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Jumpstarting post-conflict strategic water resources protection from a changing global perspective: Gaps and prospects in Afghanistan

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ABSTRACT

Notwithstanding ambiguities, long-term economic resurgence in Afghanistan amidst water insecurity exacerbated by climate change decisively requires a water protection strategy that will complement a multitude of agroindustrial and socioeconomic activities in an environmentally sustainable and climate resilient manner. In this paper, we begin with a perspective on institutions, legislation, and key issues in the water sector of Afghanistan. We then embark on linking the integrated water resources management (IWRM) and strategic environmental assessment (SEA) approaches as a novel framework for strategic water management and subsequently propose a strategy for post-conflict water protection based on the coalesced IWRM and SEA. Context relevant good practices worldwide are presented to provide empirical evidence for this approach whereas perceived opportunities and vulnerabilities in the Afghan context are discussed. Examination of post-conflict water sector initiatives in Afghanistan reveals the critical role of foreign assistance in both water infrastructure rehabilitation and modernization of the institutional aspect of water management. The introduction of IWRM as the basis for a progressive water sector strategy has been seen as a major milestone which is detrimentally matched by substantial deficiency in national capacity for implementation. Concurrently, the role of extra-national actors in relevant policy interventions has been considered catalytic despite criticisms of proposed regulations as being anachronistic to field realities. Therefore the view is maintained to practicable policies by accelerating policy learning in the country's water and environment sectors to encourage homegrown water strategy innovations. Demonstratively, mainstreaming IWRM-SEA coalescence will bridge institutional gaps for better feedback between local and national water stakeholders, providing a venue for improved delivery of water services to sustain post-conflict socioeconomic recovery and promote environmental stewardship.

1. Introduction

Although water distribution is significantly uneven across the country, it is widely believed that Afghanistan maybe considerably endowed in water resources given the average nationwide water availability of 2775 m^3/cap.yr, ranging from 676 m^3/cap.yr in the Northern Basin to 7412 m^3/cap.yr in the Panj-Amu basin (Favre and Kamal, 2004). However, the country could be considered water insecure and increasingly water stressed in the sense that its mismanaged land and water resources has led to a general decline of water quality and availability. This is worsened by a combination of climate change and spatio-temporally unequal water distribution which causes floods and droughts (Beekma and Fiddes, 2011), exacerbating the mainly agriculture based populations' vulnerability to poverty.

The socio-politics of water distribution and use in Afghanistan is also complicated as water among its five river basins cross geographical boundaries via the riverine systems, frequently

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leading to transboundary contentions in water access and ownership (Yamin et al., 2008). There is however a clear recognition among Afghan policy makers of the potential negative impacts of Afghan water development to neighboring countries (Klemm and Shobair, 2010; CPHD, 2011; UNEP, 2011). With the apprehension that Afghanistan might regress from regional cooperation toward tackling transboundary water issues, the development of clearly defined national water strategy which entails improved hydrotechnical knowledge and capacity earned foremost consideration (King and Sturtewagen, 2010).

Concurrently, the dire state of the country's environment which intricately relates to water quality, water quantity, livelihoods, and human well-being also demands serious attention. Generally decreasing biodiversity in Afghanistan has already drawn early recognition of the benefits of conservation and sustainable use of natural resources (Adil, 2001). Noting the drying wetlands which negatively impacts on wildlife and the increasing vulnerability of communities to drought, UNEP's post-conflict assessment in Afghanistan highlighted the need for improved water resource management as an essential first step towards rebuilding rural communities and improved human health (UNEP, 2003a,b). A major policy milestone, the Afghanistan National Development Strategy details on a framework that reflects the crucial role of conservation, protection, and improvement of the country's environment in achieving national socioeconomic development (GoA, 2008a,b).

The three decades of conflict and instability in Afghanistan brought a shortage of efficient institutions to address these concerns. In the case of its water sector, overlapping water management mandates between institutions led to poor coordination of urgent interventions (Mahmoodi, 2008). With institutional memory left in the hands of only few people, the legacy of weak or nonexistent institutions presented a major hurdle to achieving strategic objectives while the very same impediment should be confronted as water management policies are being established (Wegerich, 2009). The Afghan people nevertheless showed a remarkable resilience to ensuing difficulties and hardships, whereas the will and knowledge necessary to meet the enormous environmental challenges exists across the country (UNEP, 2003a,b).

Post-conflict development in Afghanistan critically requires strategic planning for long-term multi-sector water use given the increasing demand for sustainable water supply to complement agroindustrial production, reconstruction, and general economic recovery. The immediate concern though is to halve the 75% of population without access to safe drinking water which will not likely be met in two decades beyond the 2020 deadline of the Millennium Development Goals, not to mention the inequalities in access to water and livelihood opportunities (CPHD, 2011). Nevertheless, early stages of national-level planning for water development provide an opportunity to incorporate strategic measures to counterbalance the negative impacts it will likely cause to ecosystems, natural resources, and society as strategic plans translate into action plans and ultimately local-level projects.

The multi-decade global experience in water strategy innovations provides a compendium of lessons and best practices from which water stakeholders can learn to accelerate desired reforms. Motivated by this belief, we promote the coalesced elements of IWRM and SEA approaches as key to strategic water management during post-conflict. Originally from different domains of practice, IWRM tackles the socioeconomic and environmental sustainability aspects of water management whereas SEA deals with an anticipatory appraisal of environmental impacts of policies, plans, and programs at the strategic level (see Sections 3.1–3.3). Complementation of IWRM and SEA was previously proposed for the identification of appropriate adaptation measures in farming systems to cope with climate change (Slootweg, 2008). Multilateral investors apply SEA in water sector programs as proper practice benchmark (Hirji and Davis, 2009a,b). Presently, the crucial role of coalesced IWRM and SEA in strengthening water institutions of a country at post-conflict like Afghanistan is presented for the first time. The subsequently proposed strategy design for water protection highlights a feedback loop mechanism wherein local water actors inform strategic water planning at the national level. The institutional implications of this innovation in Afghanistan as well as factors mediating relevant processes are discussed.

2. Afghanistan in perspective: water sector

2.1. Physiography and climate

A landlocked mountainous country, Afghanistan features a diversity of climatic regions ranging from the glacial landscapes of the northeast and hot lowland deserts of the southwest (Fig. 1a). The country also features extremes of temperature, ranging from −50 °C on mountain peaks during winter and +50 °C across its deserts during summer (Azizi, 2002). Among the reasons for this extreme temperature range is the absence of large water bodies that could have ensured a more constant temperature through heat exchange and is amplified by the correlation between decline in temperature and incline in elevation (Pedersen, 2009). On average, Afghanistan has sky cloud cover of 0–0.13 in summer and 0.5–0.63 in winter, average annual precipitation of 52 mm at Zaranj in southwest and 992 mm at North Salang in northeast, 10–30 days per year with snowfall in mountain valleys, average fog occurrence of 0 days per month in summer (June–September) and 4 days per month in winter (October–April), and average occurrence of blowing dust/sand of 1–2 days in winter and 6 days in July (NOAA, 2012).

As the basis for the IWRM initiative of Afghanistan Information Management Services (AIMS) and Food and Agriculture Organization (FAO), the national water atlas was edited in terms of hydrologically dividing the country into five river basins (Fig. 1a). The proposed hydrological division shows the Paj-Amu and Kabul basins as the most water endowed during the drought frequented years of 2001–2004 (Fig. 1b) and hydrometeorologically fluctuating years of 2008–2011 (Fig. 1c). Nationwide snow water equivalent (SWE) profiles for April of 2010 (Fig. 1d) and 2011 (Fig. 1e) show highest density of snow water along the Panj-Amu basin and northern tip of the Kabul basin. The profiles highlight the strong 2010–2011 interannual SWE variability. The map is computed from a distributed, physically based balanced model (Tarboton and Luce, 1996) which inputs downscaled regional climatology and daily gridded precipitation data (Xie and Arkin, 1997). Although rainfall estimates are not calibrated from rain gauges on ground, the models provide imagery that are useful for interannual comparisons.

Most of the precipitation in Afghanistan occur during winter months and snow accumulates in the high mountains. Water becomes available during the snow-melt in April–August in different parts of the country which also coincides with a portion of highest water demand period (Beekma and Fiddes, 2011). An International Water Management Institute (IWMI) report on water resources in Afghanistan indicated that the country has 55 km^3 of surface water and 20 km^3 of groundwater while water availability is about 2500 m^3/cap.yr. The 20 km^3 annual water volume for irrigation accounts for 99% of total water use. About 15% of annual water use comes from groundwater aquifers and springs and 85% comes from rivers and streams. Recent groundwater use is around 3 km^3 and could increase to 8 km^3 in a decade time due to an increase of irrigation and domestic water demand (Qureshi, 2002).