract external assistance and development funding (Vedeld et. al. 2014, Aandahl et. al. 2014).

At the end of the day, all the village communities depended a lot on outside assistance to cope with the impacts of the extreme drought in terms of e.g., water tankers for water supply and water to animals, fodder and income/employment. The government also provided at a later stage, e.g., crop credit

waivers and even later crop compensation which was considered critical to cover losses by local farmers. Although local (family-based) safety nets were reported to provide some minimum assistance across kins, most family households seemed required to manage pretty much on their own. Moreover, the more formal collective institutions, such as the SHGs and other community groups did not seem to play a major role in support of local (poor) families (see below). We suggest that full resilience to such an extreme event cannot really be expected at community or household/family level. Moreover, we also find that there is clear scope for many improvements in drought risk management by the government and in governance at multiple levels.

6.2 Extensive government drought relief system

The drought emergency situation mobilized major relief efforts on the part of the state and district government, as well as support from civil society, private companies and other local actors. Local authorities launched a massive relief operation at high costs to the government.

Our analysis shows that the government—along with the coordination ensured by the District Collector—embarked upon a wide range of measures to address the immediate impacts of the drought with support of the state government. The Government of Maharashtra, with support of the central government, had an elaborate government structure and substantive programmes for drought relief for implementation in the drought struck districts (Purandare 2013). This reflects the historic experience of the Maharashtra government with a set of droughts, e.g., during the early 1970s. More recently, the drought during the years 2002–2004, resulted in lessons drawn and a more advanced strategy and plan for addressing drought in drought-prone areas (cf. GoM 2004, 2012, 2014).

As the impact of the drought evolved in the fall of 2012, the state and district government engaged in both short-term relief measures to address drinking water and fodder scarcity and more long-term drought risk management. More than 500 tankers were provided by the government in Jalna District to villages and hamlets over a few months (Purandare 2013), and all nine villages were served almost on a daily basis. private sector and political parties also engaged in provision of tankers or local village plastic tanks. Cattle fodder camps were organized jointly by the government and NGOs, and were vital for survival of livestock in many villages. The government mobilized schemes to meet demand of specific villages for more permanent water supply schemes. Additional employment schemes were provided through MGNREGS. Both during and post-drought, the government engaged in de-silting of water reservoirs and local watershed check-dams and smaller streams, reflecting that many of these structures over time had been mismanaged and silted up.⁵ In late 2012 and early 2013, the Government of Maharashtra, with support of the central government, embarked upon a major rescue package for the sweet lime orchards, which had important impacts in terms of saving a large share of the trees; e.g., in the villages of Badnapur. Regarding crop contingency planning, agricultural officials mentioned that though sugarcane was grown much lesser in the district over the last years, but it was of concern that there was an increase in the farming of water-intensive cropping systems such as cotton, and lately, sweet lime and horticulture crops. Drought risk management became a key concern of the extension and research system and the climate service system through IMD. The local KVK (research and

⁵ At the district level, a plan for utilizing Jayakwadi Reservoir as a permanent water supply for Jalna city was set in operation; the city having been dependent on tanker-fed water for many years.

extension agent) made drought risk management a key topic of training; the main focus being on issues of water resources governance and watershed development. For example, the government provided extended support for farm ponds (with plastic linings), protective irrigation (drip irrigation), support of fodder production, employment through MNREGS, renovation of watershed structures and advice for the Rabi season (Interview 1, 19.9.2012 DSAO). Crop compensation losses schemes were also launched on a large scale at a later stage. While many farmers greatly appreciated these schemes compensating high crop losses and a majority among them benefitted directly from them, they also complained about the way crop losses were estimated, low maximum compensation (per hectare) and late payments (including for employment under the MREGS schemes).

6.3 Imperfections in the government and governance system

Despite substantial efforts by the government, our analysis reveals that there were many imperfections in the governance relief response system compared to local demands, which are also not surprising given the severity of the 2012 drought and the scale of impacts. For example, there existed no early warning system for drought linked to a district drought contingency plan with the district authorities, although the district administration possessed long-term experience with drought risk management, and fairly quickly mounted a significant operation with important positive impacts. ‘While the government did the right things, the scale and outreach and timing was not always according to local needs and demands’, as observed by one from civil society. Hence, there is scope for improvements in drought risk management on behalf of the government, as well as on the side of the private agricultural sector, which engaged in smaller operations only (e.g., provision of water tanks). NGOs seemed to be more substantially involved in relief measures at different levels.

The emergency operations were significant across different sectors, yet not always so well coordinated across different actors (public and private), especially not at village levels. People tended to claim that the relief was often delayed or was not sufficient (e.g., water supply). There were problems in terms of outreach to diverse social groups and villages and timeliness in support (e.g., late payment for MGNREGS labour and delayed efforts to rescue sweet lime orchards). Moreover, the extensive emergency system in Maharashtra comes with a substantial financial and administrative burden on the government. The total expenditures of the Government of Maharashtra to the drought damages and relief in 2012 are likely to amount to more than the total annual allocation to agriculture, irrigation and rural development combined (see estimates for 2002–04 droughts, World Bank 2008). While relief measures should be strengthened and will remain an important element of drought risk management, it is critical for the government to continue strengthen the long-term climate resilience of rural communities by addressing vulnerability and adaptation related to management of agriculture, water resources and rural livelihoods.

6.4 Long experience, but no coordinated strategy

However, reflecting past experiences with drought, there were many district and state government agencies involved in various relief efforts, with considerable support and supplement of the central government. There were also several initiatives from local NGOs and private sector agencies that assisted with smaller or larger programmes with individual villages (e.g., to run fodder camps or assist with emergency water supply). In this regard, the state government of Maharashtra and the central

government of India specify a large number of policies and schemes with a bearing on agriculture and watershed development and related drought risk management.⁶ It is the state government which is primarily responsible for drought risk management, although considerable supplements and support will be provided by the central level. Despite or perhaps due to the many rural sector policies and schemes, it is hard to find one overall or strategic policy on drought that fully incorporates key policies at state or national levels (e.g., on agriculture, watershed development and rural employment and social safety and early warning and emergency relief; Purandare 2013).

However, as already indicated the Government of Maharashtra is in this regard among the pioneering states in India and has established a set of programmes, policies and institutions to address the impacts of drought and climate-related risks. The apex level in Maharashtra for drought risk management is the state cabinet, which takes all key policy decisions and monitors the decision. Inter-departmental coordination is done by the chief secretary. The Revenue and Forest Department (Relief and Rehabilitation), under the guidance of the chief secretary, coordinates with other line departments, district administration and the central government. While the Department of Relief and Rehabilitation leads the institutional response to a drought, the mechanisms provided by other departments, such as Water Supply, Livestock, Agriculture and Rural Development (EGS) will get activated as response to local requirements and at the request of the district administration. In line with this institutional arrangement, actions at district level during the 2012 drought were coordinated by the district collector as the nodal institution.

There is no 'early warning' system for drought only a system for monitoring the evolution of the drought, according to the District level Disaster Risk Management (DRM) unit (Interview 4. 21.9.2012. DRM unit) No prior drought emergency action plan existed at district level prior to the 2012 drought.⁷ The DRM unit provides secretarial functions to the DRM Committee which is chaired by the district collector and co-chaired by the president of the Zilla Parishad. This Committee met several times to discuss the emergency situations, obviously. However, the DRM unit itself has very limited operational capacity and has no real rescue or support team at its disposal. Hence, the drought emergency system depends on the mobilization within each line department. But there is no 'emergency operations centre' within the line departments; although Department of Agriculture has the key responsibility for drought risk management. Disaster Risk Management, beyond drought risk management, is supposed to be organized with committees at district, block and village levels. However, we did not come across any operational DRM Committee in the villages engaged in the emergency situation.

The drought situation was, however, monitored closely from the district collector's office, as well as from GOM centrally.⁸ In fact, IMD had suggested 'normal' monsoons in their forecast. However, there

⁶ For example, the National Policy for Farmers lists more than twenty policies to this end with diverse goals across a set of sectors and agencies, including the National Rural Employment Guarantee Programme, The National Food Security Mission, the Horticulture Mission and the Common Guidelines to Watershed development (Sivaramakrishnan 2012). There is also the 2008 National Action Plan on Climate Change. In 2012 a Crisis Management Plan on Drought was prepared by GOI, MOA, reflecting the severity of the event.

⁷ An elaborate Jalna District Disaster Management Information Database and Disaster Response Plan existed, GOM, 2013, without addressing drought. This would be done next year, according to a local revenue officer.

⁸ However, the elaborate Jalna District Management Information Data Base and Disaster Response Plan (2013 update) did not address drought as a climate induced disaster (only floods).

were considerable past experiences in drought emergency planning at the level of the district collector (e.g., with the 2002–04 drought). As such, an emergency ‘action plan’ was fairly quickly developed by the collector as the impacts of the delayed monsoon evolved, needs were reported from the villages and support provided from the state administration and political system. While initiatives to engage by sector agencies were determined depending on the local situation, each sector agency responded according to their sector logic. There was limited hands-on coordination of activities at the block and village levels, reflecting capacity problems and lack of mandates. There was also no systematic participation of the private sector or NGOs in meetings at the level of the collector.

7. POLICIES AND INSTITUTIONS FOR CLIMATE RISK MANAGEMENT

7.1 Drought policies have old roots

The Indian government's policies on dryland farming and watershed development constitute the cornerstone in support of rural development in the drylands, and, as such, in managing climate variability in the longer term (World Bank 2008, Sivaramakrishnan 2012, Purandare 2013, GoM 2004, 2012). Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS) has more lately been conceived as a national rural employment scheme (2005), adding an important social protection dimension to these rural development policies. The roots of MNREGS can, however, be traced to Maharashtra and was a policy response to the severe rural sufferings during the 1970–73 drought. It was argued that public works was needed on a permanent basis to meet occasional drought years, as well as the seasonal variation in labour demands in agriculture (Subramanian 1975, Chen 1991, Drèze 1994, Attwood 2007). This rural employment schemes has its origin in the 1972 drought in Maharashtra. We have already explained the operations of the emergency relief system during drought. These various policies are combined with a set of rural policies to address market access and commercialization, rural infrastructure, storage, irrigation, water supply, research and extension in order to promote dryland farming and rural livelihoods. India also has an elaborate public distribution system of subsidized food. Of particular importance to local farmers were the annual crop loans (free of interest) which many farmers take on an annual basis. Farmers may, according to the local bank, take loans of between Rs25000–Rs 100000 (Interview 6. Maharashtra Bank. 25.9.2014). A key problem here is the relatively high failure rate on repayment. Most farmers obtained a waiver on the repayment of the 2012 crop loan from the bank through instruction of the GOM. Hence, the crop loans are likely to have served as an important (early) safety net for many farm households.

Overall, the relatively robust response across the nine villages to the 2012 drought is one indication of the improved dryland farming system in withstanding a failing monsoon.

Most of these rural policies are to a great extent based on principles of participation and community-based approaches. In particular, the establishment of the National Watershed Development Mission in 1990 was a result of ongoing public debates about the need for more cooperative solutions and greater participation in environmental management and rural development (Rao 1988).

Both the Government of Maharashtra and the Government of India have made several attempts to bring forward an overall or better coordinated drought risk management strategy within which participation has had an important place. At the national level, the National Action Plan on Climate Change was released in 2008, which has instituted eight national missions to further climate change adaptation, mitigation, energy efficiency and natural resources conservation (with sustainable agriculture and integrated water resources management). A multi-stakeholder advisory council on climate change has been vested with the prime minister.

Linked to this Action Plan, the Ministry of Rural Development launched the National Rural Livelihoods Mission (NRLM) in 2011. The aim of this centrally sponsored scheme (CSS) is to create sustainable livelihoods for the rural poor through the mobilization and federation of SHGs, development of physical infrastructure, and training and support for diversification of livelihoods in partnerships with other government programmes, NGOs and community-based organizations (refer www.ajeevika.gov.in). Climate change resilient livelihoods and adaptation is one of the fundamental aims of the NRLM, which is to be operated in concert with MGNREGS and other major programmes for rural development. Moreover, reflecting on the work carried out by the Ministry of Agriculture and Cooperation, a *Crisis Management Plan for Drought* (2012) was issued by the Government of India, with many critical elements for the management of a drought. There is also the *Contingency and Compensatory Agriculture Plans for Droughts and Floods in India* (2012) published by the Planning Commission.

As mentioned, the Government of Maharashtra has been a forerunner in India on drought risk management and dryland agriculture. For example, the agricultural policy of the state is basically to promote rain-fed cropping systems through agricultural research and extension (Government of Maharashtra, n.d.). Moreover, the government has continuously developed its drought risk management policies in response to actual drought episodes and kept learning from past experiences. The experiences from the 2002–04 droughts have been summarized as well as lessons included in several policy-oriented memorandums to the government.

However, perhaps reflecting that the Climate Change Strategy of Maharashtra is still in draft form and awaiting government approval at the district level, climate change and its long-term consequences was not (yet) considered to be high on the development agenda, according to local district officials. Climate change ‘was mostly discussed at state level’. There had been a few seminars on climate change with officials from Pune, possibly to prepare for the awaited Adaptation Fund (to be implemented with the help of NABARD and NGOs), but beyond that climate change had not been much discussed (Interview 4. 21.9.2012). Hence, it seems that political factors are not yet a major direct drive towards changing local climate action, except as they are manifest in various government schemes, such as the NRLM and MGNREGS.

7.2 Community-based policy principles and participation

The Indian government has since the late 1980s accepted the need for decentralized, community-based and participatory approaches to rural development and natural resources management (Farrington et. al. 1999, Vedeld 2003, 2005, Aandahl 2010, Manor 2011), for example in relation to participatory approaches to integrated watershed development, joint forest management and irrigation management. The common guidelines for watershed development, in particular, emphasized the importance of participation and the need to establish community groups, such as Watershed Development Committees (WDCs), User Groups (UGs) and Self-Help Groups (SHGs) to ensure such participation in planning, monitoring and maintenance of structures and resources. These came originally in 1994 (Farrington et. al. 1999), but have since been reformulated several times, e.g., in 2000 and 2008. The 73rd and 74th Amendments to the Indian Constitution (1992) that established PRIs as a third level of federal democracy were also inspired by a policy towards decentralization, local self-government, democratic participation, local planning and more efficient management of resources (IDFC 2013: 210).

7.3 Watershed development on the ground

Integrated watershed development, according to the DSAO, represents the main approach to dryland farming and drought risk management with emphasis on a ridge to valley approach, as it does across India (Farrington et. al. 1999, Vedeld 2005, Sivaramakrishnan 2012, Purandare 2013). This is reflected in the fact that 83% of the arable land is under rain-fed farming in the District of Jalna, while close to 60% of the micro-watersheds have not been covered with extensive watershed development. Several agencies promoted watershed development, including agriculture, social forestry and rural development. The main new vehicle for furthering watershed development was MNREGS. The key problem was that MNREGS had adopted a policy of promoting individual asset creation, such as wells for irrigation, rather than a more broad-based approach to watershed development with more collective asset building (e.g., ridge to valley approach, checking of dams, laying boulders across streams). These small interventions were difficult to coordinate with more broad-based watershed development projects undertaken by the other departments.

However, our review of empirical evidence in the nine villages suggest that there are many larger and smaller watershed development programmes implemented by different government agencies, private sector agencies and NGOs that are sometimes not well coordinated (Vedeld et. al. 2014: 28). On the ground, there have been conflicts in implementation between upstream and downstream users of the water. Between the various agencies involved there were also few formal networks and mechanisms for regular communication and sharing of approaches and experiences.

A key problem with the watershed development programmes were the lack of maintenance and silting up of structures due in part to non-functioning Watershed Development Committees (WDCs). Hence, in response to the 2012 drought, the GOM launched a major programme to renovate many watershed structures, dams and rivers.

Perhaps reflecting some of the issues with the management of collective watershed structures, the main irrigation technologies promoted in the district are geared towards individual farm households or smaller groups of farmers, such as improvements or creation of dug wells (with special recharge techniques), drip and sprinkler irrigation and farm ponds. Post-crisis there was a major drive with the government to promote these technologies. The other main strategy for drought risk management is crop diversification, e.g., custard apple (rather than sweet lime) (Interview 14. DSAO Office.19.10.2013).

7.4 Agricultural extension and research

The District of Jalna had an extensive agricultural extension system that could potentially play an important role in building awareness and capacity among farmers about climate risks and drought-related issues. The DSAO office has to this end developed an elaborate Agricultural Contingency Plan for the District of Jalna with detailed agronomic advice for addressing drought (ACPDJ 2011). The rather rapid spread of new small-scale irrigation technology through government schemes and subsidies over the last decade or so is also an indication that the extension system—and related schemes—has had some important impacts—at least to the extent that technologies offered have been demanded. This concerns, for instance, subsidies, e.g., for dug wells, drip and sprinkler irrigation and farm ponds.

However, our discussion with the DSAO and block-level extension workers, combined with surveys and interviews with farmers, brought out several issues regarding the efficiency of the agricultural extension system. There are capacity problems at all levels, especially at the village level. For example, each agricultural assistant needs to cover 5,000 family household farmers with extension services basically without access to a vehicle. Several observers, including in the DSAO office, suggested an overload of schemes (50–60 schemes often with limited funding) compared to the limited capacity of the agricultural extension agents. Given the focus on promoting agricultural schemes, rather than broad-based advisory services, there was a tendency that the agricultural assistants met up with the sarpanch and few of the larger/medium-scale farmers to ensure some enrolment in relevant schemes, rather than focusing on more general extension advice to broader groups of farmers (Interview 7b. NGO representative). Many of the government schemes had limited funding and thus ended up having rather limited outreach.

Overall, when we asked farmers through the household questionnaire (450 households) about their main source of advice regarding improved cultivation practices, only 5% pointed out the government extension system, while 17% remarked about the NGOs and 19% mentioned about the various private input companies. Among 30% of the respondents, the main source of advice came from friends/others. Regarding the main source of advice about soil and water conservation, only 14% mentioned of the government, while friends/others constituted 61%. This suggests that farmers across all landholding categories mainly depend on each other for technical advice on cultivation practices and soil and water conservation, and not on the government extension service.

While drought is clearly an issue with the agricultural extension workers in Jalna, long-term climate risk management is not firmly on the agenda (yet). That being said, as mentioned earlier, the ‘Agriculture Contingency Plan for the District Jalna’, with detailed agronomic advice for early or late season drought (e.g., delayed onset of the monsoon) suggests that drought as a hazard is clearly an issue with the agricultural department. A key issue is, however, the degree to which the plan is actually operationalized, given the constraints on the extension system. To this end, there is scope for improvements in terms of the inclusion of weather forecasting and related advisory services and in targeting this information to a greater number of farmers. This advisory service is provided today mainly from the Indian Meteorological Department to the agricultural extension system, partly via KVK. There are also various private providers of sms-weather forecasting. However, the coordination of these many providers and the combined outreach of these services still seem limited, judging from our interviews with local farmers, among which mostly a few entrepreneurial farmers have mobile phones and receive weather forecasts and agronomic advice by sms. But the majority of farmers do not have mobile phones. The farmers are organized in farmer’s groups (e.g., KVK), formally and informally, and share such weather information. We have, however, limited information on how precisely the weather forecasting and related advice is shared and, in turn, acted upon and by whom. Here more research is required.

7.5 Private sector extension and advisory services—uncoordinated

Increasingly, the local farmers seem to rely on extension advice from the private sector (e.g., seed companies) and NGOs, as is also confirmed by our survey data. The private sector is heavily involved in commercial agriculture related to the input to production and marketing of cotton, sweet oranges,

sugarcane and high-value seed production in the area. Seed production is a major source of revenue for many small farmers in the nine villages. For example, the DSAO office mentioned Pioneer as an important private seed company providing maize seeds and fertilizers and marketing assistance to local farmers for maize production as fodder to a poultry farm. The Cotton Production Initiative of India worked with local NGOs. Several national and international companies also pursued smaller, yet potentially important Corporate Social Responsibility programmes, for example by extending weather forecasting by sms (Skymet, National Bank for Agriculture and Rural Development, Reuters, Nokia). SKYMET and NABARD also provide private crop insurance in the area. NABARD keeps playing an important part in agriculture, and has recently been assigned the role of an implementer under the new Adaptation Fund (although no funding has materialized through this fund yet). There were also an array of local and international NGOs involved in community-based watershed and climate service programmes that could become closer coordinated with or through government initiatives in the region (e.g., Watershed Organization Trust or WOTR, Action for Food Production or AFPRO, Worldwide Fund for Nature or WWF). NGOs are not part of any regular coordinating bodies for emergency relief or development planning at the district level. In general, representatives of the government at district level, NGOs and private corporations complained about the lack of efficiency of the agricultural and rural development extension system in terms of capacity to coordinate and in ability to network and partner with NGOs and the private sector. This was in contrast to the expressed policy of the state government. For example, the chief principal secretary of agriculture signalled that the state government wanted to explore and mobilize further the private and civil society sectors for climate risk reduction and general development planning.

7.6 The National Rural Livelihood Mission (NRLM) and Employment Guarantee Scheme (MNREGS)

The National Rural Livelihoods Mission (NRLM) was established as a new flagship programme recently (2011) by the Government of India (GOI) in order to implement the new strategy of poverty alleviation that rally around the promotion of community-based institutions (<http://bihan.gov.in/>). The primary objective of this programme is to reduce poverty by promoting diversified employment for sustained increase in incomes. NRLM works in close collaboration with MGNREGS. A basic feature of NRLM is to organize poor households into SHGs that will be federated at higher levels, while enhancing access for these groups to farm credit, technical and marketing services through capacity building. NRLM should also improve service delivery for the poor. There are many SHGs in the nine villages and we comment on their role in climate risk management and development in the next chapter.

MGNREGS in Maharashtra has its roots in earlier employment schemes that were started in 1973 as a response to several severe drought years (1970–74). In all the nine villages surveyed, respondents highlighted the importance of the scheme for employment. Among respondents in our household survey, the majority said they had benefitted from MNREGS' work during the 2012–13 droughts (in one way or another). A striking feature of the responses was however that in some villages 100% of the respondents had benefitted, while in others only 40% or less had benefitted.⁹ We also heard complaints about how the MNREGS operated regarding timeliness of work offer, cumbersome procedures for

⁹ There were certain reliability issues with the answers to these questions, e.g., the sarpanch was present during some of the interviews.

planning investment work and late payments (although payment delays came down considerably during these two years). An additional issue with MGNREGS is that the actual work was often geared towards individual assets (e.g., improvements of private wells) and not broad-based watershed development. Hence, the coordination of MGNREGS with the watershed development work, e.g., of the Department of Agriculture and Department of Social Forestry was an emerging issue, especially since MGNREGS had become one of the main schemes for furthering watershed development (Aandahl et. al. 2014, Vedeld et. al. 2014).

8.COMMUNITY ORGANIZATIONS: LOCALGOVERNANCE OF CLIMATE EXTREMES

8.1 Governance challenges

Drought risk management needs to be tailored to the local context, perspectives and capacities (Platteau and Abraham 2002, Satterthwaite 2011). This raises particular challenges for central and local governance and adaptation policy implementation. To this end, there is a need to bridge the gaps between government policy implementation for long-term climate risk reduction and local—sometimes immediate—demands and needs for emergency relief or development support.

Governance challenges to this end relate to, for example (cf. also Sivaramakrishnan 2012, Purandare 2013, IDFC 2013),

- The present policy orientation; which to some degree is geared towards relatively costly and individual irrigation technology and water intensive crops (cotton, sweet lime) and medium-scale farmers and to lesser degree towards participatory and integrated watershed development, indigenous crops and dryland agriculture for poor and small-scale farmers and landless;
- The limited financial and institutional capacity at local levels, for example, within the public extension system of KVK and agriculture/rural development departments;
- The capacity problems for effective coordination of policies and programmes (especially at block and village level, but also at district level) and lack of convergence between emergency efforts; drought risk reduction and more long-term development programmes and adaptation;
- The problems in moving forward with the decentralization programme and building the PRIs and Gram Sabhas as representative self-government institutions;
- The promotion of decentralization and enabling of community-based capacity and organizations;
- The lack of outreach of climate services and problems in transferring climate knowledge, weather forecasting and advisory services to the farmers.

It is of critical importance for better long-term drought risk management in the individual villages of Jalna that there is a certain scale of support for integrated and participatory watershed development and that this is combined with genuine participation and the building of local capacity—both individual and collective—for managing water and land resources and related infrastructure. Given the great diversity in local institutional capacity, geographic and natural resource endowments—even from one village and block to another—the opportunities for adaptation will also vary greatly between micro-watersheds, villages and social groups.

In this chapter we discuss the degree to which some formal community-based organizations are being enabled and what capacity they possess, before we in the next chapter provide an overview of the drive towards decentralization in Maharashtra.

8.2 Community and farmers' organization

A key question is whether community-based organizations have been given a fair chance to take charge, and if they are capable of responding to the future challenges involved in governing weather and climate extreme events. Comparing the nine villages in our sample, we found considerable differences in local leadership and organizational capacity from one village to another, and in their capability of engaging with external government and non-state agencies. There is no simple explanation for such differences in village politics and governance capacity.

It is recognized by several of the respondents that many of the village committees had gradually increased their capability to take on governance tasks, even if some public officials also questioned how well these local committees actually functioned as independent community-based groups (Self-Help Groups, Farmer Clubs, User Groups) or as sub-committees under the PRI umbrella, e.g., Village Watershed Development Committees, Village DRM Committees, Village Water and Sanitation Committees and Social Review Committees (Interview 5 and 6. 24.9 and 25.9.2012).

We studied in particular the establishment and operations of the SHGs and the WDCs as these were considered main vehicles for the key rural development programmes aimed to address drought and climate risk management.

8.3 SHGs and WDCs

Related to most watershed development programmes in India there will be attempts to build local capacity for planning, implementation and maintenance by establishing WDCs and UGs. The problems of maintaining the watershed development structures across all the villages, reported in Barkved et al. (2014), is a well-known issue in watershed development in India (Purandare 2013). It reflects in part on the 'unavoidable' technical issues (check dams will always be subject to siltation), however, more so it manifests a weak participatory process and limited capacity and sustainability of the local WDCs across the villages to take on maintenance work. Despite several WDCs existing on paper, even with sizable maintenance funds in their bank accounts, these organizations seemed to stop functioning effectively once the planning and implementation phase of a watershed development programme came to an end. This is a generic problem with watershed development programmes in India (and elsewhere) (cf. Farrington et. al. 1999, Vedeld 2005). There seemed to be little difference in the degree to which maintenance was done as to whether the programme had been implemented by the government, NABARD or an NGO. The WDCs seemed to function mostly according to how effective the leader(s) of the committees were in mobilizing action. Mostly they would take on maintenance tasks on an ad hoc basis; not in a systematic manner. User Groups which were supposed to be established to maintain individual structures were either not being established, or did not seem to function well. Hence, the establishment and sustenance of such community-based groups remained an important issue and question the viability of CBA when based mainly on the building of such local groups with the present (non-participatory) approaches.

The SHGs have a very different function than the WDCs and the UGs and are meant to complement these by focusing on poor women, building capacity and enhancing local income in a modest way. According to the local branch of Maharashtra Bank, the village of Asarkheda is one of the more

successful villages in building SHGs. About 20 groups had been established and 6 SHGs had received loans (between Rs 500,000–Rs 600,000 each). These loans were extended free of interest (which is also the case with individual crop loans). The repayment rate for loans to SHGs in general would be around 80% (better than for crop loans, which were at 60% repayment only) (Interview 6. 25.9.2014). A key problem in building SHGs, according to the respondent, was that they often required close follow up and training in the villages in managing loans and in ensuring higher repayment, while his bank did not have much capacity to do so. Several other agencies also promoted SHGs, including NGOs.

A positive aspect of the SHGs is that they make the women come out of their houses and compounds and get together. The women themselves did express satisfaction with the opportunities that SHGs gave to meet and exchange experiences. Hence, when functioning well, the SHGs have potentials to provide capacities and possibly contribute to empowerment. However, our interviews in the villages suggested that the women (and men) did not really emphasize much the importance of the SHGs for income generation or safety nets in emergency situations (Aandahl et al. 2014, Vedeld 2014). The women members of SHGs we interviewed were mainly concerned with saving, and only a few attempts had been made in creating small-scale businesses like candle-making or papad-making. These income-generating activities had mostly failed, however, due to lack of local markets for the products. Few of the surveyed households actually confirmed that they were members of SHGs, suggesting that there might be an ‘over reporting’ of the number of SHGs created and functioning by the concerned agency (Maharashtra Bank). This would require further investigation to actually confirm. Regarding internal lending, the SHGs actually tend to charge relatively high interests (24% per month was mentioned). Hence, in times of stress, inter-loaning was not really considered by the women to be a good option, and was curtailed during the drought. In fact, our impression was that the SHGs stopped organizing meetings and the women preferred to hold back their monthly payments in order to ensure a more secure private economy.

The process of federating SHGs across villages and at block levels had started on an experimental scale, and may, in turn, help reinforce the groups over time. However, at the moment, the federation process is only at a very early stage and of no significance to the local women yet. In other states, such as Kerala, the SHGs seem to have taken on a much more significant role than what we found in the local villages of Marathwada (ref. Interview 24.22.10.2014) (cf. also Narayan and Glinskaya 2007 on SHGs in Andhra Pradesh).

8.4 Farmers’ cooperatives or organizations

Organization of farmers in professional cooperatives, unions or in specific political parties is critical for strong collective bargaining powers. This enhances capacity for engagement in encounters with public officials and may help ensure accountability and efficiency in service provision. It may also help farmers to achieve more efficient marketing, or more generally to gain political support of local interests. A strong organization of farmers would require organizations beyond the village and district levels. The local farms in the Jalna villages were generally quite small and fragmented and the combination of small output for sale and long distance to (cold) storage and markets put farmers at a great disadvantage in terms of access to markets. Except for areas in the villages of Badnapur Block, the agricultural potentials in these areas were relatively low. Both private and state-level support of supply and market chains and infrastructure was relatively weak and potentially undermined the production and sales

potentials of the small farmers. For a variety of reasons, many of the local farmers directed key political concerns regarding agricultural policy towards the state and its policies on minimum support prices, input prices, subsidies, compensation for crop losses and debt relief or waivers. Many farmers were disillusioned and distress sales of land did occur.

However, reflecting that these farmers are relatively marginal as producers, the professional organization of farmers, e.g. dairy cooperatives or crop producer cooperatives was only weakly developed. Two of the villages had attempted to establish dairy cooperatives, which might have helped local organization, but with limited success (Vedeld et al. 2014). The local farmers were also not organized in any particular 'farmers' political party. Local people and local leaders were, however, actively engaging political contacts and affiliations in order to obtain support, however, during and after the drought. Hence, village politics is important and political parties and MPs/MLAs represent important contacts for gaining local support in terms of development schemes.

We also found that there existed individual farm clubs or groups mobilized and utilized by the extension system, e.g., for receipt of sms messages on weather forecast or pests or for promoting certain schemes (by the agricultural department or KVK). But these farm clubs were not federated beyond each village. As already mentioned, the SHGs played a variety of roles in terms of building capacity. But the SHGs were only weakly federated, and seemed to be always in need of external support to sustain over time. They did not serve as professional cooperatives or genuine interest groups for local farmers or people and seemed to break down during the extreme drought as support structures for the women. The WDCs and related UGs also served more limited purposes in the planning of watershed development activities and not for mobilization purposes.

8.5 Linkages to NGOs and private business

In each village, there would be a few active NGOs with smaller development projects being implemented or with links to private business (related to social corporate responsibility programmes). It is our impression from local interviews that the villagers seldom directly called agencies outside the villages, such as the local NGOs or private companies for assistance or support. Even in a drought situation, it would rather be the NGOs that took contact to pursue a felt local demand. Hence, there is scope for stronger dialogue and more active engagements by non-state actors in response to local development concerns and village affairs.

8.6 Changing role of the caste relations and village organization?

The social and economic relationships in these Jalna villages rallied a lot around agriculture and related activities. Caste hierarchies also played a role in social relationships, settlement patterns and community organization. All the villages, e.g., had separate hamlets for certain (scheduled) castes or tribes. As suggested in our socio-political analysis, all the villages are dominated by the Marathas, which were the main farming community and group that on average possess the largest landholdings (although most farmers across all castes are small or marginal farmers). The Marathas have the largest share of farmers cultivating 1 hectare or more (62%). They constitute about 40% of the population in each of the nine villages. The Marathas are classified as Other Backward Caste (OBC). But all the villages have significant representation of other minorities of other castes, mainly scheduled castes, scheduled tribes

(Bhils, Matangs) and Rajputs, as well as a few Muslim community groups. Caste was related, for example, to access to land but also to other resources such as grazing and water, as well as to access to services (e.g., water supply, subsidized housing). Even if land was relatively equally distributed; 35% of the farmers in our sample possess less than 1 hectare, while 74% have 2 hectares or less. Moreover, 33% of the SC/ST groups were landless, compared to 7% landless among all groups (only 2% of the Marathas were landless).

Among the landless (SCs/STs) living in outskirts hamlets we met concerns about exclusion and discrimination, for example, they would be less well served regarding access to drinking water and other services/institutions. They also raised concerns about access to good quality land and water resources (see Aandahl et. al. 2014 for further details). A question worth pursuing is whether the relative declining importance of agriculture in these rural villages and the increased importance of urban employment and education might impact on the power and prestige associated with land ownership, and, as such gradually affect caste as an organizing relationship of local society (as observed for India as a whole in IDFC 2013: 7).

9. MOVING TOWARDS DECENTRALIZATION

9.1 Local or decentralized capacity required for adaptation

The international literature on governance and decentralization suggests that strong decentralized structures would be required for an ‘enabling’ framework for CBA. The following institutional reform elements would thus be considered critical (Ostrom 1996, 2005; Vedeld 2003; Peters 2008; Adger et. al. 2009; Sorensen and Torfing 2009; Osborne 2010; Bicknell et. al. 2010; Ribot 2010; Manor 2011):

- Decentralization and devolution of key functions and resources of the public sector to the district-, block- and village-level governments in response to local needs, while addressing vulnerability and inequality (through *vertical coordination* and integration)
- Delegation of public authority to civil society and private market actors with the potential of strengthening networks of local actors (including through Public-Private-Civic Partnerships or PPCP) and/or enhancement of local self-governance, including the provision of political and legal support of local groups and capacity for autonomous adaptation with critical watershed development committees, user groups for check dams, farmer groups and SHGs (for *horizontal coordination*)
- Deconcentration of public authority and tasks to district- and block-level state bodies

To what degree had there been changes that could be considered as ‘transitional’ or ‘transitional adaptation’ that enabled stronger community capacity for adaptation, reflecting relevant changes in governance (Pelling 2011) or ‘transformation’, i.e., deep or more radical changes in structures or values that are geared to address extreme climate risks?

9.2 Maharashtra among the best in decentralization?

Maharashtra is considered among the best performing states—or even the best—in India with regard to devolution of functions, functionaries and funds to local government (IDFC 2013: 219).

Maharashtra did have in place a system of local government prior to the 73rd Amendment of the Constitution Act of 1992 which formally established the PRIs as the third level of federal democracy in India. In Maharashtra there is a three-tier local government structure; district (zilla); block (taluka); and village level. This local self-government was intended to facilitate greater democratic participation, local planning, more effective use of resources, delivery of services and implementation and monitoring of local assets and development. To this end, the Gram Sabha (GS) was established as the primary deliberative body under which the gram panchayat (GP) or village council of elected officials operates.

How did this system operate to further CBA and community action to respond to and withstand extreme climate events?

Our study did not in any detail study the operation of the PRIs at village level. The interviews conducted at different levels, do suggest, however, that the PRIs invariably function as the empowered local self-government institutions they were meant to be. This is so even if they have been recently capacitated, e.g., with contractual staff to assist in the local offices and all had secretaries and functional

offices. It seems, however, that GS meetings were mostly held irregularly and not generally attended by a majority of the local people (especially not the disadvantaged groups and women). The efficiency of the PRIs seem to rely a lot on the capability of the sarpanches and his allies (i.e., local elites) to act as visionary leaders and bring together diverse coalitions of villagers for some common purpose. In all villages the sarpanches were active as the monsoon failed and the drought in 2012 became a reality, e.g., in terms of bringing the villagers together for meetings and agreeing on letters to be forwarded to the block development officers with requests for water (and better permanent water supply systems), fodder and emergency assistance (Vedeld et. al. 2014).

Although many functions had been devolved to the PRIs in Maharashtra, there are still many that are not and accompanying funds are often lacking. According to IDFC, there are funds transferred from 11 departments in Maharashtra out of the 29 functions recommended (IDFC 2013). But also important, the village level lacks staff and capacity, including technical capabilities, to carry out even many of the functions already mandated to them. Moreover, while the GOM has recommended the allocation of 40% of the state revenues to local bodies, the allocation in 2009-10 was 17% only.¹⁰

However, our impression was that with more appropriate, less bureaucratic and timely support from local state services, e.g., in participatory planning and implementation of watershed development projects, the PRI system could likely take on greater responsibilities in managing finances, contracts and programs. Many of the important centrally state sponsored schemes kept being hampered by insufficient technical support, cumbersome procedures and non-participatory planning and deficiencies in implementation. This concerns the establishment of the SHGs within the flagship of rural development programme (NRLM), rural employment (MGNREGS) and watershed development. Imperfections in implementation also involve favouring the better-off farmers or community groups and clientilism, although we have not investigated these issues in detail. This is in line with what other observers say (Sivaramakrishnan 2012, Purandare 2013, IDFC 2013).

On the other hand, we also found examples of PRIs functioning relatively well and with progressive sarpanches that furthered the interest of the village population, e.g., by attracting watershed development programmes or water supply schemes, such as in the village of Asarkheda. Moreover, several villages had been able to attract or were supported in different manners by local NGOs in capacity building (e.g., for Integrated Pest Management/low-cost agriculture or other investment programmes), and there were important examples of private sector involvement. None of these programmes were directly involved in climate change adaptation per se or emergency response activities, however. But several of these local programmes had a bearing on broad-based drought risk management.

9.3 Parallel structures—the Rural Development Agency

The decentralized structures in Maharashtra, both those of the deconcentrated state and those of local government, obviously, exist within a multi-level structure. To this end, the national and state apparatus reaches right down to the village level through a set of parallel structures and important programmes

¹⁰ The GOM suggests that 15 functions have been transferred in their own audit report (local bodies) for year ended March 2010. Moreover, the recommendation to transfer 40% of the state revenues came in March 2002 with the Second Maharashtra State Finance Commission (GOM, Undated, Audit Report).

(e.g., through the Gram Sevaks, agricultural assistants, rural development officers). The district and block level administration and services are instructed from regional and state and national levels through a variety of policies and programmes. The GOI also provides guiding policies and large funding on important centrally sponsored schemes (CSS) for direct investments at the district and village levels (NRLM, MNREGS). Adaptation and drought risk management, in addition to being dealt at multiple level, therefore needs to be considered within a multi-sectoral, multi-agency and territorial perspective.¹¹

The chart below shows the organizational structure for drought management in the State.

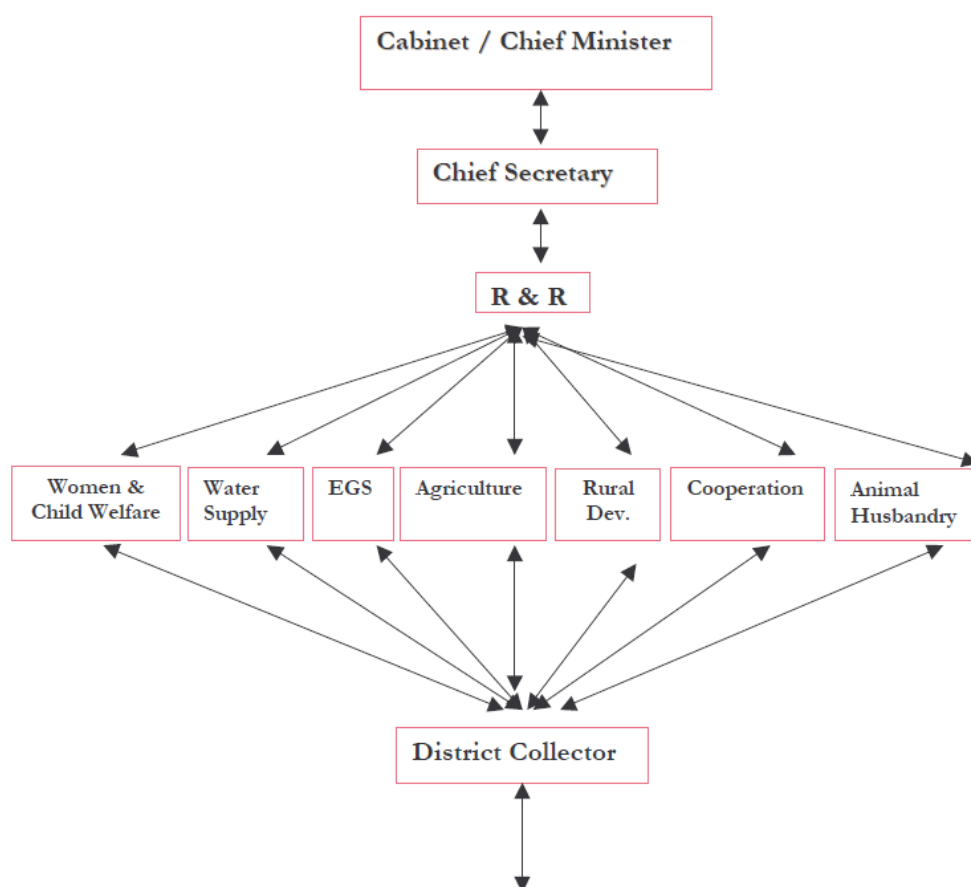


Fig. 9.1 The centrality of the district collector in coordinating sector programmes

In Jalna District, we found mechanisms for vertical coordination and integration of adaptation and attempts at horizontal coordination of actors from the district government, civil society and the private sector. Specifically, we asked if the arrangements of governance at the district, state and panchayat

¹¹In India there is basically a five-tier government structure, characterized by fairly strong federal and state-level structures with strong deconcentrated administration and services at the regional and district levels coordinated by the regional and district commissioners, respectively. There is a three-tier decentralized structure with a relatively autonomous district level (Zilla Panchayat) which is fairly strong, while the block level and village panchayat levels are much weaker in terms of powers, staff and resources.

levels and below are functional, flexible, responsive and adequately resourced with financial and technical capacities to withstand and recover from drought and adjust resilience over time.

Obviously, the choices of governance structures and related policies raise issues about the state and local government capacity to respond in an effective, unbiased and participatory manner in service delivery. Our findings suggest that while the government might have done many of the right things in meeting the drought crisis, the scale of the different schemes and the outreach and coordination (across sectors and with NGOs and the private sector) was not adequate to meet local demands (according to our interviews with several local professionals). There are also coordination and cooperation issues at different levels regarding long-term programmes with a bearing on climate risk management.

The regional state administration, represented by the district collector, seemed in this regard to maintain the 'strong' steering and coordination position, reflecting the presence of other important decision-making centres at this level with relevance to adaptation and drought risk management. For example, there are key agencies situated at this level within the sectors of agriculture, water resources, watershed development and disaster risk management (Fig9.1). However, with regard to broad-based rural development, the Rural Development Department and the District Rural Development Agency (DRDA) were of central importance with the District or Zilla Parishads and its president played a key coordination role, supported by the chief executive officer. At block level, the block development officer holds a key position; and at village level, the Gram Sevak provided daily support for governance at village level to the sarpanches and the subject committees under the Gram/Village Panchayats. The Gram Sevak is the 'secretary' of the village council and the sarpanch. The Village Panchayat Act provides for the constitution of Gram Sabha (village general assembly), which is the body consisting of persons registered in the electoral rolls of the village territory. The GPs are empowered to levy local taxes; which they often fail to do. They are required to meet periodically and select beneficiaries for state/centrally sponsored schemes, prepare local development plans and projects to be implemented by the GPs and manage local budgets.

In this regard, although the block development officer holds a key position in terms of coordination within and between villages, his capacity to actually coordinate across sector programmes and public-private actors seemed limited. Sector programmes tended to work according to their own agency logic. Private businesses, as well as local NGOs, have limited tradition for engaging with the local government, and are not typically called for coordination meetings at village or block levels.

9.4 Emerging capacity for coordination at local level?

The 'place bound' character of adaptation and drought risk management suggests that high capacity to withstand and respond to drought is required at the local and community levels. At the same time, the capacity for coordination was weakest at the village level. Local capacity would bargain for relatively fast and adequate responses in an evolving emergency situation, as well as in relation to adjustments to future extreme events. Given the strong capacity of the district for coordination within the present structure, it is assumed that the Zilla Parishad in concert with the district collector need to bring coherence to the integration of agendas that may not always have been well enough integrated, i.e., drought risk management, adaptation and (sector)planning and development. This level also has an important mandate in the policy for coordination through district level planning, financial management,

and implementation. Centrally sponsored schemes are, however, implemented through the DRDA with sanctioning of the Department of Rural Development.

On the ground, one would expect the Village Panchayat and Gram Sabha to play an increasingly more important role in ensuring coordinated responses and interventions, which was also the intended policy of the Government of Maharashtra. Today, however, the village (and block) level stand out as fairly weak in terms of coordinating sector schemes and interventions in response to drought and local development. This not only reflects the limited actual mandate, resources and powers of the Village Panchayat, but also shows how the system operates on a daily basis.

The village PRI system was, invariably, dominated by individual sarpanches and/or his local elite networks. Although the PRI was considered the most important local institution for rural development and climate risk management by most village respondents, the impression was that GS meetings were only held irregularly, sometimes on ad hoc basis. Village affairs related to emergency relief or planning were often resolved by a more narrow group of local leaders close to the sarpanch. There were also other important local leaders that took on tasks of furthering broader village concerns through the PRI system or through other connections, e.g., local teachers or business men that resided in nearby towns. These local leaders were important for gaining agreements among villagers to take actions, including investments in collective drought risk management measures. They facilitated day-to-day management of village or family affairs and attracted outside attention for funding of schemes, sanctions of MGNREGS work, approval of relief measures or support of NGOs or private sector actors. Local leaders also drew upon the political system and direct links to MLAs or MPs for support. The MLAs were members of the Zilla Parishad and engaged in local political affairs and provided support for concerns raised, e.g., by sarpanches of the same political party. Several respondents mentioned that the MLAs, which possessed their own small development funds, were active during the drought putting pressure on the district collector or other levels of the government for local support.

At the same time, given the weakness of other local organizations explained in the previous chapters, the local farmers and villagers at large depended mainly on the PRI system in terms of raising local concerns or voice claims outside of the village. They would raise issues in the GS meetings, or directly in informal meetings with the sarpanch. The Gram Sevak—with his direct link to the block development officer—also held key mediation positions for raising local concerns at higher levels or for engaging in local conflict resolution.

In this regard, the strengthening of GS and the Village Panchayat is as such of critical importance to good local governance and improved CBA. A senior official of the Rural Development Department insisted that ‘The PRIs at village level have relatively limited executive powers and financial and administrative capacity. A key problem is the very limited financial autonomy and little local revenue collection.’ However, he concluded by saying that the ‘committees under the PRIs were able to solve more and more problems’ (Interview 25.9.2012). In the final chapter we will dwell more on the potentials for decentralization and stronger community-based institutions.

10. CONCLUSION: ENABLING COMMUNITY CAPACITY

10.1 Transitions in policy and governance observed

In an extreme drought situation neither the small farmers nor the landless can cope on their own and the local communities require external support from the government and from NGOs and private sector actors. Both incremental and more transitional and transformational adaptive action is required to meet future climate change and extreme weather. To this end, it is critical that the local rural dynamics and ongoing transitions in agricultural practices, social relations and markets be reflected in climate risk management policies and governance at different levels. The government at all levels needs to ensure better cooperation and coherence between national and state level rural policies and local responses through participatory governance and development.

In this report, we initially asked whether changes in response to extreme weather and drought at district level had been incremental or more transitional in character, and if such changes enabled or constrained community-level capacity for adaptation. To this end, we have explained how the state government, as well as the central government, continuously changed policies in response to ‘climate drivers’, i.e., extreme droughts of the past. This happened after the 1970–74 droughts as well as after the droughts in the years 2002–04. These events impacted upon the local political economy and political factors and prompted the government to adjusted policies and institutions towards stronger drought risk management systems. The transitions in policy and governance have had positive implications for the resilience of farmers in Marathwada and Jalna. We have pointed to important shifts in the policies and institutional approaches to dryland agriculture, watershed development and changes in rural employment schemes. We have also highlighted the state government’s clear drive towards decentralization and building of capacity of community-based groups and village PRIs, albeit with mixed success. Hence, we observe important *transitions* in the governance system, combined with a set of *incremental* changes in the actual operations of various programmes, e.g., for introduction of irrigation technologies and crop diversification. The 2012 drought also mobilized a set of substantive initiatives on the part of the state and central government, which had profound implications for how the district and village level were able to respond and cope with the drought. There were also policy measures taken to meet more long-term climate changes after the 2012 drought.

10.2 Climate change awareness nascent at district level

While we observed that drought risk was a well-known issue among local officials, we were much less convinced about how well the more recent climate change discourse had become firmly established at district level and below. It remained a fairly nascent agenda with district public officials. Climate change was referred to by public officials as a topic discussed mostly at the state level. The many actions taken by the district administration to address drought risks were, however, not necessarily associated with long-term climate change. We, however, found great interest among key public officials in discussing the topic, and there was clear demand for more information and training on the subject. There was considerable awareness and more action in relation to potential future climate change among local

agricultural researchers and NGOs (e.g., with KVK and local research stations). Local farmers were also concerned about changing monsoon and rainfall patterns; the severe occurrences of hailstorms 2014 that led to massive destruction of the standing crop added to their concerns.

10.3 Furthering a multi-agency and multi-level governance approach

Given the diversity of constraints observed on local rural livelihoods, climate risk management in Jalna needs to become integrated in all key rural sector policies, e.g., agriculture, watershed development, water resources and non-farm employment. We propose that a multi-sectoral and multi-agency oriented approach is required to climate risk management to build more resilient dryland communities. Climate change adds new risks and uncertainties and complexity to local governance, and thus requires the combined knowledge, resources, and agency of communities, civil society, private business, local and central government. Hence, coordination and cooperation and new partnerships between government and non-state actors are essential, especially since rural development has become more and more dependent on the efforts of private business and NGOs for extension, input investments, sales and marketing. The governance of extreme events requires in particular improved local coordination through strengthening the PRIs and GSs and enabling CBA through improved accountability, social audit and participation. Greater impacts on local watershed development and farming systems and thus community-based resilience can be achieved if the central government improves policy and programme integration, and, we suggest, ensures greater transfer of capacity and powers to the district and local level levels for coordination and convergence of development programmes.

10.4 Shift from relief to long-term climate risk management

Moreover, adaptation to future climate change requires a shift from relief measures to long-term watershed development, crop diversification, improved irrigation facilities, improved infrastructure, climate services and safety nets/employment. Short-term drought relief planning and investments should become better integrated with the long-term adaptation agenda and sector development programmes. A further rationalization of state and centrally sponsored schemes might be required including support for improved climate services.

10.5 Policy implications: Enabling Community-based Adaptation

The following are some selected policy and institutional implications of importance to better community-based governance of extreme climate events derived from the empirical findings in the nine villages and interviews at village, district and state levels.

- **Decentralize the governance of climate extremes:** The state (and national) drought risk management strategies need to be decentralized, and policies and plans at state levels better linked to district-level policies and plans and coordinated with private business and civil society initiatives at village level. It is necessary to shift focus from short-term relief measures to long-term climate risk management
- **Undertake climate/risk and vulnerability assessments:** Drought and climate risk and vulnerability assessments should be undertaken at the regional, district and/or local levels. The integration of climate risk assessment data – focusing on scarce and variable water resources –

may help to prioritize investments in agriculture and watershed development and integrate and operationalize climate risk governance in sustainable rural development

- **Improve climate services and early warning systems:** The government should continue to improve the weather and monsoon forecasting and advisory system and expand the system to ensure greater outreach by building links and partnerships with private and civil society service providers. It is important to improve targeting and outreach of hydro-meteorological services as regards drought (and flood) preparedness; build linkages between climate services and systems of early warning, contingency planning, water budgeting, weather index insurance for farmers, and improved social safety nets. It is critical to reinforce local capacity building at village and block levels
- **Prepare district-wise drought contingency plans and related financing:** DRM activities need to be linked to early warning systems, at national, local and community levels
- **Ensure better integration of climate risk management knowledge and capacity with watershed development and agricultural approaches and technology:** This requires, e.g., participatory management of scarce water resources, innovative cropping patterns, pasture production and integrated crop-livestock production, forestry management, and improved/participatory extension (weather forecasting, early warning, advisory services)
- **Reinforce Community-based Adaptation:** It is critical to enhance community and local initiatives including through training and financial support of SHGs, watershed development committees, farmers' groups and linkages to committees under the GS and the PRI system. This requires long-term and genuine support and training.
- **Improve risk financing (weather-based index insurance):** Consider ways of improving credit schemes and risk transfer mechanisms and design of catastrophe risk financing strategies. It is important to promote risk financing as an integral part of the state's economic policy and an important component of a strategic framework for climate and disaster risk management
- **Improve the operations of MGNREGS:** It is essential to ensure increased efficiency in the operations of the rural employment schemes (MGNREGS), related to outreach and targeting, empowerment of women, and active participation of the GS in developing good quality collective assets (e.g. infrastructure for watershed development, rural roads and connectivity, storage systems)

Moreover, it is critical that *climate risk management becomes everybody's business*. Hence, there is a need for capacity building of leaders and the public at large to internalize risk awareness and risk management in everyday practices, and develop an understanding of the social dimensions of vulnerability and resilience. For this to happen new public–private–civic partnerships are required and network governance developed with stronger local self-government and community organization and strong local participation. Business as usual is not enough to address future climate challenges.

Finally, we suggest that more research is required to understand how Maharashtra and India as a whole operationalize climate change policies from national to local levels with a particular focus on

coordinated climate services. While climate services in Maharashtra have improved considerably over the last few years, for instance, with better weather information and related advisory services, there is a need to better understand the interface between the various service providers and the diverse users of weather and climate information. In particular, it is important to better understand how scientific climate knowledge is translated and transferred through the system, and how it meets the local, experience-based knowledge and the demands of both small and large farmers.

11. LITERATURE

Aandahl G. 2010. 'Technocratic Dreams and Troublesome Beneficiaries: The Sardar Sarovar Project in Gujarat'. Unpublished PhD-dissertation. Oslo: Department of Sociology and Human Geography, University of Oslo:.

Aandahl, G. Et. al. 2014. 'Impacts and Vulnerability of Human Systems Depending on Dryland Ecosystems', *Final Report on WP3.1., Extreme Risks, Vulnerabilities and Community-based Adaptation in India (EVA): A Pilot Study*. New Delhi: CIENS-TERI, TERI Press.

Adger, Neil, Irene Lorenzoni and Karen O'Brien. 2009. *Adapting to Climate Change: Thresholds, Values, Governance*. New York: Cambridge University Press.

ACDPDJ. 2011. Agriculture Contingency Plan for District Jalna, 2011. Central Research Institute for Dryland Agriculture; [http://www.crida.in/cp-2012/statewiseplans/Maharashtra\(Pdf\)/MAU,%20Parbhani/Maharashtra%2033-Jalna-31-12-2011.pdf](http://www.crida.in/cp-2012/statewiseplans/Maharashtra(Pdf)/MAU,%20Parbhani/Maharashtra%2033-Jalna-31-12-2011.pdf) (Last accessed by 29 January 2014).

AFPRO. 2008. Impact Evaluation Report, Asarkheda Watershed, NABARD Supported Indo German Watershed Development Programme. AFPRO: Ahmednagar

Attwood, D. W. 2007. 'Small Is Deadly, Big is Wasteful', A. Baviskar (ed.), *Waterscapes. The Cultural politics of a natural resource*. Ranikhet: Permanent Black

Baas, Stephan and Selvaraju Ramasamy. 2008. 'Community Based Adaptation in Action', *FAO Environment and Natural Resources Service Series*, No 14. Rome. FAO.

Barkved L., Gosh, S., Seifert-Dahn, I., and S. G. Salunke 2014 2014 (in press). Water resources, water use and potential risks in Jalna: Impacts of extreme drought on water issues and use, New Delhi: TERI/CIENS

Bicknell, J., D. Dodman and D. Satterthwaite (eds). 2010. *Adapting Cities to Climate Change: Understanding and Addressing the Development Challenges*. London: Earthscan Climate.

Bulkeley, H. 2013. *Cities and Climate Change, Critical Introductions to Urbanism and the City*. Oxon/New York: Routledge.

Chen, M. A. 1991. *Coping with Seasonality and Drought*. New Delhi: SAGE Publications.

Drèze, Jean. 1994. 'Famine Prevention in India', J. Drèze and A. Sen, *The Political Economy of Hunger: Selected Essays*. Wider Studies in Development Economics, Oxford: Clarendon Press.

Government of Maharashtra (undated). *Final Copy of Documentation on the Drought of 2002–03: State-level Efforts*. Mantralaya: Mumbai, Relief & Rehabilitation, Revenue & Forests Department.

Farrington J et al. (eds). 1999. *Participatory Watershed Development: Challenges for the Twenty-First Century*. New Delhi: Oxford University Press.

Government of Maharashtra. 2013 (unpublished). 'Jalna District Disaster Risk Management Database & Disaster Response Plan'. Jalna: District Collector.

Government of Maharashtra (undated). 'Government of Maharashtra Relief and Rehabilitation Division'. Available at <http://mdmu.maharashtra.gov.in/pdf/droughtmgmt/drought02-03.pdf> (last accessed 30 August 2012).

Government of Maharashtra. 2004. 'Revised Memorandum to the Government of India on Drought Relief and Mitigation in Maharashtra (2003-04)'. By Relief & Rehabilitation Revenue & Forests Department, Government of Maharashtra. Available at <http://share.pdfonline.com/966a3c9abfcb4c14944d10e4e4f927dd/drought03-04.pdf> (last Accessed 15 January 2014).

IDFC. 2013. 'India Rural Development Report 2012/13'. IDFC Rural Development Network. New Delhi: Orient BlackSwan

IISD (with IIED). 2011. A Summary of the Fifth International Conference on Community-based Adaptation to Climate Change. *Community-based Adaptation to Climate Change Bulletin* 135(4). Available at <http://www.iisd.ca/ymb/climate/cba5/>

IPCC. 2012. 'Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation'. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge, UK: Cambridge University Press.

Intergovernmental Panel on Climate Change (IPCC). 2013. 'Summary for Policymakers', *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fifth Assessment Report of the IPPC [T. F. Stocker, D. Qin, G-K Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P. M. Midgley (eds)]. Cambridge, UK and New York, USA: Cambridge University Press.

Intergovernmental Panel on Climate Change (IPCC). 2014. *Summary for Policymakers. Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Cambridge, UK and New York, USA: Cambridge University Press.

O'Brien, K. 2012. 'Global Environmental Change II: From Adaptation to Deliberate Transformation', *Prog Hum Geog*, 36(5): 667–76.

Osborne, S. 2010. Introduction: The (New) Public Governance: A Suitable Case for Treatment? S. Osborne (ed.) *The New Public Governance. Emerging Perspectives on the Theory and Practice of Public Governance*. Routledge: Oxon.

Ostrom, E. 1996. 'Crossing the Great Divide: Coproduction, Synergy, and Development'. *World Dev*, 24(6): 1073–87.

Ostrom, E. 2005. 'Understanding Institutional Diversity'. Princeton and Oxford: Princeton University Press.

Platteau, J-P and A. Abraham. 2002. 'Participatory Development in the Context of Endogenous Community Imperfections'. *The Journal of Development Studies*, 39(2): 104–36.

Pelling, M. 2011. *Adaptation to Climate Change: From Resilience to Transformation*. London: Taylor & Francis Books.

Peters, B. G. 2008. *The Two Futures of Governing: Decentering and Recentering Processes in Governing*. 114 Reihe Politikwissenschaft/Political Science Series. Wien: Institut für Höhere Studien.

Purandare, P. 2013. Water Governance and Droughts in Marathwada. Commentary, *Economic and Political Weekly*, 68 (25), 22 June.

Manor, James. 2011. 'Perspective on Decentralisation', Working Paper no. 3. Visby: ICLD, Swedish International Centre for Local Democracy.

Narayan, D. and E. Glinskaya. 2007. *Ending Poverty in South Asia. Ideas that Work*. Washington DC: The World Bank.

Rao, C., et. al., 1988. *Unstable Agriculture and Drought: Implications for Policy*. Delhi: Vikas Publishing House.

Reid Hannah, Saleemul Huq and Laurel Murray. 2010. List of Abstracts from the Fourth International Conference on Community-Based Adaptation, Dar es Salaam, Tanzania, 2010. 'Community Champions: Adapting to Climate Challenges'.

Ribot, J. 2010. 'Vulnerability Does Not Fall from the Sky: Towards Multiscale, Pro-poor Climate Policy', R. Mearns and A. Norton (eds), *Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*. Washington DC: The World Bank.

Satterthwaite, D. and D. Dodman. 2013. 'Towards Resilience and Transformation for Cities Within a Finite Planet'. *EnvUrb*, 25(2): 291–98.

Satterthwaite, D. 2011. 'Editorial. Why Community Action Is Needed for Disaster Risk Reduction and Climate Change Adaptation?' *EnvUrb* 23(2): 339–50.

Sivaramakrishnan, A. 2012. *Public Policy and Citizenship: Battling Managerialism in India*. New Delhi: Sage Publications.

Sorensen, E. and J. Torfing, 2009. 'Making Governance Networks Effective and Democratic through Metagovernance', *Public Administration* 87: 234–58.

Subramanian V, 1975. *Parched Earth: The Maharashtra Drought 1970–73*. New Delhi: Orient Longman.

Vedeld, T. 2005. 'Decentralisation of NRM: The Case of Watershed Development in the Lower Himalayas, Paper presented to NFU Annual Conference; available at www.nibr.no/trond.vedeld@nibr.no

———. 2003. 'Democratic Decentralisation and Poverty Reduction: Exploring the Linkages'. Forum for Development Studies No 2.

Vedeld, T., G. Aandahl, L. Barkved, U. Kelkar, K. de Bruin and P. Lanjekar. 2014. *Drought in Jalna. Community-based Adaptation to Extreme Climate Events in Maharashtra*. The Energy and Tesource Institute (TERI) and Norwegian Institute for Urban and Regional Research (NIBR). New Delhi: TERI Press

World Bank. 2008. 'Climate Change Impacts in Drought and Flood Affected Areas, Case Studies in India', Report no. 43946-IN, South Asia Region. Washington DC: World Bank.



About the Project

The EVA project focuses on the state of Maharashtra. More than 30 % of the state of Maharashtra falls under the rain shadow area and about 84 % of the total cultivated area is rainfed. Drylands in Maharashtra face the combined stress of human pressures and drought. Communities within these drylands are poor and face extreme conditions of water stress. This pilot project aims to assess the extreme risks and vulnerabilities to climatic extreme events in the drylands of Maharashtra and their impacts on agriculture and water resources, and the implications for community-based adaptation in response to these extreme events.

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