

## ***Community Based Adaptive Measures to Address Climate Change in India***

***Dr. Jacob John, Director, KDS Delhi  
Ms. Seema Chelat, Research Officer, KDS Delhi***

### **Introduction**

The United Nations Framework Convention defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability Observed over comparable time periods". (<http://unfccc.int/>) According to this widely accepted definition, the impact of climate change on the community is immense. Climate change has started affecting adversely numerous people through increased floods, reductions in water supply, drought, increased rainfall and various health effects. Various recent studies have highlighted adverse impact of climate change on the poor and downtrodden. According to Oxfam, climate change is likely to impact in a much more serious manner to the poor due to various reasons such as soaring food prices, increasing expenses on medical care, etc. (<http://www.oxfam.org>) Climate change could result in a permanent change in yield variability and excessive food price volatility, which could leave many poor countries with potentially insurmountable food security challenges in the near future. Indian experience is also similar as the adverse impacts of climate change have already threatened the livelihoods of many Indians, especially the poorest and marginalized. Poverty and livelihood issues are the root cause of various environmental issues in India. Climatic risk reduction apart from other aspects is a matter of enacting and enforcing laws, building and maintaining accountable institutions, and creating an environment of mutual trust between government and the population. Currently various state governments in India have started designing many adaptation programmes aiming to mitigate the impact of climate change and help the vulnerable people to tide over the situation. In this context, the significance of adaptive measures, especially with the active involvement of communities needs a special attention. Against this backdrop this paper discusses the role of communities in adaptation measures and examines the significance of Panchayati Raj Institutions (PRIs) and Self Help Groups (SHGs) in formulating and executing adaptation measures. The paper also tries to formulate an action plan for the effective utilization of PRIs and SHGs in the adaptation strategies.

## **Community Based Adaptation Measures: A Brief Review of International Experiences**

Adaptability refers to the degree to which adjustments are possible in practices, processes, structures of systems to projected or actual changes of climate. Adaptation can be spontaneous, or planned, and can be carried out in response to or in anticipation of changes in conditions (IPCC, 1996). Adaptive capacity is the ability of a system to adjust to climate change, including climate variability and extremes, to moderate potential damages, to take advantage of opportunities or to cope with the consequences (IPCC Working Group II). Community-based adaptation is an approach of harmonizing human development and efforts to manage climate change as it is possible to accelerate culturally appropriate strategies and mechanisms to promote adaptation and thus contribute to sustainable human development at the grassroots level.

Communities have long been adapting to climate changes as they have information regarding the practices, but these adaptations have been most of the time reactive. The awareness that adaptation to climate change should be planned, proactive, and anticipatory is relatively new and is an important element of Community-based adaptation. As many vulnerable and marginalized people are living in remote locations, they have difficulties in accessing government support and services. Most of the people vulnerable to climate change and climate-related risks are poor and marginalized people and their livelihoods are often directly depending on natural resources. Community based management has emerged from the fact that the information and local practices of locals can be effectively coordinated and utilized while developing a mitigation programme.

Several studies clearly indicated the need to involve local people and local institutions in the designing of adaptive managements and execution adaptive measures. Several common property resources were successfully managed at local level by common property regimes through arrangements among the local community or a defined user group. This had resulted in the sustainable levels of consumption of the resources by preventing overuse and destruction in the long run (Ostrom 1990). Climate policy or for that matter, environmental policy increasingly emphasizes involvement of local players and land owners. But the planning and policy development is still a bureaucratic exercise. The economic costs for third-party

enforcement and monitoring of formal institutions tend to be higher relative to the costs of enforcement and monitoring of informal institutions (North 1990). Norms are generally hard to change in a given society and may gradually weaken over time (Ensminger 1996). Cultural traditions and mechanisms that have been developed as adaptations to the environment over tens or hundreds of generations may quickly be cast aside when a local community comes in contact with new technologies and outside influences (McNeely 2001). Above studies clearly emphasize the need to involve local actors while designing adaptive managements.

UNIFEM (2009) while explaining the role of indigenous women and SHGs in mitigation and adaptation activities emphasized the need for further research regarding effective adaptation and mitigation strategies for involving indigenous communities. IDEX Update (2009) in an article on “mitigating climate change” has elaborated the experiences of Sahyog, a local NGO in regard to the activities of self help groups in adaptation and mitigation in the field of agriculture. The study found that focus of self-help groups on resource management and sustainable agriculture has helped people better prepare and surmount the growing threats of food and water crises. Water harvesting, vermiculture, and organic agriculture offer viable ways for communities to adapt to, and mitigate, the impact of climate change. While examining adaptation strategies developed and deployed by SHGs and promoter of SHGs, there is a need for replicate the same in other regions.

A major outcome of the 13th Conference on climate change held in Bali, Indonesia in December 2007 was an agreement by various representatives of local governments and Mayors to work collectively to achieve reductions in greenhouse gas emissions. In a landmark agreement entered into by the local government representatives and Mayors along with other civil society organizations certain concrete commitments were made. It includes the implementation of sub-national, national and international frameworks that enable local governments to avail resources, authority and sufficient mandate to carry forward these roles and responsibilities. Their commitments also include the execution of climate change adaptation and preparedness measures through local government planning, development and operational mechanisms, prioritizing the most vulnerable cities (Institute of Social Sciences 2009).

A few empirical studies have confirmed the impact of adaptation activities of local communities in agriculture sector. Maureen Biermann, Pennsylvania State University, USA in her study on “the role of local NGOs in anticipating and responding to climate change” examined how local NGOs in Arusha, Tanzania, facilitate or constrain the adaptive capacity of their partner communities. This study employs a framework that identifies institutional flexibility, cross-scale, interaction, and opportunities for collective and anticipatory learning as indicators of adaptive capacity. The indicators of adaptive capacity are used to assess how well each NGO facilitates adaptive capacity in its partner communities. The study has drawing on data from local NGOs that identify how they understand climate change, how this understanding shapes their agendas, and how these agendas translate to projects and programmes.

### **Panchayati Raj Institutions in India and Community Action**

The Constitution (Seventy-third Amendment) Act 1992 made drastic changes in the **role** of Panchayati Raj Institutions (PRIs) in India. The Act made a provision for creating a three-tier Panchayati Raj system. Panchayat is defined in the Indian constitution as an ‘institution of self-government for the rural areas. PRIs have started to play a significant role in the planning for economic development, social justice and also implementation of various schemes. A total of 29 subjects are devolved to PRIs and these subjects include agriculture, water management, social forestry, minor forest products, small scale industries, drinking water, roads, health and sanitation, women and child development, maintenance of community assets etc. Since maintenance of community resources and other related subjects are under the domain of local people much can be done in adaptation management with the help of communities. A large amount of funds as grant –in – aid under various state and central government programmes have started to flow to PRIs which can be employed for various activities at the grassroots’ level as it is closer to people. If we strategize and engage these local resources with funds, people and local knowledge, the desired objectives can be achieved. The delivery of these functions and planning for economic development and social justice can work effectively and equitably only at the local level. It is a fact that devolution of funds, functions and functionaries to PRIs is not uniform among various states resulting in state variations in the power of PRIs. However, PRIs have the potential in creating an environment for risk reduction and livelihood protection though these potentials remain unexploited in India. Without an active

involvement of PRIs, mitigating and adaptive measures are directionless and difficult to get implemented. Adequate attention is not given for the execution of climate change adaptation and preparedness measures through PRIs. Climate change related activities of PRIs are missing in most of the Indian states.

Some PRIs with the support of professional organizations have made efforts to involve in the planning and execution of adaptation measures. For instance, an initiative taken by three organisations led by Intercooperation promoted the role of PRIs in Rajasthan in the execution of climate adaptation programme. The Harren irrigation system has open diversion channels that are used to distribute water from a storage area to low lying places by gravity flow. This traditional irrigation system is mostly prevalent in semi arid areas in Rajasthan. The irrigation system in Amid was quite weak and ineffective. With the support of climate adaptation programme irrigation systems were upgraded through building of cement lining of the earthen channels in 2007. The essential feature of this programme was the creation of user groups with the involvement of PRIs for the operation and management of the irrigation system. The major achievement of this project intervention was the tremendous increase in the efficiency of the irrigation system. It is significant to note that currently water distribution system is being overseen by a number of senior community members ( V&A Pilot Programme, 2009).

Another example is reported from V& A Pilot Programme in Andhra Pradesh. Tanks are a traditional system of rainwater harvesting in many semi-arid areas of Andhra Pradesh. Tanks are used to sustain various rural livelihood activities that include agriculture, fisheries and livestock rearing. Initially operation and maintenance of these Tanks was quite regular due to the availability of adequate government funds. When the fund allocation came down this system of irrigation became inefficient. As the significance of tank irrigation system declined there was a flourishing of private ground water irrigation system. When it was realized that current levels of ground water usages were not sustainable due to limited groundwater sources government and community had devoted attention to the proper management of tanks. A community based tank restoration intervention activities were undertaken. Various community groups had taken several initiatives in ensuring adequate maintenance and overseeing the distribution of the

tank water. The revitalization of community based management structure of the tanks helped the communities to tide over the difficulties. (Narsimah Reddy and Murali, 2006)

M.S. Swaminathan Research Foundation, in association with the Ministry of Earth Sciences had initiated a mass movement in Chennai to mitigate the effects of climate change and global warming at the local level with the active involvement of PRIs. Under the programme one male and one female member from each Panchayat in vulnerable states were trained as climate risk managers (CRMs). Initially, PRI leaders from Tamil Nadu, Kerala, Orissa and Pondicherry were trained as master trainers. They were given training in the field of science and art of managing climate changes to make them capable in addressing various issues especially in respect of local level planning that can reduce hardships and save human lives and protect livelihoods. According to Prof Swaminathan, father of the Green revolution, CRMs are grassroots level workers capable of disseminating details about vagaries of weather to fellow villagers(<http://www.dnaindia.com/india/report>). These are some strong evidences to prove the potentials of PRIs in mobilizing communities in the planning and execution of various adaptive measures.

### **Self Help Groups in India and Community Action**

Self Help Group(SHG) is a group in which members provide each other with various types of help for a particular shared cause. This group is organized and led by lay people, rather than professionals. In India, there are mainly four types of SHGs in India: (1) formed under government programmes, (2) formed with the support of NGOs or international organizations, (3) formed with the support of political parties, religious organizations, etc and (4) formed without any external support. SHGs are small, informal and homogenous groups. These groups have proved as cyclic agents of development in both the rural and urban areas. SHGs have become a powerful social capital in executing a social development programme in many states. Social Capital, a term being employed in development discourse in recent times, refers to such features of social organization like trust, norms and networks that can help to improve the efficiency of society by facilitating coordinated actions. The emergence of well-functioning SHGs and their

associations in many parts of India provide an opportunity to Central and State governments, to involve them in the implementation of various government and non-government programmes. There are several ongoing initiatives that involve SHGs and their associations in poverty alleviation programmes. The concept and importance of SHGs has been accepted and adopted by policy makers and it forms the backbone of rural poverty alleviation strategies, implemented by Government of India. Government of India (2008) Second Administrative Reforms Commission, Ninth Report on Social Capital, analyzed the strengths of SHGs and local NGOs as social capital institutions in dealing with various development issues.

Kudumbashree a women- SHG based anti poverty programme in Kerala can be made effective as a sub system of local government as well as its agency for executing its development activities. Moreover, lease land group farming of Kudumbashree programme which promoted the participation of SHG women in the farming sector helped in changing the negative social outlook towards farming or agriculture as a major occupation(John,2009). Unfortunately, SHGs are not actively involved in the programmes to address various issues of climate change. India has a strong, untapped SHG base which encompasses huge potential in mitigation process. Successful adaptation to current and future climate change needs synchronizing the local demands with resources and information. Empirical research on how local organizations respond, and manage and prepare for climate change is minimal in India. Such research is crucial to uncover and generalize institutional strategies for building adaptive capacity that can be applied to a range of situations. SHGs and SHG promoter NGOs have been emerging as a strong social capital in Indian states. SHGs and SHG promoter NGOs have been carrying out different adaptation activities in Indian villages, especially in agriculture sector. There is a need for examining adaptation strategies developed and deployed by SHGs and SHG promoter NGOs. Currently various state governments in India incur expenditure on adaptation to climate variability. This funding is mainly towards various governments' initiatives such as diffusion of renewable energy and energy efficient technologies, water resources management, joint forest management, agricultural extension services, environment education, etc. However, the local communities such as Self Help Groups or SHG promoter NGOs do not play any

significant role in these initiatives, activities and the traditional knowledge of these groups are not shared because of which these activities do not yield the desired result.

The SHGs with their social capital have huge latent potential in community based management programme for climate mitigation. The SHGs are primarily woman-based and have a specific role as women and girls are more vulnerable to negative consequences of climate change while the grassroots level NGOs act as facilitators and intermediaries between SHG members. In India like many other developing countries the risks associated with climate change threaten to reinforce gender inequalities. The discrimination which the poor and marginalized women face makes them more vulnerable than men to the impacts of climate change. Women and children living in poor countries like India are more vulnerable to loss of livelihood and variations in natural resources due to climate change. Their dependence on natural resources and ecosystem means that impact of climate changes poses a real threat to life, food security and health. With the involvement of local people especially women, mitigation of climate change impacts and a larger role of adaptive measures can be developed. A Community based adaptation is one of the components of this larger picture but a very important one. Under this programme, the local government can design and implement various schemes as the local people can provide information and put pressure on authorities. The experiences, measures and practices specific to a location can be community managed. Since the women and children are the most affected parties, the adaptive management can be shared and replicated through SHGs as some of these measures are common. By incorporating these existing coping strategies, we can build adaptation projects for communities. If trained properly, members of SHGs can be the main proponents of adaptive measures.

The basic premise is that interactions through SHGs enable people to build communities, to commit themselves to each other, and to knit the social fabric. A sense of belonging and the concrete experience of social networking can bring great benefits to people. These are informal association and the members share some common features such as common belief system, culture, language, economic background, etc. Their tradition and practices related to nature and resources can be incorporated effectively while weaving an adaptation/mitigation strategy. Such an action will be very effective as they are both the



ends and means. Recently SHGs and promoter of SHGs which are invariably local NGOs, have been carrying out different adaptation activities in Indian villages, especially in agriculture sector.

There is an excellent example of involvement of SHGs in adaptation measures in Banswara district of Rajasthan. Crude form of Self Help Groups of tribal women in Banswara district has successfully designed and implemented adaption programme. With two consecutive drought years 2008 and 2009, the most forest-dependent Bhil tribe's men had to migrate to neighbouring cities for daily wage labour employment. As a result Bhil women had struggle in managing their families for almost six to eight months during these drought seasons. In fact most Bhil families were able to remain in their villages during drought years almost two decades ago as they were able to adapt to the climate impacts by depending on non-timber forest resources. In recent years, recurrent droughts over longer periods, degradation of forests and uncertain forest tenure rights have made non-timber forest resources an insufficient source of livelihood. In this situation these tribal women joined together in a crude form of Self Help Groups and started to work as a community to face the challenges of climate variability

The newly formed women group aimed to revitalize the indigenous and scientific strategies for coping with drought. Their focus was on horticulture activities, kitchen garden and drought-resistant millets for agriculture. They had taken initiatives to explore different varieties of traditional millets that can withstand drought and dry soil conditions. Tribal kinship relations helped them to support each other in household chores and in farming drought-resistant millets. Though the crop was a failure in the first ear subsequently they had managed to succeed. They had successfully created pressure on the district government to support their adaptation practices. In the second year, which was again a drought year, the tribal women successfully farmed the drought resistant millets. The men of the household, on the other hand, initially opposed the women's interest in practicing horticulture on farmland. The fact that most women were devoid of any land tenure rights made them dependent on the men of their household. However, the support of the local organization and the training of the women's group helped the women to gain approval from their household head, and the women were empowered by the fact that they could now access the market. Exchange of their agricultural output in the market gave them economic and

political independence. Because of their success, horticulture and a community-based approach to alternative crops were extended to the other neighbouring villages (Bose 2011)

SHGs in some parts of India have taken up certain innovative steps to help poor families in adaptation to climate change. For instance a local SHG NGO promoter, namely Gorakhpur Environmental Action Group helped a group of women in the district of Gorakhpur in Uttar Pradesh, flood-prone areas of eastern Uttar Pradesh where climate vagaries have been impacting agricultural production for some years. These poor families could not produce enough food for a year because their village gets water-logged by the flood waters. Gorakhpur Environmental Action Group facilitated the affected farmer families in getting training on various adaptation measures from government's Agriculture Technology Management Agency The various adaptation measures include grain banks, seed banks, fodder banks and inputs for kitchen gardens , usage of early maturing paddy varieties and organic manure, These training programmes enabled the villagers in addressing the problems and now they can produce crops at least to meet their domestic needs throughout the year ( Kapoor,2012).

From the foregoing discussions it is clear that the social capital generated through Self Help Groups can effectively be utilized with an appropriate institutional design. Proper policy measures can lead to better coordination and integration of plans and objectives in adaptive management and climate mitigation activities. Central to any Climate Change adaptive management is the realization of the importance of the local people's involvement. This recognition is important as local people are both beneficiaries and affected parties. To bring about the adaptive measures, it is very important to have these institutions in the forefront. But the reality is that for governing the natural resources or for that matter to receive benefits from these natural resources and involve them as partners in decision making process, they are marginalized and kept away. The policy framework as well as natural resources management practice requires significant changes by bringing local institutions to the forefront of mitigation programmes.

The social capital generated by SHGs are effective in utilizing the various practices which are linked to social mechanisms such as adaptation tactics used for generations, flexible user rights and land tenure;

the accumulated knowledge and practices, the dynamics of social institutions; mechanisms of traditional cultural practices and the internalization process and cultural values of different sects, etc. In many aspects the informal institutions will be advantages relative to a formal one. Some of these benefits include costless voluntary compliance measures. Since adaptation measures are associated with uncertainty about its spatial and temporal features and due to lack of complete information about such features, local adaptation practices and associated institutions will be able to provide useful 'rules of thumb' for management of local resources with greater ability. This will in turn lead to the tightening of exploitation and resilience measures. Some of the areas where the SHGs can be very effective are conservation of natural resources, degradation of forest, rehabilitation, restoration of depleted forest resources, crop diversification and cropping intensity, forest and bio-diversity conservation, waste management, participatory impact monitoring etc.

#### ***Community Based Adaptive Measure: Major Recommendations***

While concerted efforts are needed to promote decentralized planning in the implementation of adaptation measures local communities should be enabled to play a central role in adaptive management. Decentralized planning helps in efficient use of local resources and better planning of adaptive mechanisms. Participatory and transparent processes help to decrease the misuse of resources and in many cases, additional resources can be mobilized for better implementation of adaptive programmes. Certain concrete measures are to be implemented on a priority basis for the effective involvement of communities in adaptive management and some of them are listed below:

**Capacity Building of PRIs and Community Members :** Capacity of target communities, partners and associates should be built up for managing adaptive measures. This can enable them to work in the decentralized and viable institutional mechanisms and collaboration systems, Services, support and interventions of various institutions such as government, non government , local and national institutions need to be availed in the capacity building programmes.

**Identification and Dissemination of Case Studies and Best Practices:** It is quite significant to identify, document and disseminate lessons learnt and best practices in climate mitigation programme

This can enable local communities to participate in adaptive management and generate sustainable economic benefits from natural resource.

**Civil society Groups and Various Stakeholders:** Formation of various civil society groups on specific climatic needs is an important step in adaptive management since local communities who live in association with nature are the chief custodians of natural resources. It is essential to empower the civil society on the rights and responsibilities for the management and sustainable use of natural resources; they should collaborate as equal partners with other stakeholders in the adaptive management. There is a need to establish a working arrangement at the local level among government agencies, NGOs, and local communities engaged in implementing adaptation practices (Pradhan. et al. 2012). Moreover, adequate financial resources must be allocated at the community level and an effective mechanism for their disbursement and use should be designed preventing the misuse of funds.

To conclude, there are many national and international best practices where the local information and resources have been used for adaptation and mitigation processes. Converging actions and involving the local people and utilizing local information in decision making process within the framework of PRIs are the major policy prescriptions that needs wider attention and acceptance. There is an urgent need for a unified and focused approach towards community based adaptation programme for climate change in India.

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