Chautari Foundation Lecture 2015

TRACK II – NEPAL'S PLURALISTIC HYDROPOWER DEVELOPMENT POST-ARUN

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It is my pleasure delivering the Chautari Foundation Lecture 2015.[1] The debates on Arun III were among the many early discussions at Chautari. They were among the first issues that drew a wide public interest after the 1990 political changes, and carried out as a movement in a particular way: through discussions, and without politicizing or organizing mass protests. Martin Chautari was set up in the belief that open and active discourse among citizenry on alternative development pathways and required changes would make for a more robust and vibrant democracy in Nepal. It was fitting that Chautari has invited me to revisit, and in a way, reinterpret the history of Arun III story.

In the lecture today, I will lay out the logic behind the arguments around the Arun III hydropower project: what that meant at that time versus what it means today; what conclusion we reached then versus how we can understand the developments in the intervening 20 years. I will try to connect the two in the presentation.

The Arun III debate was one of the early outcomes, to my mind, of the democratic change of the 1990 when it was finally possible to discuss a major topic like this and to be hopeful that such discussions would lead to change. In August 1995, the World Bank finally pulled out of the Arun III. The development in Nepal's hydropower sector in the 20 years without Arun III provides an interesting opportunity to reflect. While debating Arun III, several predictions were made: some foretold darkness forever; others

[1] This first Chautari Foundation Lecture organized by Martin Chautari was delivered in Kathmandu on 22 February 2015. This annual lecture series is much more than a celebratory event specific to Martin Chautari's historical contribution to the culture of public debate in Nepal. Every lecture is an occasion both of mature reflection on Nepal's past trajectory and of stimulating debate on its future by some of the best public minds.

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spoke of brighter alternatives. Today, at this juncture, we have unusually rich empirical evidence to analyze how the investment landscape evolved for capital-intensive hydropower projects in Nepal.

I do want to make a quick disclaimer. Several institutions were engaged in the Arun III debates: The Alliance for Energy was one, with a couple of members from that alliance present in this hall today; Martin Chautari, as mentioned before, where many of the discussions took place in the early days; Intermediate Technology Development Group, where I worked and where Martin Chautari held the first discussions every other Tuesday. Winrock International, where I work today had no role then. I want to emphasize that I am not speaking today on behalf of these institutions. But I am very much indebted to these institutions for having provided the forum and the opportunity for me to develop insights I wish to share with you all.

I expect that less than half of the people in this audience had finished their high school 20 years ago. What was a shared experience to many may not be thus obvious to others. So I will start with a bit of background in terms of what the debate was about. I will next recount some crucial developments in the hydropower sector in Nepal since then. I will then move on to making the link with Arun III as I see, chiefly in terms of cause and effect: what happened, what the results were, how I understand the changes, and perhaps discuss some ways to go forward.

The Arun III Debate

I wish to clarify a common confusion about the arguments against the Arun III. The Alliance for Energy was definitely against the way the project was formulated. Its main grievance was, however, about the way development projects were implemented in Nepal: the way donor aid drove them, and the narrowing of options down to the fatal point where nothing else could be considered. The details of how Arun III was selected for implementation are important: its location, power output, projected project costs, sources of funding, projected benefits and beneficiaries. Arun III was chosen after a least cost generation exercise and was touted to be Nepal's best hydropower project. It was scheduled for construction over eight years. Major donor conditionality was that no other hydropower project could be considered for construction by the public sector in Nepal, or even studied for feasibility until Arun III was well underway. This condition was ostensibly put in place to avoid distraction. The limited management capability available,

within the Nepal Electricity Authority (NEA) and the Government of Nepal (GoN), could be focused on successfully completing the Arun project, so it was thought.

The project however had major weaknesses from our perspective. It was essentially two mega projects back to back: it first required a 120-kilometer (km) long road, just to reach the project site; and then, building the hydropower project itself, which included the largest dam and tunnel in Nepal till that point. The chance of constructing both these mega projects in the required sequence, on time and within budget, to our mind, was close to impossible. Building a 120 km road in Nepal itself was a major undertaking in the eastern Himalayas that never had a road before and was fraught with risks of delays and cost overruns. The proposed solution was to transport construction materials by helicopter to several points to speed up the road construction. To our mind, there were real risks to constructing Arun III under these extreme artificial conditions. Consequently, what was argued as one of the best projects in Nepal was also going to be the most expensive one: close to US$ 5,383/kilowatt (kW) for the first, 201 megawatt (MW) phase. Given the usual uncertainties in hydropower construction projects, the risks in Arun III were really stacked one on the top of the other making it both impractical and highly risky.

Our other major objection to the Arun plan was about the crowding out of alternative investments. The alternative pathways to hydropower development in Nepal were blocked both from within NEA and without NEA. For close to eight years during the planned construction of Arun III, no other projects could be considered for development by the public sector, so the donors argued, to save NEA from distraction. Investment into studying any other projects would be considered competition and therefore a diversion for the NEA management. Such exclusive pursuit meant that potentially better options could not even be explored even if serious problems surfaced while developing Arun III. Note that policy makers had not seriously considered the private sector as a source of investment at that time. NEA had turned down the approaches by independent power producers (IPPs)/developers of Khimti and Bhote Koshi to sign a power purchase agreement (PPA). Discussions on mobilizing private capital as a way to meet Nepal's power needs had not started in any meaningful way. The investment plans laid out for the Arun Valley – including Upper and Lower Arun following the Arun III – suggested that 80 percent of country's total future investments

would be in a single river basin at one end of the country and there would be limited if any role for the private sector in this future. This was leading Nepal to, what we called, 'no option trap.' Allowing Arun III meant going down through a narrow path that further tapered to developments in a single river Valley for at least the next 15 years.

There was no environmental argument. There were environmental concerns but they were not part of the main argument made by the Alliance for Energy. We did not contest that Arun III was Nepal's best project. But we argued that there had to be a natural course for building Nepal's best project. If Nepal's most attractive project was going to cost us US$ 5,383/kW, future hydropower growth in Nepal would be stunted for a long time to come. We thus put forward what we called an alternative approach. The fundamental element of that alternative approach was to promote multiple pathways so as to reduce risk to the country, utilize diverse sources of investments, and avoid wastage of time in developing hydropower. We proposed, with involvement of both public and private sector companies, to start by building projects in the one to 50 MW range which Nepali engineers and construction firms could design and construct.

These were two different ways of looking at things. Nepal's growth in demand for power was only 20 MW per year in 1995. The World Bank and other donors argued that given the time it takes for donors to process a project loan, it made sense to develop a large 200 MW project with a typical design to construction cycle of ten years. There was no point in considering projects of smaller sizes since it took the same amount of time to process a loan for a 20 MW project or a 200 MW project. These larger projects would be built by international companies selected through international competitive bidding. The Alliance pointed out that a planning process developed around donors' project loan cycle resulted in a repeating cycle of flood and droughts for Nepal. The gap between projects was too long to allow for a natural growth in demand for power. We had load shedding for several years after Kulekhani before Marsyangdi came on line. There was serious load shedding on the system already and at least eight years before Arun III could be completed. This artificial way of building up generation capacity in the country was damaging to the economy and perpetuated aid dependency. Foreign aid was being injected intermittently to meet demand for a few years, and once every ten years.

We disagreed with such an approach because we knew that power supply should be added to the system incrementally rather than having a single large public sector project once every decade. If yearly demand was growing at 20 MW, that could be met more naturally with several projects under construction with at least 20 MWs of new power coming on line each year. Hydropower projects should be constructed in different parts of country and under different sorts of ownership and management to further balance supply and reduce risks. We felt that there was a need to mobilize lots of idle money in the local economy to develop hydropower in Nepal. We also believed public sector investment should facilitate, and not substitute for, private investment. Public funding should target many other sectors in need of investment where private entrepreneurs had little incentive to invest. These sectors include education, health, sanitation and social welfare. Major public investment concentrated in a potentially commercially attractive sector would not only drive out private capital from that sector but also deprive other social sectors of public investment.

At the Alliance for Energy, we believed that hydropower development really needed to be built on a foundation of the Nepali developers, Nepali construction industry, Nepali engineering professionals, and Nepali investment. Such a strong local capacity would bring the energy prices down to a reasonable level at the range of US$ 2,000/kW instead of the price tag of Arun III of US$ 5,383/kW. We thought that this alternative route was the way for realizing Nepalis' aspirations for inexpensive and affordable energy. The proponents of large projects like Arun III should carry the burden of proving that such public sector projects would not block investments into other feasible projects and by other actors. They were not able to do this. For us, it was very clear that Arun III design was a risky investment for Nepal which could be unmanageable because of technical and bureaucratic hurdles. It also presented the negative impact of foreign aid where a single large donor-funded project stood on the way of alternative and less risky development pathways which could free Nepal from perpetual dependency.

What Happened since Arun III

There is now an opportunity to look back at the issues raised during the Arun III movement and see what has really happened since the World Bank and donors withdrew funding from the project. It is a history that offers us a rare opportunity to compare predictions made by activists with the results that

followed and provide an occasion to reconcile them. One might expect that the results would be mixed. Indeed, they did not turn out 100 percent as we expected. In some aspects, the outcomes went slower. In other aspects, the predicted changes happened rather surprisingly faster.

Let me sketch out what I believe has happened in Nepal's hydropower sector since 1995. First, there is debilitating load shedding in the country. Many believe perhaps that had Arun III gone ahead, we would not have had the shortage of supplies against the rising demand. This is the standard question people often ask me when they know my history with the Arun III. My standard response is to point to the vigorous investment in Nepali hydropower sector since then. Over time, this momentum has built up. Although it is hard to believe while living with 8–10 hours of daily power cuts, I submit that a major change will be seen after commissioning of the under-construction Upper Tamakoshi project in the next 18 months. There are currently 42 operating projects in Nepal totaling 716 MW generation capacity; 84 projects have been given power generation licenses with estimated 2,074 MW output, and 43 among them are under construction. Survey licenses have been awarded to 87 projects combined with a potential capacity to produce 6,000 MW of power. This is a natural pyramid structure of a healthy scenario of hydropower development. Nepal's stock of existing projects is superseded by the number of ongoing construction which is further superseded by start-up projects. Compare this pyramid to what I outlined earlier as a single-stick approach with Arun III proposed to be at the top of Marsyangdi, which was built on the top of Kulekhani.

Table 1 gives a snapshot of the resulting pluralistic development of projects constructed by the Nepali private sector, international private sector, as well as NEA after the cancellation of Arun III in 1995. Many people ask why load shedding has been continuing when all these projects are being built. The answer is that while there is indeed a robust pipeline, new projects have not begun to come on line in the increments needed to significantly reduce load shedding. In 2013, we had about 45 MW added to the Nepali grid but in 2014, it was less. While about 200 million US dollars is being spent every year in Nepal, given the 4–5 years it takes to construct projects, there is a lag between when the investments take place and the actual results show up in terms of megawatts on the grid. In recent years the demand for power in Nepal has been growing at the rate of about 100 MW per year. The average annual addition in the national grid is a mere 30 MW at present

based on the smaller sized projects which have completed construction. A significantly large project like the 456 MW Upper Tamakoshi is thus needed to come on line to make a noticeable difference. I would stress, however, the strength of my argument derives from the momentum in Nepal's hydropower sector rather than in the absolute number of MW.

Table 1: Hydropower Projects since 2000

Nepali Private Sector							
S.N.	**Projects**	**MW**	**COD***	**S.N.**	**Projects**	**MW**	**COD***
1	Indrawati	7.5	2002	13	Bijayapur	1.8	2012
2	Chilime	22	2003	14	Lower Modi	10	2012
3	Piluwa	3	2003	15	Siuri Khola	5	2012
4	Sunkoshi	2.6	2005	16	Ankhu Khola	7	2013
5	Chaku	3	2005	17	Charnawati	3.52	2013
6	Khudi	4	2006	18	Lower Chaku	1.8	2013
7	Thoppal	1.65	2007	19	Middle Chaku	1.8	2013
8	Ridi	2.4	2009	20	Sipring	10	2013
9	Madi	4.8	2010	21	Tadi	5	2013
10	Baramchi	4.2	2010	22	Bhairav Kund	3	2014
11	Mai	4.5	2011	23	Mailung Khola	5	2014
12	Hewa	4.5	2011	24	Radhi	4.4	2014
Nepal Electricity Authority							
1	Modi	14.8	2000	3	Kali Gandaki	144	2002
2	Puwa	6.2	2000	4	Middle Marsyangdi	70	2008
International Private							
1	Khimti I	60	2000	2	Upper Bhotekoshi	45	2001

* COD = Commercial Operation Date

Source: Department of Electricity Development, Ministry of Energy (www.doed.gov.np)

Since 1995, hydropower construction in Nepal has changed dramatically and with a definite trend. All the recent private sector projects which have come on line have been built with Nepali rupees investment with the biggest of them being the 22 MW Chilime. The average size of the projects was about

5 MW. The portfolio of the sector, in terms of number, is clearly dominated by small projects much in the way the Alliance predicted. International private sector companies did come in but that ended after the first two projects: Khimti and Bhote Koshi. To summarize, since 2000, NEA contributed 235 MW through four projects constructed using conventional foreign aid modality. These projects mostly utilize resources which had been earmarked by donors for Arun III. International private money built 105 MW through two plants; and Nepali private capital has generated 122 MW through 24 projects. The key role of domestic rupee investment in Nepal's hydropower is clear from Table 2.

Table 2: Summary of Hydropower Projects since 2000

Developer	Total (MW)	No. of Projects	Average Size (MW)
NEA	235	4	59
International Private	105	2	53
Nepali Private	122	24	5
Total	**462**	**30**	**15.4**

The remarkable point is: How Nepali rupees have become crucial in this sector is evident when you look at the pipeline of projects under construction. In 1995, the idea of local private investment was not accepted by anyone. Hydropower could only be developed using government funds and donor investments. By 2015, roughly 20 billion Nepali rupees (US$ 200 million) have been mobilized to construct 122 MW of small hydropower projects currently supplying the grid. Even more remarkable is the fact that one and half billion US dollars equivalent in Nepali rupees has been or is being mobilized for the 1,200 MW large and small hydropower projects under construction today. It is expected that any remaining requirement will be mobilized from pension funds, commercial banks, and the general public in Nepal as these projects continue to completion of construction. To keep the significance of the figures in perspective, remember that for an aid-dependent country like Nepal, donor money has not played a significant role in mobilizing these local resources for the growth in the sector. In fact, other than diverting the resources earmarked for Arun III to Kali Gandaki and Middle Marsyangdi, donors have actually reduced their investment toward Nepal's power generation.

Looking back at the Alliance for Energy papers (1993–1994), I found that we had predicted mobilization of 200 million US dollars from the local market and the World Bank would match that with US$ 400 million. In reality, that's not what happened. While US$ 200 million has been mobilized from Nepali private sector and more is being mobilized from pension funds and other non-sovereign funds in the country, much of the expected Nepali public sector investment and donor investment have remained unrealized. It is fortunate for Nepal that liquidity in the local market allowed local investment to step into that vacuum. This trend has been accelerating with roughly 20 billion rupees flowing into the sector each year in the last 4–5 years. This is the level of investment required to produce a 100 MW per year. The results are not showing yet in terms of reduced load shedding because of the lag I mentioned earlier. But with the expected catch up point 18 months from here, I think this is a remarkable story. It has not been really appreciated enough. We have a hard time visualizing the end of the load shedding against the everyday darkness.

Note also that this vigorous hydropower development has really been led by non-conventional investors and developers, as a quick comparison between the profile of the investors in 1995 and those of today will show. None of us had predicted this. Within NEA, the Nepali engineers who thought NEA should build hydropower project themselves using local resources had been discouraged when the dominant projects in the utility's portfolio were Arun III and other aid-funded projects. The dominant group close to the NEA management went after more classy and glamorous donor-funded projects. The group favoring smaller projects using internal resources, which had a low profile before, really rose within NEA in a dramatic way after the cancellation of Arun III. Their efforts were complemented by Nepali private investors and in some cases, by non-resident Nepali investors. In terms of institutional investors, the Employees Provident Fund (EPF, Nepal) became a big source of money for hydropower as predicted by the Alliance. In addition, the Citizen Investment Trust (CIT, Nepal) became a very active investor. Nepal Telecom and Insurance companies, which nobody had seen as potential investors in hydropower, are now major investors in the Upper Tamakoshi project. Most commercial banks have now committed themselves to hydropower investment. Besides, dedicated publicly funded special purpose companies like the Hydroelectricity Investment and Development Company Limited (HIDCL) have come up precisely to invest in the sector. Several companies,

including some high profile ones, have gone public to raise capital. Arun Valley Hydropower Development Co. Ltd., National Hydropower Company, Butwal Power Company (BPC), Sanima Hydropower Limited have gone that way and have in general received excellent response. Box 1 shows the main actors currently involved in hydropower development in Nepal. There is, however, a need to organize the ad-hoc basis on which this expansion in hydropower investment has happened.

Box 1: Actors Involved in the Hydropower Sector

Project Developers
- Nepal Electricity Authority and subsidiary companies
- Nepali private sector investors
- Non Resident Nepali (NRN) investors

Institutional Investors
- Employees Provident Fund
- Citizen Investment Trust
- Nepal Telecom
- Rastriya Beema Sansthan

Commercial Banks
- Over 20 commercial banks

Special Purpose Companies and Funds
- Hydroelectricity Investment and Development Company Limited (HIDCL)

A new breed of NEA subsidiary companies has come up to construct hydropower projects mobilizing domestic resources. Twenty years ago, nobody in NEA would have believed they could go to the Nepali public to raise money and build hydro projects in Nepal. This has happened with Chilime and the Upper Tamakoshi. The Chilime project got underway in 1995 almost immediately after Arun III cancellation. Now it has three sister companies. Between them, they have started to develop a portfolio with size as much as what NEA had then. BPC, which was privatized several years ago, is another major company. BPC did not grow to the extent some had hoped, but it remains a key player. Sanima Hydropower Limited is one of the companies with significant non-resident Nepali (NRN) investments. Hydro Solutions and Arun Valley Hydropower Development Company are similar sized companies. These companies do not deal with large projects but their ambitions have been increasing. Several of these companies started with two or three MW projects in 1995 and are today building projects 20

MW and larger. They have also gone into studying much bigger projects, which they are unlikely to construct alone, and have sought international partners. To me, this is an organic growth much healthier than developing a line of single projects following one after the other without any credible base to construct and manage them.

After the cancellation of Arun III, three different pathways opened up. Khimti and Bhote Koshi were started simultaneously by international private sector developers. Chilime was incorporated in 1995 with 51 percent shares owned by NEA. Three years after Chilime, the then Minister for Water Resources Shailaja Acharya issued standard PPA for projects below ten MW suitable for development by the domestic private sector.

In terms of donor resources, German government-owned development bank Kreditanstalt für Wiederaufbau (KfW) invested in the 70 MW Middle Marsyangdi using the resources earlier earmarked for Arun III. The Asian Development Bank (ADB) invested in the 144 MW Kali Gandaki project. The World Bank put forward the Power Development Fund, which did not really go anywhere. The United States Agency for International Development (USAID) and Gesellschaft für Technische Zusammenarbeit (GTZ) provided technical support to the alternatives the Alliance had put forward. Belatedly, we now have investments from KfW, Norwegian Embassy, and the ADB for transmission infrastructure to support private sector development. Two facts seem puzzling to me. First, the donors did not support more hydropower generation as was expected. Second, they did not invest much in building complementary infrastructure like transmission lines, etc. Nepal was lucky that enough liquidity in the market stepped in their place and this has ensured that there is an active pipeline of new power generation.

One could argue that this picture of active private sector investment could have been developed alongside Arun III, and this would have avoided load shedding today, while simultaneously supporting a vibrant alternative investment sector. While it is impossible to predict trajectories, let me argue why I believe we could not have had both.

First, looking at the NEA's Investment Plan for 1994–2007, we notice that Jhimruk, Khimti and Kali Gandaki came along as had been foreseen. Then the picture differs completely from what we have today. According to the plan, Arun III, the baby Arun, would have commenced in 2002. The second phase of that was to be completed in 2006, followed by Upper Arun in 2009. The plan clearly seems to have had a limited role for international

private sector. Although it must be noted that NEA refused to sign a power purchase agreement for Khimti and Bhote Koshi until Arun III was cancelled. But it had not envisioned any role for Nepali private sector companies. In principle, the sector could have become plural but there was no plan for that to happen before Arun III was cancelled (Box 2).

Box 2: NEA's Investment Plan (1994–2007)

1995	Diesel upgrade (+6 MW)
1996	Jhimruk (12 MW) + Trishuli Upgrade+ 30 MW imports
1998	2 x 20 MW Multifuel + Modi (10 MW)
1999	Khimti (60 MW)
2000	Kali Gandaki A (100 MW)
2001	20 MW Multifuel
2002	Arun III Phase I (201 MW) 'Baby Arun'
2005	20 MW Multifuel
2006	Arun III Phase II (201 MW)
2008	20MW Multifuel
2009	Upper Arun (335 MW)

Source: NEA's Investment Plan (1994–2007); unpublished document

The second major reason was the clear narrowing of options and preconditions for doing Arun. The donor community had put forward 40 conditions on NEA and the GoN as a requirement to finance the one billion dollar project in a country with an annual budget of the same amount. Their argument was that this single largest undertaking needed extraordinary commitment from the host country. The most problematic one was that outside investment plan, NEA could not even study a hydropower project of above ten MW without donors' approval. The donors' logic was that GoN had limited management capacity and thus could not afford to be distracted. From a risk management perspective, however, this was a terrible condition for the government to agree to. Clearly, if one did not study a project, one could never start building it. Studies of hydropower project take several years. Thus, it was clear, if Arun III had gone ahead, Nepal would have had no alternative projects in case serious problems were faced by the project.

The scenario with such narrowing of options is not limited in hydropower or in Nepal. It applies to all sectors where only one option is kept open and generally because of donor requirements. This is something that frequently happens in poor, donor-dependent developing countries. Donors require

you to undertake projects which have come only through their planning process and nothing else. But that quickly turns into a risky and rigid path. Melamchi Water Supply Project in Nepal is another big infrastructure project with a similar condition. While planning started around the same time as Arun III, its end of construction is not yet in sight. In the drinking water sector, therefore, residents in the capital Kathmandu have no choice but to wait for the tunnels to be completed after a delay of over ten years. Thus I make my case that if Arun III had taken place, no other option could have even been investigated and we would certainly have no private and public sector investors in case Arun III had the same kind of delays as Melamchi.

The third evidence is NEA's continuous unwelcoming attitude to the IPPs even today, which all developers sitting in this hall can attest to. If NEA had Arun III under construction, it would have had zero incentive to sign PPA with private sector developers. It may have signed PPAs with one or two large developers five or six years down the line. Without PPAs, no other projects could reach financial closure and be able to start construction. If PPAs are so difficult with NEA even today without Arun III, it is a fair assumption that they would have been impossible had Arun III gone ahead.

Given the unstable political climate in Nepal starting around the time Arun III was to commence construction, poor governance, and unsettling of everything around, large projects like Arun III could not have been constructed in time or within budget. The accessible and much less complex 70 MW Middle Marsyangdi project funded by KfW went two times over the design cost and took twice as long to construct as planned due to strikes, shutdowns, and delays in decision making. The Alliance repeatedly asked the World Bank: there are 6,000 rivers in Nepal; there are hundreds of other potential projects, why are you selecting the one project that requires a 120-km road to be constructed before the dam and tunnel could even start construction? The answer was that this had come out of a planning process and had been agreed with the government and donors. Therefore, they could fund Arun III, or nothing else.

It was better for Nepal that cancellation of Arun III avoided this straitjacket. The same delays and cost overrun of Middle Marsyangdi is happening to the Melamchi drinking water project today. With such a track record of implementing large projects in the country by the public sector, the delays and cost overruns on Arun III, with two mega projects back to

back, could easily have increased by a factor of five: Arun III was three times bigger than Middle Marsyangdi and did not have road access.

Conclusions

I have two simple conclusions: First, Nepal is now in a much better position for constructing Arun III than 20 years ago. As I mentioned, our argument had never been that Arun III should never be constructed. Our objection was to a scenario in which we would have trapped the country into a single development pathway for the next 15 years. Arun III had the risks common to those surrounding any project of its size and complexity. But such risks would be better borne if the country had several other avenues open. Second, it was important for alternative avenues to be opened for multiple projects to be constructed simultaneously by Nepali private and public sector companies. The developments which have taken place in Nepal after the cancellation of Arun III have meant that project risks are now being divided among many projects and institutions. Public resources should have been used to facilitate vigorous private sector development in the sector not to substitute for it as Arun III threatened.

The access road to the Arun Valley project site is now largely completed. There was a very strong argument in favor of the project that the people in the Valley would have at least gotten a road had Arun III gone forward. In these intervening 20 years, a huge number of mountain districts in Nepal have constructed roads as part of a natural development process. Having a road in place, development of Arun III makes more sense today. A more dramatic benefit to electricity consumers in Nepal is the reduced cost proposed by the new developer: billion dollar projected cost is now for a four and half times bigger 900 MW project. Arun III could be an attractive project if done in the right way. Local people are much more aware of their right and share of benefits from hydropower development than 20 years ago. They now look for benefit sharing beyond just mitigation of negative impact of project development. Arun III would provide significantly more dividends to the local population today than if it had been developed 20 years earlier. This is one set of conclusions.

The alternative approach articulated by the Alliance for Energy, to my mind, is well on its way to being realized. Nepal's hydropower sector is a dramatically more pluralistic sector than in the 1990s. The complementary public sector investments to support private sector investment into

hydropower have unfortunately not been forthcoming, although it is belatedly catching up. By the complementary public sector investment, I mean the investment in those projects that private sector will not or cannot do in a rational planning system: the public sector should erect transmission lines and other necessary infrastructures to support private sector investment into hydropower; secondly public sector investment is needed into large multi-purpose power projects which the private sector can't invest in. This has not happened so far. The alternative approach was an organic result of Nepal's economic development in the past 20 years and was not really supported by the government in a planned manner. Donors did not come through with investments to help mobilize domestic investments into hydropower; but, thankfully, the volume of remittance surprised everybody and saved not just the hydropower sector but the country as a whole during the years of conflict.

Biographical Note

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