

# HYDROPOWER PROJECTS: GENERATORS OF ENERGY AND HARBINGER OF SOCIO-ECONOMIC DEVELOPMENT— A STUDY OF NATIONAL HYDROELECTRIC POWER CORPORATION ,TEESTA V PROJECT IN EAST SIKKIM

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## **Introduction**

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Down the ages, rivers have been the basin of human development. They have provided man water, fertile soil, aquatic flora and fauna, and given them reasons to bind together in a social formation. Several great human civilisations took shape on riverbanks.

The development of hydropower projects on high-gradient rivers has added a new dimension to the virtues of rivers. They have helped in the development and progress of far-flung remote areas in hilly terrain. The bonus, this development

has no price attached to it. The energy generated through this mechanism is eco-friendly and extremely reliable. On these scores, hydropower easily outscores other forms of power generation sources, viz., thermal or nuclear power plants.

Wherever a hydropower project is constructed, questions are often raised about the changes in the environment it might bring. Admittedly, any major infrastructural development ushers in a number of changes. While some changes may be detrimental, there are many more of the beneficial kind. The negative changes in the environment brought on by the hectic activity at the

construction site are at worst temporary, whereas the benefits of such projects bring to the well-being of the native people, state and the nation last for several decades.

National Hydroelectric Power Corporation (NHPC) is a major force in hydropower development in India. Formed in 1975 to harness the vast hydro potential of the nation, it has a mission to generate clean, cheap and quality power for the development of the country. It has a clear objective— while aiming at progress, it would not deprave the ecosystem.

Since its inception, this corporation has generated 123153.55 MW of electricity up to March 2005. With the manpower of 13,000 behind an installed capacity of 2755 MW, 10 power stations and 32 generating units, it is committed to provide cheap and clean power for the socio-economic development of the nation.

The corporation has taken up numerous projects in remote, hilly areas of the country and brought about a major development and improvement in socio-economic milieu of these undeveloped areas. In the recent years, it has designed and made operational a number of hydro projects in Sikkim, Arunachal Pradesh, Jammu and Kashmir, Himachal Pradesh and Andaman and Nicobar Islands.

The most obvious limitation of hydropower development is the loss of land—the habitat of people, plants and wildlife due to submergence. However, most modern day projects do not cause any large submergence, as they are run-of-the-river type, which require a small storage, equivalent to a few hours of running.

The advantages of hydropower over other energy sources viz. thermal power and gas-generated power are manifold:

1. Hydropower is renewable and non-polluting source of energy. It helps in conserving scarce fossil fuels.
2. It has an inherent capability for instantaneous starting, stopping, and load variation. It thus helps in improving reliability of power system and optimising the resources.
3. Operates on high efficiency (about 90%) and low operational cost.
4. It makes a sound choice for meeting the peak energy demand.
5. It enjoys a longer useful life.
6. It helps in opening up of avenues for development of remote/ backward areas.

### **Role in Socio-economic Development**

NHPC is an organisation with assets worth ₹ 70,000 crore and an authorised share capital of ₹ 15,000 crore. It earned a profit of ₹ 694 crore during financial year 2004-05. Apart from generating the cheap and clean hydropower, it has been contributing to the overall socio-economic growth of the undeveloped remote hilly terrains of the nation.

The progress it has brought about in states of Jammu and Kashmir, Himachal Pradesh, Sikkim, Arunachal Pradesh and Uttranchal has been remarkable. Each of its projects brings in a spate of developmental activities for the region, state and nation.

The socio-economic development that ensues in various direct and indirect ways is tabulated here.

## Direct Benefits

### 1. Employment Generation

The NHPC directly employs 13,000 men and women for construction, operation and management of power stations. It also engages a number of construction agencies to carry out its projects. These, in turn, provide huge employment opportunity to the locals.

### 2. More Energy to the Beneficiary State

NHPC has been providing 12 per cent free power to the beneficiary states, which they can use for their consumption or sell it to

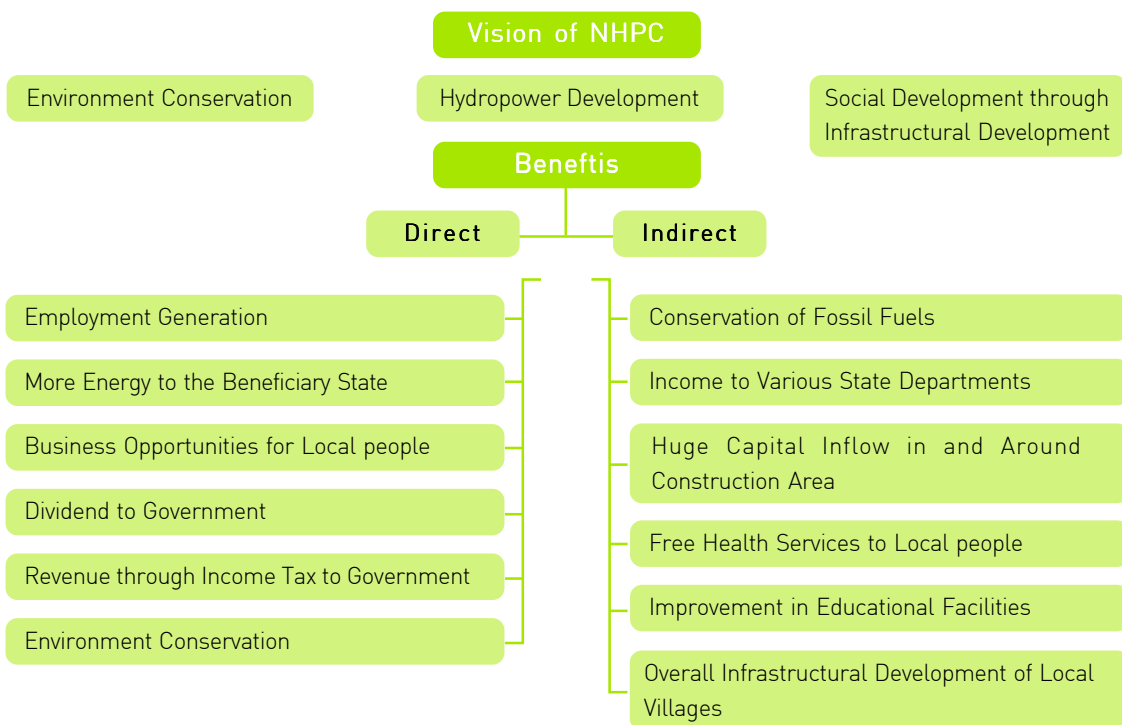
industries at cheaper rate for encouraging industrial development in the state. Small states like Sikkim and Uttranchal have the potential of becoming the richest states in the country just because of their immense promise to generate hydropower.

### 3. Business Opportunities for Local People

NHPC has been providing local people opportunities to be a partner in the development by giving them business openings.

### 4. Dividend to Government

NHPC being Government of India Enterprise pays a considerable dividend to the exchequer



as a part of its profits. During the current year, it has paid ₹ 150 crore as interim dividend to the Government.

## 5. Revenue through Income Tax to Government

NHPC has been contributing to the economy of India by paying huge corporate taxes, which, in turn, are used for the development of the nation.

## 6. Environment Conservation

NHPC, since its inception, has been committed to the sustainable development of the nation by protection of environment along with improvement in environmental quality through comprehensive environment management programmes viz., compensatory afforestation, catchments area treatment, green belt development, reservoir rim treatment, and wildlife and fishery management plan.

## Indirect Benefits

### 1. Conservation of Fossil Fuels

One of the most important indirect benefits of massive hydropower development initiative taken by NHPC has been the huge reduction in use of non-renewable and scarce fossil resources for the production of fossil fuel based energy. The way NHPC has taken up hydropower construction in entire India and successfully completed projects in scheduled time even in the hostile terrain of Andaman and Nicobar, everybody has started to believe now that developing the hydropower is not so difficult. Due to these efforts, even the conventional thermal power developers have

forayed into the area of hydropower development. This should go a long way in conserving the scarce fossil fuel resources of the country.

### 2. Income to Various State Departments

States, where NHPC has gone into operation or is constructing hydropower projects, are getting huge revenues because of various state taxes, royalty and developmental boost it gives to the infrastructure. The Sales Tax department, Forest department and Transport department (hiring charges of vehicles) are the major beneficiaries. These revenues come useful in the development of that state.

### 3. Huge Capital Inflow in and Around the Construction Area

During the construction of its hydropower projects, NHPC pumps up huge money in and around the project area. Since hydropower construction is labour intensive, much of the income of the labourers and contractors, and the employees of NHPC is spent in the project area to meet their daily requirements. This leads to an indirect addition to the income of the state.

### 4. Free Health Services to Local People

NHPC has been making its medical facilities available to the local people living in the surrounding area free of cost. Even the medicines are distributed free of cost to the extent possible. This becomes a major benefit, since most of the areas where the projects are coming up are in such remote areas that regular medical facilities are not available in routine to the locals. In places like East Sikkim where Teesta-V Project is being constructed,

NHPC is providing on an average free medical services to more than 1,500 local people each month.

**5. Improvement in Educational Facilities**

Similar to the health facilities, NHPC has been developing the educational facilities in the project areas and local children are also getting benefited from this. The ladies welfare associations of NHPC have been opening and running various *anganbari* and adult education schools in project areas.

**6. Overall Infrastructural Development of Local Villages**

Due to the massive shift of man and material that hydropower projects require,

development of infrastructure like roads, bridges, communication facilities become a necessity. This has become a boon for the native people. It has permitted a better connectivity of the remote areas, and as a result, local people are getting an opportunity to join the mainstream of development.

The activities related to development and operation of hydropower projects benefit the locals in a number of ways, while boosting the economy of the region, state and the nation. This can be explained easily if the activities of the hydropower development are listed vis-à-vis the benefits and overall impact (see table).

**How Hydropower Projects Benefit People and Society**

	<b>Activities</b>	<b>Beneficiary</b>	<b>Impact</b>
When the hydropower project is under construction	Employment generation	Local people (primarily in unskilled and semi-skilled category)	Enhancement of local economy
	Business opportunities	Local people (due to increase in demand of man and materials)	Enhancement of local economy
	Revenue to the state departments	Local people (since the funds shall be invested in the State)	Development of the State
	Dairy and Poultry development	Local people (to cater to the requirement of NHPC employees, labourers and contractors' staff)	Expansion of local economy
	Vegetable farming	Local people (to cater to the requirement of NHPC employees, labourers and contractors' staff)	Expansion of local economy
	Infrastructure development viz., roads, bridges, communication facilities, etc.	Local people	Better connectivity leading to socio-economic development of the region

	Development of medical facilities	Local people	Improvement in the health status of the society
	Better educational facilities	Local people	Improvement in the literacy levels
When the project becomes operational and begins to generate power	Power generation	Several states connected to the grid which receives the power from the project	Industrial development in the neighbouring states
	Free power	State where the hydropower project is constructed	Boosts state economy through industrial development

## Social Impacts

Social impacts due to the projects are mainly positive and beneficial. The negative impact is displacement of people due to acquisition of land for submergence and project components. However, this impact is compensated by the comprehensive rehabilitation and resettlement plan, which is formulated after due consultation with the affected people and the state

government. Various benefits provided to the affected people are: employment, education, medical facility at project dispensaries, vocational training, protected water supply, housing, etc. The main objective of this plan is to provide for better living conditions to the displaced.

The number of families displaced per MW of installed capacity of power is 0.47 and number of families displaced per hectare of submerged area is 1.1.

Sl.No.	Project	Installed Capacity (MW)	Submergence Area (ha)	Displaced Families
1.	Chamera-I (HP)	540	975	1174
2.	Tanakpur (UP)	120	140	60
3.	Uri (J&K)	480	0	121
4.	Rangit (Sikkim)	60	13	19
5.	Dhauliganga-I (UP)	280	29	33
6.	Chamera-II (HP)	300	25	30
7.	Teesta-V (Sikkim)	510	68	46
8.	Loktak d/s (Manipur)	90	87	42
9.	Parbati-II (HP)	800	27	0
	<b>Total</b>	3180	1364	1525

## **Impact on Local People**

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### **1. Cultural Impact**

The people living in proscribed area have strong cultural heritage and have been protected for a long time. In the other areas, there is dilution of culture. Hence, cultural impact is likely only in the Dzongu area. Labour population would bring in different cultures into the area. However, impact is expected to be marginal since most of the labour population comprises of local people. Only skilled and semi- skilled people will be brought into the area from outside. Further, most of the project components are outside the proscribed area and only diversion tunnels of project are in the adjoining Dzongu area. Submergence area shall be used only after project completion and will be non-approachable, hence no impact on population in proscribed area is anticipated. Further, it has been ensured that no labour population is living in the prescribed area and no one can go there without the prior permission of concerned District Collector.

### **2. Economic Impact**

Positive impact is visible on economic front. More opportunities have opened up for the Lepchas and Bhutia population living in the project area as they are getting employment as labourers, petty work contracts and many individuals have been taken in the NHPC on deputation from state government. This has opened new avenues and new source of income to the people.

### **3. Etiological Impact**

Health surveys have indicated that the locals in the area suffer from a variety of diseases including

malaria, gastro intestinal disorders, skin and respiratory problems. Until now, they relied on traditional medicine, which was not very useful. With the development of the Teesta project, however, better medical facilities are now available to the native people including tribals. They are being provided free medical check ups, medicines, vaccines and ambulance facilities. This has helped improve their health status. The facility of protected water supply has reduced the burden of water borne diseases.

## **Development in the Community**

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### **1. Development through Direct Benefits**

The direct benefits to the local and ethnic communities are in the form of employment with NHPC or due to the employees and family of NHPC and its contractors. This has improved the socio-economic conditions of the people living near the project area and has encouraged people to take up higher education.

### **2. Development through Indirect Benefits**

The indirect benefits to the local and ethnic communities are through indirect employment or benefits from the activities of NHPC and its contractors.

### **3. Rehabilitation and Resettlement Plan**

As this is a run-of-the-river scheme, the submergence due to the reservoir is very small. In fact, most of the affected people are those whose lands have been acquired for the construction of various components of the project. The number of those displaced is 46 and partly affected 125 as per the detail obtained from the office of District

Collector. Most of the affected families are small farmers with meagre land holdings. Each of them is being rehabilitated suitably.

## **Conclusion**

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Hydroelectric power projects set up in far-flung difficult hilly areas are contributing to the socio-

economic as well-being of the native people and the region by improving their economy, infrastructure, connectivity, health status, education facilities and job opportunities while providing a fillip to the development of the state and the nation by offering cheap, efficient and reliable energy source that does not corrupt the environment.