Asia-Pacific Network for Global Change Research

Institutional Capacity in Natural Disaster Risk Reduction: A Comparative Analysis of Institutions, National Policies, and Cooperative Responses to Floods in Asia

Final report for APN project 2005-01-CMY-Nikitina

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Institutional Capacity in Natural Disaster Risk Reduction: A Comparative Analysis of Institutions, National Policies, and Cooperative Responses to Floods in Asia

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Final Report submitted to APN

Overview of project work and outcomes

Non-technical summary

IFA (*"Institutions for Floods in Asia"*) project focuses on institutional dimension of river floods risk reduction in the Asian countries that along with structural approaches constitutes the core in human responses to floods. IFA aggregates and compares results of country-based research in order to further explore the problem How to strengthen capacities and performance of institutions to reduce flood risks. Rich evidence for testing IFA approaches is provided from recent case-studies of big river floods in Bangladesh, Burma/Myanmar, Japan, Russia, Thailand and Vietnam representing developed, developing and transition economies; for each of them flood risks are at the top of national disaster reduction agenda, but institutional capacities and practices vary. IFA assesses the gaps between *design* and *action* of existing institutions at particular stages - before, during and after a flood. It explains success and failures and identifies common and specific problems across countries. It tracks a variety of instruments applied by them to reduce flood risks, including for example such instruments as insurance and micro-finance. Lessons learned and good practices are discussed, as well as problems in their transfer and adaptation across countries. Policy advice on how to enhance performance of institutions towards greater human security against flood risks is provided.

Objectives

The main objectives of the project were:

1. Analyze existing institutional designs, capacities, practices, national policies and cooperative responses to floods risk reduction
2. Compare national institutions in the countries of Asia and identify common and specific problems in policies and measures implementation
3. Assess possibilities and constraints for institutional capacity building and explain success and failures of institutions
4. Exchange lessons learned and good practices across countries
5. Suggest policy advice on how institutions for floods risk reduction can be made more effective

Amount received for each year supported and number of years supported

35 000 USD in 2004-2005; 45 000 USD in 2005-2006; 2 years

Participating Countries

Bangladesh, Burma, India, Laos, Japan, Philippines, Russia, Thailand and Vietnam

Work undertaken

1) "Institutional Capacity in Floods Risk Reduction in Asia", IFA 1st International Workshop, USER, Chiang-Mai University, Thailand, 12-14 December 2004; 2) "Comparing institutional designs, capacities and national policies to reduce risk of flood disasters in Asia", IFA 2nd International Workshop, USER, Chiang Mai University, Thailand, 26-28 January 2006; 3) Organization of IFA session, IHDP 6th Open Meeting, Bonn, Germany, 10 Oct.2005; 4) 3) Presentation of IFA results at UNU/EHS Workshop "Measuring the 'Un-Measurable: Indicators for Vulnerability and Coping Capacity", Bonn, Germany, 12 Oct.2005; 5) IFA presentation at ADRC/UNU-EHS Workshop "Measuring Vulnerability and Coping Capacity", WCDR, Kobe, Japan, Jan. 2005; 6)

Participation in "Human Security and Climate Change Workshop, GECHS/IHDP, Oslo, Norway, 21-23 June 2005; 7) Participation in workshop "Water Resources in South Asia: An Assessment of Climate Change-Associated Vulnerabilities and Coping Mechanisms", Chiang Mai, Thailand; 8) Participation in local action within Tsunami reconstruction activities in southern Thailand; 9) Field trip of IFA partners to Mae Ping River and Meeting with the Fai Phaya Kham Committee and the "RiverCare" local organisation; 10) Presenting the ISDR contribution (brochures, kids'game-kit , literature, etc.) to FPK Committee; 11) Development of networks with the UN Centre for Regional Development, Disaster Management Planning, Japan; UNU/EHS, Bonn, Germany; the Mekong River Commission, Vientiane, Laos; 12) IFA presentation at IHDP/GECHS annual scientific committee meeting, Cape Town, Oct. 2004; 13) Discussion of IFA findings with the GECHS/IHDP scientific committee, Bonn, 11 Oct. 2005; 14) Participation in 1st Expert Groups Meeting "Institutional coordination and cooperation between stakeholders in environmental risk management in large river basins", Nizhny Novgorod, Russia, 29 Sept. 2005; 15) Presentation of IFA results at 2nd Expert Groups Meeting "Institutional coordination and cooperation between stakeholders in environmental risk management in large river basins", Kazan, Russia, 6 Apr. 2006; 16) Participation in VARIP Workshop, Bonn, Germany, 9 Oct. 2005; 17) Networking with M-Power project.

Results

1) IFA Reports from 1st and 2nd IFA International Workshops in 2004 and in 2005; 2) Publication of IFA articles in the Special Issue on *Floods Disaster Risk Reduction in Asia*, Science and Culture Journal, 2006; 3) Publication of IFA session abstracts "Human dimensions of natural disasters risk reduction: comparative analysis of institutions and mitigation responses to river floods in Asia". Conference Book, IHDP, Bonn, Germany; 4) IFA article in UNU/EHS publication; 5) A series of publications based on IFA findings; 6) IFA working papers on country studies of institutional capacities in flood risk reduction; 7) "Vulnerability, Livelihood's Security and Well Being: An Action-Research Platform and Dialogue Project on Tsunami Reconstruction." Concept Development, USER, Chiang Mai University, 2005; 8) IFA - nominated as a core project of GECHS/IHDP

Relevance to APN scientific research framework and objectives

IFA ideas correspond to priority topics of the APN research framework: the project makes comparative analysis of institutions and mechanisms of human responses to global environmental change. Lessons learned and good practices applied by the Asian countries can be transferred across states and regions, thus, strengthening their institutional capacities. IFA focuses on assessing institutional regimes of human responses to global environmental change which is essential for reducing human vulnerabilities against floods. It promotes and strengthens interactions between scientific community and practitioners as well as the dialogue between natural and social sciences. IFA has also direct links to the IHDP research and networking activities: its approaches are in line with the foci of its GECHS programme which concentrates on exploring human vulnerabilities to global change and finding tools to increase resilience of societies to major risks associated with it; they also correlate with the IDGEC endeavors.

Self evaluation

IFA has conducted activities and has findings of a broader scale than envisaged by its original proposal; however we have not accomplished the whole set of items envisaged by its quite ambitious research protocol developed at the start of the project. It would still

serve as guidance for follow-up activities planned by consortium partners. More in-depth aggregation of rich evidence compiled by IFA in the countries is needed, as well as strengthening practice-oriented assessments of its results. Bigger attention should be paid in the future to expand relevant networks in the countries of Asia and pursue interactions with ongoing international effort in the filed.

Potential for further work

1) IFA *Policy brief on national floods risk reduction institutions in Asia* for UNESCO, Sustainable Water Management Section, Division of Water Science; 2) Development by consortia partners of follow-up research proposal on Flood risk reduction institutions in action; 3) IFA presentations at Water Governance Workshop, Germany, June 2006; 4) Joint activities with international CABRI ("Cooperation along a Big River") and M-Power ("Mekong Program on Water Environment and Resilience") projects; 5) Participation in activities of UNU/EHS, Center for Environment and Human Security, Bonn; 6) Presentation of IFA findings at IHDP/GECHS scientific committee meeting and at Woodrow Wilson International Center, Washington.

Publications

Abstracts of IFA session "Human dimensions of natural disasters risk reduction: comparative analysis of institutions and mitigation responses to river floods in Asia", 2005. In: Global Environmental Change, Globalization and International Security: New Challenges for the 21st Century, Conference Book, IHDP, Bonn, Germany: 211-214

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Technical Report

Preface

IFA focuses on institutional dimension of floods risk reduction in the countries of Asia. It aggregates evidence from case studies to further explore the problem How to strengthen institutional capacities and enhance performance of institutions. Gaps between *design* of institutions and their *action* at particular stages - before, during, after the flood are identified. It explains success and failures in performance of institutions and identifies common and specific problems across countries. It tracks a variety of tools applied, including such instrument as insurance. Lessons learned and good practices are discussed, as well as problems in their transfer and adaptation across countries.

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1.0 Introduction

IFA project explores the challenging problem of *how to effectively shape human institutional responses* to the risk of natural disasters with a special focus on floods. In Asia, human vulnerability to natural disasters and, particularly, to those amplified by global climate change, is increasing. Today, Asia accounts for about 90% of the world population affected by natural disasters, and among it with more than half - as a result of floods.

States of Asia no longer respond to flood disasters, they manage disaster risks, and do so with increasingly sophisticated institutional frameworks, i.e. socially constructed arrangements created by societies to guide individual and collective behavior and to govern human interactions to reduce the risk of floods. A variety of domestic and regional institutions, including legislation, agencies and administration, decision-making procedures, arrangements for planning and coordination, programmes aiming to respond to floods are in place in the Asian countries, and protection measures are undertaken. Institutional frameworks cover arrangements for undertaking both structural and non-structural efforts towards flood risk reduction. However the number of people affected by floods (including losses of lives, homes, crops and animals, as well as destroyed livelihoods, infrastructure and moral damage) has almost doubled during the last decade both in developed and in developing countries; the poor communities are especially vulnerable.

Are institutional efforts undertaken leading to reduce flood risks? In this context the overarching questions are *how* national and regional institutions are designed and what policies and measures are undertaken and *what* can be done to enhance institutional capacity in each country to make local communities more resilient to hazards in the coming years. Why are existing institutions and behavior of main actors not always effective to enhance human security? Why implementation failures occur? What innovations and reforms of institutions are needed? How to shift from conventional hazard protection to disaster risk management?

To help answering these questions IFA analyses and compares national and regional institutional regimes, policies and measures to *protect* (including preparedness, emergency response and rehabilitation) from destructive effects of floods and to *reduce risk of floods* through their mitigation. Human security in local communities and social rehabilitation of population affected is the red thread of this project; that is why institutions installed and measures applied for this purpose - by the governments at various levels, by business, and through public participation are in the focus of the study. Countries selected for analysis represent developed, transition economies and developing countries (Bangladesh, Japan, Myanmar, Russia, Vietnam, and Thailand): for each of them counteracting floods is at the top of the national risk reduction agenda; institutional capacities and responses, however, vary considerably across them. IFA compares major lessons learned from rich experiences of these countries, as well as the possibilities and constraints for effective risk management. The project also explores options for cross-country transfer and adaptation of best practices in institutional capacity building in the region. It concludes with policy recommendations on how to make institutional capacities more effective.

In finding answers to these quests IFA focus on the following objectives:

- Analyze existing institutional designs, capacities, practices, national policies and cooperative responses to floods risk reduction
- Compare national institutions in the countries of Asia and identify common and specific problems in policies and measures implementation
- Assess possibilities and constraints for institutional capacity building and explain success and failures of institutions
- Exchange lessons learned and good practices across countries
- Suggest policy advice on how institutions for floods risk reduction can be made more effective

2.0. Methodology

2.1. IFA Methods

In order to achieve the stated project goals IFA has applied the following research methodology.

IFA research and networking are performed within two major consecutive phases:

- During the ***first phase*** (2004-2005) the study and discussion of domestic *institutional designs* and *institutional practices* in flood risk reduction in four countries of Asia, namely Japan, Russia, Thailand, Vietnam is undertaken; regional *cooperative* flood risk reduction policies are explored.

- The ***second phase*** (2005-2006) focuses on *analytical assessment* of findings from case-study research, on *comparative analysis* of evidence and results from country studies.

IFA *country-based* research is organized according to two **research modules**:

- The 1st module performs analysis of national and regional institutional capacities and practices in flood risk reduction in four partner countries.

- The 2nd module concentrates on case-studies analysis of institutional capacities and practices during recent floods in four countries: the Red River flood in Vietnam, the Lena River floods in Russia, the Fukuoka floods in Japan, and floods at the Chao Phraya River in Thailand.

Each research module is structured around a set of interlinked common research questions and tasks. They are presented in IFA Research Protocol. It is applied by all project teams. Both assessment of (a) domestic institutional frameworks and implementation problems in the countries under study and (b) how institutions perform during particular flood events is planned according to a common Research Protocol. Common research questions contained in this protocol allow high extent of compatibility of research paths and findings from the countries. Such approach allows to process results from the case-studies and to draw conclusions according to a common setting.

Analytical assessment during the second phase of the project includes *aggregation* of main findings from (a) country studies related to identifying their institutional capacities in flood risk reduction and (b) case-studies of recent flood disasters in these countries and performance of institutions during these events. Comparative analysis of national

practices in flood risk reduction in the countries of Asia is an integral part of this direction of IFA activities. Comparisons of domestic institutional frameworks and implementation problems across countries incorporate assessment of existing capacities, success and failures in performance of institutions, explaining possibilities and constraints for institutional capacity building and performance, and identifying and contrasting lessons learned from each county's experiences. A variety of tools and mechanisms applied by each country is reviewed. Identifying *common and specific* problems in capacity building and implementation across countries allows IFA to make a step further in finding answers to the question of how to increase domestic institutional capacities and enhance their practices in floods risk reduction towards greater human security. Generalization of major findings across cases and across countries is an important output of IFA project. A number of framing and cross-cutting questions have been formulated in a course of IFA activities and they are discussed in the next section of this Report.

Comparative analysis and aggregation of research results on designs and practices of flood risk reduction institutions in the countries of Asia is based on evidence collected by four core teams of partners in their countries. Results of analysis of floods risk reduction institutional frameworks in Bangladesh, Burma/Myanmar, India and Philippines are assessed as well.

2.2. Country case-studies

Four country teams perform compatible studies of domestic institutional capacities and practices in flood risk reduction in their countries. For this purpose they start with analysis of existing frameworks, i.e. legislation, administration, policies, strategies, measures and financial mechanisms applied to *protect* (including preparedness, emergency response and rehabilitation) from destructive effects of floods and to reduce risk of floods through their *mitigation*. Evaluation of rules defining collective and individual behavior of actors and their interactions is a part of this exercise. Human security of local communities and social rehabilitation of affected population is the red thread of the project: each country team is interested in assessing institutional responses to reduce human vulnerabilities, and explores how and to what extent existing governmental institutional arrangements target safety of individuals in local communities. Each team also analyses public behavior and local public participation in floods risk reduction.

Then, the detailed inquiry is made about how domestic institutions "act in practice" and what policies and measures are applied in particular cases of recent floods in each country – the Fukouka flash floods in highly urbanized area of Japan, the 2001 spring freshet flood on the Lena River in Siberia, Russia, a series of the Red River delta floods in Vietnam as a result of heavy seasonal rainfalls, the flash floods on the Chao Phraya River in the northern Thailand and Hat Yat floods in its southern areas. IFA Research Protocol defines common and compatible format for each case-study and allows comparisons across cases and across countries.

According to the Research Protocol each country case study presents its analysis according to the following common themes:

- general national institutional design for floods risk reduction;
- portrait of floods and related institutional capacities and practices;

- assessment of institutional 'design and action' to enhance human security;
- major lessons from capacity building towards flood risk reduction
- lessons learned about success and failures in performance of institutions

As a result, four IFA Working Papers had been prepared:

1. Institutions for floods risk reduction in Japan and the Fukuoka floods
2. Institutions, policies and measures in floods risk reduction in Russia and the Lena river flood
3. Institutional incapacities: the politics of re-distributing risks and altering vulnerabilities to floods in Thailand
4. Institutional capacity for floods risk reduction in Vietnam and the Red River delta floods

IFA research and networking is undertaken by four core country teams from Japan, Russia, Thailand and Vietnam. Each country team consists of scholars from social and natural sciences; practitioners from each country take part in respective activities. Contributions of researchers from other countries of Asia are included (Bangladesh, Burma/Myanmar, Laos, India, Philippines). All partners jointly take part in analysis, discussion, assessment of lessons learned from domestic practices and in development of policy advice and follow-up actions. They are responsible for preparation of working papers, presentation of their findings at IFA workshops and participation in brainstorming exercises. All IFA partners take part in expanding the project networks.

2.3. Tools for analytical assessment of institutionalized capacities and practices

According to IFA approach significant capacities to reduce the risks of flood disasters lie both within actors and in the relationships among actors. We call relations that regularly define roles, responsibilities and rules of engagement in ways that enhance the capacities of actors, *institutionalized capacities*.

Relationships among actors have different functions that may be institutionalized (Lebel et al. 2006). IFA assessment framework focuses on four classes of institutionalized capacities and practices (Table 1). The capacity for *deliberation* and negotiation is important to ensuring that interests of socially vulnerable groups are represented and different knowledge can be put on the table for discussion and that, ultimately, fair goals are set. The capacity to mobilize and then *coordinate* resources is often critical to prevention and response actions. The capacity to skillfully use those resources to carry out actions transforms potential into *implementation*. Finally, the capacity for *evaluation* is important because it can be the basis for continual improvement, adaptive course corrections and learning by key actors. We can also ask questions about each kind of relationship across four conventionally designated phases of the disaster cycle. In the case of evaluation these questions are similar and largely cross-cutting. These questions, in their turn are included into IFA Research Protocol.

Table 1. **Framework for assessing institutionalized capacities and practices with regard to flood-related disasters**

Functions	Phase of Disaster Cycle *(Timing)*			
	Mitigation *(Well before)*	**Preparedness** *(Before)*	**Emergency** *(During)*	**Rehabilitation** *(After)*
Deliberation *What should be done?*	How were decisions made about what and who should be at risk? Whose knowledge was considered, whose interests were represented?	Was the public consulted about disaster preparations? How were decisions to give special powers to particular authorities made?	How were decisions made about what and who should be saved or protected first? What special directives or resolutions were invoked?	How were decisions made about what is to be on the rehabilitation agenda? Whose knowledge was considered, whose interests were represented?
Coordination *Who is responsible?*	What national and basin-level policies, strategies or legislation were in place to reduce risks of disaster?	How were responsibilities divided among authorities and public? Was an appropriate early warning system implemented?	How were specific policies targeting emergency operations implemented? Were there gaps between stated responsibilities and performance of key actors? Who was in charge?	Were the resources mobilized for recovery adequate? Were they allocated and deployed effectively? How was rehabilitation integrated into community, basin or national development?
Implementation *How was it done?*	What structural measures were undertaken to reduce likelihood of severe flood events? To what extent were laws and regulations regarding land-use in flood prone areas implemented? What measures were taken to improve coping and adaptive capacities of vulnerable groups?	Were public authorities well prepared? Was the public well-informed? How were specific national or basin-level policies targeting disaster preparedness implemented?	How were emergency rescue and evacuation operations performed? Were special efforts made to assist socially vulnerable groups? Was there any measures taken to prevent looting?	Did the groups who most needed public assistance get it? Who benefited from reconstruction projects? Was insurance available and used and if so how were claims processed? Was the compensation process equitable and transparent?
Evaluation *Was it done well?*	How is the effectiveness of risk reduction measures assessed?	How is the adequacy of preparedness monitored?	How is the quality of emergency relief operations evaluated?	How is the effectiveness of the rehabilitation programs evaluated?
	To whom and how are authorities accountable? Were institutional changes made to address capacity and practice issues learnt about in the previous disaster cycle?			

2.4. Data sources

IFA research methodology is scale-dependent (Table 2). We assess information about national- and basin or regional-level scale institutions mostly through review of documents and interviews, but we evaluate performance and practices at local scales through analyses of particular flood events. Our original comparison included two-level case studies in Vietnam, Thailand, Russia and Japan (Nikitina 2005).

Table 2. **Illustrations of scale-dependent actors, institutions and perceptions with regard to flood-related disasters**

Scale of interest	**Key Actors**	**Examples of institutional responses**	**Common perceptions of disaster**
Nation	National governments, multilateral banks	State laws, policies and programmes, insurance, emergency legislation	Infrastructure losses and re-building costs; losses of investments, debt-burden
Regions, provinces, locales	Regional, provincial, local governments, river basin organizations and councils, sector associations	State laws, regional/provincial policies and programmes, emergency legislation	Destruction of infrastructure, disruption of regional/local economy
Community	Households, firms, local government authorities,	Local norms and regulations, social safety nets, revolving loans, micro-credit schemes	Loss of social control and safety nets (e.g. looting), Displacement-induced breaking of social networks
Household	Individual	Family, marriage, kinship networks	Loss of home, crops and family members, livelihood disruption and insecurity

Exploring specific cases of severe floods that have recently taken place is often crucial for understanding institutionalized practices, the divergence between rules on paper and in use, and underlying diversity of actor behaviors (Table 1). IFA, therefore, is most appropriate for areas that have recently experienced major floods, whether or not they resulted in disasters, as it requires asking actors to recall information about actions taken by themselves or others. Although secondary information such as newspaper and agency reports is also important, good primary data is crucial for validation. For example, in local community level studies of flood events in urban, rural and remote rural locations in Thailand we used household questionnaires to: characterize flood events, identify prevention and mitigation measures; assess effectiveness of relief, compensation and rehabilitation actions; explore household and village level coping and adapting strategies; and assess channels for public participation and accountability of decisions. Field trip to Faham Community during 2004 IFA workshop in Chiang Mai, Thailand showed how

valuable are the results of discussions and contacts at the locales (IFA Field Trip Report. Report from IFA Meeting, 2005).

During the project the collaborating IFA country teams compile data-sets and share their data with each other. They collect primary data, take interviews in a course of case-studies, and review mass media coverage of flood events.

3.0 Results & Discussion

This chapter of the Report is organized around three main sections that build up to IFA research framework[1]. The **first** section introduces a number of framing and cross-cutting discussion questions and IFA findings related to assessment of institutional capacities for floods risk reduction in the countries of Asia which emerged in a course of our research and brainstorming sessions with experts. The **second** section presents IFA's findings and discussion on institutional arrangements and assessment of institutional capacities and implementation results, as well as on success and failures of institutions in the countries under study. The **third** section reflects discussion and results of case-studies on national institutional capacities for floods risk reduction in Japan, Russia, Thailand and Vietnam and practices of institutions and tools applied by these countries during recent major river floods. .

3.1. Flood risk management in Asia: an institutional and political context

3.1.1 When is a flood a disaster?

In the tropical parts of Asia most of the major cities have grown in the deltas literally building on the foundations of a rice-growing civilization. The landscape has been managed for floods for centuries. Communities whose livelihood depends on the productive functions of "normal" seasonal flood cycles have learned to live with floods and have embraced its arrival with songs and dances. Institutions and governance arrangements often centered on the collection of crop taxes and forced labor by nobility. Institutions and cultural practices around the "management" of floods are among the most persistent, sometimes, surviving for centuries. Over the last few decades industrialization and the accompanying processes of urbanization have led to very different land-use patterns, economic structure and livelihood base. Political organization has also changed. IFA's evidence confirms that floods are now perceived as much more threatening events by people for whom the idea of living with floods is anathema to a modern society built around highways and the automobile.

As the potential for floods, when they occur, to be a disaster has increased, societies have invested more in protective structural measures. Decades of economic growth also mean that the domestic resources available to households, firms and state authorities to address "disaster" risks and events have substantially increased in most countries. At the same time what constitutes a flood disaster has correspondingly shifted from an emphasis on losses of life and famines from crop failures to losses of property and investments. These distinctions reflect changing perceptions and beliefs about societies' relationship to nature. Floods are now more likely to be seen as a hazard that has to be controlled. Not

[1] Results and discussion presented in this chapter of IFA Report are published in the 2006 Special issue of *Science &Culture* journal and in the United Nations University publication "Measuring Vulnerability to Hazards of Natural Origins: Towards Disaster Resilient Societies".

surprisingly, an operational definition of what constitutes a flood disaster remains a contentious political issue.

Disaster is defined in the United Nations International Strategy for Disaster Reduction as a "*serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources*"(ISDR 2004). In many parts of Asia a declaration of state of emergency signifies a state's recognition of a disastrous event and often is based on loss of property and investments.

IFA indicates that there are two main discourses on flood disasters (Adger 1999; Bankoff 2004; Dixit 2003). The first, and dominant view, is that flood disasters are inherently a characteristic of natural hazards. Disasters arise inevitably when the magnitude of a hazard is high. This contrasts with the alternative discourse that sees flood disasters as being jointly produced by interaction of the physical hazard and social vulnerabilities. This alternative discourse brings into the fore social relations, structures, institutions and governance in understanding flood disaster. This view posits that flood disasters are not only the result of natural hazards, but also of socio-economic structures and political processes that make individual, families and communities vulnerable (Blaikie et al. 1994; Dixit 2003). States no longer respond to disasters, but they manage disaster risks, and do so with increasingly sophisticated institutional frameworks.

Flood disasters are the most frequent and devastating natural disaster in the Asia region, and like disasters in general, their impacts have grown in spite of our improved ability to monitor and describe them. For the past thirty years the number of flood disasters has increased compared to other forms of disaster (Dutta & Herath 2005). China and India are the most frequently affected followed by Indonesia, the Philippines, Bangladesh, Iran, Thailand, Sri Lanka, Vietnam and Pakistan; floods are at the top of disaster reduction agenda in the Asian Russia as well.

3.1.2. Who and what should be at risk?

This is the central unasked question in disaster management. IFA has learned that framing disaster as solely a technical problem has constricted spaces of participation and transparency and in the process conceals the politics of shifting risk to already vulnerable groups. The only way the sharing of involuntary risks can be negotiated is if interests of marginalized and vulnerable groups are represented, the quality of evidence is debated and challenged, and authority is held accountable for its decisions. Our studies showed that alternative dialogues, the mass media and acts of civil disobedience may be critical to raise issues of unfair distribution of involuntary risks into the design of flood and disaster programmes. Without opportunities for deliberation women-headed households, the elderly, ethnic minorities and other marginalized groups are unlikely to benefit and may even be disadvantaged by programmes and policies aimed at reducing risks of flood disasters. For example minority households affected by landslides and floods in one of our studies were ineligible for most kinds of post-disaster assistance because they were poorly informed about correct reporting procedures or did not hold citizenship documents an apathetic state had failed to provide them. Small fishers in southern Thailand had similar difficulties navigating bureaucratic barriers and corruption in compensation programmes after the Indian Ocean tsunami.

In contrast to the neglect of questions about "*who will be at risk*?" questions of "*who will pay?*" are intensely debated from day one. IFA indicates that the main debate is often between levels in the administrative hierarchy: should funds come from local, regional or central budgets? Local governments often find they need to locate additional sources to fund recovery and rehabilitation operations. Our studies in Thailand, for example, indicated that this country has a fairly clear set of rules for budget requests up the hierarchy depending on levels of damage. The problems are with accountability and timeliness of available funds. IFA research in Russia shows that the vertical division of responsibilities is institutionally fixed by national rules, but in crisis and emergency situations the provinces and locales tend to do their best to bargain with the national administration for extra resource allocations (Kotov 2006). Constant debates and controversies between the 'center' and the regions requesting increased involvement and support from the central authorities, especially at recovery stages where mobilization of significant funds is essential, can turn into conflicts and gridlocks that weaken institutional performance.

3.1.3. Who is responsible?

Being able to count on institutionalized capacities to mobilize and coordinate resources when and where they are needed is crucial in all phases of the disaster cycle, sometimes with very little scope for delay or errors of judgment. Because there are many uncertainties involved in knowing where disasters will occur and exactly how they will unfold it is important that this "institutionalizing" aspect fosters flexible and adaptive responses that rely on coordinated, as opposed to uni-and populace, because people were afraid that if they abandoned their homes they would be looted. The response of the state disaster agency was to propose compulsory evacuation measures.

Among IFA findings is that coordination among agencies and stakeholder groups is important for flood mitigation, in particular, the design and execution of programs and policies to help address underlying causes of extreme vulnerability. In urban areas of Asia, the problems of flooding can be severe and almost chronic for slum dwellers forced into high risk zones because of lack of low-cost housing in more desirable areas.

Mobilizing adequate funds, both for protection measures before an event and for recovery and rehabilitation of affected areas and livelihoods after, is the core "coordination" and "cooperation" issues for local authorities because it has a large bearing on their ability to implement plans. IFA learned that significant gaps and problems exist in this field. What will be the major sources of funding? Who will benefit most from their deployment? In Russia, Vietnam and Thailand, flood insurance schemes are at a very rudimentary stage so there is a strong reliance on the state to come to the rescue. In more wealthy countries like Japan state guarantees have allowed significant entry by the private sector into insuring against flood disasters (Kitamoto et al. 2005). Here damages are compensated by the household's comprehensive insurance provided by the private insurance companies. Insurance is optional, but people who build their houses using housing loans are obliged to buy a comprehensive insurance (for details on insurance in Japan, see Annex 1).

IFA confirms that if local authorities have the capacity and legal framework that enables them to seek loans and private sector cooperation, then they may be able to secure more and diverse funds for disaster risk management. For example, after the 2001 Lena river

flood the Sakha Republic administration applied for central bank credit for housing renovation; it also formed a partnership with the Alrossa company, a leading diamond producer based in Sakha, to help rehabilitate and restore livelihoods (Kotov 2006). Elsewhere there are examples of non-government organizations venturing into micro-finance, training and mobilization in intervention programmes to reduce disaster risk. For example, in the aftermath of the Indian Ocean Tsunami in 2004 that caused severe coastal flooding in southern Thailand, fishing communities established "*community-shipyards*" with the support of a private firm (the Siam Cement Group) and an NGO (Save Andaman Network) (Lebel et al. 2005). A community banking and revolving fund system were established for recovering people's livelihoods.

Among important findings of the project is that coordination of activities across phases of the disaster cycle is necessary because there is often need to link or transfer responsibilities and budgets for programs over time. One approach is through limited-life but clear objective cross-agency and multi-stakeholder task forces that can help guide these transitions.

3.1.4. How were risks of disaster changed?

IFA learned that wonderful planning and coordination mean nothing when it comes to reducing the risks of disaster if there is no follow-through because of corruption or other institutionalized and *ad hoc* incapacities that prevent appropriate use and allocation of the resources available.

Assessing institutionalized capacities to effectively use resources and execute critical actions requires several different kinds of measures corresponding to different kinds of resources and actions. At the simplest and most conventional level we need to look at actual structural and non-structural responses made in preparing for, and responding to, flood disasters.

Forecasting and early warning systems are often the weakest element in the chain of purpose-built institutions for reducing risks of flood disasters. First, there are the technical challenges of obtaining critical information and sharing it in timely fashion. Second, there are organizational and individual behaviors that undermine otherwise sound information-sharing arrangements. For example, in Russia in 2001, the Hydromet service provided early warning forecasts of dangerous spring thaw conditions in the Lena River basin. Local and provincial administrations in the Sakha Republic were slow in responding. As a result, the population was not well informed and losses were much higher than they needed to be (Kotov 2006).

In most countries a national-level institutional framework for emergency response is well established. Normally, such frameworks incorporate a set of administrative structures, governmental programmes and legislation defining the conduct and interactions between specialized task forces that are usually well trained and able to perform skillfully in extreme situations. Often the military is involved.

States differ greatly in how they view their own involvement in recovery. In transition economies like Russia and Vietnam, the state's role remains high. Thus, in the case of the Lena flood in Russia (Kotov 2006) a combination of tools was applied, including (1) introduction of a programme to resettle populations from the affected areas, (2) allocations from federal to provincial budget for this purpose, (3) allocation of housing

certificates from the state Reserve Emergency Fund for the population affected by flood, and (4) material compensations for the affected livelihoods (although too modest to restore them).

Financial resources matter hugely for what set of actions are plausible. IFA studies argue that in Vietnam and Bangladesh resource constraints have meant that soft measures have, by default, been pursued more frequently than costlier hard measures. Some case studies suggest that community-based initiatives can be more effective than state-led efforts but that they are not without shortcomings. In India as much as half of the vulnerable area has been provided with reasonable protection although floods continue to cause losses. It was also documented very thoroughly how investment costs in flood protection measures rise with development in Japan, not least from damage to those very structures (Takeuchi 2001).

For the most part, implementation always lags far behind promises ideals when it comes to addressing the underlying causes of disasters. Consider, for example, issues related to housing and road construction both in mountain areas and in floodplains. Economic imperatives would argue for taking structural measures to protect these investments before disaster strikes, rather than exploring their role as contributing causes of disasters after the fact. Poorly constructed roads destabilize slopes or act as channels for debris in mountain areas, while in deltas and wetland areas they can prevent and alter natural drainage, thus increasing the duration and height of floods.

During post-disaster periods there is often a flurry of programmes, investments and rule changes. All such actions are far more likely to be followed-up and implemented if there is a significant group of stakeholders involved, who have a sense of ownership and responsibility for them. This means going beyond the project-bounded logic of "implementation" ending when the final budget item of the initial action has been spent, towards integrating projects and programmes into local development. In a real sense it is about creating a sense of stewardship for disaster risk management. This is most likely to be fostered when there is significant decentralization to local authorities who are, in turn, accountable to local affected communities.

3.1.5. How is performance evaluated?

The performance of institutions and organizations should be monitored and evaluated. This has to be done with a degree of independence or the opportunities for organizations to learn, for authorities to be held accountable, and for success at reducing the risks of the next disaster. Institutionalized evaluation and monitoring procedures of flood management system must be present. Otherwise, there can be no improvements in performance or adjustments to take account of changing contexts like altered flood regimes resulting from climate change. IFA confirms that a number of problems exists in this area, and further in-depth analysis of related issues are important.

In our studies of upland flash flood events in northern Thailand, conflicts arose with respect to irregularities, lack of transparency and accountability in compensation payouts involving the village head (Manuta et al. 2006). A mobilization by villagers was able to oust corrupt officials, but delayed compensation. Similar problems have plagued recovery processes in small fisher villages in southern Thailand after the tsunami of December 2004 (Lebel et al. 2005; Manuta et al. 2005) .

An assessment framework like the one we are now discussing could itself be part of an institutionalized learning process by key disaster organizations. Regular assessment exercise by particular publics and bureaucracies could consult expert advice as needed. Thorough and well communicated research could contribute to such evaluations.

Prior to reforms in October 2002, the Thai approach to disaster was explicitly reactive, focussing on readiness and response. Since then a more pro-active rhetoric has been adopted, which aims to minimize the risks and impacts by using both structural and non-structural measures that include preparedness by mobilizing the resources of the government offices, private sector and community (Tingsanchali et al. 2003). This development might be evidence of nascent learning. The huge problems with the still technocratic institutional response to the Indian Ocean Tsunami (Lebel et al. 2005; Manuta et al. 2005) underlines just how many more lessons still need to be learned.

3.2. Role of institutions in floods risk reduction in Asia

This section of Report focuses on results of analysis of institutional perspective in flood risk reduction in the countries of Asia. It presents project findings related to defining the role of institutions in altering vulnerabilities of societies to floods. It discusses a number of key issues and IFA research results related to 'design and action' of institutions and to implementation of flood risk reduction policies and measures. It focuses on a number of factors defining performance of institutions and implementation problems. This section discusses some of our results and approaches to identifying domestic institutional coping capacity against floods, to tracking performance of flood risk reduction institutions in a variety of national contexts and explaining success and failures in their action.

3.2.1. Influence of institutions on societal vulnerabilities

Institutions, whether purpose-built to address floods or flood-related disaster risks, or not, may influence vulnerabilities of various society groups through several pathways (Figure1). In our conceptualization the influence of institutionalized capacities and practices (inner box) on the disaster cycle (outer ring) are mediated by ecological and social resilience as well as attributes of the flood event itself (middle box). Some examples of typical institutions are shown (outer box). The pathways themselves may be complex. For instance loans for investments in structural measures and regulatory practices with respect to land-uses in river basin will alter the attributes of floods in terms of onsets, durations and peak flows by altering run-off, retention times and river-flow regimes. Other pathways alter how involuntary risks are distributed, either by modifying likelihoods of exposure or the capacities of different actors to avoid, cope with or adapt to floods.

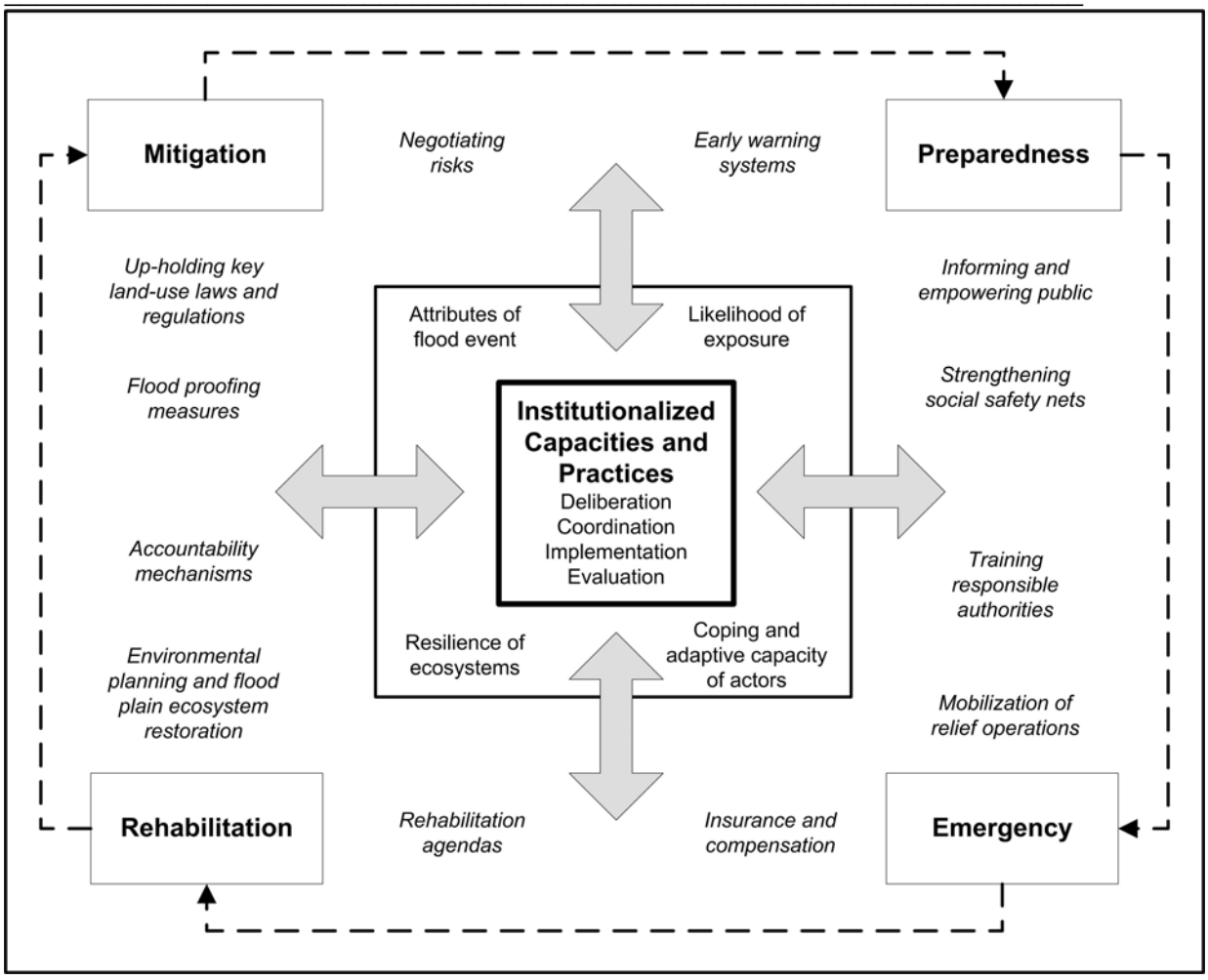

Figure 1. **Institutions modify vulnerabilities and hence risks of flood-related disasters through several pathways (*Source:* Lebel, et al 2006)**

3.2.2. IFA's approaches to assessing institutional capacities

Institutional capacity (or incapacity) of societies to respond to floods is among important vulnerability indicators. It sounds quite trivial, but weak institutional settings or failures in performance of flood risk reduction institutions define to a high extent human vulnerability to natural disasters.

We believe that in order to take one step closer to answering questions about how to improve institutional capacities for floods risk reduction it is important to differ between *design* and *action* of institutions. Indeed, our research indicated significant gaps between challenging goals of existing institutions and implementation results in floods risk reduction. Thus, among primary goals of IFA is to identify and assess the *design* and *action* of flood risk reduction institutions. Tools used include outlining possible gaps between design and action of institutions and explaining *success* and *failures* in their performance and in behavior of main stakeholders. Analysis of major *lessons learned* about coping capacities/incapacities of the countries during catastrophic river floods is equally important. Such approaches allowed IFA to define major trends and processes within institutional cycles, including institutional regime formation and its implementation. Both design and performance of institutions is rooted to a high extent in

national contexts and in specifics of economic, social, political development and cultural traditions of countries under study. Altogether they serve for identifying institutional vulnerabilities, loopholes in their design and weaknesses within implementation process. Cross-national comparisons and tracking *common* and *country-specific* problems they are facing contributes to answering the question of what can be done and what innovations and reforms of institutions are needed to increase coping capacities of societies to the risk of floods. It is suggested as an important area for further analysis.

Assessment of particular elements of institutional design such as legislation, programmes, strategies, action plans, administrative organization, vertical and horizontal subsidiarity, coordination between bodies, financial mechanisms and tools, insurance schemes, national approaches, policies and measures (structural and non-structural), rules of behavior for individuals and stakeholder groups is important for achieving IFA's aims to characterize existing domestic capacity. Extent in development of institutional structure, or tracking the lack of its particular elements contributed to evaluation of national institutional capacities.

Several paths are selected to assess institutional potential. First, a vertical scaling includes analysis of domestic institutional frameworks at *national*, *sub-national* and *local* levels along with capturing main features and specifics for each country. The initial generic top-down study of national institutional frameworks for floods risk reduction in selected countries is combined with bottom-up evaluation of local and provincial institutional responses during particular flood events. Second, for assessment of institutional capacity to address floods IFA uses a system approach. Our method decouples specific features of institutional settings at each stage of flood management: mitigation (structural and non-structural responses), preparedness, emergency and rehabilitation.

3.2.3. IFA's approaches to assessing institutional practices

IFA suggests that not only well structured and developed institutional design matters for measuring coping capacity of a country. Equally important is an assessment of *implementation* process and outcomes of how institutions perform at particular stages of flood event. Case studies indicate that to a high extent institutional vulnerabilities of societies are rooted within the latter phase of institutional cycle. Gaps between stated policy goals and practice or between design and action of institutions are tracked quite often, and good intentions might turn into 'dead letters', thus, contributing to increased vulnerabilities.

It happens due to various reasons, and a broad *variety of factors* define patterns of how institutions act in practice. Identifying the impacts of these factors is critical for assessment of institutional vulnerability. Its causes are often rooted not only in internal design of institutions, but in many cases are attributed to sets of external factors which affect implementation process and performance of institutions in different socio-economic and political circumstances. Messages from our studies in countries with different contexts (developed, developing and transition economies) allow identifying a variety of 'situational factors' which significantly alter implementation process. For example, such specific conditions as financial deficiencies, administrative barriers and conflicts between organs, weakness of authority at different levels, corruption, poverty, lack of economic incentives, low public participation and awareness, unsustainable development and many others might contribute to institutional vulnerabilities in flood risk reduction. In many cases situational factors might block or alter the performance of

institutions or modify already designed 'good' pathways for implementation of policies and measures.

3.2.4. Assessing success and failures of institutions in action

Existing legislation, administrative structures, policies, their tools and other institutional elements provide only for a basic framework for flood risk reduction. Among crucial issues is how these arrangements perform in practice. Implementation results *before, during* or *after* a flood is one of the core indicators for assessing effectiveness of institutional capacities. Most country case-studies demonstrated that there were significant gaps between 'design and action' of institutions, gaps between goals of institutional regimes and outcomes they manifest in a course of floods risk reduction. The effectiveness of institutions including their ability to impact and change behavior of the targeted groups of stakeholders to respond to floods often appears to be lower than envisaged. Unfortunately, implementation failures occur quit often, and as a result human security appears to be under threat. IFA research indicates that not only poor institutional capacities but also well-designed and developed regimes under certain circumstances in practice might produce failures. It is extremely important to track and predict possible "deformations" of institutions in order to avoid them in the future. It represents a promising research area for the future.

Effectiveness of existing institutions can be judged from tracking the results of their performance during particular flood events which are described in IFA case-studies. While a variety of good practices of institutions had been demonstrated in the countries of Asia, still a great deal of shortages in actions of institutions can be indicated. Among recent success stories about institutional performance during catastrophic floods had been, for example, well organized emergency actions of Russian Emercom ministry during the Lena River flood in Sakha Republic when professionals of this agency provided rescue and relief support to 17.5 thousand of citizens of Lensk evacuated from the chill waters mixed with ice during the catastrophic spring freshet flood in 2001. Among failures during the Lena River flood had been the inability of local administration to properly react to early warnings of Hydromet and Emercom about difficult freshet situation in the basin. As a result 87 settlements with population over 400 thousand were severely affected by this spring flood; the number of victims might be much less if instead of receiving belated information the public could get adequate timely warnings to be able to take actions in advance.
There is a lot of interesting evidence about recent domestic settings and links between government and community action to increase resilience against floods. A unique innovative programme was introduced in Vietnam. As children appear to be the major victims of floods (up to 90% of victims), the temporary "emergency kindergartens" are opened where parents can leave their children under organized adult supervision during emergencies, while they are preoccupied with securing personal belongings and other resources crucial for continuing their livelihoods after the floods <Face, 2003> .

Another success story about local institutional arrangements is the case of the Fukuoka flood in Japan. Local community action has been encouraged by the Fukuoka city since mid-1990s: it supports formation of voluntary organizations for disaster prevention within each elementary school district; they were involved in active emergency measures during the Fukuoka flood inundation. Leaders of small communities using the broadcasting equipment in the community centers urged the residents to evacuate, or to

move their cars to the hills as a lessons learnt from the previous 1999 flood indicated that many private cars were damaged.

3.2.5. Explaining success and failures of institutions

Variety of factors. Evidence from IFA country studies indicates that there is a broad variety of reasons for success and failures demonstrated by institutions in action. There are several groups of factors affecting the results of implementation process either during emergency situations and afterwards, or in a course of flood risk mitigation.

Practice shows that shortages in institutional performance can be explained either by loopholes in existing designs of institutions for flood risk reduction, or by their poor action. However, even well designed institutions under certain conditions might demonstrate failures or weak performance and compliance with prescribed rules. Thus, IFA distinguishes two main groups of factors affecting implementation process, namely *internal* and *external* ones. Internal factors are associated with shortages and deficiencies in internal design of flood management institutions. The group of external factors is defined by broader national socio-economic, political and cultural contexts within which institutions function. Our studies indicated that quite often the 'standard institutions' for flood risk reduction that are effective in some countries can be significantly deformed and produce 'non-standard' results while applied under different domestic circumstances. For example, weakness of local and regional authorities and deficit in financial resources during the transition period in the nineties in Russia had been the major reason explaining the neglect of structural measures on the Lena River in Siberia, although they had been regularly executed previously; due to these constraints existing anti-flood disaster action plans turned into 'dead letters'. Similar factors are in effect today in Vietnam.

Internal factors. Among critical issues predetermining low effectiveness of institutions in flood risk reduction are internal loopholes and deficiencies in their design. There are a number of examples from the national practices when shortages in existing institutional design contributes to institutional vulnerabilities, and hence to increase of a flood risk. For example in Russia, poor coordination between authorities and low effectiveness of existing river basin administrations responsible *inter alia* for coordination of flood management. Practice shows, that cumbersome administrative structures, parallelism in competences and insufficient coordination between them, overlaps in control functions allow avoidance for any of their responsibilities. Recent inventory of hydro-technical facilities in Russia indicated that although dozens of organizations at various levels are responsible for maintenance and repair, many of these engineering structures all over the country are left unattended and approaching collapse.

Among important emerging concerns noted by IFA relating to the structure and mechanisms enabling institutions to function effectively is incorporation into their designs mechanisms that allow monitoring, verification and evaluation of their performance, including, for example, means to verify recovery operations and accounting of relief allocations, provision of materials and other humanitarian assistance. Our studies in Vietnam indicated that recently adopted national legislation on flood risk management does not contain clear mechanisms and system for sanctions, and there is a question whether newly installed rules on incentives and rewards are functional, and rules regarding sanctions are enforceable which might result in difficulties with handling violations.

External factors. While the problems defined by negative impacts of internal factors can be solved by reforming and 'improving' institutions responsible for floods risk reduction, problems associated with external factors and rooted in a broader domestic "situational" specifics are much more difficult to deal with, and more comprehensive solutions are needed. Problem-solving is linked to broader issues of sustainable development and poverty reduction, it is positioned within national economic and political agendas and within existing cultural and behavioral traditions and stereotypes. It happens often that good performance of flood risk reduction institutions can be negatively affected by external factors that are beyond the scope of the competence and control of such institutions. Below we briefly outline a set of external factors that according to IFA assessments affect implementation of flood management policies and measures.

Economic development. Existing trends in economic development and urbanization are among powerful drivers which under certain conditions might accelerate flood risks. IFA notes that strong pressures for economic development in most developing and transition economies tend to overshadow environmental concerns while many of them, in their turn, are closely linked to the risk of floods. Even developed institutional structures for flood management such as in Japan might appear to be not effective enough under impacts of such external factors. For example, among main causes for the Fukuoka floods in 1999 and 2003 had been rapid recent urbanization in the basins of the Mikasa and the Umi rivers and rapid growth of uncontrolled run-off from the upper-stream areas causing inundation of highly developed underground infrastructure. Regular structural measures such as widening of the river flow were not possible any longer in highly urbanized territories. Fast unregulated development in flood-prone areas in many countries of Asia, or violations of existing bans and norms (Russia, Vietnam) contributes to escalation of flood risks.

Changes in land-use. Results of IFA case-studies in the countries of Asia reconfirm that land-cover change and unsustainable land-use patterns, and especially deforestation significantly contributes to the risk of floods and landslides. For example, increased deforestation during the last fifty years in Vietnam in the upper-streams of the Red River basin is one of the main causes of a series of catastrophic floods in the delta areas. In combination with rapid urbanization in the basin it contributes to increased risk of floods, and is beyond the scope of control of flood management institutions.

Societal transition. Situational factors of the transition period - from communism to a democratic society and from command-based economy to markets in Russia and in Vietnam appeared to have very strong impacts on performance of flood risk reduction institutions. Specifics of the economic and political transition in these two countries brought in certain constraints into implementation of flood risk reduction policies. Together with significant positive opportunities for decentralization, broader local participation, application of new market tools and incentives, transition has certain negative implications. Recently, flood management had become increasingly dependent on specifics of economic and political development, on under-financing from the state budget, on uncertainties in the legal system, on social instability. Widely spread corruption, uncontrolled siphoning of funds, weak government authority lacking control at all levels, lobbying by interest groups for influence over funds allocations, under-reformed property rights were crucial factors .The situation was exacerbated by economic crisis and financial shortages, a shadow grey economy, and lack of effective public control over performance of government institutions. The cumulative negative impact of these 'situational factors' led to deformations in practical application of flood

management schemes. It was particularly strong during the nineties, while recently active attempts were undertaken by these countries to overcome these problems. Among conclusions from our studies is that success or failure of flood risk reduction policies depends not only on their design as such, but also on the advances of domestic economic and political reforms.

Financing. Problems in financing are often indicated as one of the most important factors defining failures in performance of institutions; while on the contrary sufficient funds can be an important prerequisite for good institutional performance. Along with well structured and transparent channels efficient mobilization of funding is one of the characteristic features of high institutional capacity. In most developing countries and transition economies financial deficit is assessed as one of the major obstacles for effective performance of flood risk reduction institutions at all stages. Equally important is the problem of mobilization of existing financial resources. There are a lot of debates on the issue, and IFA supports the approaches that the problem is not in the deficit of domestic finance, but in how to mobilize and channel existing resources and to avoid misuse of funds allocated. There is a growing understanding that in many countries allocation of funding is not just a technical problem, but a political one and it is dependent on lobbying capacities of various interest groups. This is a promising area of future research, and in combination of further exploring the opportunities of micro-finance and insurance it is believed to be a promising mechanism for problem solving in increasing institutional capacities in floods risk reduction in Asia.

3.3. Domestic institutional frameworks for flood risk reduction

3.3.1. Case-study analysis of institutional capacities during floods

Along with generic analysis of institutional frameworks and capacities for floods risk reduction in selected countries of Asia, IFA explores a number of recent cases of big floods in Japan, Russia, Vietnam and Thailand; results of research in Burma/Myanmar, Bangladesh and India is also taken into account. These countries represent developed, developing and transition economies. For each of them counteracting floods is at the top of the national disaster risk reduction agenda, but institutional capacities, their designs and responses vary across countries. Domestic socio-economic contexts and political culture within which flood risk reduction institutions perform are different as well. Focus of our research is on assessment, *first*, of domestic designs of flood risk reduction institutions, and, *second*, on their performance during recent big floods. The following flood cases are explored: the Fukuoka flash floods in a highly urbanized area of Japan caused by a heavy seasonal rainfall, the 2001 Lena River flood in Siberia, Russia as a result of spring freshet flood[2] due to abnormally rapid melting of thick snow and ice-cover in the river basin, the series of Red River delta floods in Vietnam in a course of heavy summer seasonal rainfall, and the Chao Phraya River Basin flash floods in the northern Thailand and Hat Yat floods in its southern parts.

[2] The term "freshet" is most commonly used for describing a spring thaw resulting from snow and ice melt in rivers located in the northern latitudes of the Europen and Asian parts of Russia and in North America, particularly Canada, where rivers are frozen each winter and thaw during the spring. A spring freshet can sometimes last several weeks on large river systems, resulting in signficant inundation of flood plains as the snow pack melts in the river's watershed. Spring freshets associated with thaw events are sometimes accompanied by ice jams which can cause flash floods. http://en.wikipedia.org/wiki/Freshet

Rich evidence for testing IFA approaches to assessment of institutional capacities and practices is collected in a course of case-studies. It is summarized in order to inquire how institutions act during particular flood events, what problems do they face and what are lessons learned about their performance. Each case-study provides and discusses examples of success and failures during particular flood events, and explains 'good' and 'bad' practices in institutional actions (or inactions).Cross-national comparisons and identifying common and specific problems across countries provide results for broader generalizations.

Human security of individuals and local communities and rehabilitation of population affected by floods is the red thread of our study. Within particular flood cases IFA was focusing on assessment of institutions' actions and measures applied by the governments, by business and by the local public. *First*, actions of responsible government institutions at each stage of flood event to reduce human vulnerabilities are assessed. Particularly, IFA inquires how existing institutions (national, sub-national, local) deal with early warnings of population, emergency evacuation, provision of public goods, economic, social and medical assistance, rehabilitation of households, protection from marauders, etc. It also explores evidence about mitigation responses to floods in river basins under study. S*econd*, as successful performance of institutions against floods directly depends on wide public involvement in floods risk reduction. IFA assesses local public participation and community action. We identify major types of behavior of local population and track wrong behavioral stereotypes (for example, rejection of calls for emergency evacuation because of the risk of marauders) which significantly hamper performance of institutions. IFA believes that this is a promising area of further research and its results can be applied for developing advice on how to enhance institutional capacities in the countries of Asia.

3.3.2. Asia: a variety of national institutional designs

A variety of institutional frameworks to counteract floods are in place in the countries of Asia, including legislation and regulations, administrative organs at different levels, action plans and strategies, financial mechanisms, wide range of tools and measures (structural and non-structural). IFA illustrates that some of them are positioned within broader schemes of natural disaster management, while others have special mandates and target flood mitigation. IFA summary of existing institutional arrangements in Japan, Russia, Thailand and Vietnam as a result from case-studies is presented in Table 3.

Although in some countries, like Japan, the formation of flood risk reduction institutions has a very long tradition since Meiji era, in many others the contemporary institutional settings with developed supporting infrastructure had been formed mainly during the last decade. Starting from the 1990s serious institutional reforms, including changes in disaster management policies and reorganization of institutions responsible for floods risk reduction took place. For example, in Russia, during the nineties quite effective institutional system of emergency response has been set up, while Thailand reconfigured in 2002 its domestic system to set up a new focal point for natural disasters management, i.e. the Department for Disaster Management in the Ministry of the Interior; these arrangements were combined with development of domestic legislation, national policies and action plans.

IFA notes that domestic institutional designs vary across countries depending on national political system, economic development, vulnerability to and perceptions of the flood risk

and many other factors. Needless to say that national institutional capacity to counteract floods differs significantly across countries. However, there are a number of *common features* across countries.

First, almost all countries have a designated government authority dealing with natural disasters. *Second*, for a long time the state has been regarded to be primarily responsible for authority and action in dealing with floods. *Third*, there are a lot of similarities in the structure of national institutional designs. For example, institutional organization of disaster risk reduction in Russia has a lot of common features with those of Japan. However, the implementation results and performance of institutions might vary in some cases. *Fourth*, vertical subsidiarity in flood risk reduction is established in many countries. *Fifth*, most government institutions involved in floods management focus today mainly upon emergency rescue and rehabilitation of population and territories and reconstruction of livelihoods once the crisis occurs. *Sixth*, much less resources and attention are paid to non-crisis comprehensive flood risk reduction which incorporates hazard risk assessment, monitoring, forecasting and prevention of catastrophic events in the flood prone areas. *Seventh*, in some countries, unfortunately, for a long time the accents had been put not on enhancing human security and protection of individuals and their livelihoods, but primarily on reducing damage to economic assets and infrastructure. For example, these were the cases of the former socialist countries like Russia and Vietnam, with a specific set of values within communist ideology; since then the situation has changed considerably and perceptions of national security have been totally reconfigured to incorporate emphasis on human values <Kotov, Nikitina 2001>.

IFA discussion with experts during the project workshop in Chiang Mai in 2006 showed that formal institutional arrangement is mostly driven at the national level when it comes to flood disaster and at this level the management comes as a one-stop measure which is characterized by ambitious coordination mandate and unmatching low capacity (for details of discussion see Annex). Authorities tend to be heavily top-down. At the local level, governance reforms often account of splitting areas of responsibilities to geographic units. It often creates issues of fit, for example when left and right banks of the same river are divided into different jurisdictions. At the same time fitting institutions to ecosystem boundaries alone does not solve much; a lot depend on the scale. For a large river basin, centric approaches tend to unyielding and the sense of ownership is often weak among the stakeholders. Inhibiting the improvement is lack of monitoring and evaluation on the ground which feeds into learning and adaptation. Public awareness about the institutional structure regarding disaster is weak.

Table 3. **Domestic institutional arrangements for disaster risk reduction**

Country	Focal point for disaster management	National legislation	National action plans	State or provincial organs
Japan	Central Disaster Management council	Disaster Countermeasure Basic Act Flood Control Act Flood Prevention Association Act Urban River Inundation Prevention Act Meteorological Service Act River Act Erosion Control Act Forest Act Support for Reconstruction of Livelihoods of Disaster Victims Act	Basic Disaster Management Plan	Prefecture disaster management councils Municipal Disaster Management Councils
Russia	Ministry for Civil Defense and Emergencies (Emercom) Ministry for Natural Resources Federal Service of Russia on Hydrometeorology and Environmental Monitoring Interagency Commission for Disaster Reduction	On Protection of Population and Territories from Natural and Technological Emergencies On Emergencies and Rescue Service and on Status of Rescue Forces On Sanitary and Epidemiological Safety of Population On Civil Defense Statute of the Ministry of the Russian Federation on Civil Defense and Emergencies On Emergency Situation On Environmental Protection	Federal Programme on Natural and Technological Risks Mitigation Federal Programme on Development of All-Russian Service on Emergencies Medicine	6 regional centers of Emercom Territorial organs in 89 federation subjects Municipal bodies for Civil Defense and Emergencies Territorial organs for Natural Resources
Thailand	Department of Disaster Prevention and Mitigation Department of Water Resources Royal Irrigation Department Department of Public Works and City Planning Meteorological Department Ministry of Social Development and Human Security	Civil Defense Act, 1979 + 34 disaster related laws	National Civil Defense Policy Plan 2002	
Vietnam	Central Inter-ministerial Committee for Flood and Storm Control National Committee for Search and Rescue Department of Dyke Management, Flood and Storm Control, Ministry of Agriculture and Rural Development	Ordinance on Flood and Storm Prevention and Mitigation Ordinance on Emergency Situation Ordinance on Dyke Maintenance Law on Forest Protection Law on Water Resources Resolution on Basic Measures for Immediate and Long-term Flood Mitigation	National Strategy and Action Plan for Water Disasters Mitigation	Provincial committees for flood and storm control District committees for flood and storm control Commune committees for flood and storm control

3.3.3. Trends in domestic institutional capacity building

Recently, in the countries of Asia a number of new trends have been emerging within domestic institutional settings. *First*, natural disasters risk reduction in general, or floods risk reduction, in particular, are getting higher priorities on national agenda and institutions are modernized to enhance domestic potential to change behavior of stakeholder groups. IFA tracked gradual shifts from response to floods towards flood risk management. This sector of domestic institutions is turning to be a dynamic domain. More consistent research in this area is needed and it is a challenging task for scientific community.

Second, there is a growing attention to developing comprehensive institutional settings that can provide for flood risk reduction through combining emergency and relief actions, on the one hand, with prevention and planning of reducing flood risks of catastrophic scales, on the other hand. Since mid-1990s Vietnam has undertaken significant efforts in

development of national strategy for natural disaster management [3]and to reinforce the national disaster management unit, while Russia is initiating coordination of actions between the Emercom ministry with the Ministry for Natural Resources responsible for maintenance of hydro-technical facilities and river basin management.

Third, in many countries there is an emerging understanding that institutions for flood risk reduction and non-crisis management should be heavily based on broader involvement of capacities at the local level that are positioned 'closer to the risk' than bureaucrats from the central government. It is suggested that part of responsibilities can be decentralized and coordinated by municipalities, townships and communes. Community based action and local public education – for the public to 'be better prepared than scared', contribute to enhancing local institutional capacities. However, still there is a great deal of discussion underlining that especially during the catastrophic flood events combination of local public action with the state efforts is crucially important.
Fourth, some countries have developed a refined vertical subsidiarity of the government. IFA studies show that, for example, in Japan, Russia and Vietnam similar vertical systems are being established. In Japan it is based on combination of central, prefecture and municipal councils[4] that are highly efficient in practice. In Russia it incorporates the federal agency with 6 regional centers and also territorial disaster management bodies in all 89 federation subjects. In Vietnam as a result of several rounds of reforms a quite comprehensive system of central, district, provincial and commune committees for flood and storm control is enacted. At the same time IFA notes that in some countries in practice development of vertical subsidiarity is accompanied by a number of problems: there is no clear understanding how to make existing vertical systems provide effective interactions between levels during and after floods (for example, constant contradictions between levels are tracked in a course of resource allocation and financial transfers, especially in crisis situations). More research and thinking on the issue is essential.

Fifth, there are new trends indicating that countries tend to incorporate floods management, or broader natural disaster risk reduction, into national socio-economic development plans. IFA findings from Vietnam indicate that new approaches are developed by the new national disaster reduction strategy that requires the flood-prone provinces to plan for more appropriate land-use and to take into account crop schedules better suited for the likelihood of floods, as well as to reforest 5 million hectares upstream of the flood prone areas of the Red River, and to control urbanization processes. It is considered as a good example illustrating synergy between reduction of flood risks and natural resources management, agricultural development, forestry and fisheries initiatives, and increasing local production and economic development. With annual floods along the Mekong River basin in addition to modernization of local infrastructure to reduce flood damage and to change the crop patterns, plans are underway to take advantage of flooding by expanding aquatic production methods and increasing fishing market opportunities.

[3] In 2001, Vietnam introduced the 2nd National strategy and Action plan for water disasters mitigation up to 2020
[4] In Japan, basically each municipality has primary responsibility of lifesaving or support for the victims of disaster, while national government under the Disaster Relief Act provides some financial support to share municipalities' burden in case of serious disasters

4.0 Conclusions: Lessons learned about How institutions can help to address human vulnerabilities to floods

1. States no longer respond to flood disasters, but tend to manage flood risks, and do so with increasingly sophisticated institutional frameworks. However, domestic institutional capacities for undertaking both structural and non-structural efforts as well as cooperative institutional responses to floods in the countries of Asia are still inadequate to significantly reduce the risks of flood disasters. Despite the better understanding and monitoring of disasters, losses of life, property, moral damage from flood disasters remain unacceptably high and are increasing.

2. Institutional reforms with the aim of reducing the risks of flood-related disasters have largely been unsuccessful. There are six main reasons. *First* is the misplaced emphasis on emergency relief to the detriment of crafting institutions to reduce vulnerabilities and prevent disasters. *Second* is the self-serving belief that disaster management is a technical problem that calls for expert judgments that systematically exclude interests of the most socially vulnerable groups. *Third* is the over-emphasis on structural measures, which again and again, have been shown to be more about re-distributing risks in time and place than reducing them. *Fourth* is the failure to integrate flood disasters into normal development planning in flood-prone regions. *Fifth* is the failure to recognize the importance of learning for building social and ecological resilience and for guiding individual and collective behavior. *Sixth* is the existing gap between the declared goals and mission of institutions, on the one hand, and results of their actual performance in flood risk reduction, on the other hand.

3. It is widely acknowledged that the design of an institution is decisive in determining how effectively, equitably and resiliently it will function. IFA suggests that not only *design*, but also *action* of institutions in particular domestic settings and results of their performance is equally important for assessing institutional capacities of societies to reduce risk of floods. Among IFA findings is that in practice, unfortunately, not always well-structured institutional designs assure high coping capacities against floods in the Asian countries. Implementation process and outcomes how institutions perform at particular stages of flood event or for its prevention really matter. To a high extent the institutional vulnerabilities of societies towards floods are rooted within the latter phase of institutional cycle.

4. The effectiveness of institutions for floods risk reduction including their ability to impact and change individual and collective behavior of stakeholders is often lower than planned. IFA indicates several reasons including ‘internal’ and ‘external’ factors. One group of them points at loopholes in internal design of flood management institutions and at shortages to coordinate structural and non-structural efforts within common setting and with the sustainable development of the river basins. Another group of factors is defined by national social, economic and political specifics of the countries within which flood management institutions perform; such national contexts might seriously alter the implementation process.

5. Situational factors and national contexts appear to have powerful impacts on *transfer and adaptation* across countries of best institutional practices in flood risk reduction. Not always the best practices, although being appealing to others, can be automatically transferred from one country to another. Sometimes they need to be

adjusted to the national specifics, traditions and existing behavioral stereotypes. IFA notes that although flood insurance in Japan is an important tool in flood management, many developing countries in Asia due to various reasons are facing problems in incorporating its analogues into their domestic practices.

6. IFA identified a number of common features of national institutional frameworks for flood risk reduction across countries of Asia. *First*, almost all countries have a designated government authority dealing with natural disasters. *Second*, for a long time the state has been regarded to be primarily responsible for authority and action in dealing with floods; since recently in some countries more attention is given to how enhance local public participation. *Third*, there are a lot of similarities in the structure of national institutional designs. For example, institutional organization of disaster risk reduction in Russia has a lot of common features with those of Japan. However, the implementation results and performance of institutions might vary in some cases. *Fourth*, most government institutions involved in floods management focus today mainly upon emergency rescue and rehabilitation of population and territories and reconstruction of livelihoods once the crisis occurs; much less resources and attention are paid to non-crisis comprehensive flood risk reduction which incorporates hazard risk assessment, monitoring, forecasting and prevention of catastrophic events in the flood prone areas, linking flood management with sustainable development of the river basins. *Fifth*, in many countries, unfortunately, for a long time the accents had been put not on enhancing human security and protection of individuals and their livelihoods, but primarily on reducing damage to economic assets and infrastructure.

7. Lessons from IFA country studies indicate that insufficient funding for flood risk reduction in the countries under study, especially in the developing and in transition economies, are often referred to be among key problems. At the same time quite often funds planned for flood programmes are not transferred in a full scale; controversies in coordination of resources allocations between central, regional and local levels are indicated; resources allocated are misused. Country-studies indicate that diversification and resource mobilization from various sources at all levels, including locales, is essential; control over resource flows, transparency and strict accountability is in the core. However, financing and resource allocation problems are common to developed countries as well. They are accompanied by strong lobbying by various interest groups. Often financial allocations appear to be not just a technical problem, but a political one.

8. Who bears financial burden for flood risks prevention and mitigation? A mix of different financial mechanisms emerged from case-studies and discussion with experts. The social role of the state in providing food, health care, renovation of livelihoods and housing certificates for affected people (Russia), houses and livelihood compensations (Thailand), peoples and livestock shelters (Bangladesh), support for houses repair, agricultural production allowances, provision of seeds and fertilizers, water treatment chemicals (Vietnam), crops and housing insurance (India) turned to be among success examples from IFA assessments. The leading role of the state in funding for flood control purposes is combined with other sources, including with private sector's involvement (banking and investments) in flood risk management which is recognized as important institutional tools in mitigation, recovery and rehabilitation. However, wide private sector involvement remains problematique in many developing countries, while its role is higher in the developed world and is rapidly emerging in transition economies.

9. IFA notes that the specifics of floods entail spatial and temporal dimensions. Usually floods encompass different sub-basins within a country or within several countries. Thus, the *scale* in regional or transborder cooperation and institutional coordination of flood risk reduction efforts becomes of utmost importance. In this context development of procedures and mechanisms for coordination of interests and solving possible conflicts of interests between various regions, provinces and countries within the same river basin is at the top of flood management agenda. IFA indicated a variety of approaches suggested or already applied in practice, including river basin committees, river basin management administrations or public-private companies, special national coordination bodies, and cross-national cooperation agencies.

10. There is a growing understanding that institutions for floods risk reduction are to be heavily based on broader involvement of capacities at the local level that are positioned 'closer to the risk' than bureaucrats from the central government. On the basis of its studies and its field research in the Asian countries IFA confirms that part of responsibilities can be decentralized and coordinated by municipalities, local governments, townships and communes. Community based action, local public education, wider use of traditional knowledge accumulated during the centuries of flood record contribute to enhancing domestic institutional capacities. However, many unresolved problems exist: there is still very poor understanding about the most effective ways to open channels for public participation in flood risk reduction. At the same time there is a great deal of arguments that during catastrophic floods combination of local public action with the efforts of the state is crucial.

11. Debate, consultation, public participation, representation procedures should be incorporated as integral element into 'good governance' of floods. A return to community-based flood disaster management is being widely promoted by international agencies, but only cautiously adopted by national ones. The key idea is that greater involvement of the public in decisions about all stages of flood disaster cycle will make better use of local knowledge and capacities and help identify risks and pragmatic opportunities to address them. The area requiring the most profound engagement with wider group of stakeholders is in assessing and addressing the underlying causes of vulnerability. State agencies usually find these very difficult to do because it requires dealing with fundamental issues of governance and social justice that may undermine positions of authority.

12. In most flood-affected and -dependent regions, especially in the developing world, institutionalized capacities and practices to reduce the risks of flood disasters remain weak. This is especially true in the fast developing regions where the entire livelihood and socio-economic context is in flux and traditional institutions may no longer be relevant or functioning well and new relationships among firms, communities and state agencies have not emerged or kept pace with shifting risks. The mature industrial and service economies have fewer institutional gaps, but still face daunting challenges of escalating costs from the legacy of controlling, rather than living with, floods. A systematic approach of IFA to diagnosis of institutionalized capacities and practices in flood disaster management could help societies identify critical gaps beforehand, and thus learn more from experience and practice.

5.0. Ways Forward: Recommendations for Future Action on Strengthening Institutional Capacities

1. As states no longer respond to disasters, they tend to manage disasters and are doing so with increasingly sophisticated institutional frameworks. In this context growing attention is to be paid to interdisciplinary/integrated approach to flood management within particular river basins, building on establishing knowledge and setting common objectives. These elements are to be essential components of institutional regime formation on floods risk reduction. Closer links and integration of technical/hydrological regimes with institutional regimes is essential.

2. The interdisciplinary integrated approach to flood management implies public participation and involvement of local authorities and representatives of civil society. These features will contribute to public acceptance, develop awareness, enhance capacity building, all essential elements of sustainability which since recently is being more tightly interlinked with floods risk reduction. There is a need to identify ways of how to better incorporate flood disaster risk reduction within sustainable development strategies and poverty alleviation programmes in the Asian countries. Thus, development of flood management institutions that incorporate all these new perceptions and elements is a challenging direction for action in the future.

3. Consolidation of institutional capacities that allow wide participation of all stakeholders as much in decision-making process as in the implementation phase and in actions against flood disasters is another challenge for perspective institutional regime formation. Consequently the term “policy-maker” does not only cover elected representatives of the legislative and in the executive branches of government but basically all those who are interested in reducing the flood disasters in their countries and locales. This is especially important for the developing countries and transition economies in Asia where development of pluralistic democratic societies is an important challenge.

4. In the countries of Asia, institutional coordination in flood risk reduction between government bodies – both horizontal and vertical, is essential for the future; today in most cases it is insufficient. Thus, respective coordination instruments and tools should be selected within the capacity building process. Equally important is to study and find optimal solutions for trans-boundary and intra-regional institutional arrangements concerning flood risk governance within large river basins. Establishing institutional regimes and mechanisms (at various levels) that can provide for coordination between actions of various stakeholders in flood risk reduction, as well as for coordination and taking into account their multiple interests within decision-making, and setting up frameworks for solving possible conflicts between them should be in a focus of future actions.

5. More theoretical and practical thinking should be given to assessing roles and influences of flood risk reduction institutions on collective and individual behavioral stereotypes not only during flood events but in a course of in-advance flood mitigation. Selection proper tools and means for increasing effectiveness of institutional frameworks in terms of their impacts to change behavior of actors to

reduce vulnerabilities of societies to disastrous floods should be at the top of capacity building agenda in all countries of Asia prone to flood disasters.

6. In most Asian countries both developing and developed, of particular importance is the need for financial resources for flood risk reduction. It cannot be expected that these resources will be made available in the future from outside of the regions. They have to be generated and mobilized from within – from services, agriculture and industries. Promising instruments in that respect would be disaster insurance, micro-finance, contingency funds that can be set up by regional and local governments to support recovery of property and livelihoods after flood disaster. Developing institutional regimes that strengthen links and combination of public and private sources of finance is essential.

7. There is a great deal of evidence about good practices and lessons learned from institutional experiences in the countries of Asia on how to reduce the risk of flood disasters. More attention should be given in the future to selecting mechanisms and tools for exchange of good practices across countries. At the same time in many cases direct automatic transfer of national experiences without their prior adaptation to natural, socio-economic, cultural and political specifics of the recipient regions in the countries of Asia not always does provide for expected results. Thus, 'transfer and adaptation' of good practices and experiences should go hand by hand; analysis and assessment of related problems and challenges is among important avenues for future action.

8. Important common consideration which emerged in a course of IFA studies and discussions with various experts and with other international projects and agencies is that the knowledge presented by science is very often difficult to use in decision-making regarding flood risk reduction. While the reasons may have been understandable in the past, today they have become counter-productive for science itself and society as a whole. Scientists are to become aware of their societal responsibilities and make their data, information and results transparent and policy-relevant.

9. Extending to decision-makers the documentation and assessments on the structure, main features, success and failures in problem-solving, evaluation of effectiveness of national institutional arrangements and common and specific problems in institutional capacity building for flood risk reduction across wider range of developed and developing countries of Asia can be among practical outcomes of IFA activities. These efforts should be built as well on inventories and experiences of ADRC and ADPC and other regional organizations. Such review should be distributed to governmental and non-governmental organizations involved in disaster risk reduction in the Asia-Pacific region. Further inventory compilation of good institutional practices and experiences are equally important.

10. In many developing countries there is a need to re-design or improve the formal institutions dealing with disasters but the time/costs of doings so are high. Short-cuts would be very welcome. Workshops or trainings for bureaucrats that could learn from best institutional practices elsewhere would be very valuable in the area of designing of systems of laws, regulations, administration, policy tools, programming as well as ways of improving compliance through penalties, sanctions and education/awareness. Training or workshops should be conducted for various

stakeholder groups (including media, business, municipal services, community-based organizations, schools) at all levels local-district-provincial-national for better understanding how floods risk reduction institutions act in practice and what problems they are facing.

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