

THE PARADOX OF NEPAL'S HYDROPOWER

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The mantra about Nepal's immense hydropower potential is deeply instilled in the Nepali psyche. Proponents have long proclaimed hydropower as the source of clean and affordable energy and a means of enhancing Nepal's economic growth through exporting electricity to markets in India and beyond. In reality, however, the country has been reeling from power shortages for decades and is increasingly dependent on the import of electricity from India to meet its tiny demand. This begs the question: why has Nepal failed to adequately harness its hydropower potential?

An assortment of factors is attributed to Nepal's hydropower failures – the impact of the armed insurgency, the lack of adequate or misaligned financing, and India's hegemonic control over Nepal's water, among others. The problems in the sector are thus multifaceted and involve a wide range of stakeholders with contradicting interests. Solutions are unclear and may even require a bit of muddling through. In view of these complex dimensions, this paper examines the evolution of the Nepal's electricity sector and the roles of various institutions in shaping the current status. Finally, it offers some thoughts on how best to move forward.

The Pathway of Nepal's Hydropower development

This section briefly describes the three key phases of the evolution of hydropower development in Nepal. It is intended for readers that may have limited knowledge of Nepal's hydropower sector.

The early days: Nepal's first efforts to harness hydropower dates back to the early 1900s, but sizable investments, sourced to bilateral aid assistance, began only in the 1960s with the 2.4 MW *Panauti* and the 21 MW *Trishuli* projects. Multilateral engagements were added to the mix starting with the 60 MW *Khulekhani-1* in 1982, followed by the 69 MW *Marshyangdi* in 1989. By the mid-eighties, the government was already looking into a number of potential development projects, with the 144 MW *Kaligandaki* and the 402 MW *Arun-3* as potential candidates. After years of consultation, the government decided that the latter project was more suited to Nepal's development context, and decided to pursue it first. As can be seen, in these early days, Nepal's hydropower development was primarily a state-led donor-funded initiative. A major criticism of this approach was that the incentive structures in both these bureaucratic agencies resulted in large projects that were misaligned with the pattern of incremental increase in demand for electricity in the country, always resulting in a period of excess capacity followed by a period of under capacity.

Although the state dominated Nepal's hydropower development during the first hundred years or so, a non-governmental initiative¹ began in the 1950s experimenting with smaller hydropower.² This initiative sought to build the technical capacity of local individuals and institutions to achieve economic development. By the nineties, it had played a major role in the completion of the 6.5 MW *Andhikhola* and the 12.5 MW *Jhimruk* projects, and was considering the 60 MW *Khimti* as its

¹ This was also being financed largely through the Norwegian assistance.

² This initiative was led by Odd Hoftun, an electrical engineer with the United Mission to Nepal. His first undertaking was the 0.5 MW *Tinau* project in Butwal, later increased to 1 MW. For a detailed account of the UMN/Hoftun's work, see Svalheim, P, (2015) Power for Nepal: Odd Hoftun & the History of Hydropower Development. Martin Chautari

next project. The size of *Khimti* and its financing requirements opened up a space for Stratcraft SF, the Norwegian state-owned company that was looking for avenues to expand internationally.³ This new approach involved private financing and required a new legal structure. While the initial idea was to draft specific legislation to enable *Khimti*, this approach was later changed to incorporate the larger needs of the sector.

Nepal's electricity sector experienced a major paradigm shift in the early 1990s, as a direct result of some of the seminal political events of that period. First, in the initial election following the ratification of a new constitution, the Nepali Congress party, considered to be relatively more market friendly than its opponents, won a majority in the election. Second, the global push for liberalization, such as through the Washington Consensus, significantly influenced Nepal's policymaking environment. As a result, the new Nepali Congress-led government introduced a number of liberal policies, often referred to as the first generation of economic reforms, which included a full set of new hydropower legislation. This legislation, for the first time, explicitly gave space for private sector to invest in Nepal's hydropower. Concurrently, the changing political order brought in another unexpected event: for the first time a section of Nepal's nascent civil society was able to vehemently criticize and rally against the development of the *Arun-3* project. On one side of this debate were proponents, who enthusiastically hailed the economic benefits that the local communities and the country as a whole could reap from investing in the project. On the other were those who opposed the project based on the overall cost of the project, the crowding out of alternative investments, and the loan covenants to which Nepal would be bound.⁴ In the end, in 1995, the World Bank, the lead financier of the project, rescinded its commitment. It cited concerns over social and environmental costs of the project, a claim also raised by a group of Nepali and international activists, which, however, did not fully reflect the complexities on the ground. Two decades later, those who supported Arun-3 still feel that the opposition misrepresented key facts and are keenly aware of the opportunity that the locals and the country lost. Those who opposed the project point to the "pluralistic terrain" that was able to better align with the market demand for electricity as well as generate an equal number of megawatts, if not more, at a much lower cost.

The pluralistic terrain: Amid the contesting narratives about how the fallout of Arun-3 affected Nepal, the looming power crisis provided an opportune moment for the private sector to expand into Nepal's hydropower sector. In the immediate aftermath, the development of two projects, both financed with foreign direct investments, moved extremely fast. First off the ground was the shovel-ready *Khimti*,⁵ followed soon thereafter by the 36 MW Bhotekoshi. Although these two projects were instrumental in filling the energy deficit, their dollar-denominated power purchase agreements⁶ would later be a topic of major controversy. Nevertheless, the financial successes of these projects helped spark the Nepali private sector's imagination and led them to invest in

³ Ibid.

⁴ Their criticism was that the projected cost was being developed at over \$5000 per MW, which was significantly higher than any other project built. Those in support do not disagree about the high cost of the project, but emphasize the larger intent of the project.

⁵ The government had entered into agreement in 1992 to commence preparatory work and a power purchase agreement was signed on 30 March 1994.

⁶ The PPA for *Khimti* and the Bhotekoshi projects were x cents respectively. Whereas, at signing US\$1 = NRs. 50, today US\$1 = NRs. 102. Clearly, the issue of who bears the currency risk (through what mechanism) needs to be taken into consideration while signing any PPA in foreign denomination.

the country's hydropower. By 2017, these private developers were consistently adding smaller projects and contributing to over a third of Nepal's total installed capacity.

One major innovation took place in the mid-nineties with the establishment of the Chilime Hydropower Company Limited, a subsidiary company incorporated by NEA for the purpose of developing hydropower projects. The *Chilime model*, in which NEA retained 51% ownership of the company and offered the rest to its employees (25%), the general public (14%), and the project-affected local people (10%), now forms the basis for three key developments in Nepal's hydropower sector: i) NEA's preference for developing projects through its subsidiary companies, ii) the growing rhetoric of indigenously-designed and locally-financed projects, a narrative further strengthened by the near-completion of the 456 MW Upper Tamakoshi project, and iii) a policy innovation known as "local shares," i.e., the opportunity for local communities to individually invest in the equity of a project within their vicinity, as a means of giving local ownership of the project to mitigate local disputes. The issue of local shares has gained significant support from politicians and policy makers, especially as it fits into the larger national narrative that Nepal—and now also its people—can achieve prosperity through the exploitation of the country's hydropower potential.

However, the sector was severely affected by the Maoist insurgency, which created an unfavorable climate for the development of all infrastructure projects. As the state had little or no presence in many of the remote areas controlled by the insurgents, especially during the peak of the war, the development of new projects came to a near standstill. During this period, Nepal was able to add less than 50 MW of hydropower onto the national grid, other than a few larger state-led initiatives.⁷ By 2006, with the end of the armed conflict in sight, there was a sudden rush to acquire hydroelectricity licenses. While this may appear to have been caused by the increased attention of investors, nothing could be further from the truth. In reality, this rush was propelled by the politics of hydropower licensing: those politically connected, willing to feed the bureaucracy's hunger for rents, would purchase licenses for the sole purpose of squatting on them, a practice infamously termed as "*jhola ma khola*," which literally translates as putting a "river in a bag." Ironically, in 2006, the government also reintroduced the practice of load-shedding, i.e., scheduled power cuts, which eventually reached as high as 18 hours a day in 2011, a tacit acknowledgement that the failure to exploit the licenses directly resulted in energy deficits.

Newer context in a "Naya Nepal": Several factors shaped the path to hydropower development in the post-2006 "*Naya Nepal*."⁸ First, the longstanding political stalemate in the country finally ended in a settlement to establish Nepal as a federal democratic republic. However, how the country will deal with the issue of hydropower and the management of its water resources in the federal context remains unclear. Second, Chinese investors are increasingly interested in Nepal's hydropower. The combined generation capacity of projects developed through Chinese investment, either in operation or under construction, is already nearing 200 MW, and more – a lot more – is on the way. Additionally, the government has had a number of discussions and at times even made commitments to grant Chinese companies the right to develop two large hydropower projects.⁹ Part of this is a natural outgrowth of Chinese companies bidding on

⁷ The largest one being the 144 MW Kaligandaki HPP.

⁸ "*Naya*" translates as "new". The concept of a "*Naya Nepal*" became a cliché used to describe the beginning of a new political era in 2006.

⁹ These two projects are the 750 MW West Seti and the 1200 MW Budhigandaki. The politics of these are very alive and it is difficult to predict how the projects will unfold in the coming days.

construction projects around the world; the other part is the result of changing geopolitics and China's growing interest in Nepal.

Third, in 2008, the Government of Nepal invited global tenders to develop large export-oriented hydropower projects, two of which were won by Indian companies. The *Upper Karnali* project was awarded to GMR, an Indian private infrastructure company; the *Arun-3* project was awarded to Sutlej Jal Vidyut Nigam, a joint venture company of the Government of India and the Government of Himanchal Pradesh. And fourth, the economic blockade imposed by India in 2015 exposed Nepal's energy security vulnerabilities. This crisis may have prompted the government to reassess some of the underlying factors limiting the growth of the hydropower sector and to proclaim its mission to generate 10,000 MW in 10 years (although this was not the first time the government had made such grand promises). However, if we closely examine the action plans for tackling current issues, we see a lack of well thought out policy responses to the deeper sectoral problems.

Still, the greatest and most surprising change in the sector environment has been the end of scheduled load shedding. In the official explanation, this became possible after the government decided to end the policy (and allegedly the corrupt practice) of supplying uninterrupted power through dedicated feeder lines to large-scale industries during peak hours; the amount being supplied was around 300 MW, just enough to cover the general consumers' demand. Another factor cited was the emphasis on improving the demand-side management through technical and non-technical measures, such as pushing for energy efficiency and curtailing theft of electricity. While many fully believe that NEA's new management is responsible for the end of load shedding, framed largely in terms denoting better governance, others attribute it to technical initiatives, particularly the completion of the cross-border transmission lines that have allowed Nepal to import additional electricity from a willing and capable India. Without systemic reforms in the sector, particularly with regard to longstanding institutional constraints, it is hard to tell how long the current good fortune will last.

The three key factors of influence

This section describes the political economy of Nepal's electricity sector, with a focus on the state and its institutions, their incentives and the interrelationships that have resulted in the current state of affairs.

State institutions and existing incentives: Two institutions have the greatest influence over Nepal's hydropower sector. At the policy level, this is the Ministry of Energy, which came into existence after the Ministry of Water Resources was split into two separate ministries (for energy and for irrigation). The decision was part of the process of a political *bhagbanda* and took little account of the interrelated functions of the resource itself. The ministry is led by a minister, a political appointee (generally with limited knowledge of the sector), and in a fleeting moment of power (note: there have been 10 ministers of energy in the past 10 years), he¹⁰ has very little time or incentive to pursue systemic reforms. Instead, the sector is driven by the politics of patronage, populist reform initiatives, and hollow promises of potential megawatts and national prosperity. The minister is supported by several senior bureaucrats who have long experience in and technical expertise of the sector but also fully aware of the politics of patronage necessary to get there. The bureaucrats derive power from the procedural mechanisms of the state, which give

¹⁰ There has been only one female Minister of Energy to date.

them, i.e., for those willing to engage, adequate opportunities to extract rents. In the electricity sector, this is most evident in the process of awarding licenses and approvals and facilitating projects. Add to this the politicization of the civil service, the increasingly recalcitrant bureaucracy, and its lack of accountability to the public and the result is an institution largely characterized by its inactions.

At the operations level, the Nepal Electricity Authority, the government-owned vertically integrated public utility, is responsible for planning, constructing, operating, and maintaining the country's power system. NEA was originally intended to overcome the inefficiencies of a fragmented sector, but in less than two decades it had become an extremely politicized bureaucratic behemoth with weak financials and unable to deliver adequate and reliable service to the public. This failure, to be fair, is partly because the institution is trapped within the changing context of Nepal's electricity sector. For example, while the NEA Act defines NEA as a corporate body, the state has delegated to it the responsibility of providing electricity to the general public as a public service. This means that NEA cannot distinguish between its interests as a corporation and the larger public interest. For example, NEA relies on a very conservative demand forecast and every PPA it signs is dependent on its corporate projections. This conundrum, however, is compatible with NEA's interest, as it allows NEA to attribute its losses not to its inefficiencies but to its responsibility to serve the public at large. However, NEA's inability to remain financially strong, as the sole off-taker of electricity in the country, is one of the principal concerns of investors.

Despite the recent political changes, the Nepali bureaucracy continues its overriding tendency to exercise control. In fact exercise of power is the *raison d'être* of the Nepali bureaucracy,¹¹ a fact also reflected in the energy sector. For example, despite the recognition of the role of independent power producers in Nepal's hydropower sector, the bureaucracy is still driven by its distrust of the private sector, preferring to maintain complete control. According to a private sector estimate,¹² a developer has to deal with more than 7 ministries, 23 departments, and 36 different laws prior to getting the necessary approvals to develop its project. Each of these institutions has its own mandate and established procedures for action, each thereby contributing to the sector's collective failure. The government has previously attempted to implement a "one-window" mechanism to facilitate transactions, including the Investment Board of Nepal, but institutional turf wars have extinguished any rational hope that such an institution would facilitate harmonization among the involved administrative bodies. The end result is a policy regime that discourages potential investors in Nepal's hydropower sector. Because the policy regime makes it difficult for the private sector to invest, those willing to play by the established "home" rules will remain. All of this promotes a vicious cycle of rent and patronage, and the departure of the better investors into other sectors or elsewhere.

The costs and benefits of (not) developing hydropower: The power crisis of the last few decades has come at a huge cost to the Nepali economy. From homes to hospitals, schools to supermarkets, small and medium entrepreneurs to big industrialists, all Nepalis have been compelled to collectively spend billions of rupees on expensive generator sets and imported fossil fuels, which at the peak of the crisis were estimated to be producing around 700 MW of

¹¹ The Asia Foundation. 2012. Guide to Government in Nepal.

¹² This number is cited frequently by Khadga Bisht, former president of the Independent Power Producers Association of Nepal. Retrieved from <https://bit.ly/2NMDsQB>

electricity.¹³ The resulting cost of electricity, estimated to be approximately three times higher than that purchased from the grid, not only means that everyday consumers end up paying a higher price for everything, it also impedes the ability of Nepali industries to compete in the global market. This inability also contributes to the overall decline in health of the manufacturing sector and the loss of employment opportunities for the Nepali youth. Indirectly, reliance on subsidized petroleum products for electricity means that the government must bear a significant cost, spending funds that could have been used for other more pressing matters. Much of this immense cost borne by the Nepali economy could be offset simply by providing a better environment for hydropower developers.

But developing large infrastructures can pose peculiar problems for the state whose responsibility to provide the necessary foundations for economic development may be in direct conflict with its responsibility to protect the rights of its citizens. The contradiction lies in the inequities inherent in infrastructure projects, where benefits are distributed over a large region while its costs are concentrated in a small area. For example, a hydropower project that drives the economic activities of an entire country may require the involuntary displacement of a group of individuals and their families, particularly indigenous communities from remote areas who will forever lose not just the land on which they subsist, but also significant aspects of their culture and tradition. The perception of inadequate compensation for their financial and social losses drives many of these communities to resist such infrastructure projects. This is exacerbated by on-going attempts to redefine the state-society relationship in Nepal and the increasing pressure that indigenous groups are putting on the government to ensure their rights over resources, in accordance with national and international laws that Nepal has signed on to. Complicating an already complicated situation are the entrenched politics of patronage and the extractive tendencies of community-level actors, including the demand for petty contracts, which can blur the lines between the genuine demands of communities and demands shaped by political and other interests. Under these circumstances, developers often find it much easier to engage with political elites who raise local issues for their own benefit, placating whoever to get their project moving forward.

The benefit-sharing regime in infrastructure development has been evolving globally and the Nepali state is, in law if not in fact, in line with this development.¹⁴ It has established mechanisms for sharing the benefits of project development directly with the affected communities, including, among others, the allocation of royalties derived from the sale of electricity, the opportunity to invest in project equity, and the provisions for rural electrification. But given the weak systems of governance, local communities seem not to trust the existing mechanisms to deliver development. Instead, they often take it upon themselves to negotiate directly with the projects. This has led the private sector, uncertain about what local communities demand, to seek clarity from the state regarding their responsibilities. As projects seek to manage expectations and the underlying interests of local stakeholders, their work is often delayed due to unfulfilled demands. This not only increases costs in financial terms but also in terms of establishing a congenial relationship between the communities, the project and the state.

Hydro, hydropower, and the Nepal-India Relationship: No discussion on Nepal's hydropower can ever be complete without taking into consideration the interests of its immediate southern

¹³ Nakarmi, A. 2016. Current Energy Consumption Trends and Future Energy Scenarios of Nepal [Powerpoint slides]. Retrieved from <https://bit.ly/2v7so8P>

¹⁴ For a detailed discussion, see Shrestha, P. et al, 2014. Benefits Sharing in Hydropower Development

neighbor. To begin with, the northern states of India have always been regarded as the ready-made market for Nepal's electricity, whether to sell excess generation or for dedicated export-oriented projects. In reality, however, Nepal is increasingly reliant on the import of electricity from India: in 2017, Nepal imported more electricity than the total contribution of all its private developers. This import is likely to decrease once the projects for which NEA has already signed PPAs, totaling over 2000 MW, come into operation. But given the seasonality of its rivers—resulting in monsoon surpluses and winter shortages of electricity—and the lack of adequate storage capacity to power through the dry winter months, Nepal has little option but to continue to import from India. Additionally, while India is at the moment a net exporter of electricity, there is significant untapped and unmet demand, coupled with the need to optimize peaking demands in the neighboring states of India, that Nepal's electricity can/should aim to service.

The Nepal-India electricity trade is currently limited by the lack of adequate infrastructure. The recently completed and on-going work on the major cross-border transmission lines is expected to help overcome this technical limitation. Optimized trade, however, will continue to be hindered by other non-technical issues including differences in grid codes and regulatory mechanisms. Even then, the larger challenge for Nepal is the question of whether or not it can compete in the Indian electricity market. Currently Nepal's electricity is relatively more expensive than its Indian counterpart, because of, among other things, high project financing costs, high expected returns on equity, and most importantly, India's reliance on cheaper, albeit dirtier, coal-based generation. India's commitment to the international climate agreements, including the Paris Accord, is likely to put some downward pressure on this reliance, but unless and until the environmental cost of fossil fuels is truly accounted for, Nepal cannot take for granted the market it has always counted on in India. Furthermore, Nepal's ability to access the larger regional electricity market of South Asia, particularly Bangladesh, is curtailed by India's traditional interest in maintaining its hegemonic position by dealing with all its neighbors on a bilateral basis.

Further complexities arise from the other competing interests around water—with hydropower being only one among many—and the contentious relationship between the two riparian entities. Nepali rivers contribute about half of the total flow of the Ganges—up to three-fourths in the lean season,¹⁵ offering immense possibilities for irrigation but is also responsible for recurrent flooding and inundation, which involves a huge cost to the riverine communities. To maximize the benefits of irrigation and minimize the damages from water-induced calamities, the Indian government, since the early 1900s, has sought to tame the rivers north of the border. In the 1950s, the governments of Nepal and India signed major treaties on the water usage of two major rivers, the Koshi (in 1954) and the Gandak (in 1959). The resulting infrastructure and the management of the stored water, however, drew heavy criticism from Nepali academics and water experts for the unequal sharing of the burden and benefits of the undertaking: with the former skewed towards Nepal and the latter towards India.¹⁶ As a result, both these treaties were subsequently amended: Koshi in 1966 and the Gandak in 1964. Three decades later, in 1996, the two countries signed

¹⁵ Dhungel, D. N., & Pun, S. B. (Eds.). 2009. The Nepal-India water relationship: challenges. Springer Science & Business Media

¹⁶ One of Nepal's major political parties, the Communist Party of Nepal (CPN)-Unified Marxist Leninist (UML), split as a result of this controversy.

yet another treaty over the bordering Mahakali River, amid great political controversy in Nepal.¹⁷ As two decades have passed since the signing and with little progress in implementation, critics on the Nepal side raise doubts about India's true intent in the signing of the treaty, which they feel was done to legitimize India's previous alleged transgressions related to that particular river.¹⁸

Moving forward

This closing section highlights three critical issues that must be addressed, not just to overcome the current impasse of hydropower development in Nepal but also to ensure sustainable use of the country's water resources.

Restructuring the institutions: NEA's monopoly and its inherent conflicts of interest serve to distort the country's electricity market. There is an ongoing discussion around the pursuit of an open and transparent electricity market in Nepal. The ministry has attempted to introduce reforms, including the unbundling of NEA into separate functional entities, to which there is significant resistance, particularly from NEA's politically affiliated unions that stand to lose out the most in the process. Unable to deal with its own company, the government has been establishing companies with parallel responsibilities, e.g., in generation and transmission, that compete directly with NEA's mandate. There is a danger that without tackling the core issues in the sector these institutions could also become just as dysfunctional. Instead, the focus should be on streamlining NEA's human resources, strengthening its systems for financial accountability, gradually separating its functions with a long-term goal of an eventual unbundling.

Concurrently, it is important to ensure the functional integrity of the recently established Electricity Regulatory Commission and strengthen its capacity to regulate the country's electricity sector. Given its mandate to protect the interests of all sector stakeholders and to establish a level playing field for everyone in the market, which includes curbing NEA's monopoly, the Commission can greatly contribute in ensuring a robust sector. In the end, however, the most critical reform would concern individuals and institutions with the key responsibilities for the sector. This could be achieved partly by transforming the way the ministries and their line agencies conduct business, whereby future reforms help streamline the bureaucratic process and reduce rent-seeking opportunities. In addition, those in charge would need to introspect and be willing to break away from the entrenched mindset that longs for absolute control and enjoys exercising power above all else.

Reframing the Nepal-India water discourse: Nepal and India can each realize significant gains if the two sides are able to better appreciate and integrate their real interests in making the optimal use of their shared rivers. On one hand, Nepal's long-dominant narrative is focused on harnessing its hydropower potential and gaining access to the electricity market in India and beyond; yet at the same time there is limited emphasis on how to harness the other benefits from its rivers. India, on the other hand, is primarily interested in the regulated water from the dams developed in Nepal in order to manage flood during monsoon and increased water in its rivers for irrigation during the drier winter months. Additionally, India has a grandiose plan to interlink over 60 of its major rivers, including some from within Nepal, through a network of reservoirs and canals to manage its

¹⁷ Among other things, this treaty included several agreements on the controversial infrastructures previously built along the river, namely the Tanakpur Barrage, as well as an agreement to construct a new 6,000 MW Pancheswor Multipurpose Project through a mechanism to share equally the associated costs and benefits of the project.

¹⁸ Pun, S. 2009. Tanakpur Barrage Thirteen Year Saga of the Nepal Canal Sill Level. Hydro Nepal Vol. 5, July 2009 Page: 2-7

perennial problem of flooding and drought. This shows that India's main interest is to regulate the Himalayan waters and Nepali water experts have highlighted India's unwillingness to accept and accommodate the values of these benefits. As a result, Nepal is made to bear the entire cost of developing hydropower, both in terms of financing the project and the submergence of valuable land, while India, being the lower riparian, gets a free ride. Further, experiences of past negotiations and India's hegemonic status and upper hand in the bilateral relationship have made the Nepali public highly suspicious of any proposal from India for infrastructure near or within the Nepali territory. Across the border, it is often easier for politicians to placate the wrath of its citizens by blaming Nepal for releasing its water than in engaging in a long-term solution to minimize the impacts of flooding. Furthermore, India's obsession with national security and its desire to maintain a monopoly over any data on water leads to both power and information asymmetries.

To initiate change in the status quo—clearly a daunting task—the focus should first be on ways to move away from state-centric negotiations to dialogue where newer voices and innovative stakeholder agenda can help chart an alternate pathway.¹⁹ Newer voices can come from within the government, from outside actors and agencies that are not affiliated to traditional power centers, or from civil society actors that are willing to take the lead in rethinking the bilateral relationship. Given the fast pace of technological advances, civil society actors should be taking the initiative, ideally through transboundary collaborations, to develop and disseminate relevant data that assists in promoting a better evidence-based discourse on water governance by and between the two countries. Democratization of data will contribute towards transforming the state's dominance over information and promote transparency at both the national and regional level. This is likely to have a significant impact, in that it will help change the information asymmetry and reduce mistrust among the participants. Not only would such an approach improve the relationship between the two states, it would also ensure better and sustainable management of a vital shared resource.

Reimagining Nepal's hydropower narrative: While the various constituencies recognize the need for Nepal to exploit its hydropower potential, there is disagreement on how best to go about it. Moving forward, Nepal's hydropower sector needs an imagination that can strike a balance between the following two principles:

i) *Economic growth and energy security:* Nepal has borne extremely high costs for its inability to ensure adequate, reliable and affordable electricity. To overcome the current stagnation, in addition to tackling the institutional and geo-political issues raised earlier, the state should formulate a compelling economic vision for the country, identify the corresponding energy need, build consensus around an agreeable mix of technology and associated projects, and allocate the necessary resources to bring them to fruition. While electricity trade with India is important in order to manage the seasonal variation in electricity production, given the uncertainty of the electricity market in India, the Nepali state needs to focus on creating an environment for promoting its own economic growth, especially through the expansion of its manufacturing and industrial base.²⁰ At the same time, attention should be paid to the unsustainable importation of petrol-based products, especially for transportation and household consumption, and the need for policies that encourage electric alternatives. The economic blockade by India in 2015 exposed

¹⁹ Based on personal communication with Dr. Sagar Prasai, Country Representative for The Asia Foundation-India

²⁰ These are segments that can not only consume the country's own electricity; they can also provide employment and promote import substitution.

the Nepali economy's vulnerability to the whims of its southern counterpart. Ironically, despite all the hardships sustained, Nepal is growing more dependent on India for – of all things – electricity. While this episode should have been a wakeup call for Nepal to get its act together so as to avoid similar predicaments in the future, once again the response has been business as usual. Future policies should be about achieving an appropriate energy mix with various types of projects, especially reservoir, but also solar and other renewables, while also establishing economically efficient electricity trade regime with India.

ii) *Sustainable use of the resource*: Hydropower is a major source of clean renewable energy, but the infrastructure required to harness it leaves a substantial negative footprint. As stated earlier, the burden of any infrastructure development is borne disproportionately by the people displaced, the riverine communities within the project area, and the river ecosystem, all of which have not been considered adequately in the country's hydropower vision. Today, given the limited hydropower production and high cost to the economy, there is a strong utilitarian rationale for prioritizing exploitation of Nepal's water resources. However, the risk of embedding hydropower into the vision of Nepal's long-term development is that there is no guarantee of a positive marginal utility from every additional megawatt installed. On the contrary, there is likely to be a point of inflexion beyond which no section of the society should be made to bear the extra burden of transforming Nepal into a hydropower nation. At the same time, there are other competing demands based on traditional as well as non-traditional uses of water, some of which may be incompatible with how rivers are currently engineered for hydropower. In order to ensure an optimal use and sustainability of the country's key natural resource, the state needs to shift from the current project-based development to an inclusive basin-planning approach so that it can reconcile the technical potential of the river while also meeting the aspirations of the riverine and other communities whose lives and livelihood are directly connected with the river.

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