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SUSTAINABLE DEVELOPMENT:JAITAPURNUCLEAR POWER PLANT

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Abstract

The whole world is excited to create technology for the generation of electricity from the nuclear power. This nuclear power is clean up to we are handling with care. It provides us constant source of energy. Those countries which are involved in the proper distribution of the fuel of these plants are known as powerful. And also as compare to conventional power source this plants are healthy for our nature. But there is another side of the coin on which we can face the major condition of destruction of this human being. But however by using safety factors we developed such a technique for the generation of electricity. Now this development is really sustainable to this environment? , question arises again. In India there is a proposal of nuclear power plant in the state Maharashtra named as Jaitapur. The issue related to this and also about environment isbecome barrier to completion of this plant. So here we are discussing about all this points.

Index Terms: *Nuclear power plant in India, Jaitapur project, issue, Environmental disaster.*

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1. Introduction

India is world's **6th largest** energy consumer, accounting for **3.4%** of global energy consumption, with Maharashtra as the leading electricity generator among Indian states. The **total demand** for electricity in India is expected to cross **950,000 MW by 2030.** India's nuclear power plant development began in 1964. India signed an agreement with General Electric of the United States for the construction and commissioning of two boiling water reactors at Tarapur. In 1967, this effort was placed under India's Department of Atomic Energy. But at this stage there should be attention towards the environment. The need of energy is obviously necessary to fulfill but the before that need that is first policy should be our nature which should not be destroy in this development. In the Jaipur power plant there are some issues related to environment. In this paper we are giving some discussing some issues and solution for the clean environment and clean power generation.

1.1 Nuclear power plant in India

Nuclear power is the fourth-largest source of electricity in India after thermal, hydroelectric and renewable sources of electricity. As of 2016, India has 22 nuclear reactors in operation in 8 nuclear power plants, having an installed capacity of 6780 MW and producing a total of 30,292.91GWh of electricity while 6 more reactors are under construction and are expected to generate an additional 4,300 MW .There have been mass protests against the French-backed 9900 MW Jaitapur Nuclear Power Project in Maharashtra and the Russian-backed 2000 MW Kudankulam Nuclear Power Plant in Tamil Nadu.india have aims to supply 25% of electricity from nuclear power by 2050.The utility in India has one National Grid with an installed capacity of 329.23 GW as on 31 August 2017. Renewable power plants constituted 30.8% of total installed capacity. During the fiscal year 2016-17, the gross electricity generated by utilities in India was 1,236.39 TWh and the total electricity generation (utilities and non-utilities) in the country was 1,433.4 TWh .The gross electricity consumption was 1,122 kWh per capita in the year 2016-17. India is the world's third largest producer and fourth largest consumer of electricity. Electric energy consumption in agriculture was recorded highest (17.89%) in 2015-16 among all countries. From Nuclearpower plant it contributes 13.5% energy in total energy production in India.

1.2 Major advantages of nuclear power are as follows:

1) High-capacity factors are achievable, often in excess of 90% with long operating cycles.

2) Essentially negligible operating emissions of carbon dioxide into atmosphere compared to alternate thermal plants. 3) Relatively small amount of fuel required.

1.3 list of nuclear power plant in India and its issue

Table.01:

Nuclear power plant in India	State	Capacity
Tarapure	Maharashtra	1,400
Rawatbhata	Rajasthan	1,180
Kaiga	Karnataka	880
Kakrapar	Gujarat	440.
Madras/ Kalpakkam	Tamil Nadu	440
Narora	Uttar Pradesh	440
Kudankulam	Tamil Nadu	2,000

1.4Factors on which nuclear power plant can be succefully installed:

- locations and General Area
- Land availability
- Available source of cooling water
- Electrical System
- Meteorology
- Population Distribution
- Land Use
- Foundation Conditions & Seismicity Flood Analysis & Safe grade elevation at site etc. Solid Waste Management & Radiological Burden
- Proper access for transportation of heavy / over dimensional equipment.
- The place where plant is to be located should be away from earthquake hazard zooming map, so that damages from earthquake will be avoided and incident as kind of Fukushima, japan will be avoided.

2. Jaitapur nuclear project detail

Jaitapur Nuclear Power Project is a proposed 9900 MW power project of Nuclear Power Corporation of India (NPCIL) at Madban village of Ratnagiri district in Maharashtra. If built, it would be the largest nuclear power generating station in the world by net electrical power rating. Estimated cost of this project was around ₹1,000 billion. The proposed Jaitapur Nuclear Power Project is located at the west coast. It has an average elevation of 90 feet (27 m). This project will spread over 968 hectares of land. Jaitapur is on the Arabian Sea coast in Ratnagiri district in the south-western part of Maharashtra, India. The district is a part of Konkan in Western Ghats. The Sahyadri Mountain range forms the eastern boundary of the Konkan, and the Arabian Sea marks the western boundary. Jaitapur was one of the important ports in ancient and early medieval times.

3. Issue regarding jaitapur nuclear project

- The Department of Atomic Energy (DAE) maintains that the Jaitapur nuclear power park will not lead to any displacement of people, and that much of the acquired land is unproductive. This strains credulity. As we see below, the land in the area supports a thriving agricultural and horticultural economy—and thousands of livelihoods.
- People in the Jaitapur area received land acquisition orders in 2007, and by January 2010, the government of Maharashtra had completed the acquisition of 938.026 hectares. Villagers were offered Rs 2.86 per square foot for barren land and Rs 3.70 per square foot for cultivable land. This was subsequently raised to Rs 4 lakhs an acre, and most recently, to Rs 10 lakhs, with the guarantee of one job for every affected family.
- However, despite forcible acquisition of land, only 114 out of 2,375 farmer families have claimed the compensation offered; all others have refused to take the cheques. The land acquisition process has been utterly undemocratic and violent at times.
- Interestingly, despite the environmental clearance given to the project six years ago and completion of the land acquisition process, no nuclear plant was set up at Jaitapur as the Nuclear Power Corporation of India Limited (NPCIL) and the French company are yet to sign certain techno-commercial agreements.
- NPCIL has labelled 65 percent of the land as barren. The local population finds this outrageous because the land is highly fertile and produces rice, other cereals, the world's most famous mango (The Alphonso), cashew, coconut, kokum, betel nut, pineapple and other fruits in abundance. Some of the land is also used for cattle-grazing and rain-fed agriculture and is hence productive.
- Ratnagiri was declared a "horticulture district" by the Maharashtra government in 2003. Farmers have invested big amounts in horticulture (mainly mangoes and cashew nuts) under government schemes, often with loans. Besides complaints about the government not recording their plantation crops correctly, people also claim that the compensation for these trees is substantially less than what they earn from them annually.

- Ratnagiri has 15,233 hectares under mango cultivation, with an estimated annual business turnover of Rs. 2,200 crores. The mango crop is extremely sensitive to the minutes changes in temperature and soil chemistry. The local people apprehend that a good deal of the mango harvest would be lost if the project comes up.
- After the Jaitapur nuclear power project row, another protest is brewing in the Konkan over a mega oil refinery project worth around Rs 1 lakh crore to be set up in Nanar and 16 villages of Rajapur Tehsil, Ratnagiri, by the Centre.
- Villagers are strongly opposing the project even as the process for land acquisition has started. Meanwhile, opinion on the project seems divided as a certain group claims to have the support of villagers and is ready for the project. Whereas, another group which claims to have resolutions of all gram sabhas opposing the project, is firmly against it.
- The Maharashtra government has declared this zone of 14,000 acres as an industrial area and has started the land acquisition process through its industrial body, Maharashtra Industrial Development Corporation (MIDC). However, a large number of villagers is against setting up of the project in their area due to environmental concerns. Ashok Walam, a villager who is part of the agitation, said, "We will not allow this project to be set up in our villages. We come under an environmentally sensitive area. We are happy with our traditional means of livelihood such as horticulture and fisheries.

3.1Reasons why we should protests to jaitapur plant

- **Strikes the visitor to Jaitapur-Madban**:- The first thing that strikes the visitor to Jaitapur-Madban in Maharashtra's Ratnagiri district, about 400 kilometers from Mumbai, is the sheer beauty of the place, lush with varying shades of green, and with a spectacular view of mountains, valleys, plateaus, lagoons and creeks, besides orchards and farmlands. You at once become aware that this is a great treasure-trove of nature, exceptionally rich in plant diversity, including cereals, grasses, roots, legumes, herbs and flowering trees, including those bearing fruit (especially prime varieties of the world's best-known mango, the Alphonso). This region receives 3,000 to 3,500 mm of rain every year. There is hardly a square foot of land here which is not green.
- **Displacement**:- The project will occupy over 968 hectares in five villages—Madban, Niveli, Karel, Mithgavane and Varliwada. It will affect the livelihoods of some 40,000 people, including farmers, horticulturists, fisherfolk, agricultural workers, loaders, transporters, traders, street-vendors, and providers of many other services.
- **Earthquake hazard zoning**: - Jaitapur is located in a seismically sensitive region. It comes under Zone IV in the earthquake hazard zoning map of India, ranging from I to V in growing seismic intensity. This zone is called the High-Damage Risk Zone and has a potential for strong earthquakes. It is not far from Koyna, also in Maharashtra, where an earthquake of Magnitude 6.4 on the Richter scale killed 200 people in 1967
- **Water discharged**:- Water discharged from the plant into the sea will be 5 ℃ hotter than the ambient sea temperature. But "even a 0.5 ℃ of continual thermal stress will lead to mortality of marine species," says a BNHS report. The Society has mapped 407 hectares of mangrove vegetation in a 10 km-radius around the nuclear plant.
- **Farming and horticulture**:- Besides farming and horticulture, the Jaitapur-Madban area has a sizeable fishing economy. Fisheries will be affected since the plant will daily release a huge 52,000 million litres of hot water into the sea. Tight security in the coastal region would also severely restrict fishermen's use of the Jaitapur and Vijaydurg creeks, where they get a draft of 20 fathoms, usually only found at a distance of 2 to 3 nautical miles. At least 15,000 people depend on fishing in the area.
- **Threat to a Unique Ecosystem**:- Konkan has been called the "Kashmir of Maharashtra" because of its stunning beauty. The Konkan ecology contains virgin rainforests and an immense diversity of plant, animal and marine life. Botanists say it is India's richest area for endemic plant species. Konkan is one of the world's 10 "Hottest Biodiversity Hotspots".The Sahyadri Mountains in the Western Ghats are home to over 5,000 species of flowering plants, 139 mammal species and 508 bird and 179 amphibian species, including 325 globally threatened ones. Two great peninsular rivers (the Krishna and the Godavari) originate there. The region's ecology is so unique that one would need a diabolically destructive mind to want to wreck it by building a nuclear power plant in it. The gigantic Jaitapur nuclear project will damage this ecosystem irreparably.

4. Solution on jaitapur plant issues

- The Ivanpah system consists of three solar thermal power plants on 4,000 acres (1,600 ha) of public land near the California–Nevada border in the South-western United States. It is near Interstate 15 and north of Ivanpah, California.The 392 MW Ivanpah Solar Power Facility, located 40 miles (64 km) southwest of Las Vegas, is the world's largest solar-thermal power plant project, which became fully operational on February 13, 2014.
- In this solar thermal power plant very much amount water is required for that the Department of Energy to report on ways to reduce water consumption by CSP. The subsequent report noted that dry cooling technology was available that, although more expensive to build and operate, could reduce water consumption by CSP by 91 to 95 percent, bringing their consumption below that of conventional power plants. A hybrid wet/dry cooling system could reduce water consumption by 32 to 58 percent.

- **Dry system:**

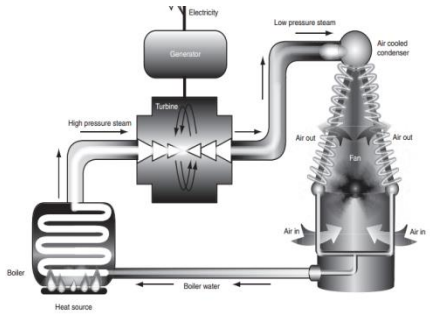

Fig.1

- Here water requirement is feed by this technology we can use this wet/dry system for nuclear power plant in desert to store the water and use for the operation. In India there is Rajasthan which have one nuclear power plant Rajasthan is famous for its heritage and tourism potential. It also has the country's biggest nuclear power plant -the Rajasthan Atomic Power Station (RAPS). The RAPS with its four reactors already in operation and four more in the pipeline hopes to make the country self-reliant in its energy requirements. The four operational nuclear power reactors contribute 740 MWe of power out of the national capacity of 2720 MWe being generated from 14 nuclear power reactors.
- The first two Indian PHWRs- RAPS-I and RAPS-2 were taken up for construction as a joint venture with Canada. They are situated in Rawatbhata, a remote village in Chittorgarh district of Rajasthan and about 64 kilometres from the industrial town of Kota. The land selected is in between the Rana Pratap Sagar Dam and Gandhi Sagar Dam at the right bank of the Chambal river. The water from the reservoir meets the requirement of nuclear power stations.
- Rajasthan state is India's largest state by area and home to one of the largest desert in the world. The Royal state has major river system in India such as Banas River,Jawai River and the Chambal River, These rivers of Rajasthan are lifeline for drinking water in the state and some of the major dam built across rivers of Rajasthan includes Khandip Dam,Jaggar Dam,Jakham Dam,Morel dam,Jawahar Sagar Dam and Kota Barrage.There 5 largest dam in rajshthan is besalar dam,mahi bajaj sagar dam,rana pratap sagar dam,meja dam, jawai dam.
- By implementing this two states idea the jaitapur project is shift on to the desert area without disturbing the jaitapur biodivercity,and human being life is better solution on to this issue.

3. CONCLUSION

From all the above points we can say that India is unique due to only its biodiversity. And we are stand in the world due to this biodiversity so that the need of energy can be fulfil by any other way but not by destroying this uniqueness of our nation. By shifting this location of plant we can prevent the destruction of the environment.

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