



SMALL HYDRO-POWER PLANTS IN INDIA AND ITS IMPACT ON ENVIRONMENT

By *Anuj Gupta*
From *Indore Institute of Law*
Indore, Madhya Pradesh

ABSTRACT:

Small Hydropower (SHP), considered as the non - contaminating sustainable power source having high transformation efficiency with tremendous adaptability and working and financial supremacy over other power age modes up to 25 MW, has been agreed best urge and need by Ministry of New & Renewable Energy (MNRE), Government of India because of its condition well-disposed and environmental friendly nature. Environment Impact Assessment (EIA) can be used as a device to check the ecological effects of SHP extends in pre-development, development and post-development stage. Ministry of Environment and forest (MOEF), Government of India has set the rules for EIA, an arrangement of Environment Management Plan (EMP) and observing of moderation measures for a vast number of modern, development and different tasks including power ventures.

The present paper plots the upsides of SHP, hindrances in the improvement of SHP, EIA process in India, their effects on biological assets and human condition and EMP. Paper also integrates literature on negative impact as well as positives, highlighting its impact on both.

The Paper considers and reviews on the principles and doctrines which has direct connotations with the environment, human life, and Sustainable development. The Paper layout the key impacts on a scheme and socio-economic policy framed by the government to safeguard the human right with regard to constitutional provisions and various legislations keeping earlier judgments in view with the very existence and development of small hydropower plants. With Growth has arrived Significant Ecological Impacts Regardless of those segments constantly dubbed naturally benign, stronger and a greater amount compelling regulations would those need of the hour.

INDEX OF AUTHORITIES:

STATUTES REFERRED:

- The Indian Constitution, 1950
- Electricity Act , 2003
- Environment Protection Act,1986
- Wildlife Protection Act , 1972
- Forest Act , 1927
- The Water (Prevention and Control of Pollution) Act , 1974
- Biological Diversity Act , 2002
- Environmental Impact Assessment Notification (Amendment), 2014



BOOKS
REFERRED:

Legal

Databases

- H.M. Seervai, Constitutional Law Of India, (Universal Publishing Pvt.Ltd.,4th edn., Vol.1)
- D.D. Basu , Shorter Constitution of India (Wadhwa& Co. law publishers Nagpur , 13th edn. 2004
- Dr. L.M. Singhvi , Constitution of India (Thomson Reuters , 3rd edn. vol.2)
- P. Leelakrishnan , Environment Lw in India (Lexis Nexis Butterwort's Wadhwa Nagpur , 3rd edn. 2008)
- Desai. A. Ashok , Environmental Jurisprudence , (Modern Law House , 2nd edn. 2002)
- Dhirajlal&Ratanlal , Law of Torts (Lexis NexisButterworthsWadhwa , 26th edn. 2012)
- Leela Krishnan P. , Environmental Case Law Book (2nd edn. 2006)
- Doabia T.S., Environmental & Pollution laws in India (1st edn, 2005)

- *Manupatra*
- *SCC Online*
- *Hein Online*
- *Westlaw*
- *India Kanoon*
- *Sage Online*



International
Instruments

- Universal Declaration of Human Rights, 1948
- Stockholm Conference, 1973
- Rio Declaration , 1992
- International Union for Conservation of Nature
- Asia - Pacific Partnership on clean development and climate
- Kyoto Protocol , 1997

Principles and Doctrines

- Public Trust Doctrine
- Precautionary Principle
- Principle of Sustainable Development

List of Cases



- M.C. Mehta vs. Kamal Nath (AIR (1997)1 SCC 388
- Francis coralie v. Union Territory of Delhi (AIR 1994 SC 1844)
- M.P. Rambabu v Divisonal Forest officer (AIR 2003, AP 256)
- Shubhash kumar v. State of Bihar(AIR 420, 1991)
- MC Mehta v. Union of India (SCC 589(SC 1998)
- Virender Gaur v. state of Haryana (2 SCC 577(SC1995)
- MC Mehta v. UOI, 9 SCC 589, (SC 1998).
- AP pollution control board v. prof. M.V. Nagandu AIR 1999 SC 812
- Sachinandpandey v. State of west Bengal. AIR 1987 SC 1109
- Olga Tellis v. Bombay Municipal Corporation (AIR 1986 SC 180.)
- Orissa mining corp. ltd. v. ministry of environment and forest,
- Vishakha vs. state of Rajasthan (1997) 6 SCC 241.
- People union for democratic rights v. UOI.(AIR 1982 SC1473)
- Indian council for enviro-legal Action v. UOI, (1996) 5 SCC 281.
- Thirumalpad v. UOI&Ors, (2002) 10 SCC 606;¹ Subhash Kumar v. State of Bihar, AIR 1991 SC 420.
- AP pollution control board v. M.V. Nayadu, AIR 1999 SC 812
- TN Godavarmanthirumul Road v. UOI, AIR 1997 SC 1228.
- Banwaslseva Ashram v. State of U.P., AIR 1987 SC 374.

1. Art.	-
Article	
2. Edn.	-
Edition	
3. Hon'ble -	Honorable
4. SC	- Supreme
Court	
5. v.	-
Versus	
6. Govt.	-
Government	
7. UDHR	- Universal
Declaration of Human Rights,1948	
8. UOI	- Union
of India	
9. SHP	-
Small Hydro Power Plant Projects	
10. EIA	-
Environmental Impact Assessment	
11. MNRE	- Ministry
of New and Renewable Energy	
12. MOEF	-
Ministry of Environment and Forest	
13. CSE	-
Centre for Science and Environment	
14. RE	-
Renewable Energy	
15. ROR	-
Run- of- River	
16. MOP	-
Ministry of Power	

SCOPE:

This Research Paper will highlight the issue of sustainable development in India with context to critical concern for power in

LIST OF ABBREVIATIONS



particular region i.e. in the state of Uttarakhand. The paper covers the development of Small hydropower plants especially in the Himalayan region grown at much faster pace in last 7 years; they are backed up by the government as 'green and renewable energy'. An advocacy body contended it to be not as green as it has been framed by the ministry and severely causing ecological imbalance and violating much legislation including constitutional provisions of citizens and to maintain the sustainability of development along with the ecology. This Research Paper contains all decisions of Honourable Supreme court with context to same and Respective committee on Sustainable Development.

LIMITATIONS:

The Development of Small Hydro Plant Encroaching the Rights of the Citizens of the state and this issue of SHP and Problem created by it has not been given enough emphasis and ignored in various aspects such as Hydropower plants are not abiding the minimum rules and regulations of the legislation and still there is no due detail of the same. SHP's are basically required in the Himalayan Region as Indian State Himanchal Pradesh and Uttarakhand but SHP falls under State Control Board or EIP is still a matter of Debate in the Current Scenario.

LITERATURE SURVEY

I would like to thanks to the Literature Sources and their authors from where I have picked up the vital and research points

which I analyze and interpret to put in my Research work which helped me in accomplishment of my project.

1. Manoj Kumar Kesharwani, Assistant Engineer Uttaranchal Jal Vidyut Nigam Limited, Dehradun, *Over-view of Small Hydro Power Plant in Himalayan Region*, Himalayan Small Hydro-power Summit, Oct, 12, Dehradun.
2. Ministry of New and Renewable energy, Government of India, Annual Report 2015-16
3. Chandra Bhushan, "Green Norms for Green Energy", Centre for Science and Environment, 2013.

RESEARCH QUESTIONS:

1. What are the Constitutional Provisions for the protection of Environment and whether rights guaranteed under it are violated?
2. Whether SHP Violates Green norms?
3. Whether Exemption of SHP from EIA is Valid?
4. What are the adequate policies of the Government for the Development of Small Hydropower plants with the contribution of Public and Private Enterprises?

INTRODUCTION

The Ministry of New and Renewable Energy has been Vested with the power to look after the business of Small/ mini/ micro power plants with 25 M.W. station capacities. However, generation of electricity with the



assistance of hydropower plants is the matter of concurrent list but water falling under the state list that's why Small Hydro-Power Plants (SHP) is governed by the state policies.

Hydropower is a renewable, clean, and non-polluting or contaminating power resources with high operational flexibility and economically docile over any other power resources. As depending on the analysis, India's economic exploitable factor is 84044 M.W. at 60% load factor and installation capacity up to 1, 50,000 M.W. India is very short in its power capacity and it's about 13%. To meet the changes and to exploit the power need the Ministry of New and Renewable sources has unveiled the Small Hydropower plants and has been painted by them to be best-suited to combat with the problem of sustainable development as they are considered to be the primary source for electricity generations as well as they are less prone to exploit the environment and emit toxic gases and are considered to be best suited for environment.

Small Hydropower power is among one of the earliest identified and known Renewable energy sources existed in the nation since the 20th century and before as it was used in the Himalayan region as water wheels which provide power to run devices like grinders. Small Hydro Power plants have been introduced in India after the short while of its Commissioning of world's first hydroelectric installation at Appleton, the USA in 1882. The first Energy Resource that was installed in the country was of 130 k.w at Darjeeling in the year 1997. In the Purview of Environmental law M.C., Mehta vs. Kamal Nath Case has been regarded as the Landmark Case

KAMAL NATH CASE:¹

In the State of Himanchal Pradesh, Span Motel, Possess by those relatives for Shri Kamal Nath, Minister for Environment and Forests, Govt. of India Diverted the Course of river Beas to enhance the beauty of motel and also invaded upon some forest land. The apex court ordered the management of the Span motel to give forest land to the Govt. of Himanchal Pradesh and remove all sorts of invasions. The Court Delivered the Landmark Judgment and enact principle of exemplary damages for the first time in India. The court said the polluter must pay to reverse the damages caused by his act and imposed a fine of Rs. Ten Lakhs (Rs. 10,00,000) on the span motel as exemplary damages. The Supreme Court Recognized Polluter Pays Principle and Public Trust Doctrine. Laws applied in this case law were Constitution of India and Environment Protection Act, 1986.

CHAPTER-1

1. SMALL HYDROPOWER PLANT IN INDIA

The utilization of Small Hydropower plant in India goes way back in the Historical backdrop With the country first SHP coming in the year 1897, The Sector has been growing uncommonly especially in the decade between 2003-2013 with almost double plants have been set up. In India

¹AIR (1997)1 SCC 388



SHP's are referred to be a power plant with generating capacity below 25 megawatts (M.W.). No justification is available for this but according to the statutory body associated with the union ministry of power has defined SHP's to be below 15 M.W. As this Hydropower does not abuse environment much that's why it has been excluded from the research.

The classification/ categorization of Small Hydropower plants in India has been following as under:

Micro(kW)	Less Than 100
Mini (kW)	101- 1000
Small (MW)	1-25

however seasonal potential would be about 600 billion units per year that means the hydro potential of 84044 MW at 60% load factor when completely developed turns out to result in capacity about 150000 M.W. on an average basis.

Presently, the following forms of hydropower project are prevailing in India:

1. Storage Schemes
2. Run-of-River (ROR) Schemes without Poundage
3. Run- of –River Schemes with Poundage
4. Pumped Storage Scheme

2. HYDROELECTRIC POTENTIAL IN INDIA

2.1 First Survey (1953- 59)

The First study to assess to hydroelectric resources was shoot at the duration of 1953-1959 by the Power Wing of the bygone Central Water and power commission on the basis of existing technology of hydropower. The study exploited the potential of the hydropower at 42100 M.W. at 60% load factor

2.2 Re-assessment Studies (1978-87)

It was done by the Central Electricity Authority in 1987, have allocated the hydropower potential at 8044 MW with 60% load factor. The Recognised hydropower schemes have been 845 in numbers that will generate 442 billion units of electricity

3. DEVELOPMENT OF SMALL HYDROPOWERPLANTS

The Ministry of New and Renewable Energy (MNRE) has been allocating the Central Financial Assistance to the State Government and public sector as well as set up Small Hydro Power Plants. Through the Alternative Hydro Energy Centre (AHEC), IIT Roorkee technical assistance is being provided to them.

According to Ministry, SHP's in India has been a Private investment oriented program with the economic viability and keen desire of Private sector to setup SHP's.

The Schemes offered by the Government are under follows:

- Resource assessment and support for identification of new sites:
- Scheme to support for setting up new SHP projects in the private/ co-operative/ joint sector, etc.



- Scheme to support for setting up new SHP projects in the Government Sector
- Scheme to support for Renovation and Modernization of existing SHP projects
- Scheme to support for development/Up gradation of Water Mills (mechanical/ electrical output) and setting up Micro Hydel Projects (up to 100KW capacity)
- Research & Development and Human Resource Development.²

environment and ecology. Because of the Fact that SHP's are exempted from Environment Impact Assessment (EIA), not many detail projects can be found out of the cumulative impact of SHP's in environment and ecology. At the one instances, it can be seen that in many mountainous areas development of hydro leads to electricity generation with strengthen the economy of rural areas and when Small industries linked with hydro-power there will be a lesser amount of greenhouse gases effect. The SHP's are being promoted by the Ministry but without proper regulatory framework it is causing imbalance

Chapter-2

1. Environments Impacts of Small Hydropower Plants And Violation of Green Norms

Small Hydro-Power Plants are subjected to Various Green Norms and the Various Legislation which is governed by the Ministry of New and Renewable energy (MNRE). SHP's are considered to be as green and renewable technology when compared to other forms of energy it does not have any adverse effect on the environment as its fuel is inexhaustible so it does not have any hand in polluting the air. Water pollution is also relatively low and happens only in the course of construction of the dams and cause little or no-displacement of the people. SHP's can employ diverse impacts on local

The environmental impact of small hydropower (SHP) projects, of up to 25 megawatts (MW) capacity, which is being promoted by the government as 'green', is not green as it painted out to be. "Even on implementing the norms, the environmental impact will continue to be an issue. Redesigning the SHP projects to allow a part of the river to flow should be the next level of research." At present, the SHP projects in the State do not follow even minimal environmental norms.

2. Typical Hydro-power Project

Hydro Power Plants with the water at head which spins turbine to convert kinetic energy to generate electricity. The very nature of hydro-power plants change dramatically so their affects also can be. Exemplified by the modification of the existing dams may have the negligible affects. Water Management by the Hydro-power plants are Categorised into two types:-

²Ministry of New and Renewable energy, Government of India, Annual Report 2015-16, available at http://164.100.47.193/lsscommittee/Energy/16_Energy_13.pdf, last seen on 08/02/2018



- Storage – the water flow is controlled, typically using a dam, to provide a consistent supply of water and electricity.

This approach permanently floods the area behind the dam, modifies natural cycles of high and low flows, and restricts sediment movements and migrating species.

- Run-of river – the natural flow is diverted, but with negligible time delay or storage facilities. A weir, small dam, canal, penstock and other structures may be used to direct the water to a turbine, under pressure and then is released.

3. Environmental Impacts:

Overall, a hydro-power plan adjusts the regular variability of a waterway. Furthermore its accessibility to species, what's more provides for this control shall not fall within and consequences would not be appropriate. The Hydro-power project while setting up Govt. should understand the environment flexibility and dynamic changes which affect the wide-area.

3.1 Environmental Impacts:

Hydro-power neither required diesel nor batteries. Small System might be set up near the river and thus mostly requires concrete and clearing for construction that would change the flow of water and at the same time require an electricity network because of the small system planted near the river.

Hydro-power may require at times up-stream catchments for which it results in positive for ecology. If Dam requires changing its stream flow can affect eco-systems, flooding patterns, and sediments movements.

- **Fish & Fauna:** Construction of dams and dry-river stops the migration of fish species from spawning. 'Fish ladders' which basically blocks river streams and created by the humans either or in existence naturally does not allow fish to pass through and 'low' stream side are only source to travel through the phase. The impact of SHP's plants, dams and drying river beds to large extent are unknown.

- **Dry-river:** SHP plants close to the maximum capacity potential of hydro-power may have dams up to the height of 10 meters. These Plants re-route the flow of water through the pipelines to maximize the pressure and leaving dry long stretch of river. The River left short by the Run-of-River (ROR) plants and remains dry depending on their size and geographical area from the run-of-river project.

3.2 Eco-system:

Water Quality and the flow both are the major focus in this. Both can affect the migratory species and ponds. These may also result in barrier to aquatic life. Instruments like fish ladders can be used to



combat with ecological problem.

3.3 Ecological flow

- Ecological flow is the concept of keeping enough water in the river downstream from a dam to sustain ecosystems and human livelihoods dependent on water from the river. 70 hydropower projects with a capacity of 9,580.3 MW have “affected” 60-80 percent of the river, without taking into consideration the river’s ecological flow (e-flow). This leaves large stretches of the river dry, affecting the aquatic flora and fauna, water quality, sediment carrying capacity, erosion, groundwater quality and recharge, climate, soil and geology. It also interferes with drinking and agricultural water availability.
 - Agriculture and drinking water- The water is coming from SHP. So water is being diverted to several pipes as well as the machinery of hydro power. While passing through all these it contains some impurities like of lubricant of machines etc. So drinking or using this type of water is injurious to health³

3.5 Cumulative impacts:

Large Catchments are required for the multiple and large hydro-power projects and setting up multiple plants on the river increases the chances of catchment level

3. CHANDRA BHUSHAN, “Green Norms for Green Energy”, Centre for Science and Environment, Pg. No.07,2013

impact on these areas such as drought and cyclones or may be heavy rainfall. Secondary impacts could be of the influencing land use.

- **Land:** Land can be degraded by the soil erosion. This is very essential to protect the locations from soil erosion, encourage afforestation, and to ensure proper utilization of muck during the construction of roads, check dams and slope maintenance. Renewable energy projects can be resource-intensive — 1 megawatt (MW) of solar power needs 2.5-3 hectares (ha) of land. This raises concerns of land acquisition, impact on local ecology if the land area is large and in eco-sensitive areas, and issues of waste disposal⁴

CHAPTER-3

The Effective Use and Guidelines of EIA For SHP

To Understand the Consequences and forecasting its effect on environment and people is referred to be as Environment Impact Assessment (EIA). The objective of the EIA is to look beforehand and address potential environmental look over and concerns at the very early stage of project planning and set-up. According to the EIA notification 2006, a hydro-power plant below 25 MW capacities does not need an EIA. The major problem that started occurring is that every project in India is being started constructing without EIA regulations and in a falsifying manner. The

⁴ Ibid



large Hydro-power plant constructor split them into two parts to place plant in the category of small hydro-power capacity.

- The EIA (ministry) prepare a comprehensive policy per inspection, verification, and monitoring and the overall procedure relating to the grant of forest clearances and identification of forest in consultation of state.⁵

3.1 To Improve the Quality and transparency:

- The overall aim and object of the environmental permitting are to look after the environment and human health as well (in a transparent accountable manner) on a legally binding requirement through environment mechanism (OECD, 2007). Any projects at their primary stages have to go down through various states of check and clearances. Ministry of Environment and Forests (MoEF) at the central level and Pollution Control Boards (PCBs) at the state level are approached for various consents.
- For improving the quality and transparency of the environment clearances process, prior informed consent of local self-government of the respective area may be introduced for the proposal requiring environmental clearance.

A public hearing should also be made mandatory for the activities specified in the environment impact assessment notification.

- An Environment Impact Assessment (EIA) is a programme that analyses the environmental impact and lowers down its effect much before setting up when the planning and plotting were desired and before any promise being made. In most of the industrialized country, EIP is implemented when there is exceed the size of the hydro-power plant.

Meanwhile, the 12th Five Year plan's strategy aims to develop the renewable energy sector through capacity addition in wind power, small hydropower, solar power, and bio power. Thus the renewable energy space in the country is going to witness a large number of renewable energy projects in coming years. Considering the energy security concern and commitment for a 'Low Carbon Growth Strategy', the 12th Five Year plan has provisions to ensure sustainable development of the power sector. In their efforts to reduce GHG emissions, Government is emphasizing the development of small hydropower as well from renewable sources.

- According to section 8, any generating company intending to set-up hydro- generation station

⁵Ministry of Forest and environment, Government of India, Annual Report, January 2014, available at <http://envfor.nic.in/sites/default/files/OM%20FC%20100114.pdf>, last seen 07/02/2018



shall prepare and submit to authority for its concurrence.

- As also, stated earlier that EIA is the mechanism which analyses the overall effect of the SHP on the environment. The possible reason for exemption of EIA from SHP could be that government doesn't want to face the impact and let people know about the harmful effect of SHP. Mission 2022 power for all which is the ambitious target of achieving 175 G.W. of energy from the renewable source.

CHAPTER-4

CONSTITUTIONAL PROVISIONS

Protection and improvement of the environment is a constitutional mandate. The idea of Welfare State is the commitment weaved with a country which is subjected to constitutional provisions for environmental protection under the chapters of Directive Principles of state policy and Fundamental Duties. Provision of the Constitution which recognize the fundamental right to clean and wholesome environment is absent and has been set off by judicial activism in the recent times.

- Art. 21 of the constitution envisage a right to life and personal liberty of a person. The Word "life" under Art. 21 means a quality of life, which includes right to get pollution free air and water, protection of ecology and environmental pollution and freedom

from noise. Also UDHR under Article 3 recognizes right to life and liberty. Article 3 UDHR

- The right to pollution free environment and protection of ecology came to acquire the status of fundamental rights under Article 21 by giving liberal interpretation.
- It is accepted throughout that the right to life under Art. 21 also embrace the right to live in a wholesome, pollution-free environment. This is to be read with Art. 48 A and Art. 51A (g) of the constitution that imposes a duty on the state to preserve and improve the environment. Further, this is in line with India's international obligations, i.e. The Rio Summit, Kyoto protocol, etc.
- In MC Mehta case, imposed on the state, a duty to anticipate, prevent and attack the causes of environmental degradation.
- Also, under well established, Public Trust Doctrine, the state is the trustee of all national resources which are by nature meant for public use and enjoyment. Public at large is the beneficiary of the running water, air, forest and ecologically fragile lands. The state as a trustee is under a legal duty to protect to natural resources; these resources is meant for public use
- Principle recognized regarding the matter i.e. precautionary principle, it is based on the theory that it is better to on the side of caution and prevent environmental harm which may indeed become irreversible.



Precautionary principle anticipated action to be taken to prevent harm. The precautionary principle makes it mandatory for the government to Anticipate, prevent and attacked the causes of environmental protection degradation Thus it is high time the govt. policy environmental friendly way possible permission 2020, power for all to sustain and preserve the rich, diverse ecosystem and preventing the infringement of rights of citizens.

- The SHP's projects are causing right to live& livelihood which might cause displacement. Any person who is deprived of his right to livelihood except according to just and fair procedure established by law can challenge the deprivation as offending the right conferred by Art 21.
- Also throwing light on the Rio Summit, 1992, the UDHR, the Asia- Pacific partnership on clean development and climate, all to which India is a signatory deals with the issues of pollution, sustainable development, environmental rights and these international instruments are consider important to be read with Fundamental Rights as they further, enlarge the scope of the same
- In Virender Gaur v. State of Haryana , by referring to principle no. 1 of Stockholm deceleration of United Nations on Human Environment, 1972, the court observe that right to have living atmosphere congenial to human existence is a right to life. The state has a duty in that behalf and to shed its extravagant unbridled

sovereign power and to forge in its policy to maintain ecological balance and hygienic Environment

- The Principle of Sustainable development has been also the effective doctrine has maintained the harmonious balance between environment, economy, and society keeping in view the protection of the ecology with sustainable development. The principle endeavors that while looking at economic growth the state should focus on environment growth as well and do not cause ecological imbalance.

This concept of 'Sustainable development' recognized as a Fundamental Right under Article 21 to keep in mind the "principle of proportionality" so as to ensure protection of environment on the one hand, and to undertake necessary development measures on the other hand, since, the economic development cannot be allowed to take place at the cost of ecology but the necessity to preserve ecology and environment should not hamper economic and other developments.

CHAPTER-5

CONCLUSION & RECOMMENDATIONS

RECOMMENDATIONS:

As Long as there is the talk of development of SHP's we must consider the Principle of



Proportionality where development and Ecological balance must go hand-in-hand so there is a lesser chance of conflict where to government or state focus on. At the cost of development, the environment should not be put in danger and vice-versa.

SHP plants either of small capacity shall also be included in the EIA clearance process by the notification of 2006.

Local Community should be benefitted from the project. Profit generated should be shared with them for development process; they should have the 'Right to Power'.

CONCLUSION:

Human Beings can ensure fundamental equality and adequate conditions of life in an environment that permits a life of dignity and well- being. There seems to be urgent need to formulate law keeping in mind those who pollute environment are not just destroying environment but also violating human right as well. Government needs to re-think that the ecological development should be kept over environment or not.

It becomes the need of an hour that the development of small hydro-power plant should take place keeping in view all the safety parameters for the environment so that the problems which is the concern should not re-occur.

