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EVALUATION OF HYDRO POWER IN INDIA WITH SPECIAL REFERENCE TO HIMACHAL PRADESH

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Abstract

India, the 7th largest hydropower making country in the world, had an installed hydro capacity of around 45,400 MW by end 2018. The annual growth in capacity last year was just 1 per cent, which was the lowest since 2009. It is estimated that about 35 hydel power projects of 12,000 MW are under construction at various stages, but at least half of them worth over 6,000 MW have been stalled due to many issues from environmental issues to local protest, land acquisition and funding. Expanding the electricity user base in the country is constantly taken as a ground for pushing hydropower, as around 280 million in India do not have access to electricity. But these grid connected hydropower projects never benefit the local populations. In any case, such large hydropower projects are not the best way to make electricity accessible to those that do not have access currently. The protests of locals trying to safeguard their villages and livelihoods and the concerns of environmentalists are quelled in the name of the greater 'national interest'. Recently Himachal Pradesh, has been marked as the 'Power state' with a good potential to produce electric energy. The pressure is not just to make electric power, but to make clean power with good technology use which is less damaging and more environmental friendly. The protests in a number of localities of study area have indicated that these projects are damaging livelihood and environment in different ways.

Keywords: *Hydro Power, Projects, Environment, Electricity*

Introduction

Propelled by sustained economic growth and rise in income levels, India is poised to face significant increase in energy demand in the next few decades which also translates into higher demand for electricity. The gap in the electricity demand-supply situation is highlighted by the fact that the country experienced a peak deficit of 5.2% and energy deficit of 4.2% in FY 13-14 , with the surplus western and eastern regions unable to compensate for the severely deficit northern, southern and north-eastern regions. Considering an energy elasticity of 0.82, India is projected to require around 7% annual growth in electricity supply to sustain a GDP growth of around 8.5% p.a. over the next few years. This requires tapping all potential sources to address the deficit and meet the demand growth for accelerating

economic development while taking into account considerations of long-term sustainability, environmental and social aspects. Climate change and other negative effects of using fossil fuels for power generation along with growing concerns over energy security are driving the expansion of hydropower around the world.

Cost overruns, time delays due to geographical challenges and land acquisitions have historically delayed most of the hydropower projects in India for many years. The Central Electricity Authority had earlier assessed economically exploitable hydropower potential to the tune of 1,48,700 MW of installed capacity in India, which is ranked 5th in the world in terms of exploitable hydro-potential. In addition to this, the CEA had felt India can add 94,000 MW of pumped storage and hydro-potential from small, mini and micro schemes to the tune of 6,782 MW from 1,512 sites.

The last survey for assessing hydro electricity potential in the country was completed by Central Electricity Act (CEA) in 1987. The broad parameters adopted for assessing the hydro potential in the country mainly included the then available topographical and hydrological information.

As per the study completed by CEA in 1987, the identified hydropower potential in the country has been assessed is 1,48,701 MW (1,45,320 MW from HE schemes above 25 MW capacity). Apart from this, there is also potential of 96,524 MW of Pumped Storage. Thus the total hydro power capacity including pumped storage is 2,41,844 MW.

The details of the total potential are as given under:

As on 31.10.2018

	Conventional		**Pumped Storage**		**Total**
	Nos.	I.C.(MW)	Nos.	I.C.(MW)	I.C. (MW)
Identified Hydro Capacity	593	145320	63	96524	241844
In operation	197#	40613.62	9	4785.6	45399.22
Under construction	34*	10973.50	3	1205	12178.50
Allotted for development					
(i) Cleared by CEA and yet to be taken up for construction	40	25460	1	1000	26460
(ii) Under Examination/scrutiny in CEA	6	1224	0		1224
(iii) DPRs appraised and returned for revision	29	9852	0		9852
(iv) Under S&I	35	5439	3	2920	8359
(v) S&I is held up/to be taken up	45	14332	1	660	14992
Sub-total (i-v)	155	56307	5	4580	60857
Total (I+II+III)	386	107894.1	17	10570.60	118464.72

Note- 14 nos. of Pumped Storage Schemes with aggregate capacity of 11245 MW have been identified as doable schemes for development. This includes development of PSS on existing conventional hydro projects includes utilizing either one or both the reservoirs in the upstream and the downstream thereby economizing the cost and minimizing the impact on environment.

The total No. of HE Stations are 204 as N J Sagar HE Station (Southern Region) is having 1 conventional unit and remaining 7 units are PSS. Also, 1 unit of Panchet HE Station (Eastern Region) is conventional and other unit is PSS.

* Out of 34 Schemes under construction, 16 schemes aggregating to 5190 MW are stalled due to various reasons,

details of which is as follows.

As can be seen above, conventional hydro electric projects aggregating to 40,614 MW (27.9%) capacity are in operation, while 10,973.5 MW (7.6%) is under construction. In addition, DPRs in respect of conventional schemes with total capacity of 25,460 MW (17.5%) have been concurred by Central Electricity Act (CEA) which are, however, yet to be taken up for construction.

Details of hydroelectric potential in state endowed with substantial hydro power potential is as given under:

State	**Identified Capacity (MW)**	
	Total	**25 MW**
Arunachal Pradesh	50328	50064
Himachal Pradesh	18820	18540
Uttarakhand	18175	17998
Jammu & Kashmir	14146	13543
Rest	47232	45175
Total	148701	145320

As the assessment of hydro power potential was done long before in 1987, there is a need for re-assement of the same.

All India installed capacity (in MW) of Hydro Power Stations is as under:

Sector	**Hydro Power**
State	29878.80
Private	3394.00
Central	12126.42
Total	45399.22
%	13.1%

The share of hydro power in the total energy mix is on a constant fall ever since it reached its peak of 51% in the year 1962-63. At present the share of hydro power is meager 13%. The details of generation capacity since 1947 including share of hydro power is given below :

The details of generation capacity since 1947 including share of hydro power

As on 31.10.2018

Year	**Installed Capacity (MW)**		**Hydro share (%)**	
	Total	**Hydro**		
1947	1361.76	508.13	37.31	
1956	2886.14	1061.44	36.78	
1960-61	4653.05	1916.66	41.19	
1962-63	5801.19	2936.35	50.62	Maxm
1965-66	9027.02	4123.74	45.68	
1973-74	16663.56	6965.30	41.80	
1978-79	26680.06	10833.07	40.60	
1984-85	42584.72	14460.02	33.96	
1989-90	63636.34	18307.63	28.77	
1996-97	85019.31	21644.80	25.46	
2001-02	103410.04	26261.23	25.40	
2006-07	132329.21	34653.77	26.19	
2011-12	199627.03	38990.40	19.53	
2012-13	223343.60	39491.40	17.68	
2013-14	243028.95	40531.41	16.68	
2014-15	267637.35	41267.42	15.42	
2015-16	298059.97	42783.42	14.35	
2016-17	326848.53	44478.42	13.61	
2017-18	344002.39	45293.42	13.17	
2018-19 (upto Oct. 2018)	346047.57	45399.22	13.12	

* Hydro capacity with station capacity above 25 MW (2008-09 onward)

Following is the details of hydro power projects in operation – Sector-wise:

Private	Central	State	Total
7.5% (3394 MW)	33.1% (15,047 MW)	59.4% (26,958 MW)	45,399 MW

EVALUATION OF HYDRO POWER IN HIMACHAL PRADESH

Himachal Pradesh has large hydropower potential 25% of India's total 84,000MW (Himachal Pradesh State Electricity Board (HPSEB), 2014; National Institute of Hydrology, 2014) and extensive experience of hydropower development at various scales. Its hydropower potential, together with its large forested area, give it a crucial role in India's Green Economy and low-carbon development ambitions.

The State of Himachal Pradesh has an estimated Hydro Potential of 27,436 MW out of which 24,000 MW has been assessed as harness able while the Government of Himachal Pradesh has decided to forgo balance potential in lieu of safe guarding the environment and to maintain ecological as well as protect various social concerns.

Out of the total harness able potential of about 24,000 MW, a potential to the tune of 20,912 MW already stands allotted under various sectors. The State has been accelerating the pace of Hydropower development through the active involvement of both the public and private sectors. A potential of about 10,547.17 MW has already been harnessed so far under various sectors.

Power harnessed under various sectors

SECTOR	Capacity (MW)
HPSEBL	487.55
HPPCL	170.00
CENTRAL/JOINT	7,457.73
HIMURJA (STATE)	2.37
HIMURJA (PRIVATE)	310.45
PRIVATE above 5 MW	1,964.90
HP SHARE	159.17
Total	10,547.17

Source: Economic Survey 2018-19 H.P.

The largest potential for electricity generation lies on the river Satluj (13,332 MW), followed by Beas (5,995 MW), Chenab (4,032 MW) and Ravi (3,237 MW).

Through preliminary hydrological, topographical and geological investigations, it has been estimated that about 27,436 MW of hydroelectric potential can be exploited in the state by

constructing various major, medium, small and mini/micro hydroelectric projects on these five river basins.

The Status of hydro power potential in Himachal Pradesh is as under:

Total identified Hydro Power Potential	27,436 MW
Harnessable Potential	23,500 MW
Harnessed so far	10,547 MW
Foregone Potential	755 MW
Construction Stage	1,885 MW
Clearances/ Investigation Stage	9,136 MW
To be Allotted	1,364 MW

List of Hydro Stations in Himachal Pradesh (ABOVE 25 MW CAPACITY)

SL. NO.	UTILITY/STATIONS	NO. OF STATIONS	No. of Units	NO. OF UNITS X CAPACITY (MW	RIVER/ BASIN	DISTRICT	CAPACITY (MW)	YEAR OF COMMISSIONING
	CONVENTIONAL H.E. STATIONS BBMB							
	BHAKRA LEFT*	1	5	(2X108+3 X126)	SUTLEJ	BILASPUR	594.00	1960-1961
	BHAKRA RIGHT	1	5	(5X157)	SUTLEJ	BILASPUR	785.00	1966-1968
	DEHAR	1	6	(6X165)	BEAS	MANDI	990.00	1977-1983
	PONG	1	6	(6X66)	BEAS	KANGRA	396.00	1978-1983
	SUB-TOTAL BBMB (HP) NHPC	4	22				2765.00	
	BAIRA SIUL	1	3	(3X60)	RAVI	CHAMBA	180.00	1980-1981
	CHAMERA- I	1	3	(3X180)	RAVI	DALHOUSI E	540.00	1994
	CHAMERA- II	1	3	(3X100)	RAVI	CHAMBA	300.00	2003-2004
	CHAMERA- III	1	3	(3X77)	RAVI	CHAMBA	231.00	2012
	PARBATI-III	1	4	(4X130)	SAINJ	KULLU	520.00	2014
	SUB-TOTAL HP NTPC LTD.	2	12				1912.02	
	KOLDAM	1	4	(4X200)	SATLUJ	BILASPUR	800.00	2015
	TOTAL NTPC LTD.	1	4				800.00	
	TOTAL CENTRAL SECTOR	12	54				7248.02	
	HPSEBL			-	-		-	-

BASSI	1	4	(4X16.5)	BEAS	MANDI	66.00	1970-1981
GIRI BATA	1	2	(2X30)	YAMUNA	SIRMAUR	SIRMAUR	1978
LARJI	1	3	(3X42)	Beas River & its tributaries Sainj & Tirthan	KULLU	126.00	2006
SANJAY	1	3	(3X40)	SATLEJ	KINNAUR	120.00	1989
TOTAL HPSEBL HPPCL	4	12				372.00	
INTEGRATED KASHANG	1	3	(3X65)	SATLUJ	KINNAUR	195	2016-17
SAINJ	1	2	(2X50)	SAINJ	KULLU	100	2017
TOTAL HPPCL PSPCL	2	5				295.00	
SHANAN	1	5	(1X50)+(4X15)	UHL & Lamba Dug River	MANDI	110.00	1932-1982
TOTAL PSPCL-HP	1	5				110.00	
TOTAL STATE SECTOR	7	22				777.00	
PRIVATE							
MPCL			-	-		-	-
MALANA	1	2	(2X43)	MALANA	KULLU	86.00	2001
TOTAL MPCL	1	2				86.00	
GBHPPL							
BUDHIL	1	2	(2X35)	RAVI	CHAMBA	70.00	2012
TOTAL GBHPPL	1	2				70.00	
EPPL							
MALANA-II	1	2	(2X50)	MALANA	KULLU	100.00	2011-12
TOTAL EPPL	1	2				100.00	
IA ENERGY							
CHANJU-I	1	3	(3X12)	RAVI	CHAMBA	36.00	2017
TOTAL IA ENERGY	1	3				36.00	
ALLAIN DUHANGAN	1	2	(2X96)	ALLAIN NALLAH		192.00	2010-11
TOTAL ADHPL	1	2				192.00	
HBPCL			-	-		-	-
BASPA	1	3	(3X100)	BASPA	KINNAU	300.00	2003

KARCHAM WANGTOO	1	4	(4X250)	SATLUJ	R KINNAUR	1000.00	2011-12
TOTAL HBPCL	2	7				1300.00	
TOTAL PVT	7	18				1784.00	
TOTAL HP	26	94				9809.02	

ISSUES IN DEVELOPMENT OF HYDRO POWER PROJECTS

The country is endowed with huge hydro power potential, however, only a fraction of it is being utilized at present. Despite the numerous benefits and compelling need of balancing power for grid stability, the pace of development of hydro power in the country has been sluggish. The Ministry have stated the following reasons/issues that hinder the growth of the sector and causes delay in commissioning of the projects:

a) Land Acquisition

Land acquisition is a persistent issue involved in the implementation of hydro projects. Acquisition of land for various locations of the project such as Dam, HRT, Power House, Switch yard etc. delay the commencement / progress of works. e.g. Koteshwar, Parbati-III HEPs

b) Environment and Forest issues

Three types of clearances are mandatory from three different wings of Ministry of Environment and Forest (MoEF) i.e. environmental clearance from Expert Appraisal Committee (EAC), Forest Clearances from Forest Advisory Committee (FAC) & Wildlife Clearances from National Board of Wildlife (NBWL). This makes the whole process very cumbersome which otherwise would be easier and less time consuming.

c) Rehabilitation & Resettlement

Dislocation of the people from their houses/fields/workplaces etc. and their resettlement is a sensitive issue and involves a lot of time and money. Many times this issue leads to court cases resulting in delay in project execution/completion. e.g. Koteshwar, Maheshwar HEPs

d) Law & order problem & Local issues

Protest by the local people against the construction activities, like blasting, muck disposal, etc. and also for various demands like employment, extra compensation, etc. often create law and order problems and delays the completion of works. e.g. Uri-II, Subansiri, TLDP-III & IV HEPs.

e) Cultural / Religious/ Political Issues:

Religious sentiments attached with the rivers, cultural importance of rivers, lacks political traction due to long gestation period, Inter-state issues, especially over Riparian rights

f) Technical / Geological issues:

Geological surprises resulting from weak geology in the Young Himalayan region, lack of technology to deal with weak geology, lack of major contractors with expertise in hydropower sector, natural calamities like landslides, hill slope collapses, road blocks, flood, and cloud bursts etc are a cause of severe setbacks in construction schedules

g) Difficult Terrain & Poor Accessibility

Difficult terrain & poor accessibility of the hydro project site takes lot of time & money to develop / maintain the infrastructures like road, establishments, etc. causing the delay in completion of hydro projects.

h) Inter-state Issues

Sometimes Hydroelectric projects get delayed due to inter-state disputes between the states.

i) Cumulative Basin Studies

The impact of recommendations of Cumulative Basin studies of different basins result in change in parameters such as FRL, Head and Annual Energy Generation etc. of hydro projects necessitating formulation of new DPR.

j) High Tariff of Hydro Projects

Tariff from hydro projects tends to be higher compared to other sources of power (conventional as well as renewable sources) mainly due to construction of complex structures which have long gestation period, unavailability of loans of lower interest rate & longer tenures, high R&R cost, infrastructure (roads & bridges) cost etc. As such, many hydro projects even after commissioning are facing financial distress due to dishonouring of PPAs / non-signing of PPAs.

k) Financing issues:

High cost of Finance and lack of long tenure funding for hydropower projects.

l) Levying of Water Cess

Levying of water cess by the States like J&K has also affected the viability of the projects and increased the tariff by about 50p-Rs 1/unit.

SWOT – STRENGTH, WEAKNESS, OPPORTUNITY AND THREATENING OF HYDROPOWER PROJECTS

Strength

• Environmental friendly, clean renewable • ¬High degree of flexibility • ¬Part of multi purpose project with additional benefits. • ¬Pumped storage for optimal integrate operation of grid • ¬Least operational and maintenance cost • ¬Additional benefits of Flood control, Tourism, fishery. • ¬Well recognized for obtaining financial support.

Weakness

• Mainly depends on rainfall/snowmelt. • Run of river not for peaking • High capital intensive. • Remotely located • Gestation period is very large. • Relatively smaller units. • Non standard occurrence.

Opportunities

• Vast potential untapped • Requirement for power peaking • Greater concern towards increasing pollutions on land, water and in air causes leading inclination towards hydro • Depletion of fossil fuels.

Threats

• Ambitious plan for thermal/nuclear programme for power. • Growing concern of environment. • Prone to natural calamities. • Submergence of land and displacement of population • Apprehension on seismic disturbance • Over emphasis of other renewable energy sources development.

DETAILS OF UNDER CONSTRUCTION HYDRO ELECTRIC PROJECTS (ABOVE 25 MW) HAVING TIME OVERRUN IN HIMACHAL PRADESH

Sl. No	Project Name/ (I.C.)/ Executing Agency	Sector	Org. Comm. Sched.	Ant. Comm. Sched.	Time over run (months)	Reasons for Delay/ Current Issues
1.	Parbati - II (4x200 = 800 MW) NHPC	Central	2009-10 (Sept'09)	2021-22 (Dec,21)	147	➢ Hon'ble High Court of Himachal Pradesh ban on stone crusher operation. ➢ Delay in revised forest clearance. ➢ TBM suffered extensive damage due to heavy ingress of water and slush in TBM face in Nov, 2006. ➢ Slide in Power House area in Apr-04, Jun-06 and Feb-07. ➢ Flash flood in 2004,2005,2010 and 2011. ➢ Jiwa Nallah works affected due to cavity treatment. ➢ Contractual issues.

					➢ Poor geology in HRT. ➢ Cash flow issues with civil contractor. ➢ Current Issues: Slow progress of excavation by TBM due to geological constraints.
Uhl-III (3x33.33 = 100 MW) BVPCL	State	2006-07 (Mar'07)	2019-20 (July,19)	149	➢ Delay in transfer of forest land. ➢ Delay in acquisition of private land Delay in transfer of quarry sites. ➢ Delay in award of works. ➢ Contract for construction of HRT rescinded twice i.e. during April, 2008 & July, 2010 due to slow progress and non-performance by the contractor. ➢ Poor geology in HRT. (-leakage observed in Penstock during HST of Penstock -Repair of Penstock)
Sawra Kuddu (3x37=111MW) HPPCL,	State	2011-12 (Jan'12)	2019-20 (May,19)	88	➢ Delay in MOEF clearance. ➢ Delay in award of Civil & E&M works. ➢ Poor geology in HRT. ➢ Slow progress of HRT Lining. ➢ Contractual issues. Contract for HRT package terminated on 9.1.14. Re-awarded in Nov,2014 to M/s. HCC. ➢ Current Issues: Completion of HRT.
Shongtom Karcham (3x150 = 450 MW) HPPCL 16.08.2012	State	2016-17 (Mar'17)	2024-25 (Apr,24)	85	➢ Shifting of Army Ammunition Depot. Local Issues. ➢ Current Issues: Slow progress of works.
Bajoli Holi (3x60=180 MW) M/s GMR Bajoli Holi	Private	2018-19 (May' 18)	2019-20 (Aug,19)	15	➢ Slow progress of works.
Tidong-I (2x50 =100MW) Statkraft India Pvt. Ltd.	Private	2013-14 (Dec'13)	2021-22 (Oct. 21)	94	➢ Delay in NOC by Projects affected Panchayats. ➢ Suspension of works by Govt. for one year. ➢ Funds constraints with the developer ➢ Current Issues: Project stalled

					since July, 2016 due to funds constraints with developer. M/s Statkraft India Pvt Ltd has acquired the 100% equity of the project on 04.09.2018. Mobilisation is under progress.
Tangnu Romai-I (2x22 = 44 MW) TRPGPL	Private	2014-15 (Jun'14)	2021-22 (subject to re-start of works(4 years))	93	➢ Slow progress of civil works. ➢ Poor geology. Difficult area. Weather conditions & accessibility. ➢ Financial constraints with the developer. ➢ Current Issues: Project stalled since January, 2015 due to funds constraints with developer.
Sorang (2x50 = 100MW), HSPPL	Private	2011-12 (Nov'11)	2020-21 (subject to re-start of works(1 Year))		➢ Poor geology. ➢ Poor weather conditions, difficult & poor accessibility. ➢ Penstock cracks / leakage during filling of Water conductor System in Nov '13. ➢ Rupture in surface penstock in Nov-15 during trial run. ➢ Funds constraints with developer. ➢ Current Issues: Project stalled since November, 2015 due to funds constraints with developer.

Source: 43rd Report of Standing Committee on Energy (2018-19) Ministry of Power

Review of Literature:

❖ Forty-third report on hydro-power: Standing Committee on Energy (2018-19)

The Standing Committee on Energy present this Forty-Third Report on 'Hydro-power' relating to the Ministry of Power. The Committee, considering the greater importance of hydro power and the slow pace of its development in the country, took this subject for detailed examination. It is a matter of great concern that despite having numerous benefits and compelling need to have more balancing power in wake of huge upcoming renewable energy in the system; hydro power has not been paid the due attention. The fact that against the total potential of 2,41,844 MW hydro power including pumped storage scheme, only 45,399.22 MW is actually been utilized, speaks volumes. For optimum utilization of our hydro potential, there is a need for formulation of an enabling policy and taking this task on a mission mode with a timeline as it has already been done in case of development of solar and other renewable sources. During the examination of the subject it was felt that for the growth

of hydro power sector the cooperation and coordination between the Central Government and the State Government has become a pre-requisite.

- Hydropower construction taking a toll on HP: Report:

The report finds that the existing studies available on these impacts are inadequate or biased in favour of the hydropower producers, with economics as the main concern. Environment impact assessment (EIA) reports of hydropower projects gloss over the geological and seismic vulnerability of the project sites, with an explanation that the "hurdles, surprises and in competencies" of the mountain geology would be handled at a later stage, if and when they occur. "Scientific" linkages become difficult to establish later, and during EIAs, the concentration is to only rush through the studies to get "clearances." According to the report, "The contribution of hydropower sector today to the country's total electricity production has halved from 25% to 13% in the last decade. While this state of hydropower industries was an opportunity to review hydropower policy and the sector's viability, the report of Parliamentary standing committee on energy that reviewed the performance of hydro projects in 2018 turned a blind eye to environmental impacts and safety norms."

- Hydropower Construction: A Huge Risk for Himachal Pradesh:

An NGO called Himdhara in its report highlights the risk and environmental hazards hydropower is posing in the state of Himachal Pradesh. Highlighting the devastation and many risks which are associated with hydropower construction, especially in the ecologically fragile Himalayan regions like Himachal Pradesh, Himdhara Collective has released a report called 'The Hidden Cost of Hydropower'. The report is a compilation of some primary and secondary pieces of evidence. The report highlights four major impacts of this kind of construction: Geological impacts – triggering of landslides/slope failures leading to damage of roads, farms houses. Hydrogeological impacts – drying of springs and underground water sources. Muck Dumping – along rivers leading to increasing siltation, in forests and pastures. Safety negligence leading to accidents. The report echoes with various studies and reports that have been trying to educate governments and authorities about the dangers of large hydro electric projects. While the country is moving ahead with other sources of Renewable energy like solar and wind, huge constructions like that of dams should be now avoided. The cost of these mega structures are usually borne by affected people or are transferred to the public exchequer, in cases of unwelcome surprises. Costs that producers have been forced to bear have led to financial losses, bad loans and cumulatively a slump in many Himalayan states too.

- Institute of Earth and Environmental Science in Germany (2018)

A research study released in 2018 by the Institute of Earth and Environmental Science in Germany concluded that one in four hydropower projects in the Himalayan region are at risk from landslides triggered by earthquakes and tremors. The report cites examples to illustrate how risks of accidents around hydropower project sites are higher due to climate change related disasters like flash floods and cloudbursts.

- A Landslide Hazard Risk Assessment study, Himachal government's Disaster Management Cell

For instance, 97.42% of the total geographical area of Himachal Pradesh is prone to landslides, according to the Geological survey of India. A Landslide Hazard Risk Assessment study published by the Himachal government's own Disaster Management Cell found that a huge number of hydropower stations are under threat of landslide hazard risk and at least 10 mega hydropower stations are located in medium and high-risk landslide areas.

- HIMACHAL PRADESH HYDROPOWER PROJECTS IN 2015

Throughout the year, various media reports wrongly projected hydropower as the best hope to improve India's capacity to meet energy demands while being a non-polluting source (in fact they are responsible for severe methane emissions, showing how ill informed the media reports were). Some of the benefits attributed to using hydropower are that they offset reliance on fossil fuels and are not under risk of fuel price hike, but this ignores the huge social and environmental impacts of the projects. They are said to be the ideal solution for meeting peak demand, as they are relatively easier to switch on and off, compared with thermal sources. However meeting peeking demand requires optimal use of existing plants, not coming up with more plants, but unfortunately no one is making any efforts in that direction. They are also said to have a longer life than other renewable ones, but other renewable capacities can be rebuilt at the same locations, which is not possible for hydro projects.

- Hydropower in Himachal: Do we even know the costs?

For every large hydropower project, a detailed project report is prepared and clearances are required from various government agencies. The CEA gives techno-economic approval, the Central Water Commission (CWC) approves the hydrology design, safety and cost estimates, the Central Soil and Material Research Station (CSMRS) approves the construction material aspects and the Geological Survey of India (GSI) looks into the geological aspects. It is shocking that despite there being such requirements on paper, hydropower projects are

allowed in places which are fragile, vulnerable to disasters and completely devastated by the construction activities, even without basic assessments. The overruns in time and cost only suggest that the bureaucratic decisions are flawed. The government has displayed a complete lack of will in regulating the acts of the developers undertaking these projects and has demonstrated absolute disregard for the rights of the locals of the project sites and also for the sustainability of the environment or even the projects. The government and construction companies try to convince the locals to consent to these projects by offering some influential local people contracts or employment at the project site. However, the companies exploit their workers exposing them to dangerous conditions causing many casualties and fatalities and pay meagre wages. The government looks the other way as these companies flout labour laws and takes note only when it has to intervene to assist the management to repress protesting workers.

After analysing the data and related studies following Roadmap can be followed accelerate responsible Hydroelectric power:

Efficient coordination for implementation of policy goals and targets:

Ministries, departments and state governments need to work together collaboratively and efficiently, in a coordinated manner, to achieve policy goals and capacity addition targets. Alignment of processes, structures and institutional framework is necessary to achieve this.

Planning for integrated river basin development:

The government of India needs to ensure that inter-state agreements for water sharing must be in place to avoid disputes. A National River Authority of India may be constituted to improve river management, address inter-state disputes and for integrated river basin development.

Project allocation procedures:

Allocation of hydro sites to developers needs to be done in a fair and transparent manner, keeping in mind the optimal development of the river basin. Specifically, the state government needs to ensure project allocation on inter-state rivers in line with the CEA's/CWC's optimal development plan of the river basin. A comprehensive cost-benefit analysis between different project allocation models (e.g. MoU vs competitive bidding) needs to be carried out on a case-to-case basis based on project specific issues. Further, the project allocation model needs to give due weightage to the financial capacity, technical capacity as well as credibility of developers.

Streamlining clearance processes:

Appropriate institutional mechanisms need to be set up by each state with a clear mandate to speed up clearances and eliminate duplicity of clearances. Specific timelines to award all statutory and non-statutory clearances to a project at both central and state levels need to be fixed, along with accountability for delays. Specific timelines for the concessionaire to initiate, execute and commission the project must also be decided.

Benefit-sharing with PAPs:

A structured mechanism needs to be developed for balancing benefits from hydropower projects and transferring economic rents from projects to the government which should ultimately be passed on to affected stakeholders. The mechanism should find an optimal balance, to the consensus and benefit of all stakeholder, between modalities: Revenue sharing, Local development funds, Ownership structure, Taxation levels, Preferential electricity rates, etc

Focus on responsible development:

Social and environmental impact assessments need to be given due importance, instead of treating them as mere legal formalities. The process needs to be participatory and transparent.

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