

**Nepal and Hydropower:
What Will it Take for Nepal to Invest in Hydropower and
Develop Sustainably?**

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Introduction

The Central Intelligence Agency (CIA) lists Nepal as one of the least developed countries in the world.¹ Given the current energy crisis, Nepal has faced more challenges than ever to develop economically and socially. Therefore, one of the best ways to develop Nepal will be to help it to walk on the path of sustainable development by investing in hydropower.

Sustainable development is used as the process in which the present generation meets their own demand without compromising the ability of future generations to meet their own needs. Green energy is renewable energy available in nature.² In this particular case hydropower is one form of green energy.

The citizens of Nepal have been struggling in order to escape poverty and dependency on foreign nations' aid to be able to achieve a better life. There has been political and economic instability in the country for decades. Given the decades of instability and abject poverty, will Nepal be able to develop as a modern economy that reflects the principles of sustainability? The answer to this question will require one to deeply examine many factors. The current discussion looks at the economic problem and the challenges faced

¹ *CIA: The World Factbook*. <<https://www.cia.gov/library/publications/the-world-factbook/print/np.html>>.

² Robert W. Kates, Thomas M. Parris, and Anthony A. Leiserowitz.. "What is Sustainable Development?," *Environment* 47 (3) (2005): 3.

by women and children. The potential solutions of these two problems are derived with green energy, specifically hydropower.

Introduction of Nepal

Nepal is home to Mount Everest and it is dominated by some of the world's most imposing mountains. The nation is relatively small and 80 percent of its territory is occupied by the dramatic peaks of the Himalayas. The population of Nepal is 23.8 million, as of 2005, densely clumped primarily in the Terai and Hilly regions.³ Five percent of the population lives in the Kathmandu Valley, the urban areas of Kathmandu (the capital), Patan, and Bhadgaon. The nation is divided into three major topographic and ecological zones: the mountains in the north, the hills (containing some large valleys, such as Kathmandu Valley) extending across the center of the country from west to east, and a narrow strip of the low-lying Gangetic plain (terai) in the south. The Terai (plain areas) is now completely converted into agriculture production and serves as the breadbasket of Nepal.⁴

Currently, the country is now in a period of a deep crisis whose major components, driven by serious over-population relative to employment opportunities and ecological collapse. The ecological collapse is mainly caused because of overuse of land, where 30 percent of the cultivable land supports 60 percent of the country's rural population, and partly because of the elimination of other natural resources (e.g timber), both in the hills and in the plains.⁵ There will be growing food shortages, and consequently with the development of widespread unrest in both rural and urban areas,

³ Shanta Pandey, "Women, environment, and sustainable development," *International Social Work* 41 (3) (1998): 339.

⁴ Piers M. Blaikie, *Nepal in crisis: growth and stagnation at the periphery* (New York: Calerndon Press, 1980), 12.

⁵ Blakie, 14

which together will threaten the viability of the prevailing political system.

Finally, Nepal is a developing and a newly democratic nation. The problems this country is facing are incalculable, ranging from basic needs such as food and water to mass illiteracy and environmental issues. The following section looks into economic problem of Nepal.

Dependent Nation faces challenge to operate independently

Nepal faces troubling barriers to economic development. The country has been facing this problem for decades. Since the 1970s, Nepal has become a very poor country, which appears to be increasingly incapable to provide resources to its rapidly growing population. It was confirmed by the author of the book *Nepal in Crisis: Growth and Stagnation at the Periphery* that Nepal is in crisis and it will face and currently faces serious challenges when it comes to economic development.⁶

Dependency theory is used to explain and understand the root cause of the economic problem in Nepal. Dependency theory indicates that underdevelopment is a consequence of incorporation of a pre-capitalist system dominated by western economies and western powers. Bailkie argues that:

the case of Nepal is one in which apparent isolation and the maintenance of a non-capitalist economy and society within a formally autonomous state are specific consequences of Nepal's somewhat

⁶ Shallgram Pokharel. "Hydropower for Energy in Nepal," *Mountain Research and Development* 21 (1) (2001): 4.

exceptional involvement in the global political economy of capitalism.⁷

Blaikie also states Nepal was never a colony nor genuinely isolated from foreign powers to be completely an independent state. Nepal suffered from the very beginning and continues to suffer, mainly because of its inability to carry out its economic activities independently. Hence, there is economic stagnation. The economic stagnation is a product of its specific form of partial incorporation. There are two reasons for this: first as a semi colony of the British Raj and more recently within the political economy of India. The second is true even though Nepal has not yet formally lost its political independence.⁸

Nepal continues to rely on India for fuel and other resources. Research suggests there is always a gap between the energy demand and energy supply. This gap is somewhat bridged by importing petroleum products from foreign nations. From 1990-2000, the government spent more than 40 percent of its export earning on petroleum products.⁹ The other problem is the rising cost of petroleum prices and the natural resources.

At present, Nepal's demand for electricity is just over 350 Mega Watt (MW), while the current capacity from hydropower station is 250 MW- a mere 0.3 percent of the potential capacity. Only about 15 percent of the population have access to electricity.¹⁰ It is obvious that if the country does not have energy to operate, in this case energy to operate its industries, then the country will suffer and will fall into deep economic abyss. It is hard for the common people to develop professionally when they do not have access to electricity

⁷ Blakie, 188

⁸ Blakie, 188

⁹ Pokharel, 5.

¹⁰ Pokharel, 6

or energy to cook or light their house in the night. Hence the market lacks workforce. Furthermore, a nation cannot attract foreign entrepreneurs when it does not have energy to perform its daily activities. In this global competitive market, entrepreneurs are willing to invest where there is proper raw material and enough energy and workforce to utilize those raw materials.

The lack of energy will also will hamper the formation of new industries. This will decrease the number of new jobs available in the market for the growing working force. The increase in unemployment rate will have adverse effect in the society inevitably leading to decrease in the living standard and rise in crime rates in the society.

It can be concluded that the economic crisis will put the country into other crises; it may become politically and socially unstable. This is definitely a serious problem and the sooner it is addressed the better.

Special Concern of Women and Children

Women and children are one of the most important entities of any society. The health of a nation is directly correlated with the status of its women and children.¹¹ Therefore, this part of the discussion focuses to placate the suffering of women and children. In most developing countries, the household sector is still the largest energy consumer- and the poorer the country, the truer this is. Nepal is one of the poorest nations in the world, and the household sector of Nepal accounts for more than 90 percent of total energy consumption. The share of biomass fuels in the household sectors remains over 80 percent in Nepal.¹² The population has been rising in

¹¹ George Davey Smith. "Increasing inequalities in the health of the nation," *British Medical Journal* 309 (3) (1994): 2.

¹² Eliazabeth Cecelski. "Energy and rural women's work: Crisis, response and policy alternatives," *International Labour Review* 126 (1) (1987): 41.

Nepal as in many parts of the world. This leads to more deforestation and overuse of lands. Deforestation and desertification are two of the most serious consequences of this reliance on biomass fuels.¹³

Agriculture productivity falls when there is deforestation and desertification. The growing use of tree, crop and animal residues for fuel deprives the soil of recycled nutrients and thus reduces crop yields and also agriculture's capacity to support livestock. This creates the pressure on the family which usually encourages men to leave the land in search of rural work to support their family. This leads to reduced labor force for agriculture putting more pressure on women.

Furthermore, Nepal is conventionally a patriarchal society because of which women are largely responsible for subsistence food production.¹⁴ They are forced to increase their own labor inputs as productivity decreases and men migrate. Women usually do not migrate in Nepal due to social reasons. As quality and quantity of forest decreases, the level of water also relatively declines.¹⁵ Women have little choice but to work more and sometimes also use child labor to help them. When the deforestation increases, it impacts family nutrition and income which is provided by the land. It contributes to the vicious cycle of poverty in which the poor get poorer, specifically women suffer more.

One of the most important long term effects of deforestation is decline in agricultural productivity.¹⁶ This means more land must be brought under cultivation. Also to compensate for deteriorating land production women must spend more time working on it. Women are key workers in agriculture. They are responsible for 60 to

¹³ Ayhan Demirbaş 4. Şhin-Demirbaş, Ays, and A. Hilal Demirbaş. "Global Energy Sources, Energy Usage, and Future Developments," *Energy Sources* 26 (3) (2004): 191-204.

¹⁴ Elizabeth, 2

¹⁵ A S Mather, and C L. Needle. "The relationships of population and forest trends," *Geographical Journal*, 166 (1) (2000): 4.

¹⁶ Mather, The relationships of population, 7.

70 percent of output, working three hours longer than men each day.¹⁷ It is true that the hardest hit by the energy crisis and deforestation is rural women. The damage caused to the environment by women is insignificant.¹⁸ However, the damage caused to women because of environmental degradation is more because women are more exposed to smoke and low quality fuels, which also affects their health. The reliance on Biofuels can be decreased if there is an alternative form of energy, especially hydroelectricity.

The World Health Organization (WHO) examines the serious health effects of prolonged exposure to emissions from biomass fuels in the kitchen to recommend policies to alleviate the problems.¹⁹ Mostly, in developing countries like Nepal, women face enormous challenges in their daily lives when it comes to cooking food. As a result, children suffer from lack of proper food and care too. It is obvious that lack of proper food and care leads to health issues. When children do not get proper nutrition, it is very unlikely they will be interested enough to get formal education.²⁰ Education produces skilled human power and it is also a catalyst for political and social stability.

There are no doubts that economic problems and the problems faced by women and children are the two most challenging problems that must be addressed in Nepal. Investment in hydropower may present a solution at least in part to the economic problem and the challenges faced by women and children. The availability of a large volume of water, combined with steep slopes, offers the potential to develop more than 83,000 MW of hydroelectricity. This Himalayan nation, which is a sandwich between

¹⁷ *Greenwood Encyclopedia of Women's Issues Worldwide: Asia and Oceania*, s.v. "Nepal".

¹⁸ Cecelski, "Energy and rural" 6

¹⁹ R Martorell, J Leslie, and PR Moock. "Characteristics and determinants of child nutritional status in Nepal, *American Journal of Clinical Nutrition* 39 (1984): 77.

²⁰ Pokharel, 6.

India and China, would then not only become capable to meet its domestic demands of electricity, but could also export to its neighbors. Currently, Nepal is harnessing less than one percent of its potential hydropower energy.²¹

This discussion takes a three way approach in explaining why these problems in Nepal can be addressed if Nepal invests in hydropower. The economy of Nepal can be developed if there are policy interventions to promote hydropower development. Three approaches are conceivable.²² All the industry relies on energy and hydropower is one of the best ways to meet that energy.

First, a decentralized approach for a small scale project should be made. There are sites smaller than 300 square Km to generate up to about 1 MW of hydropower.²³ Pokharel argues that these small projects could also stimulate other sectors of the economy. It will involve local entrepreneurs and develop the economy from the grassroots level, which can be beneficial for the democracy and the state. Local projects will especially benefit women and children. Readily available energy resources, especially to fix meals, will decrease the work load for women significantly.

Energy is a very effective starting-point for addressing rural women's priority concerns with food, income and time preservation. The study done by the International Labor Organization shows that the pressure on women's time has greatly increased because of the growing scarcity of accessible wood fuel, together with the cost of production and income sources resulting indirectly from deforestation and desertification.²⁴ The electricity produced by the decentralized approach could be used to irrigate the lands, grain milling and such. It will also reduce the amount of work women have

²¹ Pokharel, 7.

²² Pokharel, 7

²³ Blaikie. 68.

²⁴ Ibid., 72

to put into agriculture. As a byproduct, women will be free to parent and pursue other goals.

It is important to understand that these approaches can manage energy demands and increase energy supply too. If there is grassroots participation, then these goals are achievable and will be highly successful. The policies that are made must consider the priorities of the consumers. It is possible both to manage energy demands and to increase family welfare through improved household fuel planning and cooking efficiently.²⁵

The second approach can be a centralized strategy for supporting medium scale projects. This approach will benefit both the industry and the service sectors. This can potentially assist in creating industries, construct infrastructure, and upgrade service sectors. This will create more jobs. Hence, it will also assist in the political and social stability of the society.

A medium scale project cannot be launched without skilled human power. This will lead the government and international donors to focus on the educational system of Nepal at the same time, further helping the country. The improvement of the educational system of Nepal will eventually benefit the whole nation in a broader range.

The third and last approach should be export-oriented, and this should be a large scale project. There are rivers of more than 1000 square km in Nepal and there is a market in Bangladesh and India for electricity.²⁶ Potentially, this project can also attract foreign entrepreneurs to invest their money further creating possibility of a broader market in Nepal. The income earned from exporting the electricity to two of its neighbors can be used to invest in sectors like education, health, social development, and infrastructure building.

²⁵ Ibid., 74.

²⁶ Aaron Wildavsky. "Why Planning Fails In Nepal." *Administrative Science Quarterly* 17 (4) (1972): 509.

Nepal will need funds to invest in all these projects. Nepal receives foreign aid for development as it is one of the poorest nations. Discussed in the next section will be foreign aid.

Geopolitics and International aid

Over the past decade the volume of aid to Nepal has increased substantially, the major aid donors being India, China, and the U.S.A.²⁷ The heavy dependence of Nepal on aid inevitably involves it in international politics, such as its physical location between India and China. The role of India and China in world politics ensures that pressures from outside which is often expressed through aid, are even greater than in the case of most underdeveloped countries in receipt of large amounts of foreign assistance. However, there are three problems associated with the strategic and political context of aid, regarding both the international interests involved and those of the ruling class within Nepal.²⁸ Hence, foreign aid has not been able to ameliorate economic condition and related crisis in Nepal.

Opportunity

The first problem of foreign aid is related to the determination of aid investment by strategic and political considerations, at least on the part of the major donors. The second is related to the uncertainty in the timing and nature of aid allocations from the many smaller donors. This process of aid collection and uncertainty related with it makes the problem of incorporating such foreign aid into the integrated long-term national planning framework immensely challenging.

Also, Nepal has suffered from civil war recently because of which it is in a weak position to demand greater control over the new sectional and regional allocation of resources from foreign aid. There is an indication in any case that the ability of the Nepalese state

²⁷ Blaikie. 95

²⁸ Lok R, Baral, *Nepal, problem of governance*, (Delhi: Konark Publishers, 1993), 485

machinery to handle such increased responsibility is at present insufficient.²⁹ Furthermore, the Nepalese bureaucracy itself lacks the mechanisms to maintain sufficient communication and cooperation between different departments.³⁰ This situation could, perhaps, be improved by greater willingness on the part of donor countries to integrate the projects and programs they wish to be implemented more closely with those favored by the Nepalese administration. It can be done through closer cooperation between the foreign experts and local planners, and a greater emphasis on technical assistance and human power training. Another suggestion is a greater willingness to channel aid thorough the available multilateral or international agencies.

However, even these two suggestions are unlikely to be incorporated for two reasons. Firstly, Blaikie argues that the existence of the conservative power structure in Nepal produces a bureaucracy which is by no means capable of implementing radical economic and social change.³¹ Secondly, is the fact that many donor countries face disadvantages of close co-operation with the relatively inefficient and cumbersome Nepalese bureaucracy? The inefficiency of Nepalese bureaucracy does not allow foreign donors to implement the project; related to Nepal's particular needs.

Foreign aid can provide financial and technical expertise vital to Nepal if it is to achieve any degree of economic and social development. Foreign loans and grants have met a large proportion of the cost of Nepal's development efforts.³² Therefore, proper scrutiny should be done before providing aid to Nepalese governments. The international community should provide training

²⁹ Krishna Bahadur Karki. "Greenhouse Gases, Global Warming and Glacier Ice Melt in Nepal" *The Journal of Agriculture and Environment* 8 (2007): 4

³⁰ Karki "Greenhouse Gases, 6

³¹ Ibid., 7

³² Ibid., 7.

and advice to the bureaucratic agents of Nepal. This will allow the Nepalese to properly allocate and utilize foreign aid. This will not only benefit the Nepalese population but will also make Nepal economically independent in the long run.

The donors should also understand that Nepal is weakest at the operating level.³³ It is understandable that planning for economic growth depends on a flow of well-conceived projects designed to increase national income. There is evidence that in poor countries well conceived projects are hard to find. The crisis of Nepal's present, Wildavbsky argue that it is fundamentally rooted in the failure of productive organization associated with economic and political underdevelopment.³⁴

Those in the higher level of the bureaucracy tend to have in common their connections with the capital. More than half the civil service is drawn from households originating in the Kathmandu valley (capital of Nepal) although that area contains only some 5 percent of the total population.³⁵ The concentration of high officials in the Kathmandu Valley is one side of the coin; the concentration among higher posts of individuals originating from the Kathmandu valley is other side. There exist important divisions within the bureaucracy that correspond to class divisions.

It reflects the inequalities prevalent in Nepalese society as a whole. But the perpetuation of privilege, patronage, discrimination, and regional inequality within the apparatus of state is particularly damaging to Nepal's prospects. In the absence of an open political structure and genuine popular participation, the nation as a whole will fail to plan and implement measures capable of preventing the coming crisis.

³³ Ibid., 7.

³⁴ Ibid., 7

³⁵ Ibid., 7

After the emergence of Nepal as a nation-state in the last quarter of the 18th century, the primary goal of the Nepali political system became the maintenance of the status quo, which meant the continuation of the delicate balance of power among the various elite families composing the Court.³⁶ Nepal needs to decentralize the power and let common Nepalese people actively take part in the political deliberation. The involvement of common Nepalese individuals is very important in the rationalization of the hydropower projects at all the levels. If Nepal is able to invest in hydropower, there are skeptics who argue that it is not feasible or sustainable because of the current environmental condition.

Threats to hydropower projects

The temperature has been rising as in other parts of the world. The increase in atmospheric temperature has direct effect in the melting of glacier ice in the Nepalese Himalayas.³⁷ When ice melts the water volume in glacier lakes rises and there is the potential for dangerous floods. There have been more than 15 of these floods in Nepal, occurring at frequency of one every two to five years, according to the Nepalese Department of Hydrology and Meteorology (DHM).

There have been cases when the floods have not only destroyed lives and property but also hydropower plants. There are 19 glacial fed rivers in Nepal with 3252 glaciers.³⁸ Tscho Rolpa is one of the biggest and potentially dangerous glacier lakes in Nepal. Scientists predict that an outburst flood would endanger thousands of lives and cost millions of dollars in economic losses. Rise in water volume beyond its capacity of the glacial lakes burst will release millions of cubic meters of water and take millions of lives and properties downstream. If this continues there will be no more ice

³⁸ Pokharel, "Hydropower", 1.

left in the Himalayas and in the long run all the rivers of Nepal will go dry and the country will face serious water shortage for drinking, irrigation and other purposes. Eventually, according to scientists, the Himalayan glaciers will shrink so much their melted waters will dry up. Catastrophes like flooding will die out. At the same time, rivers fed by these melted glaciers will turn to trickles. There are several studies conducted and still running in Nepalese glaciers such as British, Germans, Japanese and Norwegians. They warn that there is short-term danger of too much water coming out of the Himalayas and greater long-term danger of there not being enough. Even worse, when Nepal's glaciers melt, there could be no water to drive the plants.³⁹ The region faces losing its most dependable source of fresh water. It is pinpointed that the cause is global warming.

One of the ways to mitigate global climate change in Nepal can be done by using hydroelectricity. When the country starts to use renewable energy like hydroelectricity, there will be less deforestation and desertification. The industries and service sector can use electricity instead of fossil fuels. If Nepal will not provide alternate form of energy via hydroelectricity then the deforestation and desertification will increase, leading to more environmental degradation. It is not only logically right to invest in a hydropower project but also ethically the right thing to do.

Given the political and social context of the decision, utilitarianism is used to defend the investment in hydropower with addition of caring for the underprivileged. It is in the best interest of greater numbers of Nepalese citizens and the neighbors to invest in hydropower. All the citizens of Nepal want a harmonious and prosperous life as the citizens of any part of the world. Albeit, it is true that one's particular way of life can be different from others but everyone will like to be happier in life. Therefore, the entire Nepalese

populations including the elite and political leaders have the same reason to use the hydropower.

The utilization of hydropower is not only ethically right which will produce the most good but it is also the best means to an end. Nepal has no other better natural resources to uplift itself from its economic and social problem. Furthermore, this course of action will not only benefit the greater number of people but will also benefit the poor people and its neighbors.

Conclusion and Implication

Nepal has been facing an energy crisis for over a decade. The energy crisis has adversely affected the socioeconomic development of Nepal. It will be prudent for Nepal to invest in green energy (Hydropower). Nepal has the potential to generate 83 MW of electricity and currently it generates less than 1 percent of its potential.⁴⁰ It is imperative if Nepal wants to utilize the full potential of its hydropower a fundamental change in the political system of Nepal is necessary. This fundamental change will not only improve the socioeconomic condition of Nepal but it will make Nepal a stable and prosperous nation. Nonetheless, investing in hydropower is sustainable and environment friendly. It will enhance the political image of Nepal in the world.

It is an ambitious goal for a poor and politically unstable Nepal. However, proper assistance and financial aid from the international community can help Nepal achieve its goal in the near future. This paper provides an insight to political leaders, economists and other social activists who want to see Nepal become a peaceful and developed nation. The state has lost its economic direction for decades and a new democratic Nepal has yet to free itself from the stranglehold of past economic policies and their aberrations. It will be premature to be confident of any radical measures.

There is no doubt that Nepal's new rulers would have more challenges ahead. The economic problems it faces are heightened either by natural conditions, lack of management or by the emerging global and regional economic trend.⁴¹ The process of nation building, in this case for Nepal to be able to invest in hydropower is one of the most crucial tasks faced by Nepal. At this stage, interest should necessarily be centered on the development of political institutions capable of achieving this basic goal. There seems to be at least three basic prerequisites in any country, no matter how developed or underdeveloped, for the effective implementation of nation building programs. These are⁴²:

1. Rationalization of the political process in conformity with the circumstances, needs and history of the country.
2. Rationalization of the problem solving administrative machinery;
3. A sense of national unity and solidarity.

The success or failure of political development in a country can be judged by its capacity to establish these prerequisites on an enduring basis. It is especially useful for Nepal when it considers investing in hydropower.

⁴¹ Baral, 200

⁴² Ibid., 516

Further Study

It is imperative to study how investing in hydropower will be able to alleviate other problems of the country such as the unemployment rate, poverty, social discrimination, etc. It is also important to understand what it will take for Nepal to improve its foreign policy. What will be the ecological affect of building dams in the Himalayas of Nepal? Is there a way to use smart grid systems in Nepal to use electricity in a more efficient way?

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