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A Review- Sustainable Energy Source and Its Impact on Environment

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Abstract: ***Hydropower plays an important role for the development of social and economic growth of country as it provides the electricity at cheaper rates. Hydropower is a sustainable and renewable source of energy due to large amount of the energy generated by hydropower plants. Dams or reservoirs can be used for many purposes such as irrigation, fishing, water sports and bird sanctuary. This gives us a solution for the problem of today's boom and gloom economy. These cause severe damage to our environment to maximize the benefits and minimize the negative environment social and economic impacts, sustainability of water resource project is required. In this paper we will analysis the hydropower technology as a sustainable energy source and its impact on environment.***

Keywords: Energy; Hydropower plants; Environment; Renewable sources.

I. INTRODUCTION

Currently one of the issue and challenges in India is to achieve the sustainable energy system [1]. India is the only country in the world that have dedicated ministry for renewable energy development [2]. India has 4th rank in the world in total energy consumption. Thus it is rich in abundantly full of resources with wind, solar and hydro energy. India contains of very small amount of hydrocarbons (0.4% of worlds total). Being a net importer of energy, more than 35% of the countries primary energy needs are ensured through import [3].

India's energy challenge-India needs more power day by day because of increasing and growing population. According to CEA, the peak demand in 2008 was 120GW of power, while only 98GW could be supplied. The future target is to share of renewable energy is 24% for 2031 with the solar energy increasing to 56GW of installed power. The average consumption of electricity in India is still lowest in the world at just 630KWh per person per year. But this is expected to grow to 1000KWh within coming year [4].

A. Source of renewable energy available in India

1) Solar Energy
2) Wind Energy
3) Biomass Energy
4) Hydropower Energy

India currently generates 135,781MW of power. Most of the power is generated by thermal power plants.

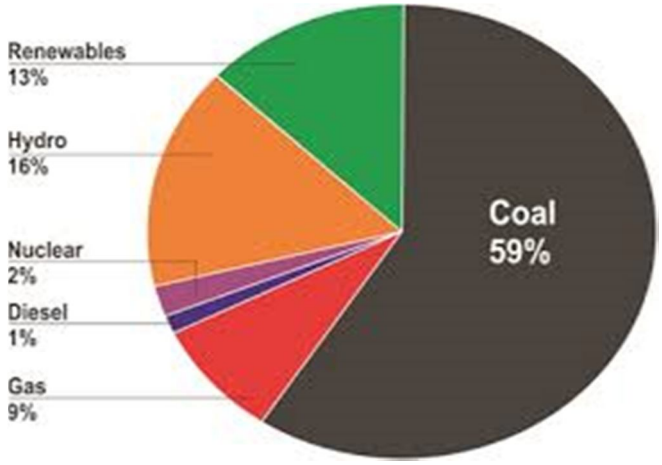

Figure 1. India energy data statistics and analysis

B. The key drivers for the renewable energy are following:

1) The demand supply gap, especially as the population increases.
2) A large untapped potential.
3) Concern for the environment.
4) The need to strength than India's energy security.
5) A perfect solution for ruler electrification.

C. Hydropower Technology

Hydropower is the technology to generate the power or electricity by constructing dam or barrage across the river [5]. Its principle of operation is very simple. Water is stored at higher level and then it flows out at a higher pressure to the downward though the penstocks which rotates the turbines so that it follows the principal of conversion of kinetic energy into mechanical energy [6].

Figure 2. Hydropower plant

D. The Basic Parts Of Hydropower Plants Are

1) Dams- There is big high walls that are used to collect water so that it serve as a water reservoir. These have huge benefits such as irrigation, flood control and water supply system.
2) Turbines- The next process is to convert the Kinetic energy into mechanical energy. The water flows from a height through the penstock and rotates the turbines.

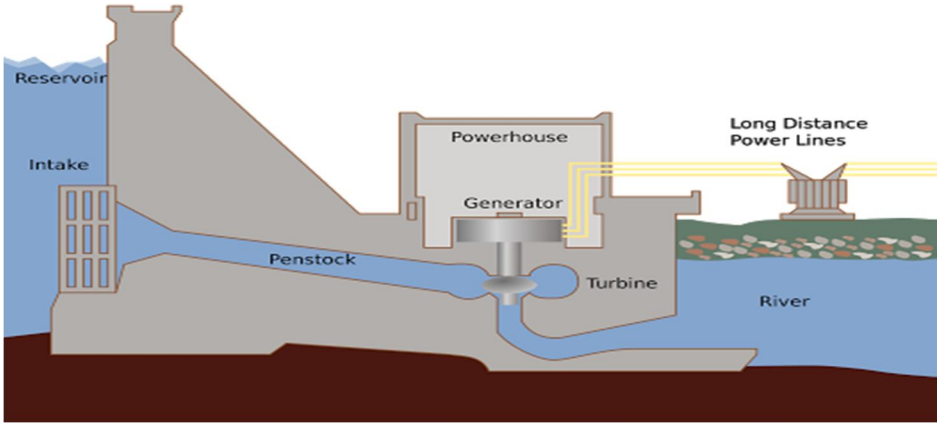

Figure 3.Parts of hydroelectric dam

3) Generator- Basically generators are used for producing current which works on the principal of magnet, when we pass a magnet near the conductor electric current is produced which flows through it.
4) Rotor and stator- The rotor consists of field pole, rotates on the specific speed. It passes the field poles across the stator to have the same effect on the electric field.
5) Transmission lines- By this electricity is transferred to the substation which provides to the consumers.

E. Benefits of Hydro plants

Hydropower is clean fuel resource that does not pollute the environment like other plants like thermal and nuclear plants. Hydropower is a domestic source of energy such as it allows each state to produce own power without depending on international resources [7].It is a renewable power source which makes it more reliable and comfort source than fossil fuels that are rapidly being depleted. Impoundment hydropower creates reservoirs that can be used in various opportunities like notably fishing, swimming and boating Hydropower plants can generates power to grid immediately so that they provide backup power during major electricity outage. Hydropower provides a number of benefits such as flood control, irrigation and water supply [8].

F. Impact on Environment

With huge benefits, hydropower plants have also several environment impacts. These impacts results from the existence of the dam as well as operation of dam [9].

Swedish researchers estimate that 60% lengths of the world large river system are highly or moderately fragmented by dams, inter-basin transfers and water withdrawals for irrigations [10].

Many of the negative impacts of hydropower plants are:

1) The damming of rivers affects the plants and animals near the waterways that are affected. The deltas near due to sedimentation of soil change the shapes of rivers that cannot support river life [11].
2) It can have large environmental impact such as changing the environment, affecting land use, agriculture in dam area.
3) Reservoir can cover peoples home, natural areas, agricultural land etc. methane (Green House Gas) may be developed from some reservoirs which can be emitted to atmosphere [12].
4) Large dams are often the largest energy development in many poor countries which can lead to the problem of unbalanced energy supply. Generally the rich countries increase the modern energy, so they become depending upon hydro-electricity that can create unbalancing and energy rationing [13].
5) Many dams which were built for industrial use are not now used and occupying a great space but they cannot be broken or removed as it would cause serious flooding. This can affects many buildings and property.
6) It can cause the river such that changing the river pathway. So shortage of water can cause serious disputes between people.
7) The water flowing through the dams collects nitrogen which can damage and also kills fish. They can also damage the reproduction of fishes

II. CONCLUSION

The large hydro-plants may solve the problem of water and power be siding the moderation of floods but these will have great impact on environment. The problem could be solved by small hydro projects with involvement of public participation. The states that need more dams at the same time are concern about huge impact on environment and face the great challenges. A well planned survey for the dams should solve these challenges and impacts on environment.

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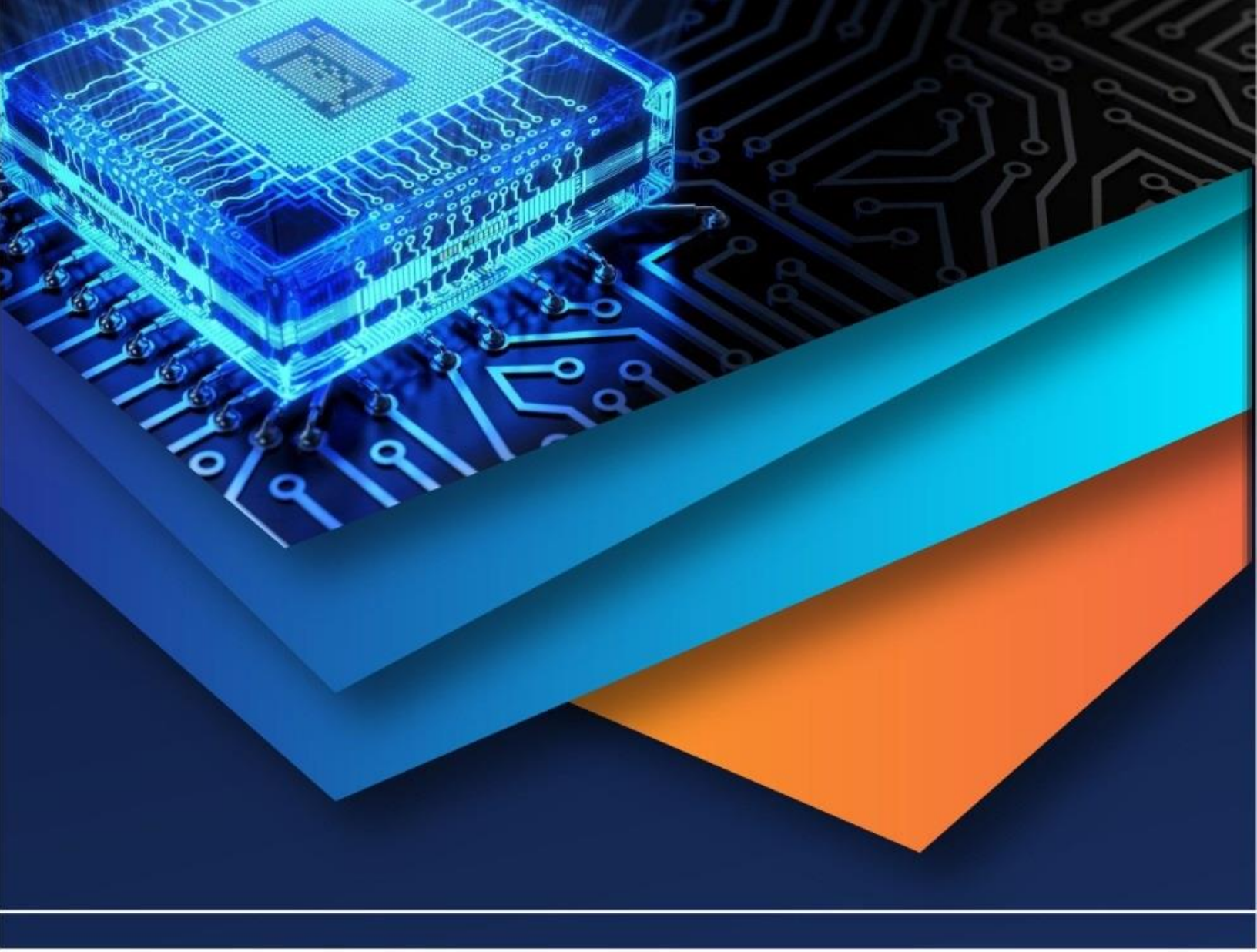

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