CHAPTER 10

Energy cooperation

Pitfalls and pathways

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Cooperation in trade among South Asian countries is not healthy by any measure in any sector, beset as cross-border trade is with rent-seeking red-tape and many other barriers.[1] The field of energy trade, which is just a subset within that overall context, is beset with many other seemingly intractable issues as well that go to the heart of governance of this sector both between and within Nepal and India. Trade may be treated as an "obvious good" by its advocates: the more people trade, more wealth exchanges hands and is put to better productive use by the participating parties, thus increasing the overall value of briskly trading economies. However, trade is rarely conducted in that ideal space called a "free market" between free and equal agents with full information at their disposal. Indeed, information itself is a strategically held item with the party holding it ending up as the bigger beneficiary and the party lacking that critical resource getting the short end of the deal. The same misfortune befalls parties with lesser technological skills or legal and institutional backstopping means: more trade does not necessarily bring more development, but can bring about significant amounts of crippling dependency and mal-development.

There are three counter-intuitive concepts that will be used in this essay to tease out the problems of energy trade (specifically Nepali hydroelectricity) within the South Asian context. They force us to rethink what we mean by a technology such as electricity and its transmission, how it has come to be in our culture

and what are the purposed ends to which it is harnessed. Too often our political discourse has remained stuck in what may be called the "hydro-dollar fallacy", the idea that Nepal has "immense hydro potential second only to Brazil" which can be harnessed and the electricity exported to earn the equivalent of "petro-dollars" similar to the sheiks of Araby and to live in comfort happily ever after. Actually, electricity is a "strategic good" that allows the development of upstream (i.e., survey, design, construction and maintenance capabilities) and downstream (through use of electricity in commerce and manufacture) areas of the national economy, which will be forfeited if exported across the border. Indeed, it has been estimated that the assessment of Nepal's potential demand for electricity is low because only the current "suppressed" demand scenario is considered: if Nepal were to displace fossil-fuel-based liquefied petroleum gas from its kitchens as well as diesel and petroleum from its transport sector by home-grown hydropower, the current demand would not be some 1,300 MW only but anywhere between 3,000 and 6,000 MW (Shrestha et al., 2018; N-CANSA, 2018). These counter-intuitive concepts are important in that they allow us to examine the underlying technical and political-economic contradictions behind this fallacy that began to dominate public discourse since the early 1970s, and which are in dire need of rethinking if the chronic impasses in water resources cooperation of the past decades are to be overcome.

Power trade rethinking

The first concept is the idea behind what may be called "terms of trade" in a more expanded sense between trading countries as described by the eminent historian Stavrianos (1981) in his book *Global Rift*. Covering not the history of a country or a region, but instead looking at *the process of Third Worldization,* he first describes the uniqueness of capitalism's rise in world history at the western end of the Eurasian peninsula around 1,500AD, and nowhere else, not in India or China that were technically more advanced and economically more prosperous. It produced a society

such as never existed anywhere before and which currently engulfs the entire globe. The factors he identifies are: the lack of a centralizing empire after the collapse of Roman rule that prevented extraction of economic surplus to be frittered away in prestige projects of rulers (such as the Taj Mahal); Black Death and the shortage of labour that encouraged technological precociousness with labour-saving devices; a Protestant Reform that allowed reification of labour and simplicity over conspicuous consumption (and hence basic democracy with no slave holding as well as accumulation of savings); and a loosening of the stranglehold of the Church allowing free scientific thinking, including loosening of anti-usury beliefs and laws to allow for collecting interests on borrowed money. It was the first time any society had allowed money to be allowed to work and make a profit for itself through borrowing and interests; and one must keep in mind how certain Islamic societies still prevent direct interest-taking through the idea of "Islamic banking".

With this "democratization of capital" also came, for the first time, the idea of the Joint Stock Company with limited liabilities: it allowed for bold, large and risky enterprises to be undertaken not just by richly endowed monarchs and dukes but also a collection of small traders pooling their savings, earning dividends from their investments but not liable beyond their immediate investments. While Columbus's expedition to the Americas might have been financed by Spanish kings and queens, the expeditions of the East India Company or the Dutch East India Company were joint stock trading ventures that ended up far more efficient in owning vast swathes of South and Southeast Asia. Stavrianos extends these key institutional innovations first, to introduce the novel phenomenon of "trade in necessities" which arose with capitalism as opposed to "trade in luxuries" which has existed since time immemorial. He then uses them to explain Third Worldization as the situation where countries without commensurate instruments of developed capitalism end up as suppliers of raw material that is processed in core countries for value addition and shipped back to periphery countries as necessities, locking such countries into a neo-colonial *dependencia situation.* Since 1,500AD, all regions of

the world—East Europe, North America, Africa, Latin America and Asia—had these misfortunes visited upon them: the only exception to avoid such a fate was Japan which merits a separate chapter in *Global Rift*.

The second idea is that of Arthur's (2008) on the meaning of technology and how that defines an economy and its structure within which the flow of goods and services takes place. Arguing for an "-ology" of technology (much like evolutionary biology) and examining its "technology-ness," he, like Stavrianos, sees it as "what separates us from the Middle Ages, indeed even from how we lived 50000 or more years ago." Arthur defines technology in three different (and intertwined) ways. Technology-singular such as a steam engine is a *means to fulfil a human purpose* which comes about with a new concept developed by modifying its internal parts. Technology-plural such as electronics is *an assemblage of practices and components* which develops by changing both its parts and practices. Technology-general is the *entire collection of devices and engineering practices available to a culture* which originates from the capture of a natural phenomenon or several such phenomena, and builds up organically with new elements forming by combination from old ones. It is this endless series of recursive combinatorial possibilities that carries within it not just the seeds of its own destruction (obsolescence) but also that of new evolutionary potential (innovation).

In Arthur's framing of its "technology-ness," two concepts are significant to explain the role of technology in an economy: *domain and structural deepening*. Domains are clusters of individual technologies that share a common theory or a family of natural effects with natural toolboxes of common building blocks (such as structural engineering or genetics or radio communications). An individual technology does a job and achieves a particular purpose: a domain (technology-plural), however, does no job but merely exists as a toolbox of useful components to be drawn from. The difference has been likened to a computer program that runs a particular device versus the programming language that can write that and other programs.

As individual technologies are pushed to maximum performance, they reach the natural limits of the tools that have harnessed that particular phenomenon. This problem is overcome by searching for and finding more efficient tools that harness a different phenomenon but can do the same job, which often have to come from some other domain. An old example is the *re-domaining* from waterwheels to steam technology to provide greater power to factories. It is this process that has led to rapid economic development. The point to keep in mind is that an economy is only as strong as its command, not over a technology-individual, but over the domain of that technology. Given the dynamic nature of modern global economy, according to Arthur, modern technology is not just a collection of more or less independent means of production but one in which command over the underlying technological grammar allows for the creation of new and more efficient functions in the economy, including for fresh new purposes, through re-domaining.

The idea behind *structural deepening* is one of fractal complexity of technological systems: an obsidian knife of primitive humans is a simple technology allowing the skinning of a hunted antelope; a modern aircraft carrier comprising a giant ship that floats on water to carry supersonic aircraft that fly in the sky is a very complex technology with technical parts that have sub-parts each of which in turn has other sub-parts to depths of several layers. The same is true of a hydroelectric or nuclear power plant, with each sub-technology having evolved from different domains.

A modern power system relies not only on the civil engineering of a diversion structure or the mechanical engineering of turbines but also fibre optics and information technology that tells the plant when to produce and how much to produce plus an entire specialized management system that ropes in banks, insurance companies and courts of law, each with their own technological grammar. While such complex systems have built-in redundancies to cover for a sub-part failure, the point, for our purpose, is that only an economy that has command over the structural depth of a modern complex technology can truly benefit from its use.

Weakness on this front leaves it at the mercy of those, as Stavrianos discussed above would have described it, at the unfortunate end of its "terms of trade" in necessities. When the largest storage dam in Nepal, the 60MW Kulekhani-1, had its penstock washed away during the cloudburst in the monsoon of 1993, its repair and replacement could not be done by mechanical workshops in Nepal: the Nepal Electricity Authority (NEA) lacked the expertise to even assess the damage and had to refer to the Japanese consultant who originally designed it (at great cost) and bring in foreign contractors to complete the repair job. NEA (and Nepal) lacked structural depth in its overall technological capacity.

The third counter-intuitive idea is that of the social construction of different types of goods and how amenable (or not) they are to trade. Economists talk of preferences for different bundles of goods and how the price mechanism in a free and competitive market will bring about equilibrium. What they do not ask is where preferences come from and why people do not always prefer a bigger bundle of goods to a smaller one.[2] This conundrum, and alternative answers, are explored by Cultural Theory (or the theory of plural rationalities) with the ideas in social anthropology propounded by Douglas (1992), Douglas and Isherwood (1979) and also Thompson (2003) and Gyawali and Thompson (2016). To quote Douglas (1992),

> The way that demand for goods is treated within economic theory blocks their curiosity about how wants are created… In economics the implicit assumption is that the origin of wants is to be found inside the individual's physical and psychical conditions. In anthropology, the implicit assumption is that wants are defined and standardized in social interaction… This latter view makes a better start for thinking about wants because it integrates the choices of the individual agent within a model of the whole economy, whereas economics leaves the choices unexplained except in regards to price.

Cultural Theory provides a remedy by showing that "individual wants are standardized by the same process that establish social solidarity." Using what are called two discriminators—whether there is strong group affinity or not, and whether individuals subscribe to pre-ordained rules or not—Cultural Theory comes up with a permutation of four social solidarities or ways of organizing: *hierarchism* (strong group cohesion, strong upholding of prescribed rules), *egalitarianism communards* (strong group cohesion, but weak on prescribed rules), *individualism* (weak on both) and the *fatalism* of the conscripted (weak on group, but strong on ascribed rules imposed upon them). Each of these four styles of organizing upholds an accompanying pattern of shared beliefs and values (or *cultural* biases and myths of nature) that is common to them, including very different perceptions of risk, i.e., risk-managing, risk-minimizing, risk-taking and risk-absorbing.

More importantly for our discussion, they subscribe to four different views of what economic goods are. In a remarkable parallel with the Cultural Theory approach described by Thompson (2003), Karl Polanyi (1944) has described three forms of economic interactions: *exchange*, which mirrors Cultural Theory's market individualism, prefers to see nature as providing *private goods* that can be traded for profit; *reciprocity* of civic egalitarian activism sees what nature provides as *common pool goods* equally available to all, including future generations; and *redistribution* through taxation and other such means of bureaucratic hierarchism is what leads to *public goods* that need to be regulated and graded for use as per rank and evaluated need. Fatalism of voters and consumers is regarded as passive because it does not cognize and strategize but is strategized upon by the other three active social solidarities; and what they see are *club goods*—goods that they are excluded from consuming because they do not belong to the club. Thompson (2017) expands this fourfold typology of goods by expanding the economists' understanding of all goods being in the *transient* category (value declining over time) until they become *rubbish*: the apparently valueless latter, however, resurrects itself in some distant future into an immensely valuable *durable* category as an-

tique! Among the many examples he cites is that of old "rat-infested slums" of London suddenly becoming "our glorious Victorian heritage" worth millions of pounds.

This fourfold typology builds on previous research—particularly regarding the dualism of hierarchy and markets—but opens up relatively unexplored but important avenues of cultural expression, specifically fatalism and egalitarianism. Cultural Theory bridges the old and the new in organizational studies by opting for a three- (or four- if passive fatalism is included) legged policy instead of the previous attempts at one- (pure authoritarianism) or two-legged (bureaucratic socialism and free market individualism, i.e., public-private partnership) ones. The important implication of this way of looking at goods, whether they be bags of rice or electricity from hydroelectric dams, is that these four different types of goods (upheld by the four different social solidarities) are not all equally amenable to trading to the same degree. Private goods can be exchanged easily when buyers and sellers agree between themselves with little else standing in the way. Public goods can also be traded but with difficulty and only with adherence to strict rules and regulations that have to reflect the social and political mood. Common pool goods such as those with environmental, strategic or national pride values, on the other hand, cannot be traded because they carry significance and meaning that cannot be transferred or alienated.

What these three counter-intuitive examples do is to nudge us to rethink energy trade. Is the item proposed to be traded a strategic necessity where the terms of trade are stacked against one of the trading partners under monopsonist conditions leading to debilitating *dependencia* conditions? Does the economy proposing to deal with this resource as tradable goods have sufficient structural depth with its concomitant technologies and sub-technologies? And finally, is energy (especially hydroelectric power with its environmental and social issues associated with water) a private good, public good or common pool good—or some mix of all three categories—that requires management approaches that severely curtail the capacity to trade with it?

So far, we have deconstructed the meaning of "tradable goods": we need to proceed with deconstructing the concept of "transboundary" before we move to address what energy trade and governance can mean in South Asia, especially in the Ganga Basin between Nepal, India and Bangladesh.

Clarifying transboundary

Defining the transboundary realm of South Asia can be a difficult exercise in grappling with fuzziness, especially when one is forced to shed a purely nation-centric approach as one must. The nation-state, a European Westphalian concept, is not the only container of rich social interactions in this part of the globe: they come in a variety of social configurations ranging from family clans to ethnic and regional groupings to religious, linguistic and cultural ties that spread far and wide. And they very much determine how individuals look at the world and react to it, much more deeply than just how national laws and international treaties/conventions say national citizens should. In the broadest sense, South Asia covers the Indic civilizational entity, which is much of everything south of the Hindukush-Himalaya. It extends from Afghanistan all the way down to the western flanks of the Anamite Cordillera in Cambodia. This is where the linguistic and cultural commonalities, the stuff that defines communication and natural behaviour, abound; and this is where history has overlapped and constantly shifted internal boundaries as different rulers have vied with each other to hold sway over its geography.

Another feature that unifies South Asia as a concept is its meteorology: the region is mostly dependent on the summer monsoon for much of its water, a unique weather pattern of global wind circulation which does not recognize national and administrative boundaries but affects the entire region in a more or less common manner. While its north-west end may get some winter precipitation from the westerlies as does its very southern tip from the trade winds, the monsoon rains from June to September define its liveability as a semi-arid zone. What happens with this precipita-

tion depends very much where it happens, how fast it happens and during what temperature and humidity regime it happens. With its origins in the Indian Ocean and the Bay of Bengal, this moisture movement that also gets additional feeding with evapotranspiration from forest and agriculture lands along this semi-arid zone—called the "flying rivers"—carries enormous volumes of water much greater than that of our rivers (Creed and Noordwijk, 2018). That being the source of all our waters and indeed of all life and economic activities, it is surprising how very little effort South Asian countries have spent to understand its nature and vagaries. One would have thought that transboundary collaboration would have started from this meteorological input point; but a failure to do so means that cooperation in river flow allocations has remained in an impasse. This is especially so when collaboration on understanding our common monsoon regime and its vagaries would have been a win-win proposition for all countries concerned; but limiting cooperation to water allocation in our rivers subjected to semi-arid conditions is a lose-win proposition: what I get you don't and vice versa.

While much of the precipitation drains off as flood waters, an amount depending upon the topography and geology seeps into the underground and is stored as groundwater that is the primary lifeblood of much of South Asia for the dry months between October and May. Indeed, the water flow during this period of the year in its rivers is nothing but groundwater backflow. In that sense, South Asian rivers are, during the dry, non-monsoon months, nothing but leaking outflow of the massive groundwater tank of the region, which was traditionally exploited through stone wells and hand-lifted buckets. With the wide-scale proliferation of modern deep-boring wells and electric or diesel pumps since the latter half of the 20th Century, groundwater depletion has become a serious problem all over South Asia, so much so that even NASA satellites that monitor gravity strength of the planet are able to record this over-pumping (Mukunth, 2015). This basic problem of depleting river flow especially in the dry season, not so much from climate change (where forecasts predict increased flow due to increased precipita-

tion probabilities) but from unregulated extraction of groundwater and declining groundwater table, has to be kept in mind as we discuss transboundary rivers as they will affect the energy output and viability of transboundary energy agreements, especially with Himalayan hydropower.

Another aspect of defining transboundary concerns of South Asia is to ask how many types of boundaries are there that are crossed. Rivers crossing international, subnational or administrative boundaries is the obvious conventional focus, but even here we have to examine the hitherto not seriously acknowledged flow of subterranean groundwater which can differ from the flow direction of the river crossing the boundary and affect its volume. However, when it comes to water (and energy), there are many other boundaries that also get crossed, and which have implications for their development. When these concerns began to surface with the rise of environmental and social activism, it was realized that hydropower could not just be a matter to be decided on civil, electrical and economic grounds. The concept of Integrated Water Resources Management (IWRM) was advanced in the 1980s as the interlinkages between technological interventions and social milieu became apparent with the rise of environmental and social concerns as well as the emergence of some intractable conflicts. The need for multiple expertise addressing this complexity meant that planners and implementers of water and energy projects had to constantly cross disciplinary boundaries, something that large bureaucracies in their silos are very reluctant to do.[3]

IWRM was subsequently critiqued for two primary reasons: it failed to answer who does the integrating and how, i.e., to ask the tough political questions, and was limited to merely procedural inputs to hierarchism (Gyawali et al., 2006; Allan, 2003). In Cultural Theory terms, the voices that were missing at the policy table were still the civic activist egalitarian and market individualistic ones. To remedy this lacuna, a new and broader concept is currently being advanced, that of the nexus approach (Allouche et al., 2014; Gyawali, 2015). The advantage of this approach over IWRM is that it broadens the interconnected sectors beyond just water to water,

energy, food, etc. While this increases the complexity much more, it also makes it more realistic in that the happenings within one sector have serious ramifications in another and that must be dealt with, not ignored. The implication of shifting to this broader approach is that hitherto ignored economic benefits and costs, such as with Nepal's 60 MW Kulekhani-1 hydroelectric project, which generates, besides electricity, significant benefits in irrigation, water supply, fisheries and inland navigation, can be brought within planning and management purview (Gyawali, 2015).

Water and energy (and within Nepal's hydropower context they are intertwined) are not really subjects but the focal points where many subjects—indeed one might say all the subjects taught in a university, ranging from hard science (atmospheric physics) to soft literature—intersect. While natural sciences describing these complex resources such as meteorology, geology and soil science, civil and electrical engineering may seem "natural," the fact that the conclusions they reach have implications for individuals and the societies in varied forms they are part of puts serious question marks on the applicability and usefulness of natural sciences alone. This basic fact makes them difficult to address: even within a country, harnessing naturally flowing water becomes a complicated business with ramifications for other sectors, often with social, legal and environmental concerns.

The matter is made more intractable when these concerns are managed in different departments, as practicality and specialist needs dictate they must, in the form of silos that do not link up with each other. In Nepal's case, for instance, rarely has Nepal government's agriculture department talked with its irrigation department. Throwing transboundary implications and concerns into this complexity only exacerbates the problem, and does not make finding solutions any easier. Regarding the social sciences of water, the conventional approach has been limited to economics, often of project finance, merely feeding the formulation of legal construction contracts. It is only in recent years, with the rise of environmentalism, that other social sciences such as sociology, anthropology, ethnography and political science have

been allowed to address policymaking in the water resources sector, howsoever grudgingly.

Thus, transboundary has come to mean not just the countries of South Asia but also their different subnational constituents, the different social sciences that have to be brought to address varied concerns as well as the expanding geography where these concerns express themselves, from subecologies to the mega meteorological hydro-ecology. So far, over much of second half of the 20th Century and much of the 21st, transboundary collaboration on water and energy has been limited to the state-to-state, hierarchic realms which have often been notorious for filtering out other social and ecological concerns.

Transboundary governance conundrums

With these views expanding our range of concerns as regards transboundary resource trade and governance, we can take the examples of any of the proposed hydroelectric projects in Nepal and see serious transboundary implications: the perennially discussed 4,000+ MW Kosi High Dam, the 10,800 MW Karnali Chisapani, the 6,480 MW Pancheshwar under the Mahakali Treaty, the export-oriented 900 MW Upper Karnali or the resurrected Arun-3, or even the current "within Nepal" projects such as the 750 MW West Seti or the 1,200 MW Budhi Gandaki. In light of the fuzziness of the transboundary concept—the fact that different resources cross dissimilar types of boundaries for diverse purposes carrying sundry values even when crossing a national border, let alone an international border—what are the transboundary issues, and what approach should be taken to resolve them?

As mentioned earlier, Nepal has approached its water resources development primarily as one of harnessing its hydropower potential and exporting the electricity to India while in India, Bihar's priority is flood control and Uttar Pradesh's is irrigation. Nepal's first transboundary agreement with the lower riparian was in the late 1920s with the Sarada Treaty with British India. Valued by the Nepali state at the time was land and forest; hence

the agreement was entered into that saw Nepal allowing its border land to be used to build the Sarada barrage by swapping the dam site land with an equivalent forest area elsewhere. Nepal was allowed to withdraw up to 1,000 cusecs of water (depending upon the season) for irrigation while India withdrew almost the entire river with a canal capacity of 12,000 cusecs. Even for the meagre portion it was allocated, Nepal began harnessing it only half a century later in the 1970s.

The issue flared up in the late 1980s (by which time Nepal's exposure and expertise on matters related to water and energy had increased dramatically) when India unilaterally built the Tanakpur barrage mostly within the territory it had swapped with Nepal earlier but requiring the use of additional Nepali land to complete the left afflux bund (Gyawali and Dixit, 1999). A subsequent treaty was entered into in 1996 called the Mahakali Treaty which subsumed Tanakpur and Sarada under it and envisaged building a 6,480 MW Pancheshwar high dam with significant water storage upstream. However, this treaty has remained in an impasse these last 22 years without agreement on the overall basic project features. The opposition to the treaty even in 1996 cantered around the fact that the Nepali constitution of 1990 had a provision in Article 126 which required a parliamentary ratification of resource-sharing treaties, with a simple majority if it was not of a "serious, long-term and encompassing" nature and with a two-thirds majority if it was. This provision has been included *in toto* in the new constitution of 2015, but it has been violated in the case of some hydroelectric project development agreements such as West Seti, Upper Karnali, Arun-3, Budhi Gandaki and others, with Indian, Chinese and some international partners. An attempt to bring clarity to this constitutional provision by defining the trigger criteria for invoking the two-thirds provision of the constitution has remained in limbo since 2003 (Gyawali, 2009).

The basic problem lies in both sides treating Pancheshwar as well as Karnali Chisapani, Kosi High and other such mega storage dam projects as primarily hydroelectric projects instead of as full-fledged multipurpose ventures with the value of stored water a

public good perhaps (to some social solidarities) even more valuable than electricity. After all, electricity can be generated from many sources but the parched fields of Uttar Pradesh and Nepal's Tarai can only be irrigated with water. These initially brushed-aside facts and values evaluating those facts, with India insisting on rights over the stored water as prior rights[4], have caused serious and so far unbridged differences in assessing what are the benefits that can be shared and who bears how much of the costs of development. Multipurpose high dam projects in the Himalaya provide stored water (not naturally flowing water which has 10 to 20 times difference in variability between the monsoon and dry season flows), which provides the following benefits:

- Irrigation in the dry season to hundreds of thousands of additional hectares of land;
- Flood control that lops off the peak flood where there is exponentially more damage;
- Fresh water fisheries (the small Kulekhani-1 reservoir currently provides protein supplement to diet as well as livelihood to some 307 families who lost their land to submergence);
- Navigation, not just in the reservoir area between villages in opposite banks but also downstream to the main stem Ganga river[5];
- Tourism and satellite city development along the reservoir rim;
- Seasonal and daily peaking power to electric grids that is more valuable than base flow power because only peak power is capable of stabilizing the grid during a surge in demand.

There are a couple of points that need to be kept in mind with this list of multipurpose benefits, along with the counter-intuitive ideas we explored earlier. First, many of these benefits such as flood control and tourism potential are public goods; some such as navigation having inter-generational implications and hence requiring to be treated additionally as common pool goods. With them are also associated costs, especially social from resettlement

and rehabilitation requirements as well as environmental from permanent submergence and alienation of valuable forest, pasture and agriculture lands. Markets are poorly qualified to deal with such goods with no clear ownership rights and values that cannot be quantified in monetary terms. If such projects are thought of only as single-purpose hydroelectric projects and the entire cost of development of the dam and other structures are loaded onto the electricity sector alone, the sector will not be cost effective while other sectors (and their beneficiaries) will become free-riders. It is difficult to assess the costs and benefits (and their "stake-losers" and "stake-winners") within a country: when these benefits and costs have to be additionally shared between countries, the difficulties become much more intractable. In Nepal, the only institutional mechanism with the potential to address such multipurpose problems is the Water and Energy Commission with representations from all relevant ministries having to deal with water and energy. However, national-scale policymakers have never really utilized its potential except in the early days of its founding in the 1980s (Gyawali, 2013).

Even with electricity alone, problems are not that simple. As previously discussed, the hydroelectric projects that produce the electricity in Nepal are only partially public goods: more often than not, they are public and sometimes common pool goods fiercely defended as such by the social solidarities that prize them, often leading to long delays and costly impasse. Attempts to find equitable solutions for people affected by dams in Nepal have been many, some of them quite innovative. Nepal has a strong tradition of community-led development with community forestry, irrigation and water supply leading since long. Riding on these previous successes, community electricity was introduced in 2003 and currently has more than half a million households electrified and managed by village groups.[6] What is interesting with these groups is that when conflicts arise between users or between developers and villagers, they seem to be able to resolve them without recourse to expensive litigation in the formal court system but rather sort them out through more informal tradition-

al means. They have also developed local skills in matters electrical using this new-found technology to invest in cottage and small-scale industries even among women groups, giving their societies what Arthur mentioned above would have described as better structural depth.[7] Another innovation has been giving local villages where dams are to be built shares in the hydroelectric projects. While there are cases of over-exuberance and unreasonable expectations of profit (IFC, 2018), the mechanism has certainly mediated to some extent between parties promoting private goods and those seeing the resource in question as either public or common pool goods.

In India, electricity is not a private good: a recent study by Pillai and Prasain (2018) clearly mentions that the government of India, through its winter 2016 guidelines, considers electricity a strategic commodity and not a development input, i.e., a public and thus not a private good that markets can manage. Furthermore, it would only import power from countries such as Nepal if the exporting entity had more than 51 percent Indian ownership. To assuage Bhutan, Nepal and Bangladesh, official Indian response is that any entity other than those having majority Indian shareholding can also export power to India on a "case to case basis", thus making electricity not just a purely public good whose fate is decided by bureaucratic hierarchism but also one that has a Damocles sword hanging over any entity hoping to deal with it as a private, marketable product. Moreover, the report also describes how, after decades of shortages, massive addition of thermal capacity has created a surplus in the Indian grid which is expected to last between coming five to ten years if power planning were to be arrested and frozen at current levels. This completely demolishes any hope of countries such as Nepal who for decades falsely hoped to benefit from selling electricity to India. It also justifies the arguments made by Nepali macroeconomists such as Thapa (1997) who argued that, if Nepal had some six billion dollars (the then cost of building the 10,800 MW Karnali Chisapani project), why would it take some 10 years of investing to build the dam, export the electricity and then invest the profits that came from it for other

development works such as roads, hospitals and schools? Why not take that money and right away invest in such required national development tasks and save a whole decade?

The arguments presented above call into serious question the entire discourse on regional trade in energy. First, energy is a strategic and public good not really amenable to management through the market's pricing mechanism: the decisions behind it are very much political with economics used as a justificatory dressing up *post hoc*. Second, countries in the region have differing levels of structural depth with electrical technologies. Indeed, in a proper economic sense, the benefits of electricity are in the upstream and downstream ends of the economic process—upstream in the capacity to repair and maintain and indeed even manufacture particular components; and downstream in factories, commercial establishments, hospitals, etc. using the electricity to increase their productivity and provide meaningful jobs to their citizens. Third, without such structural depth in various domains of the economy, including in the software side of banking, laws, insurance, research establishments, etc., the terms of trade will be stacked against countries exporting electricity as a raw material to more advanced countries and they would very well fall into the *dependencia* trap. South Asia is very far from achieving any meaningful energy cooperation in the near future.

Notes

[1] As an example, at a seminar on "Cross-border inland waterways: Exploring new avenues of connectivity" on 1 October 2018 in Kathmandu, jointly organized by Asian Institute of Diplomacy and International Affairs (AIDIA) and the Indian Embassy in Kathmandu, the CEO of a freight forwarding company and other participants described how, although the actual transport time from Kolkata to Birganj might be about 14 days, there was on average an additional three weeks of arbitrarily imposed administrative hassles (including rent-seeking) at Kolkata port and Raxaul, bringing the total to more than five weeks and increasing transshipment costs significantly. In contrast, at the test run from Tianjin in China to Rasuwagadhi north of Kathmandu, containers took only 12 days to get to Nepal.

[2] Answers lie in Cultural Theory's social construction of wants with examples

of altruism and "even if the price of pork comes down dramatically, you will not find many Pakistanis buying it."

[3] One of the few South Asian initiatives to come to grips with the problems of interdisciplinary integration was through a research project of SaciWATERs: "Crossing Boundaries." Efforts to deepen IWRM can be found in: http://www.saciwaters.org/CB/resources/CB_Broucher.pdf and http://www.saciwaters.org/CB/home/index.html.

[4] India's initial position was that any water that Nepal did not use would be India's to use from the Pancheshwar storage (Nepal, after all, is water rich and (irrigable) land poor while India is just the reverse); and that India's Lower Sarada Command had prior usage rights to the water since all the canal networks had been built. Nepal's position was that it was not possible for India to have prior rights on (stored) water that has never existed and has thus never been used just by building canals that have remained either dry or severely under-utilized ever since.

[5] India's passing of the National Waterways Act in 2016 declaring 111 rivers in India, including the Ganga and the Brahmaputra, has suddenly placed new value on stored water in the Himalaya: navigation is not possible on the Ganga without augmentation of the flow, possible only with storage dams in the Nepal and Uttarakhand Himalaya. See Gyawali (2016).

[6] One of the benefits of "communitizing" their village distribution system is the lower bulk rate they pay to the national grid and to the Nepal Electricity Authority (NEA) that manages the grid. Also, theft in community-managed systems is practically zero because of the structural double accounting system (bulk metering at the grid end managed by the NEA and retail metering done by the community groups themselves. See http://naceun.org.np/ .

[7] In a remittance economy, most men folks are away in cities or abroad and women have to manage the village households. As a result they have to manage their distribution system as well, training their own women electricians. See https://thebulletin.org/roundtable/expanding-energy-access-improving-womens-lives/.

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