

# Dynamics of Making of Large Dam: An overview of Benefits and Challenges

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## **Abstract**

*Worldwide debate concerning large dam is remarkably a complex issue in development field. It becomes more complex because the issue is not only confined to planning, designing, and development of dams but also embraces a series of social, cultural and environmental aspects besides human being's desire and aspiration of progress. It is obvious that large dams are constructed to generate numerous benefits such as hydropower electricity, irrigation and flood control, increased water supply that eventually brings comprehensive benefits to the society, culture and nation as a whole. In the pursuit of development of Nepal, it is an established fact that hydropower remains the most important resource which has a huge potential to contribute for the energy demand as well as a better social and economic status of its citizen that ultimately lead to accelerate the economic growth of the country. Nepal has received tremendous support from many developed countries and various institutions for the construction of large dam with a purpose of producing hydropower. This paper seeks to analyze the various aspects and impacts of large dam construction with reference to the displacement and resettlement of the evicted people.*

**Keywords:** Dam Construction, Displacement, Resettlement, Benefits, Challenges.

## **Introduction**

Construction of large dams to generate various benefits have been very instrumental during last century for developed as well as developing nations as the advantages of large dams were realized since long. International Commission on Large Dams (ICOLD) states that dam measuring 15 meters or above from the foundation to crest is considered as large dam, however it is also considered that even the dams of 10-15 meters may also be considered as 'large dams' provided that they meet the following requirements such as length of crest should be over 500 meters, reservoir should have capacity of at least 1 million cubic meters, and maximum flood discharge should be of 2,000 cubic meters per second (McCully, 1996). Globally, the number of large dams built till 1950 were counted approximately 5000 (ICOLD, 1998) whereas by 2000, this number increased over 45,000 which was spread in more than 140 countries (ICOLD, 1998). The process of dam construction shows that, on an average, two large dams were built per day in the period of last half century (WCD, 2000). Today, the number of large dams exceeds 50,000 (Berga et al., 2006).

The large dam era started in 1930s and successfully expanded over the period of 1932 through 1960 in the United States. During the period of 1930s which is known as the time of Great Depression, building large dams was considered as a great achievement in the sense that it was perceived to be a source of job creation, financial security for farmers as it provided irrigation for agricultural lands and also provided continuous water supply to meet the demand, generated electricity etc. Prior to 1970s, large dams were regarded as a symbol of human achievement and economic progress. After becoming independent in the post world war II, many countries in Africa and Asia embarked on their development programs which included construction of large dams such as Aswan Dam in Egypt and Sudan, Volta Dam in Ghana, Kariba Dam in Zambia and Zimbabwe and Kainji Dam in Nigeria. At the same time in Asia, dams such as Bhakra and Hirakud were built in India. The then Prime Minister of India, Jawaharlal Nehru, remarked dams as the 'new temples of modern India'. Similarly, President of Egypt, Gamal Abdel Nasser, viewed Aswan as a symbol of post-colonial development shedding Egypt's colonial past (Biswas & Tortajada, 2001).

### **Dam Construction: Displacement and Resettlement**

Construction of large dam confiscates a large amount of land, as a result, great number of people have been and are being displaced involuntarily. Such displacement changes the living pattern and livelihood status of the displaced people.

Development Induced Displacement and Resettlement (DIDR) is the physical displacement and relocation of people in the event of large scale development projects such as dam's construction and construction of mines (Robinson, 2003). At the fundamental level, DIDR resistance is a discourse about people's right. DIDR is also a byproduct of development projects such as dam construction, other urban development projects but it mainly serves the vested interest of developers (Cernea, 1994). Developers tend to construct and operate sophisticated infrastructure that aims to contribute for growing economy. DIDR has incognito effect of such development projects on the individual and society at different level. The constituent of affected society losses basic roots of originality for the success of project, thus adequate focus on DIDR must be taken into consideration. It may be argued that development projects provide locals with project related jobs, but most of these jobs are short termed that normally last till project implementation stage thus these jobs are not sustaining (Cernea, 1997). Many people who are involuntarily displaced to clear the way for development projects are mostly affected by poverty even before the implementation of such development projects. These displaced people are subjected to marginalized economic situations and eventually a great struggle for better life options. To come over this inflicted situation and improve poverty related problem, they work hard and seek life opportunities at different places.

Resettlement process may not always be progressive. Failure to incorporate the fundamental needs and priorities of the displaced population can result in serious economic disorder and social disharmony. The experience of various such development projects which require land confiscation has shown that people displaced from their traditional homeland go through series of psychological trauma and material problems in the process of resettlement. Displacement or involuntary relocation of people has

come to be acknowledged as the critical negative impacts of large water resources development projects such as dams (WCD, 2000). Critiques at times compare and overshadow the positive aspect of development, in relation to the negative impact caused to numerous populations who are forcefully displaced and are compelled to be resettled. The Indian Government cancelled as much as US\$450 million loan for a vast irrigation and hydroelectricity project at Narmada River to be given by the World Bank. The main reason for cancellation of such a huge economic support was due to the project's failure to meet the World Bank's environmental and resettlement standards. In 1993, New York Times reported that for many environmentalists, dam was a symbol of misguided support of heavy-handed development projects that sometime do more harm than good.

On the other hand, the efficacious impact of large dams and inter-basin transfers could benefit people including poor at national, regional and local levels (World Bank, 2004). Report by the World Bank (2004) argues that although some past experiences with dams have been unpleasant, their stigmatization as 'unnecessary and destructive' is extreme and wrong because in many developing countries both management improvements and priority infrastructure have essential and complementary roles in contributing to sustainable growth and poverty reduction (World Bank, 2004). One advantage of dam and the reservoir is that reservoirs can store water during times of low demand and then quickly start generating during the peak hours of electricity demand (McCully, 2001). To liberate the potential of developing countries, application of technology like building of large dams has made an important and significant contribution to human development (WCD, 2000).

### **Large Dam: Resistance and Dynamics of Displacement**

In global sphere, the initiation of opposition and resistance to the construction of dams gained momentum only after 1950s. Prior to 1950s resistance against dams demonstrated by affected groups was often suppressed by the state and was overlooked by national and international implementing agencies. As the process of dam construction accelerated after World War II, group of people being affected by dam construction started organizing themselves to raise voice for their problems (WCD, 2000).

State mainly focuses on development venture by incorporating public and private capital, while depriving the rights of vulnerable peoples who are in need of resettlement (Smith, 2010). With the promulgation of 1948 Universal Declaration of Human Rights (UDHR) by United Nations, the voice of dam opponents became profound, as it provided them a space to make claims for their fundamental rights (Clark, 1999).

Human rights groups have challenged the idea that national purpose can continue to be taken at face value. They question whether decisions taken through techno-managerial forms of Cost-Benefit analysis should be set as priorities rather than other standards of judgment such as distributive justice, right to adequate livelihood, or the right to human dignity (Colchester, 1999).

In this perspective, the Narmada Bachao Andolan has been one of the strongest movements of all times against 'environmentally destructive' development. The Narmada Bachao Andolan is a rural social movement which opposes the displacement due to dam

construction along India's Narmada River, ditto is the struggle within the Sardar Sarovar and Maheshwar dams. Narmada dam is a case of development project which is both directly and indirectly causing environmental displacement on massive scale (Baviskar, 1995). The anti-dam movement spearheaded by Narmada Bachhao Andolan played a major role in drawing attention to the problems associated with large dams and is giving a voice to the oustees (Dreze, Samson and Singh, 2002). These cases show that local people have intervening capacity to raise their voice to meet their demands which has forced the project to reconsider local people's voice.

The Andolan has successfully associated with the agencies working in the area of environmental and agricultural field into the scope of their struggle. This struggle has led to the formation of social movement networks by making a collective identity to speak for displacement. Narmada situation highlights significant contemporary issues concerning development policy and implementation and thus provides a rich and complex case study concerned with economic development, sustainable development, cultural traditions and human rights. The case of Narmada challenges our assumptions about the criteria by which a state balances the needs and interests of various populations, the means by which social and environmental costs are weighed against the projected economic advantages of large-scale development projects, the degree to which the interest of so-called tribal or indigenous people and marginalized groups should receive special consideration and ultimately the definition or paradigm of development itself. The final result of this is environmental degradation and constrained economic development (Baviskar, 2004).

Prohibition of arbitrary displacement includes displacement in the cases of large-scale development projects which are not justified by compelling and overriding public interests (United Nations, 1998). Cernea (1993) proposes this justification in response to the ethical problems of displacement. He argues that incidents of development induced displacement are morally justified so long as the displaced persons are left no worse off than they were before the development project (Cernea, 1993). The displacement of the tribes and other persons would not per se result in the violation of their fundamental or other rights. The effect is to see that their rehabilitation at new locations is better off than what they were before. At the rehabilitation sites they should have more and better amenities than what they enjoyed in their tribal hamlets. Nevertheless, a gradual assimilation in the main stream of the society is expected to their betterment and progress which will enhance the economy of the nation side by side.

After multi-year study of development induced displacement by World Commission on Dams, it concludes that impoverishment and disempowerment have been the rule rather than the exception with respect to resettled people around the world (Leopoldo, Bartolome et. al, 2002). The dismantling of community structures and social organization, dispensation of informal and formal networks and associations are thus a massive loss in terms of social capital (Cernea, 2007). These are some possible consequences that can diminish the quality of human life. Poor, indigenous peoples and other marginalized groups are increasingly choosing to resist to DIDR in the event of displacement with the hope that it will prove more effective in protecting their long term interests (Fisher, 1999). The above observations suggest that various human rights groups have challenged the

idea to continue national development by development of people, by raising the question that decisions taken through techno-managerial way based on cost and benefit analysis is feasible in the long run but social components such as distributive justice, right to adequate livelihood, right to human dignity and a care for environment and ecology are seriously needs to be considered.

### **Large Dam Construction: Resettlement in the Course of Action**

The World Bank and other investors which used to finance capital and technology for conducting feasibility studies, planning processes and implementation of dam construction projects left the resettlement responsibility upon the country borrowing the funds (WCD, 2000). It was only after 1977 that the World Bank came up with a policy on dam safety and later in 1980 it adopted a policy to address issues on involuntary resettlement. This policy was further upgraded in the year 1986, 1988 and 1994 based on the research findings and the lessons learned from different cases by various scholars accompanied with the pressure from human activists (Cernea, 1996). The World Bank's safeguard policy emphasizes on minimizing the projects that cause involuntary displacement to the possible extent. However, in a condition where displacement is unavoidable, it stresses on sustainable resettlement planning. It also thrives on participation of displaced communities and host communities in resettlement planning. Substantial assistance for the resettlement of project affected is incorporated into the policy.

Large scale project creates a vicious cycle of capital accumulation by sanctioning big loans for projects which are amenable to international bidding by multinational firms regardless of environmental, displacement, human rights, and project utility concerns (Ploeg & Vanclay, 2017). The capacity of large dams to generate benefit has taken central stage controversy in the drama of 'hydro-politics' (Gupta, 1998). Widespread of larger scale construction including large dams in modern times in an inadequately controlled manner forced the societies to confront the acute and chronic threats which have become common phenomena (Cohen, 1997). The struggle against displacement becomes more complex considering losses of productive resources, inadequate compensation, changed relationships with community and the environment, non-compliance with commitments made by project authorities, violence from host populations, and disrespect for local culture and indigenous knowledge. The question of this disagreement can be resolved if the concerned authority clearly defines the position of relocation of people, compensation and environment regulation measures and set a clear roles and responsibilities to avoid uncertainties and agrees to carry out supervision and monitoring.

So far social and cultural misery are concerned, Cernea (1995) has categorized five major social effects of dam construction which are, first, forced population displacement and impoverishment as the hydroelectric dam is the only dam that displaces a higher number of people, second, boomtown formation along constructions site, third, encroachment upon the local culture by outsiders, fourth, unanticipated changes in agro-production systems, and fifth, loss of cultural heritage assets which are of significant historical importance. Cernea (1995) asserts that the probability of these effects producing serious consequences is higher in weakly or unplanned resettlement.

The constructing authority should also be cognizant enough to preset the roles of the local counsels as because local actors play a role in strategizing and determining outcomes towards their favor (Rai, 2005). Oliver-Smith (2010) has contended that internal differentiation, a multi-faceted relationship to the immediate environment and the state, the availability of local and non-local allies and the quality of the resettlement process itself are crucial factors in assessing why people resist DIDR.

It must be pointed out that treating resettlement as a way of getting people out of project areas and out of the way of projects as quickly as possible has proved to be the cause of untold human misery (Cernea, 1996). It has been observed that different displaced populace is affected differently by various risks in severity, and thus all the risks may not be present in all DIDR projects (Cernea, 1996). More recently, Dwivedi (1997) has significantly contributed several refinements to the approach, particularly regarding resistance by elaborating on the social and political dimension of risk. Drawing on Beck (1992), he approaches risk as 'a subjective calculation of different groups of people embedded differentially in political-economical and environmental conditions'. People in different structural positions define risk differently, however their risk calculations are also affected by cultural norms associated with legal and policy frameworks for compensation (Dwivedi, 1997).

As noted by Cernea (2000) development projects require already occupied land and thus involve varying degrees of forced resettlement for the implementation of the projects, the occupants of these lands are forcibly evicted with or without compensation. Displaced people are supposed to receive compensation of their lost assets and also effective assistance to reestablish them productively, yet this does not happen for a large portion of ousted (Cernea, 1996). National laws determine compensation procedure of land taken but most of the time it is inadequate. Moreover, many indigenous groups consider themselves to be the sovereign peoples of their territory and suffer the veto power of development projects on their lands (Colchester, 1999).

The Impoverishment Risks and Reconstruction (IRR) model deconstructs the process of resettlement and reconstructs a set of definable risks-reversal activities which is able to transform from landlessness to land-based resettlement, from joblessness to reemployment, from homelessness to house reconstruction, from marginalization to social inclusion, from increased morbidity to improved health care, from food insecurity to adequate nutrition, from loss of access to restoration of community assets and services, and from social disarticulation to rebuilding networks and communities. Redressing the imbalance caused by displacement and enabling affected people to be a part of benefit sharing is imperative on both economic and moral grounds. Socially responsible resettlement is genuinely guided by an equity compass which counteracts lasting impoverishment and generates benefits for both local and national economy. Yet, much too often, those who approve and design projects causing displacement are deprived of an 'equity compass' that can guide them in allocating project resources and preventing or mitigating the risks of impoverishment (Cernea, 1996; 1988; Scudder, 2011).



To undertake the challenge of balancing the dam crest and the social interest should be a beforehand strategy for any construction. Dam construction has extensive different long-term and short-term effects in the local communities, which may comprise shifting cultural, political, social, economic and ecological structures. Similarly, it directly and indirectly invites various challenges owing to traditional lifestyle and livelihood, indigenous knowledge and technology, socio-cultural trauma and social pressure, forced change and cultural crisis and impact on natural ecosystem and bio-diversity as well. It may also be political issues of development as well as questions of local displacement, use of compensation, process of resettlement, emergence of elite power, marginalization of local people, donor complexity etc. Sometimes, dam development dominates various social surroundings and excludes numerous other aspects. This illustrates that large-scale dams are in inconsistency with other social and cultural areas. The guiding principles on development suggest that where there is pre-indication of irreversible damages to the society or environment, such projects should take an anticipatory action to avoid any harm as such. Rather than only trying *ex-post* to mitigate adverse social impacts after they happen, it is much more effective to predict the social risks in advance, to recognize them transparently, and do *ex-ante* preemptive social-economic planning (Cernea, 2000).

In an attempt to sideline the possible loopholes of the displacement problem, measures such as allotting additional entitlement to titled landowners who have suffered losses is mandatory. Providing support for lost property and assets and managing a productive re-establishment needs to be adopted. It is important that satisfactory approaches are effectively implemented to ensure that communities and people are replaced in equivalent positions before land acquisition. Prerequisites for this are appropriate legal frameworks, capacities for its implementation, good governance and adherence to the rule of law.

### **Large Dam: Major Benefits**

In twentieth century large dams stood as a symbol of development and progress of the nations. It is assumed that dams became synonymous with progress, modernity and development. As a most significant clean and renewable energy alternative, hydropower has number of socio-cultural and economic advantages. By the end of the 20th century, approximately 45,000 large dams which are higher than 15 m, with a total reservoir surface of about 500,000 km have been constructed in the world, mainly for irrigation, hydroelectricity and as drinking water reservoirs (Gleick, 1998; WCD, 2000). Dams provide a major contribution for the economic development of nation, development of rural communities and are often considered as sustainable, e.g. 'sustainable hydropower' or 'green hydropower' (Truffer et al., 2003, Bratrichet et al., 2004). Thus, hydropower constructions are incorporated in adaptable development agenda with the strong assumptions of multiple benefits and potentialities. Normally, construction of dam and reservoir brings many outcomes with numerous benefits that helps in social well-being, energy generation, household water utilization, drinking water supply, irrigation

for agriculture, flood control and other livelihood benefits and tourism and recreational opportunities. So, it is obvious that large dams are appreciated for being a successful technique to utilize water resources for multiple uses and benefits. It can be said that hydropower development is a key energy priority in developing countries including Nepal for societal well-being and national progress.

Large dams provide a range of benefits such as electricity generation, irrigation for agriculture, urban water supply, flood control, tourism and recreational opportunities etc. As Scudder, 2005 has identified that large dam supply up to 20 percent of global electricity and also provide irrigation water for 15 percent of global food production. Similarly, about half of the world's large dams were built primarily for irrigation, many of them in Asia in the process of spread of Green Revolution (WCD, 2000). Today large dams are estimated to contribute directly to 12-16 percentage of global food production (WCD, 2000). Without a shadow of doubt, it can be said that large dams have played a vital role in economic growth of nation as well as social and cultural development of people.

### **Large Dam: Key Challenges**

Despite the fact that large dams generate great benefit to mankind it also present a series of complex challenges and negative impacts. Large dams have caused fragmentation of 46% of the world large river's basins which has resulted in extinction, threatening and endangerment of 20% of the world's fresh fish species combined with the displacement of 40 to 80 million people worldwide (WCD, 2000).

Large dam construction was in apex during the period of 1970s, when approximately three large dams were constructed with a large investment everyday throughout the world with the assumptions that it will result in poverty reduction and local development. These hydropower dams also cause negative impact on people's livelihoods, cultural practices, ecological settings, natural balance etc. Large dams have created unforeseen social, cultural and environmental stigma that could not be measured. Thus, in latest decades constructions of large dam, despite its benefits have become trapped in serious disagreements and inquiries to consider its various positive and negative aspects. Construction of large dams became an increasingly controversial issue, particularly after 1985 (Biswas, 2012, Dixon et al., 1989), this dam controversy and anti-dam movement emerged as a result of growing awareness on the social and environmental impacts of dams during this period. In 1984, environmentalists namely Edward Goldsmith and Nicholas Hildyard published a book titled 'The Social and Environmental Effects of Large Dams' which was the first of its kind to argue against large dams and has inquired upon the negative impact of large dams deeply, it helped to gain momentum to launch international anti-dam movement (Goldsmith & Hildyard, 1985, McCully, 1996).

During 1980s to 1990s there was a hot discussion about the large dam controversy and it consequently started anti-dam movement. Since 1980s, large dam developments have often been controversial due to their social, economic and environmental costs (Goldsmith and Hildyard, 1985, WB, 1996, McCully, 1996). Non-governmental organizations started



linking the social and environmental costs in the aftermath of dam construction related to socio-economic condition, human health and human rights (Scudder, 2005) as a result an international anti-dam movement emerged which played an important role in redefining and enforcing new policies by the World Bank on environmental assessment, resettlement, rights of indigenous people and information disclosure (McCully, 1996).

Different complexity arises in the process of pre-construction, construction and post-construction phases, out of many complications, the problem of displacement and resettlement remains the most important issue that needs to be addressed systematically. Nevertheless, dams have also worsened the living standards of people, especially those who are living in the immediate dam area and its surroundings (Cernea, 2000; Scudder, 2006; Weist, 1995 as cited in Koirala, 2015).

## Conclusion

In this modern era, development activities are largely responsible to bring about social, cultural and economic change. These development interventions execute many direct and indirect influences on the life of people. Most of large developments projects have constructions involve in it one of them is dam which is often launched in rural area. These projects happen to displace people in the process of construction which has varied impact on people displaced. Dam construction for hydropower requires confiscation of large land and eventually the displacement of large number of people. It could transform some lives for better and worse for others. Construction of hydropower not only results in technical and physical alteration of the place but its domino effects can also be seen on people as they opt for a new resettlement strategies. Development intervention leads to displacement of people to new places, where the desires, objectives and aspiration of the migrated people gets changed. Their connection with outer world increases which result in more productivity and opportunities, new services and business skills, better scope of life and new social relationships and enhance people's thinking capacity.

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