

ORGANIZING COMMUNITY PARTICIPATION FOR INTEGRATED FLOOD MANAGEMENT

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Abstract: Integrated Flood Management (IFM) integrates land and water resources development in a river basin, with a view to maximizing the efficient use of flood plains and minimizing loss of life. The aim of IFM is to put in place well-functioning comprehensive measures for flood management. The linkages between various relevant sectors become important. A participatory approach which includes a representative range of stakeholders in the decision making process is another key component of IFM. Community activities play an important role as a front-line at each stage of flood management, that is preparedness for, response to and recovery from flood disasters. It has become apparent that top-down approaches to disaster risk management fail to address the specific needs of vulnerable communities. Community participation for flood management can be organized through community's needs, effectiveness and efficiency, and practical implementation. Strategic approaches to organizing community participation comprise of three perspectives: maximizing resources through integrated use of local knowledge, understanding each stakeholder's expected role and degree of involvement, and enhancing motivation through social-economic incentives and systematic training. Though there is no single recipe for organizing effective community participation, accumulation of many cases provides general guidelines to organize appropriate community activities to ensure their participation at various level of decision making within IFM.

Keywords: Integrated flood management, community participation, decision making

1. INTRODUCTION

Community activities play an important role as a front-line of flood management. Because Integrated Flood Management (IFM) seeks for practical aspects of managing floods, community participation becomes fundamental and essential for each stage of the management, that is preparedness for, response to and recovery from flood disasters. Community activities form an integrated component of flood management. They seek to maximize the benefits through the related development activities within the river basin as a whole. Community activities provide essential opportunities for water resources development within the context of Integrated Water Resources Management (IWRM) and IFM. The benefits are derived at various levels of social and economic activities through development policy and land-use planning. As the community comprises of various sub-groups, its activities contribute to coordinate their interests and maximizing their benefits through building consensus within community, including the benefits from ecosystem. While extent of community participation is based on community's historical experience and traditional

backgrounds, the starting point in IFM is the understanding of the vision for the river basin as a whole. In the absence of organized community participation, most of the activities are carried out at individual or household level driven by individual necessity. Such activities are limited in their effectiveness and insufficient to protect the community at large and individuals in the long run from adverse impacts of floods. On the other hand, if the activities based on individual initiatives are pooled together and carried out in an organized manner at community level, vulnerability and risks due to floods can be substantially reduced¹.

2. COMMUNITY STRUCTURE AND PARTICIPATION

Several factors determine the potential and actual participation of the communities and need to be considered before initiating community activities in support of flood management. The strategy for involving communities in flood management activities should depend on the natural characteristics of the floods experienced in the past and the socio-economic conditions. It is useful to understand these factors that clarify the relationships between flood risks and the communities in the context of social and economic factors.

2.1 Social and economic factors affecting community participation

Social and economic factors have influenced a society's characteristics in their willingness to participate in various activities in terms of their differences according to their constituents and the background around communities. Poor understanding for these factors may adversely affect the strategy adopted for organizing community participation and its sustainability. The fabric of the community, such as poverty, livelihood profile, cultural beliefs, status of weaker social groups, and rights of minority and ethnic groups, define their vulnerability to floods². The framework for understanding community's state of development and the context in which floods could impact includes the basic five elements³;

- Social structure (ethnic, class, religion and language, majority and minority),
- Cultural arrangements (family and cultural structure, hierarchy, common behaviour),
- Economic well-being (livelihood sources, labour, seasonality livelihood),
- Spatial characteristics (housing location, public service facilities, agricultural land), and
- Vulnerable households and groups (category and its location, cultural positions).

Vulnerability of a community can be characterized by; physical vulnerability of people and infrastructure, unfavourable organizational and economic conditions, and attitudes and motivations of the people. The community with higher development generally responds more effectively to the floods, as their relationship with provincial and federal government in flood preparation and response works like a partnership founded on historical background⁴. However, the same study shows that social capital can be a double-edged sword in cases of disaster management because it can effectively mobilize people through pre-existing associations to assist one another on one hand while it can also block or delay urgent decisions because of greater conflicts resulting from a flatter social structure on the other hand. The disparity in wealth, gender, ages or culture/ethnic has harmful effects on success of community activities. It is not mere coincident that successful outcomes of community activities can be seen in equal society. Ethnic homogeneity, poverty (economic homogeneity), and gender are here described as social and economic factors. Community strength based on resources and processes within a community maintain and enhance both individual and collective well-being in ways consistent with the principles of equity, comprehensiveness, participation, self-reliance and social responsibility⁵.

Ethnic homogeneity: There is a distinct relationship between ethnic homogeneity and social capital, mainly in trust and participation. Ethnically diverse localities are poor in networks and low in participation^{6,7,8}. Individuals living in more racially fragmented areas participate less. One is the dynamics of ethnic construct of the community, especially with

respect to immigrants to the community and the consequent necessity for paying attention for all the ethnical constituents of community.

Poverty: Like ethnicity, there is fairly strong evidence, both at national level and local level, that rates of civic participation are higher in societies with higher and similar income groups^{9,10,11}. People living in more unequal communities are less likely to join groups. It appears that the economic homogeneity of a community conducts development of trust and participation, and makes organizing community activities easier. This means that addressing vulnerability and poverty reduction as part of flood management strategy is necessary for success of community activities for flood management. It is well known that traditionally the poorer sections of society are obliged to occupy flood prone lands. For instance, the most vulnerable were those living and farming on hillsides and near riverbanks¹². This also means that organizing community participation requires twinning with the objectives of poverty reduction.

Gender: The gender disparity in decision-making power within homes harms the participation of women, thereby losing women's potential both in human resource and knowledge. Women organizations involved in community networking can be of great help in emergency response to crises. They mostly carry the stories of the neighbourhood or family about safety and self-protection by word of mouth. Voluntary work involving women behind the scenes helps organize people for social change in many communities¹³.

2.2 Role of community participation in flood management

Experience from flood prone regions in South Asia indicates that the establishment of Community Flood Management Committees (CFMCs) with clearly defined institutional structures, roles and responsibilities before, during and after a flood, can be an effective platform for the participation of those most affected¹⁴. These committees perform various functions such as: (1) assessing the needs and capability of the community, (2) making provisions for emergency situations, (3) raising awareness, (4) managing information for future references, (5) training and capacity-building, (6) networking, monitoring and reporting, (7) planning and interface with government institutions, and (8) resource mobilization. Community participation plays an essential role in every step in flood risk management, that is preparedness for, response to and recovery from flood disasters (Figure 1). It should be noted here that community participation in flood risk assessment as well as in planning and implementation of risk management measures is a key to success of flood risk management plans.

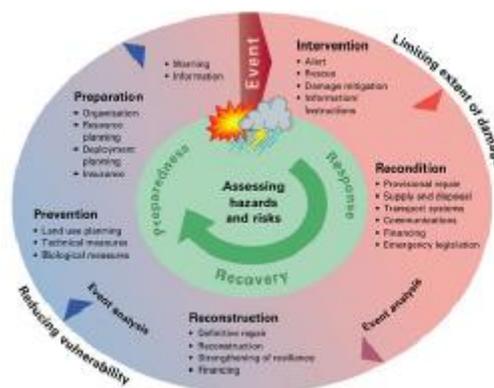


Figure 1. Risk Management Stages⁹

Preparedness: Planning for basin flood management for mitigation, land use planning and flood emergency planning are core activities at preparedness stage. At this stage, community participation in flood management contributes to building consensus among stakeholders and creating linkage with other activities. It is important to draft a shared vision reflecting relevant stakeholders' needs, aspirations and concerns right at the beginning. The basin flood management plan requires participation of all stakeholders from agriculture, fishery, forest management, industry, urban development, environmental management, and local inhabitants themselves. The flood emergency plan requires the disaster management institutions to actively participate in the process. Each stakeholder has different perceptions of risk, and various community members and groups have different vulnerabilities and capacities, which are determined by age, gender, class, source of livelihoods, ethnicity, language, religion and physical location. Community participation can provide common field to overcome such a difference by focusing reducing loss and maximizing benefits from floods. Such an interest-based problem solving can create new options, and may avoid conflicts because each considers the need of others to maximize community's interest by reducing flood risks¹⁰. Under the IFM concept, flood management have linkage with other development processes, which aims at general improvement in people's quality of life and the natural environment, assuming that addressing the root causes of floods, for example, poverty and discrimination, would contribute towards the overall improvement in the quality of life and environment. The coordination among other activities, such as land use planning, building codes, education, and water use management, can be managed through the community. While it is noted that the community activities do not exclude the need for experts' knowledge of hazard, it is important to let the community people come up with a collective understanding on their own vulnerability and capacity assessment. Flood hazard mapping is one of the effective activities to accumulate and share information for preparedness and awareness rising. Based on the probable flood or historical flood data by experts, community can identify effective evacuation routes and necessary actions to prepare for floods by themselves with the help of such maps. The field survey through this mapping also works well. Following six categories depending on the necessity may be recognized¹¹.

- (1) mapping risks and resources to identify hazards and vulnerability locations
- (2) discussing and brain-storming in groups to learn and foster ownership of community
- (3) identifying poorest and most vulnerable people
- (4) identifying all stakeholders for planning coordination and sharing responsibilities
- (5) preparing seasonal calendar for likely natural disasters, their frequency of occurrences
- (6) testing validity of plan and readiness of people to perform their responsibilities

There are strong correlations between marginalization of several populations and exposure to risks. In Bangladesh, vulnerability for disasters is perceived to be a complex interaction among unsafe conditions, poverty, lack of access to resources, landlessness, societal pressures, inequity, lack of education and other "under-development causes". All these need to be comprehensively factored in the design of community based management programme¹⁵. It is critical how the groups at risk including women, elderly, children and ethnic minorities are involved in community activities. Good governance in community activities facilitates networking and coordination of broad stakeholders' participation.

Response: On one hand, various activities, such as training, drilling, and discussion related to flood management facilitates individual efforts and develops individual capacity to respond floods. The accumulation of individual activities expects synergy effects on group advantages. The sharing of experiences, methodologies and tools continues to enrich practice. On the other hand, traditional activities or pre-existing resources can enhance community activities through providing opportunity in regular basis. Regular reminders through participating community activities make it clear that responsibility for change rests with those living in the local community to ensure sustainability.

Recovery: Community participation can represent and bridge cooperation between those by individuals and by external agencies for flood management especially at recovery stage. Nobody can understand the local situation and needs better than the local communities themselves. Such needs should be supplemented by developing linkages among communities, government, national disaster agencies and donors focusing on recovery from floods.

3. ORGANIZING COMMUNITY PARTICIPATION

Communities are at the frontline of disasters. Over the last two decades it has become apparent that top-down approaches to disaster risk management, ignoring the local capacities and resources, fail to address the specific local needs of vulnerable communities. The community-based disaster management emerged as an alternative approach, during the decades of 1980s and 1990s¹⁶.

3.1 General Principles

Community participation for flood management can be organized effectively keeping through three principles;

- Community participation has to match community's needs for
 - vulnerability reduction
 - sustainability in activities for infrequent events
 - establishing public-private partnerships, NGOs
- Community participation keeps their effectiveness and efficiency by
 - synergy effects for limited financial and human resources
 - best-mixed methods with community experience and technological knowledge
 - connection between individual requirements and government preparedness
- Community participation seeks practicability for implementation
 - flood management in each stages (preparedness, response, recovery)
 - capacity-building and coordination through dialogue and participation
 - opportunities for 'real' activities, trainings and drills

3.2 Strategy for effective participation

Strategic approach in organizing community participation in flood management activities needs to address three perspectives; participatory process, resources maximization, and motivation.

Participatory process

Participatory process has been recognized as an essential element of community-based risk management that builds a culture of safety and ensures sustainable development. It addresses specific local needs of vulnerable communities to realize the full potential of local resources and capacities and actively engages them in flood risk management. Community based activities for flood management should be organized strategically based on necessary actions for each target group, that is policymakers, disaster managers, trainers and community workers. No matter how well sophisticated assessment has been done by experts only, it does not work without actions by local people. Community members are involved in the decision-making and implementation of risk management activities. There are smaller casualties in local community where community activities are indigenous and active than in urban area where community becomes weak and inactive during a flood¹⁷. It can not be ignored that people have survived disasters and crises through their own efforts. Different communities have their own perceptions regarding vulnerability and capacity depending on the condition of their locality and experiences acquired through past floods, so there are factors that could not be measured and determined due to variable characteristics and conditions of the community. In this sense,

community people’s participation is indispensable in each step of activities toward floods; identification, analysis, preparation, response, monitoring and evaluation. It is important to clarify as to what role is expected of each stakeholder and what degree of involvement is expected from each stakeholder. Specific roles and responsibilities of a particular stakeholder must be identified based on their understanding and abilities. The level of involvement of each stakeholder differs. Different levels would require the involvement of different stakeholders. Each stakeholder categorized decision-maker (DM), creators, advisers, reviewers, observers, and unsurprised apathetic, has a specific role to play and can be said to have an orbit of influence with respect to a particular activity (Figure 2-left). There are various participation methods with varying degrees of stakeholder involvement: provision of information, public hearings, consultations, collaboration in decision-making and delegation of responsibilities (Figure 2-right). Table 1 shows a considered category at each community activity with context of expected roles and levels of participation in Figure 2.

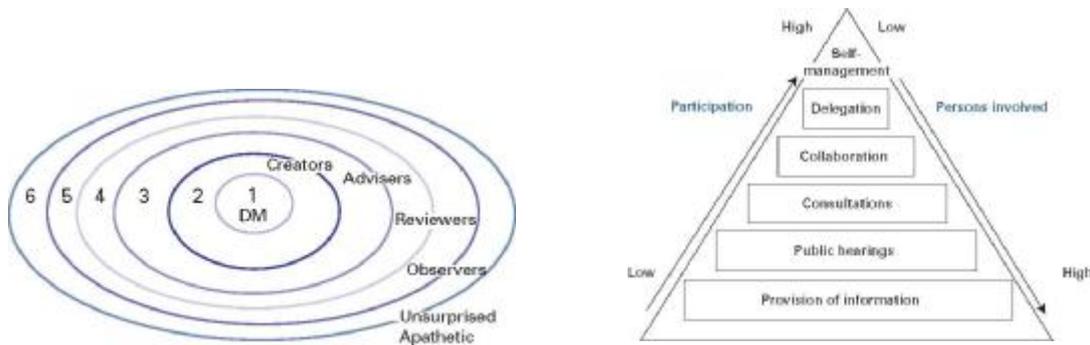


Figure 2. Orbits of stakeholder influence and Levels of stakeholder participation ⁸

Table 1. Community activity and participation (example)

Community activity - stakeholder	Stakeholder’s role	Levels of participation
Prevention <i>Land use planning</i> - residents - community leader - water users - private sector	4 Reviewer 2 Creators 3 Advisers 4 Reviewer	Public hearings Delegation Collaboration Consultation
Preparedness <i>Emergency Preparedness</i> - residents - community leader - water users - voluntary organizations - private sector	4 Reviewer 2 Creators 3 Advisers 5 Observers 4 Reviewer	Public hearings Delegation Collaboration Consultation Consultation
Response - residents - community leader - water users - voluntary organizations - private sector	2 Creators 1 DM 3 Advisers 3 Advisers 3 Advisers	Collaboration Self-management Collaboration Collaboration Collaboration
Recovery - residents - community leader - water users - voluntary organizations - private sector	4 Reviewer 2 Creators 3 Advisers 3 Advisers 4 Reviewer	Public hearings Delegation Collaboration Collaboration Public hearings

Resources maximization

In most cases, local people have been aware of flood events and had their own way of coping with them, like a “culture of coping with and reducing floods”. Such knowledge inherent in the community area forms an important existing resource. The community based flood mitigation strategies should adopt, build upon and strengthen this local knowledge and promote its integrated use. The Bicol region in the eastern part of the Philippines shows a culture of coping and preparedness developed because of their exposure to frequent, violent and devastating hazards natural to the area. The natives of the area are expecting and prepared to face five to six super typhoons in the last quarter of every year, along with the presence of an active volcano, Mt. Mayon. The local authorities in cooperation with communities have achieved a remarkable “zero casualty” rate under the three events of the volcanic eruption²⁰. It should be noted, that in some communities, severe floods might be experienced with very long intervals between events. In such cases, the local coping mechanisms may lose its momentum. Investment in public awareness based on the scientific understanding of the phenomena, in such cases, is required. Since coping capacities by community may be overwhelmed in exceptional floods, external agencies should facilitate the application of the inherent coping system together with external support for resources and capacities, such as structural infrastructure and non-structural measures. External agencies involved should be aware of the local coping mechanism and provide the necessary support to enhance it. In addition, provision of complementary resources to deprived communities has an important role in developing risk reduction culture because poorer communities with limited resources are forced to develop a coping culture rather than a risk-reduction culture.

Motivation for initiating community participation

In many vulnerable communities, experience shows that flood issues are not always on high priority compared to daily survival issues such as livelihood, lack of water and sanitation facilities, law and order etc. This makes the community passive against flood risks as they are seen as remote occurrence. This makes the communities more vulnerable and sometimes more exposed to floods. To avoid such vulnerability, motivations for initiating community participation, such as socio-economic incentives and systematic training are indispensable. Better understanding begets higher aspirations among people, which is essential for motivation and sustainable ownership of the activities. Regular messages through telltales on important structures and locations, such as dykes and lifelines, make community aware of the risks and enhance their interest and motivation. It is important for every stakeholder and local people to share the same vision. This will lead to a sense of shared ownership and motivate community action. The case study in Bangladesh shows the community based activities connected with regional development as primary motivation. The raising of yards or homesteads through earth-fill not only safeguards them against flooding but also results in long-term livelihood benefits. Improvement of the economic status and accumulation of assets from activities for floods creates additional developmental opportunities for the community. This synergy effects show a good example of the integrated flood management, in which the objective is not only to reduce the losses from floods but also to maximize the efficient use of flood plains¹⁸. One of the policy schemes motivating community based activities from economic incentives is flood insurance with community-based rating system¹⁹. In the US, the National Flood Insurance Program (NFIP), established in 1968 is a federal program enabling property owners in participating communities to purchase insurance as protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. NFIP requires communities to maintain a minimum level of floodplain management for its residence to be eligible to purchase flood insurance and established the Community Rating System (CRS) to encourage communities to exceed the minimum requirements. The participation to this program is voluntary, and only 20-30 % of those eligible participate in insurance programme²⁰. However, economic incentives to enhance motivation could be worth considered.

3.3 Necessary Steps

The required and appropriate community participation varies necessary steps quoted from some case studies are taken. Steps followed for the flood management/mitigation are patterned after the basic methodology in organizing for flood resilient community. Organizing community is just the first step towards effective participation in the activities. The goal of community participation is to transform vulnerable or at-risk communities to flood resilient communities. The process and requisites are shown in Table 2.

Table 2. Procedure for organizing community participation ⁸

<p>1.</p>	<p>Process design</p> <ul style="list-style-type: none"> - identify the stakeholders related community activities - draft shared visions reflecting community's needs and concerns - launch a public awareness campaign to keep the community informed and ensure community participation in decision-making, implementation and review - identify information required and develop data collection methodology
<p>2.</p>	<p>Risk Assessment (to be presented in the form of maps, tables and graphs)</p> <ul style="list-style-type: none"> - understand floods through historical records or hearing from people who experienced floods, as an existing local knowledge - create a database inventory determining: <ul style="list-style-type: none"> Ø current land-use practices Ø potential future land-use patterns Ø patterns of human settlement Ø location of resources (natural and artificial) Ø map the natural courses of the river - undertake hazard assessment from a multi-hazard perspective - check to ensure that the risks identified are the same as those perceived by all stakeholders - facilitate the risk assessment at the community level
<p>3.</p>	<p>Problem analysis</p> <ul style="list-style-type: none"> - conduct vulnerability and capacity assessment to determine the community at risks - identify the human factors that contribute to flooding - identify the flood plain areas in terms of their risk level with respect to different magnitudes of floods
<p>4.</p>	<p>Setting goals</p> <ul style="list-style-type: none"> - determine objectives based on risk assessment results and vision - decide the scope of community activities. Goals are largely set by regional development objectives and driven by the need to reduce flood risks, secure livelihoods, sustain economic development and preserve environmental quality¹⁵.
<p>5.</p>	<p>Draft an action plan</p> <ul style="list-style-type: none"> - evaluate various possible measures to address flood risks within the given scope such as land-use planning, building codes, zoning, conservation, drainage improvement, etc. - develop an action plan listing specific activities, roles and responsibilities of key stakeholders - set the timeline and the expected results - carry out economic analysis and financing arrangements - set monitoring, evaluation and review procedures - widely disseminate the draft plan, particularly to all those who are directly effected
<p>6.</p>	<p>Implementation²¹</p> <ul style="list-style-type: none"> - approval of the plan in the community - formation of community activities - The grassroots flood management/response organizations (community based organizations, groups or volunteers) are the key to mobilize the community at large. - Implementation of short-, medium-, and long-term community activities towards floods - monitoring and evaluation - continuous improvement of participation, documentation and dissemination of good practices for replication.

4 CONCLUSION AND RECOMMENDATION

The general objective of community participation is to save lives and damage to properties, by helping communities work to decrease their vulnerability and increase their capacity to reduce the impact of floods. Participation of community members and related stakeholders in flood management is essential in sustaining the flood risk reduction process for the community to meet intended aims and targets. Organizing community participation does not seek perfect implementation at the outset. It is expected that each community will gradually build up flood-resilient activities through continual efforts. A continual effort is a business management technique that is already incorporated in quality control, environmental management, and information security. Participatory planning for improvement and regular implementation for improvement should be noted for sustainable community base activities. Following issues need to be addressed while developing and implementing participatory community based activities.

- Community participation is fundamental and essential for each stage of the flood management, that is preparedness for, response to and recovery from. They can seek to maximize the benefits through the related development activities within the river basin as a whole.
- Natural factors that affect the way community perceives and responds to flood risks can be described in terms of their magnitude (scale, duration, intensity) and frequency of the flood hazards.
- Socio-economic factors, in terms of poverty, livelihood profile, cultural beliefs, status of weaker social groups and rights of minority and ethnic groups, influence communities' willingness to participate.
- Community participation in flood risk assessment as well as in planning and implementation of risk management measures is a key to success of flood risk management plans.
- Community activities can be successfully used at every step in flood management;
 - Preparedness: Community activities works for building consensus and collaborating with other development activities.
 - Response: The accumulation of individual activities expects synergy effects on group advantages.
 - Recovery: The cooperation among various stakeholders will be enhanced by participation of community.
- Community participation for flood management can be organized through community's needs, effectiveness and efficiency, and practicable implementation.
- Strategic approaches to organizing community participation comprise of three perspectives: resource maximization through integrated use of local knowledge, effective participatory process with clear understanding of each stakeholder's expected role and degree of involvement, and the motivation through socio-economic incentives.
- Organizing community participation can adapted from six step of Integrate Flood Management basin planning (process design, risk assessment, problem analysis, setting goals, draft an action plan, and implementation.
- Organizing community participation is gradually built to seek flood-resilient community through continual efforts. To develop and establish general plans and measures, continual and sustainable efforts are required.
- There is no single approach to organize community participation for flood management. Further continual accumulation of many cases can only facilitate them.

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