Integration of Strategic Environmental Assessment in Flood Management Planning, lessons learned from the International Experience- *Case Pakistan*

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Abstract

This paper examines the opportunities of integrating Strategic Environmental Assessment (SEA) in Flood Management Planning. In Pakistan, the flood management strategy revolves around flood forecasting, rescue and relief efforts based on contingency plans. The Monsoon Contingency Plan 2012 was analyzed in the light of the National Disaster Risk Reduction Policy 2012. The analysis shows that flood management planning is short-term, response oriented, lacking integration of environmental and sustainability concerns etc. For comparison, four international flood management sector policy, plan and programme-based SEAs were examined. In addition the approach of the National Impact Assessment Programme (NIAP) initiated by the Government of Pakistan for strengthen EIA and introducing SEA in development planning was studied. The lessons learned from the international community show that SEA has great potential of improving decision-making in flood management. Given the existence of appropriate policy and relevant implementing institutions, the situation in Pakistan appears quite conducive to making use of SEA in improving the flood management plans.

Key words: Flood Management Planning, Strategic Environmental Assessment, Pakistan.

1. Introduction

Pakistan is one of the most disaster prone countries in South Asia, and is vulnerable to a plethora of natural disasters including earthquakes, floods, droughts, cyclones and landslides. The most common ones with 85% of occurrence frequency (1987-2006) among all kinds of disasters (NDMA, 2010) are floods. Floods of various magnitudes have occurred in the country but the one in 2010 was the worst in the history of Pakistan and is believed to have taken 1985 lives (FFC, 2010). One fifth of the country was submerged, about eight millions were displaced from their homes (CRS, 2010) and around 17.6 million people were affected, nearly twice the number affected by the floods in 1992 (WB, 2010) which was significantly greater than several major disasters around the world in the last decade (CRS, 2010). Hence, to reduce and mitigate flood impacts both on human life and environment the integration of strategic environmental assessment (SEA) in flood management planning has been worldwide recognized and adopted by many countries (Carter et al, 2008).

This paper examines and explores the opportunities of integrating SEA at early stage of planning to improve decision-making by considering environmental and sustainability consequences of the proposed strategy, policy, plan or programme and vice versa. Much of the following discussion revolves around the flaws and short comings identified in existing flood management system of Pakistan by analyzing the National Monsoon Contingency Plan (MCP) in the light of DRR-Policy-2012. This paper provides insight into how a destructive flooding phenomenon can be managed strategically considering environmental and sustainability issues at early stage of decision-making by discussing four international SEA-based flood management case studies. The lessons learned from the international practice provide motivation for SEA integration into flood management in Pakistan.

2. Research Methodology

The different steps involved in research methodology are described as:

- Literature survey on flood management practice (i.e. planning, prevention, preparedness and response) in Pakistan was completed.
- A performance criterion (third column in Table-3) was selected for the analysis of MCP in the light of DRR. Further, six topics were considered to analyse the Flood Management (FM) in Pakistan as stated in Table-1.

Table-1

HFA Priorities	Indicators	Progress	Initiatives	DRR-Policy, FM & Contingency Planning (CP)	Challenges for FM arising from DDR-Policy and CP

- SEA introduction and National Impact Assessment Programme (NIAP) initiatives in Pakistan were explored for opportunities to integrate SEA in flood management planning.
- Four international flood management SEAs- based case studies were selected randomly (from developing and developed countries) to show how SEA has been applied or integrated at upper tiers of decision-making as well as the potential outcome of the process which provided good examples of global practice for Pakistan. Each case study was discussed under the following topics in Table-2:

Table-2

Country/ State	Policy/Strategy/Plan/ Program/ Project Title (Case Study)	Assessment Tool/ Approach	Study Focus	Role/purpose of SEA	Out-Comes/ Effectiveness of SEA/Added Value of SEA

- To conclude, the Table-1 & Table-2 were submerged to Table-3 for the final discussion and conclusion.

3. Analysis of National Monsoon Contingency Plan (MCP)-2012 in the Light of Disaster Risk Reduction-(DRR) Policy and comparison with four international SEA-based flood management Case Studies

The scope of the DRR Policy is to serve as a guiding framework for mainstreaming disaster risk reduction in relevant national development planning at all levels. The **DRR Policy** recommends the **contingency planning** for the specific natural and man-made disasters such as **floods**, oil-spills or terrorist attacks at all tiers of administration. To continue, **MCP** was prepared under the supervision of NDMA and in coordination with all the four provinces, states, tribal areas and federal departments. The plan is based on the „Worst Case Scenario" and assumptions considering re-enactment of floods of combined magnitude of 2010 and 2011. The following topics were taken into account, the caseload of 29.2 million people at risk, vulnerable groups, children, old people and gender issues. The main purpose of this exercise was to identify opportunities and constraints for the holistic response to monsoon rainfall in 2012.

The analysis of MCP proceeds considering the progress of Pakistan in HFA report (2009-2011). According to HFA-Report Pakistan has taken initiatives to introduce and promote DRR mainstreaming into development planning in the country, however hindered by limited resources and institutional capacities (Table-3). The flaws and shortcomings in existing institutional (overlapping, poor coordination and flood management planning etc.) capacities for disaster management in the country to deal with the catastrophes of high magnitude was reflected in floods of 2009-2010 and 2011-2012 and has proved evidence to the situation (NDMA, 2010) and continue to exist even to date (Bhatti, 2012; GOS, 2012).

Table: 3-Pakistan's DRR-Policy and HFA-Progress Asia-Pacific Regional Synthesis Report (2009-2011)

HFA-Priorities	***Indicators***	***Progress***	***Initiatives***	***Lesson learned from the Case Studies***	
Priority-1 ***"Ensure that DRR is a national and local priority with a strong institutional basis from implementation".***	1.1National Policy and Legal Framework for DRR 1.2Dedicated resources for DRR 1.3Community participation and decentralized powers and resources at local levels 1.4National-multi-sectoral platform for DRR functioning	Max score:5 Average score:3.4 Pakistan score: 4 "Substantial achievement attained but with recognized **limitations in capacities and resources".**	-National Disaster Management Act -2010 -Dedicated funds for DRR **-DRR-Policy 2012 (not included in HFA-progress report)**	**Case-1- Indonesia-** *Integrated Citarum Water Resources Management Program (ICWRMP) (ADB TA4381-INO Phase III)-2006* • **Key issues** *Institutional capacities, water disaster management (**floods/droughts**), water sharing,* community empowerment and environmental protection etc. • **Measures** -Adoption of flood management strategy focusing on non-structural measures, land-use control/settlement pattern, and modifying farming system. -Improving and construction of new embankments where needed -Rehabilitation of watersheds and flood plain management and conservation of wetlands **Case-2- Cambodia, Viet Nam, Lao PDR and Thailand-** *Mekong River Commission Basin Development Plan Programme, Phase 2 Assessment of Basin-wide Development Scenarios (2011***)** • **Key Issues:** *water supply, irrigation, hydropower and **flood protection** (Transboundary & cumulative impacts)* • **Measures** -Three Flood management Scenarios were developed (for 20-years) by Vietnam and Cambodia considering (i)early and (ii)full flood protection or (iii) combination of both scenarios and potential impacts on both countries and each other. - TSEA outcome shows that long-term flood management and conflicts resolving depends on inter-dependence and mutual understanding between two countries. **Case-3 -The Netherlands-** *SEA for flood protection in*	**Pakistan:** **1-Suggestions** -Putting the IV-National Flood Protection Plan into Action, -improving and strengthening institutional capacities -long term strategy development for integrated flood management, -Resolving provincial water sharing issues/ flood storage (dams) construction and flood management system by identifying strategic and sequenced set of priorities, wise investment on flood protection measures, stakeholder consultation, and community participation -rehabilitation of existing embankments **2- 3 Suggestions** - SEA should be mandatory for water resource/flood management to improve quality of strategic decision-making -Integrate SEA in combination with other
Priority-2 ***"Identify, assess and monitor disaster risks and enhance early warning".***	2.1 National/local risk assessment/hazard data accessible to all stakeholders at all levels 2.2 system for monitoring, archiving and dissemination of risk/hazard data 2.3 Early Warning System for all vulnerable communities 2.4 National/local risk assessment including **Transboundary issues** for regional cooperation in DRR.	Max score:5 Average score:3.4 Pakistan score: 3 "Institutional commitment attained, but achievements are neither comprehensive nor substantial.	-National Composite Risk Assessment and Emergency Response System Project (However project was not successful on the account some issues between the client and the consultant not included in Progress report).		
Priority-3 ***"Use knowledge, innovation and education to build a culture of safety and resilience at all levels".***	3.1 Disaster related data with outreach to all stakeholders 3.2 Incorporating DRR concept in school/educational curricula 3.3Development and strengthening of research /methods for multi-risk assessment, cost-benefit analysis 3.4 Public awareness strategy including with outreach to urban/local communities	Max score:5 Average score:3.4 Pakistan score: 3 "Institutional commitment attained, but achievements are neither comprehensive nor substantial.	-DRR awareness campaign (electronic & print media). -Designating the anniversaries of major past disasters in the country as a part of awareness campaign. (i-e 8-October after the earthquake in 2005).		

Priority-4 ***"Reduce the underlying risk factors".***	4.1 Integrating DRR in environment related policies/plans, land use and natural resource management and climate change adaptation 4.2 Implementation of social development plan to reduce vulnerability of communities at most risk 4.3 Implementation of sectoral policies/plans to reduce vulnerability of economic activities 4.4 Incorporating DRR measures in human settlements including building code enforcement. 4.5 Integrating DRR measures in post-disaster recovery and rehabilitation 4.6 Procedures to assess disaster related with major infrastructure developments	Max score:5 Average score:2.8 Pakistan score: 3 "Institutional commitment attained, but achievements are neither comprehensive nor substantial".	-Creation of "Gender and Child Cell" within the NDMA to ensure that the gender concerns are taken into account in recovery phase following the 2010 floods. -Efforts for incorporating DRR measures in watershed developments, drought proofing programmes and diversified crop/agricultural activities. -Integrating DRR measures in post-disaster recovery efforts following 2010 floods -Updated National Building Code including Seismic Provision	*The Netherlands- a case study (Rob Verheem & Marc Laeven.)* • **Key issues** Fluvial flood risk to people, property and environment from River Rhine and three tributaries. • **Measures** -"Room for rivers" new approach as compared to conventional structural measures. -SEA alternatives were developed considering high water level (to the year 2020), climate change and upstream developments in Germany. -Preferred alternatives constitute a best combination of safety, spatial quality improvements, and environment and cost benefits for each river branch. -SEA, open participation and good governance helped to develop a highly controversial plan successfully for entire river system. **Case-4- United Kingdom-** *SEA-River Wey Flood Risk Management Strategy (2008)* • **Key issues** Fluvial flood risk to people, property and environment from River Wey Catchment. • **Measures** -long term flood management plan development (over 100 years) -SEA was applied to ensure consistency of plan with relevant environmental plans - socio-economic and environmental opportunities were identified to improve existing settings - Detailed SEA in combination with multi-criteria assessment, technical and economic limitations has facilitated in the selection of preferred strategic options (i-e do nothing and do minimum) for each of the five reaches.	tools and approaches for fluvial and flash flood management considering potential environmental issues, socio-economic impacts, climate change scenarios and cumulative impacts associated with upstream and downstream developments/flood protection measures and impacts on both countries -adopt and promote spatial planning/zoning and environmental protection measures. -provide room for rivers by making bypass routs (where feasible). -monitoring and evaluation of flood management plans **4- Suggestions** -SEA application to identify prioritized actions/plans considering **resource limitations** (technical and financial) and environmental concerns. -By improving and strengthening EWS and other non-structural measures.
Priority-5 ***"Strengthen disaster preparedness for effective response at all levels".***	5.1 strong policy, institutional and technical capacities for DRR 5.2 Disaster preparedness and **contingency planning** at all levels of administration 5.3 Financial resources for contingency mechanism, response and relief efforts 5.4Procedures for relevant information exchange during and post disasters	Max score:5 Average score:3.4 Pakistan score: 4 "Substantial achievement attained but with recognized limitations in capacities and resources".	Preparedness/**Contingency planning** with the arrangement of search and rescue teams and relief supplies.		

Table Footnote:

HFA: Hyogo Frame Work for Action (2005-2015), **DRR**: Disaster Risk Reduction, **SEA**: Strategic Environmental Assessment, **TSEA**: Transboundary Strategic Environmental Assessment, **NDMA**: National Disaster Management Authority

HFA-Progress Asia-Pacific Regional Synthesis Report (2009-2011)*: Hyogo Framework of Action (2005-2015) is a guiding framework for all member states of UN-General Assembly. Since its adoption, three strategic goals and five priorities contained within HFA have become reference point for all member states to evaluate their progress systematically in DRR. The progress is evaluated in accordance with "HFA Monitor" providing achievement against each of all 22 indicators of the five priority areas on the scale 1-5; representing 1 means minor progress and 5 means comprehensive achievement. This report also includes the progress achieved by member states against local declarations and outcomes of the four Asian Ministerial Conferences on DRR (AMCDRR) held in Beijing, New Delhi, Kuala Lumpur and Incheon (not included in this paper). The report is based on the reviews and progress report submitted by 27 member states including Bhutan, India, Malaysia, the Philippines, Sri Lanka, Maldives, Myanmar, Bangladesh, the Cook Islands, Nepal, Australia, Japan, Afghanistan, Indonesia, China, Vietnam, Cambodia, New Zealand, the Solomon Islands, Thailand, Fiji, PDR Lao, Mongolia, Vanuatu, Samoa, the Marshall Islands and Pakistan

The DRR-Policy does not consider any intervention to improve institutional capacities, lacking assigning roles and responsibilities at respective tiers of governance and relevant institutions. Similarly, contingency planning at district level is restricted by lack of expertise, capacities and resources to devise and implement their own contingency/response plans and DRR activities. Further, it is aggravated by the lack of commitment at provincial level on account of substantial resource allocation (NPR-2009-2011 and 2011-2013).

The analysis and results from Table-1 and Table-2 are summarized in Table-3. The flaws identified in existing flood management system of Pakistan show some similarities with individual case study and are compared systematically on the base of problem similarities and all other factors were ignored. The scope of the comparison focuses on how SEA has facilitated planners and decision-makers in each case to identify opportunities and constraints for sustainable, strategic and long term **flood management** at local/ regional/Transboundary level. The suggestions made in the light of lessons learned from the case studies for Pakistan are also listed in Tabl-3.

4. Introducing SEA and National Impact Assessment Programme in Pakistan

SEA has been introduced in Pakistan under the National Impact Assessment Programme (NIAP). SEA is a process which is neither widely understood and nor currently supported by legislation and is relatively a new and complex than EIA in Pakistan. The NIAP aims to contribute to sustainable development by strengthening EIA practice and identifying opportunities for integrating SEA at planning level in Pakistan. Improvement in EIA practices and processes will contribute to more environmental friendly development at the project level, whereas SEA integration at the planning level will aid in incorporating environmental concerns into informed decision-making (IUCN, 2009). Initially, NIAP has identified six opportunities for SEA application in the Water and Energy sectors (NIAP, 2011). SEA in water sector adds supplementary mechanism to promote environmental considerations within water resource management (World Bank, 2007). An example of SEA application in the water sector is "The Clean Drinking Water for All" (CDWA) where environmental concerns were ignored at design phase but later SEA evaluation has identified merits and demerits associated with the programme implementation in the selected area (Ahmed, 2010).

5. Discussion and Conclusion

The problems identified in the flood management system of Pakistan are assumed to be similar in one way or other with comparative individual case study which provided example and base for issue-specific strategic suggestions for Pakistan (Table-3). The main purpose of SEA application in all cases was to integrate environmental concerns in strategic decision-making, incorporating socio-economic and cumulative impacts for sustainable and long term flood management planning. Other than this, every case has specific issue and focus e.g considering climate change scenarios and Transboundary impacts (Case, 2 & 3), flood management planning as a part of integrated water resource management (Case, 1) and fluvial flood management (Case, 3 & 4) focusing on non-structural measures (Case, 1, 3 & 4).

SEA has facilitated planners and decision-makers in integrating the necessary information at the early stage of decision-making which ultimately lead to the selection of best alternatives, with identified opportunities and constraints to improve the existing environmental and socio-economic settings of the study area and development of mitigation measures. The 'extent of influence' of SEA on decision-making is not a focus of the study rather a potential outcome of the process and consideration in final policy/plan/programme before its adoption/implementation. Given the existence of appropriate policy and relevant implementing institutions, the situation in Pakistan appears quite conducive to making use of SEA in improving the flood management plans. Just like all cases considered, the added value of SEA use should lead to an overall benefit to Pakistan in dealing with future floods.

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