



Water and Energy Commission Secretariat, Nepal

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Context

Lying between the two most populous countries of India and China, Nepal covers a thin expanse of the eastern half of the Hindu-Kush Himalayas along India's northeastern border near Bhutan. It is a nation of rich biodiversity and vast natural resource wealth—especially water—with more than 6,000 rivers cutting across numerous microclimates, from the high peaks, glaciers, and incised valleys of the High Himalayas (including Mt. Everest) to the tropical broadleaf and coniferous forests of the Middle Mountains and the savanna and grasslands of the Terai.

This resource wealth has not translated, however, into socioeconomic wealth. The vast majority of Nepal's population still relies on subsistence-based agriculture, and Nepal is the poorest country in South Asia. More than 30% of the population lives under the international poverty line (US\$1.25/day), there is high unemployment (as much as 46%), and the annual GNI per capita (PPP) is only US\$1,180 (World Bank 2011). Health statistics are similarly poor. There are high malnutrition rates (malnutrition causes 60% of annual child deaths due to curable diseases), and only 31% of the population has access to basic sanitation (World Health Organization 2011).

As a nation, Nepal is therefore extremely vulnerable to the impacts of climate change—especially those related to water resources. Many of these changes are already being felt (NCVST 2009; Eriksson et al. 2009; ICIMOD 2009; Bartlett et al. 2010).

Climate Change

Long-term trend data is extremely limited in the Himalayas, and building global and local circulation models is a challenge due to extreme topography changes over short distances. Nevertheless, there are emerging climate change trends in variability and seasonality, especially in the country's more mountainous regions. Annual average temperatures are increasing with altitude. The highest temperature increases in the colder regions of the High Mountains and High Himalayas ecoregions have led to drought, forest fires, higher prevalence of crop disease, higher biodiversity loss, ecosystem boundary shifts, and the drying up of spring sources. More rapid glacial melt and retreat is causing glacial lake outburst floods (GLOFs) that threaten infrastructure and population centers (Eriksson et al. 2009; NCVST 2009; Agrawala et al. 2003; Xu et al. 2009).

In terms of precipitation, local observations indicate that the South Asian monsoon is becoming increasingly variable. Fluctuations in seasonality (onset and termination dates) and short-term changes in river flows are contributing to erosion, landslides, and flooding from intense rainfall events occurring after long periods of drought (Eriksson et al. 2009; NCVST 2009; Cruz et al. 2007; Bartlett et al. 2010). These have already begun to have socioeconomic impacts—especially for food security and hydropower—because the vast majority of the country is dependent on rain-fed crops and Nepal's energy comes almost entirely from hydropower sources (NCVST 2009; Eriksson et al. 2009; Agrawala et al. 2003; WECS 2011b). Farmers, in recent years, have lost entire rice crops due to delays in rainfall that have made transplantation timing increasingly difficult. The result, especially in the rural mountainous regions, has been increased malnutrition and an enormous demand for food aid (“Nepal: Another blow to food security” 2010).

The country's national energy supply is extremely vulnerable to changes in climate, especially greater variability of river flows. This can mainly be attributed to their reliance on insufficient and degraded run-of-river hydroelectric schemes that already struggle to meet energy demand. This issue is already acute during the dry season when flows are lower, resulting in 16-20 hour power cuts per day. Increased uncertainty in low flow conditions may have even further detrimental impacts to energy supply for the country.

Certain ecosystems are also becoming more vulnerable as prolonged drought and temperature increases dry-out of wetlands and spring sources. This is leading to key species losses, which is likely have cascading effects and trigger secondary extinctions in certain regions (Xu et al. 2009).

Institutional Description and Response to Climate Change

In 1975 Nepal's (then) royal government created the country's Water and Energy Commission (WEC) as an apex body for water management. WEC had the objective of “developing water and energy resources in an accelerated and integrated manner” (Nepal: Water and Energy Commission Secretariat 2004, p. 4). To support this objective, a permanent secretariat was established in 1981 to better coordinate the commission's activities, creating WECS (Water and Energy Commission Secretariat).

WECS' responsibilities cover a wide spectrum, from formulating “policies and strategies for conducting . . . analysis on various aspects of water resources and energy development” to enacting “the necessary laws pertaining to the development of water resources and energy.” Its

goals include coordinating Nepal's existing national water and energy policies according to a host of new directives laid out in the 2005 National Water Plan (NWP)—the country's most relevant (and recent) national-level water resource planning document. The 2005 Plan organizes all of the various roles of WECS over the years into one basic, core function: "to act as an apex institution to coordinate national-level planning to the entire water resources sector" (WECS 2011a). With more than thirteen ministries and numerous other departments involved in the water sector, national coordination was and continues to be a critical need.

The WEC, which still exists apart from WECS, is currently comprised of each of the secretaries of the relevant national ministries (along with outside water and energy experts from NGOs and national universities). It is chaired by the Minister of Energy and acts as the board of advisors to WECS. WECS is broken down into four major divisions, each with its own subdivisions: Water Resources (includes Hydropower, Irrigation, and Basin Study); Energy Planning (includes Traditional Energy, Alternative Energy, and Commercial Energy); Environment; and Legal and Institutional Arrangement.

Externally, WECS is positioned at the ministerial level, liaising with the various other national ministries (Irrigation, Agriculture and Cooperatives, Local Development, etc.), and works in conjunction with, or is partially funded by, NGOs and various foreign development institutions (WWF, the World Bank, Asian Development Bank, the Canadian International Development Agency, GTZ, etc.). Ultimately, however, due to a number of constraints, it occupies a diminished role at the national level among the ministries and is struggling to meet its enormous mandate.

Like the rest of Nepal's bureaucracy, WECS generally faces many institutional pressures—from extremely limited financial resources and low capacity to diminished legal power. This is due in part to a fragmented national legislature that has been solely focused, since the end of the civil war in 2006, on a protracted political battle around writing the country's new constitution. WECS has been unable to get the necessary statutory changes passed that would empower the organization to act as a strong national coordinating agency. It has thus remained more a research institute than the national-level, central water resource/energy planning division it is intended to be.

Climate change impacts are likely to have both positive and negative effects on WECS. WECS may actually benefit from a crisis situation; obvious climate changes may provide a powerful incentive (beyond the more obvious current critical need for improvements in water resource management) for it to receive better funding and more authority—especially given the country's dependence on water. Better coordination and integration is already seen as important (especially in water resources), and there is a perception that such responses should ideally be implemented in Nepal by an apex body with exactly the mandate of WECS (Bartlett et al. 2010).

However, even if its importance is realized in-country, WECS has an upward climb. Much of Nepal's water infrastructure is in a state of disrepair, and a high percentage of the population is directly dependent on subsistence agriculture. Underdeveloped national water infrastructure will make it extremely challenging to manage increasingly uncertain flows. No matter how powerful the organization becomes, without infrastructure in place WECS will have no (or extremely minimal) control over the system.

WECS is only in the beginning stages of analyzing potential climate related impacts to water and energy in Nepal. These efforts include initial assessments of the climate change vulnerability of selected watersheds and the hydropower and agriculture sectors (WECS 2011b; Bartlett et al. 2011). While efforts to date have been minimal, there are opportunities for WECS to further incorporate climate consideration into future development, particularly in the underdeveloped hydropower sector.

Discussion of Most Important Climate-Adaptive Principles

External Regime

The most significant obstacles to WECS meeting its mandates is lack of authority. As mentioned previously, WECS lacks the basic statutory authority either to oversee or coordinate the multiple different national ministries and departments involved in water resource management. For example, the 2005 Plan gives WECS the authority to provide clearance for various major large-scale water projects (such as hydroelectric facilities and interbasin transfers) that have transboundary implications. However, because WECS does not have the legal power to enforce the relevant laws, those portions of the 2005 Plan have gone unaddressed.

A recent article succinctly states: “WECS, at the moment . . . looks like a toothless agency, having no mandatory authority in the process of implementation of water-related issues” (“Water and Energy Commission Seeking Legal Mandate” 2011). As one of its divisional engineers noted:

“As long as WECS is not made [a] mandatory institution [and given] certain legal authority, I don’t think we can make any differences. In the coming days, when Nepal has to face many challenges in the context of utilization of water in [an] integrated manner, a stronger and more powerful organization like WECS will be needed” (“Water and Energy Commission Seeking Legal Mandate” 2011).

Leadership

Larger-scale institutional instability at the national level further constrains WECS ability to begin addressing the impacts of climate change. With a different prime minister every year for at least the last ten years, the national government (including all of the subsequent ministry appointees) is constantly in a state of flux. In 2009, for example, the Ministry of Water Resources was divided into the Ministry of Energy and the Ministry of Irrigation. This caused a shake-up within WECS because the WEC had historically been chaired by the Minister of Water Resources.

The short-term nature of the Nepalese executive branch means it is extremely difficult to focus on medium- and long-term goals—especially the necessary strategic planning critical to the adaptation process.

Resources

The availability of resources to WECS is mixed. There is a general lack of financial resources which most notably results in insufficient technology and data. There are, however, also some reasons for hope.



WECS has always been characterized by genuine technical capacity and expertise in the water sector. It has an extensive knowledge base and a deep understanding of core water resource management issues. As its secretary recently stated:

"WECS's expertise on river basin planning and management, modeling of water use and allocation, development of multi-purpose projects, and trans-boundary water issues will be very useful for the government agencies as well as private developers. ... No other institution in the country can provide a holistic overview of the water sector of Nepal" (Prasad 2011).

A number of recent projects and reports focused on these very aspects prove that WECS is indeed meeting its goals related to research and reporting (Prasad 2011).

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