

COMMENTARY

People vs Nuclear Power in Jaitapur, Maharashtra

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This writer visited Jaitapur in early January 2011 on behalf of the Coalition of Nuclear Disarmament and Peace as part of a team of citizens which wanted to examine popular concerns about the environmental, safety, livelihood and governance issues raised by the project, to assess violations of civil liberties by the state, and to express solidarity with the movement against it. The team included former Planning Commission member S P Shukla, journalist Bhasha Singh, and filmmaker Rafeeq Ellias. It was guided by Vaishali Patil of the Konkan Vinashkari Prakalp Virodhi Samiti. Some portions of this article are paraphrased from CNDP's booklet, *Courting Nuclear Disaster in Maharashtra: Why the Jaitapur Project Must Be Scrapped*, available at www.cndpindia.org

Contents

- [Livelihood Destruction](#)
- [Threat to a Unique Ecosystem](#)
- [Untested Reactor Design](#)
- [EPR's Gold-Plated Power](#)
- [No Nuclear Renaissance](#)

In the Konkan, thousands of families in the environmentally-rich and verdant Jaitapur area are waging a non-violent battle against the Department of Atomic Energy's plan to construct the world's biggest nuclear power complex in the region. A report of the struggle that has been met with repression and a critique of the proposed European Pressurised Reactors which

are currently not operational anywhere in the world and have been criticised for their design flaws.

The first thing that strikes the visitor to Jaitapur-Madban in Maharashtra's Ratnagiri district, about 400 km from Mumbai, is its sheer beauty, 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.

The second thing that strikes you is the profusion of posters, banners and slogans which say "Areva Go Back", "No to Nuclear Power" and "Radiation Kills" in Marathi. These are the work of a grass root movement against the project of the Department of Atomic Energy (DAE), and its subsidiary, Nuclear Power Corporation of India Ltd (NPCIL), to locate six giant (1,650 megawatts each) nuclear reactors designed by the French-origin nuclear company Areva.

This is planned to be the world's largest nuclear power station. The project will occupy over 968 hectares in five villages - Madban, Nivel, 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.

NPCIL officials claim that two-thirds of the land being acquired by the project is "barren" and "unproductive", and will dis-place no one. The Environmental Impact Assessment (EIA) report prepared by the National Environmental Engineering Research Institute attests this claim. Nothing could be farther from the truth observed by one's naked eyes.

No wonder people are angry at the project, against which they have fought for four years. They treat the state government's offer of compensation for lands

with contempt. The original offer was Rs 2.86 per square foot for barren land and Rs 3.70 for cultivable land - equivalent to Rs 1.25 lakh to Rs 1.6 lakh an acre. It was raised to Rs 4 lakh an acre. The latest offer, of January 2011, is a "package" of Rs 10 lakh an acre plus one guaranteed job per affected family. More than 95% of the 2,375 families in the area whose land has been acquired, we were told, have refused to accept the compensation offered; those who did are absentee landowners living in Mumbai.

Livelihood Destruction

Scores of people we spoke to in Mithgavane, Madban, Nate and Nivel were emphatic that compensation is an irrelevant matter. The central issue is about livelihoods, which are deeply integrated into the ecosystem and natural resources, including fertile land, which produces an abundance of paddy, millets, vegetables, and, not least, fruit. The only assurance of people's survival is that they do not lose land and access to natural resources. The project is incompatible with this.

The Maharashtra government declared Ratnagiri a "horticulture district" in 2003. Farmers have invested large amounts of money in mango, cashew nut, coconut, kokum and betel nut cultivation. Ratnagiri has 15,233 hectares under mango cultivation, with an estimated annual turnover of Rs 2,200 crore. The mango crop is extremely sensitive to the minutest changes in temperature and soil chemistry. People apprehend that a good deal of mango would be lost if the project comes up.

Besides farming and horticulture, the Jaitapur-Madban area has a sizeable fishing economy. Fisheries will be affected since the plant will release 52,000 million litres of hot water into the sea every day. 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 two to three nautical miles. At least 15,000 people depend on fishing in the area.

According to the Maharashtra Macchhimar Kruti Samiti, seven fishing villages -

Sakhari Nate, Tulsunde, Ambolgad, Sagwa, Kathadi, Jambhali and Nana Ingalwadi – will be threatened by the project. The annual fish catch in Ratnagiri district is 1,25,000 tonnes. About 40,000 tonnes of this comes from Sakhari Nate.

A sizeable amount of the catch is exported to Europe, Japan and other countries. Fish exports are likely to be affected because they might fail the stringent requirements of European “catch certificates” which demand a declaration of the location, depth, temperature, and time of fishing. Consumers in the developed countries would resist eating produce grown in the neighbourhood of nuclear reactors. Mango consignments from Ratnagiri have been rejected in Japan because traces of pesticides were found in the packaging. NPCIL and Maharashtra government officials recently tried to tempt fisherfolk in Nate, a prosperous, largely Muslim, fishing village with 500 boats, with offers of alternative jobs. They retorted, “Will you give us another Arabian Sea?” The fisheries economy generates enough income to pay unskilled workers a daily wage of Rs 300 to Rs 400, a rarity in India and Maharashtra.

The area’s fisherfolk know through people-to-people exchanges of the plight of the original inhabitants of the villages around Tarapur, the site of India’s first two nuclear reactors, which is not far away. Three fishing harbours there have vanished, the once-prosperous farmers have become paupers, and there has been no rehabilitation worth the name.

A major complaint of Jaitapur’s people is that state and NPCIL officials treat them as ignoramuses and fools who can be taken for granted, misled or lied to. Milind Desai of Mithgavane, a medical doctor, said:

"They first refused to disclose why they conducted a feasibility study in 2003 and why the state government signed a Memorandum of Understanding with NPCIL in 2006. Then they said there would only be two 1,000 MW reactors. Now there are to be six, bigger, reactors. They also told us that radiation is harmless. After all, it exists in nature. But as a doctor, I know better."

Added Desai:

"Our people have seen films about the Jaduguda uranium mines and slide-shows on the terrible health disorders that exist around the Rajasthan Atomic Power Station. We know what happened at Chernobyl. And we know that Areva's (nuclear power plant) has not been approved for safety anywhere in the world, including France where it was designed."

The people of the Jaitapur region have stoutly opposed the nuclear project right since 2006. Initially, the opposition came mainly from Madban (literally, a forest of palm) and other directly affected villages. But soon, fishing communities, mango traders, transporters and civil society activists from the Ratnagiri district headquarters, and activists and environmentalists from Mumbai and other parts of India joined in. The state government and NPCIL have maligned the protests by attributing them to "outside elements".

However, all the five gram *panchayats* (democratically elected local governing bodies) in the affected area have unanimously passed resolutions opposing the project. During our visit, we could see great indignation over the government's imposition of the project on the villagers. The Maharashtra government is zealous about implementing the project in blatant disregard of its ecological, livelihood and economic consequences. Chief Minister, Prithviraj Chavan, was the union minister of state for atomic energy until November and is a dogmatic proponent of nuclear power. He regards its critics as uninformed, destructive, anti-development Luddites.

The government has repeatedly stooped low in maligning the project's critics. The state government has unleashed savage repression on the local people for opposing the project. It routinely arrests and serves externment notices upon peaceful protesters, and promulgates prohibitory orders under Section 144 of the Criminal Procedure Code and the tough Section 37 of the colonial Bombay Police Act. Activists have had false charges framed against them, including attempt to murder. The higher judiciary, apparently afraid to question the Holy Cow of nuclear technology, tends to refuse anticipatory bail to

them. An instance of such repression is a frail 70-year-old diabetic, Shriram Dhondo Paranjape, who was falsely charged with pelting stones at the police - when he could not have lifted a pebble. He was detained for 15 days.

Eminent citizens who wanted to visit Jaitapur to demonstrate their solidarity with the protesters were banned. They include Communist Party of India general secretary A B Bardhan, former chief of the Naval Staff Admiral L Ramdas, former Supreme Court judge and Press Council of India chairman P B Sawant, Pune-based social scientist Sulabha Brahme, and ecologist Madhav Gadgil, chairman of the Western Ghats Ecology Experts' Panel established by the ministry of environment and forests (MoEF).

In December, former Bombay High Court judge B G Kolse Patil was detained for five days and not even produced before a magistrate within 24 hours, as mandated by law. Since then, Praveen Gavankar, a key activist of the Janahit Seva Samiti from Madhan, has been detained under trumped-up charges.

Maharashtra's industries minister (and former chief minister) Narayan Rane, himself from Konkan, has repeatedly threatened protesting activists and warned that "outsiders" who visit the area to help them "will not come out (alive)". The repression is unprecedented in the Konkan belt and resembles the police raj in Maharashtra's Naxalite-affected areas.

Threat to a Unique Ecosystem

The 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. It 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.

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. It is far from clear if the project authorities have evolved the necessary construction parameters such as special reinforcements needed for "earthquake-proofing" the structure to a reasonable degree.

The Konkan region's rich natural resources are already under severe threat on account of several "development" projects along the western ghats - from Panvel in Raigad district, across Madban in Ratnagiri, to Sawantwadi in Sindhudurg. These include 15 coal-based power projects totalling nearly 25,000 MW, 40 medium and small ports, nearly 40 medium and mega special economic zones, major mining projects, and "chemical hubs". The environment minister himself has admitted that the total power generating capacity proposed on a narrow strip of coastal land 50 to 90 km wide and 200 km long is around 33,000 MW.

The gigantic Jaitapur nuclear project will damage this ecosystem irreparably. As the Bombay Natural History Society (BNHS) notes, "the true impact of a project of this scale will never be known" without a comprehensive biodiversity assessment. This has not been done.

The Jaitapur nuclear project presents other problems too. Water discharged from the plant into the sea will be 5°C hotter than the ambient sea temperature. But "even a 0.5°C 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.

A recent environmental study of Ratnagiri and Sindhudurg districts by the chair of the Western Ghats Ecology Expert Panel, the renowned environmentalist Madhav Gadgil, sharply criticises the government for violations of environmental laws and norms in the Konkan. Gadgil's interim report questions the very logic of setting up a number of power projects in an ecologically invaluable yet fragile region. Instead, the report argues for micro- and mini-hydel projects.

The current energy requirement of these districts is 180 MW, while their current production is 4,543 MW, so the area is producing vastly more than its own needs. The report holds that the EIAs conducted in the region by the government are flawed "almost without exception".

The report says it is important "not to rush into environmentally damaging options if there is evidence that much less damaging options are likely to become available in the near future". One of these is tapping the area's mini- and microhydroelectricity potential, estimated by former Maharashtra irrigation secretary D R Pendse to be as high as 2,000 MW using only 30% of the total water available in Konkan for hydel development.

Gadgil also laments the disrespect shown by the state agencies for civil rights in pushing these "development" projects.

In fact, his own field trip and consultations with the people in the area had to be cut short because the district collector had imposed Section 37(1)(3) of the Bombay Police Act, 1951 prohibiting gatherings of more than five people. Such prohibitions were in effect for 191 days between August 2007 and October 2009. None of these environmental concerns highlighted by Gadgil figures in the 1,600 page EIA report prepared by the National Environmental Engineering Institute (NEERI).

The EIA report wholly ignores the serious safety problems posed by nuclear power, including potentially catastrophic accidents and radioactivity exposure through routine effluents and emissions. Nor does it take into account the cumulative environmental impact of numerous projects under way, or the local ecosystem's carrying capacity.

By its own admission, NEERI lacks the technical competence to assess the specific radiation-related hazards of nuclear reactors. Its EIA report does not even mention the issue of radioactive waste and ways of storing it for long periods of time. The EIA was conducted for two reactors; the NPCIL wants to build six European Pressurised Reactors (EPRs) in Jaitapur.

Yet, Union Minister of State for Environment and Forests Jairam Ramesh accepted the EIA report and granted environmental clearance to the Jaitapur project with 35 conditions and safeguards on 28 November 2010 - just six days before French President Nicolas Sarkozy began

his recent India visit on 4 December last, of which the EPR sale agreement was the main highlight.

Some of these conditions pertain to studies that should have been conducted much earlier, and to safeguards that should have been designed well in advance. Many conditions are vague. Together, they fail to address the real flaws and deficiencies of the project. Some of them convert valid objections to the project - which constitute strong grounds for rejecting it - into "conditions". In any case, given the MoEF's past record, it is extremely unlikely that compliance with the conditions will be monitored.

The environmental clearance was granted to NPCIL just 80 days after it submitted its EIA report, a process that normally takes six months or longer. The mandatory public hearing on the EIA, held in May 2010 under police intimidation was a farce: three of the four notified villages did not receive a copy on the report in Marathi a month in advance, as required; the fourth got it four days earlier.

Ramesh has said he is not competent to pass a judgment on matters related to the need for, and the economics or safety of, nuclear power plants. He reportedly told activists: "I can't stop the project. It is going to come up because it is not just about energy but also about strategic and foreign policy."

Untested Reactor Design

There are serious and genuine concerns about the safety and viability of Areva's EPRs which are to be imported for the Jaitapur nuclear power "park". Nowhere in the world has an EPR been fully built or commissioned so far. Two EPRs are already beset by serious safety and financial problems and delays.

Areva itself has been going through a devastating financial crisis. In 2009, it sought \$4 billion in a short-term bailout

from French taxpayers. Its shares plunged by over 60%.

Areva sold its first EPR to Finland. This is western Europe's first nuclear reactor contract since Chernobyl (1986). The reactor has been under construction in Olkiluoto (OL-3) since 2005 and was to be completed by 2009. Several safety, design and construction problems have pushed its start-up to the second half of 2013 - a delay of 42 months, with a cost escalation of 90%. The OL-3 fiasco has led to the walkout of the German engineering company Siemens from the project and entangled Areva and the Finnish operator in bitter litigation.

France decided to set up the second EPR at home, in Flamanville. Issues similar to those at OL-3 have led to a 50% cost increase and a delay in commissioning to 2014. Several problems in the EPR design were noted by the French nuclear safety agency. France has also witnessed fierce protests against the EPR in the cities of Rennes, Lyon, Toulouse, Lille and Strasbourg, as well as in Flamanville.

Over 3,000 safety and quality problems were recorded with the construction of Olkiluoto-3 by the Finnish safety agency STUK, the French nuclear safety agency Autorité de Sûreté Nucléaire, and the UK's Nuclear Installations Inspectorate. In 2009, the United Arab Emirates (UAE) declined Franco-American bids for EPRs which were in an advanced stage of negotiation and awarded the reactor contract to a South Korean group.

Citing deficiencies in EPR's sump design, the US Nuclear Regulatory Commission (NRC) has delayed its design certification to the EPR from June 2012 to February 2013. The sump is part of the reactor's vital emergency core-cooling system. The NRC has also pointed to problems with the EPR's digital instrumentation and control design, as well as with Areva's seismic and structural modelling analysis.

If the issue of assigning responsibility for the loss caused by the 90% cost escalation at Olkiluoto in Finland is not resolved soon, the project could well be

abandoned, probably sounding the deathknell for nuclear power in the west. The EPR is the largest-ever nuclear reactor designed in the world and has a much higher density of fission-causing neutrons and fuel burn-up than do normal reactors (of 500-1,000 MW capacity). The EPR's high fuel-combustion rate will lead to greater production of harmful radionuclides, including seven times higher production than normal of iodine-129, with dangerous implications for radioactivity releases, damage to the fuel cladding, and waste generation.

India's DAE has a long history of poor or non-existent regulation, persistent below-par performance, and accidents. Moreover, it has no experience of running huge reactors like EPRs. Most existing Indian reactors are up to eight times smaller (220 MW), the biggest ones being one-third (540 MW) the size of an EPR (1,650 MW).

EPR's Gold-Plated Power

Serious questions have been raised about the economic costs of the Jaitapur project based on the extremely expensive EPRs. Each of the six 1,650 MW reactors would cost around \$7 billion assuming the capital cost of the EPR being built at Olkiluoto does not escalate beyond the latest estimate of 5.7 billion euros. This works out to Rs 21 crore per MW of capacity. This cost estimate, however, does not include other cost components - storage of nuclear waste; the cost of reactor decommissioning which could amount to one-third to one-half of the total construction cost; the extensive additional physical security costs, including anti-aircraft batteries and the extra coast guard deployment. Of course, environmental costs, and health costs imposed on miners, plant workers, and the public living close to nuclear installations, and the associated medical expenses, are ignored altogether.

Comparing the likely cost of electricity generation in Jaitapur, based only on the capital cost, with other available options leads to alarming conclusions. According to the current Finnish estimate, itself conservative, the EPR's capital costs (Rs 21 crore per MW) are far more expensive than those of the indigenous CANDU reactors installed at the Rajasthan, Madras, Narora and Kaiga power stations, which

are about Rs 8-9 crore per MW. They are even higher than the capital costs of supercritical coal-fired thermal power stations (Rs 5 crore per MW).

Put another way, the six EPRs at Jaitapur will together cost the Indian public about Rs 2,00,000 crore, even more than the upper limit of the loss caused to the exchequer by the 2G telecom scam, estimated by the Comptroller and Auditor General of India at Rs 1,76,000 crore.

The latest EPR cost estimate based on the Olkiluoto reactor may not be the last word on the issue. Several figures have been quoted in different countries for the EPR's capital costs per MW, ranging from Rs 21 crore in Finland and the UAE, to Rs 27 crore in the US and South Africa, to an astronomical Rs 59 crore in Canada.

No Nuclear Renaissance

India's super-ambitious nuclear expansion plans are based on the rosy assumption that a global "nuclear renaissance" is under way and that nuclear power is the best solution both to the climate change crisis and to the national energy security question. But there is no nuclear renaissance. Nuclear power is in decline world-wide. Nuclear power generation peaked in 2006 and is now annually falling by 2%. The number of operating reactors has declined from 444 in 2002 to 438 in 2009. A major reason for this is that nuclear power is unpopular and reactors are seen as bad neighbours.

Nuclear power generation is ineluctably fraught with ionising radiation, an invisible, intangible and insidious poison, which is unsafe in all doses, however small. Radiation causes cancers and genetic damage, for which there is no cure, antidote or remedy.

Nuclear plants expose not just occupational workers, but also the general public, to radioactive hazards in numerous ways. Radioactive wastes of different intensity or level are produced in all stages of the so-called nuclear fuel cycle. An average reactor generates 20 to 30 tonnes of high-level nuclear waste every year. Human-kind has found no way of safely storing or disposing of nuclear waste. It remains dangerously radioactive and hazardous

literally for thousands of years. For instance, the half-life of plutonium-239, a particularly lethal component of nuclear reactor waste, is 24,000 years. The half-life of uranium 235, the fissile isotope of uranium, is 710 million years!

Nuclear power generation is the only form of energy production which can produce a catastrophic accident like Chernobyl, where an estimated 65,000 to 1,05,000 people were killed. All existing reactor types in the world are vulnerable to a core meltdown like Chernobyl, leading to the release of large quantities of radioactivity into the environment. There have been at least 22 major and thousands of minor accidents before and after Chernobyl. Even during the normal operation of nuclear plants, large quantities of radioactive emissions (Rs 5 crore per MW).

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Because nuclear technology is strategically "sensitive" in nature, large-scale and centralised energy generation through nuclear power demands and encourages secrecy, and generates vested interests in the form of an unaccountable, undemocratic technocratic elite.

The mystique that surrounds nuclear technology, and arguments about nationalism and developmental urgency attached to it, are used to silence, discredit and sideline any opposition. This is evident in India in the undermining of democratic institutions - from panchayats in the case of Jaitapur, to Parliament itself in the case of the Indo-US nuclear deal and the Nuclear Liability Bill.

The Jaitapur project can only be implemented if all rational judgment is suspended, environmental considerations are trampled upon, local democracy is vetoed, and the people's resistance is crushed by brutal means.

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P.S.

* Economic & Political Weekly (EPW), February 19, 2011 vol XVI No 8 EPW:
http://www.tni.org/sites/www.tni.org/files/jaitapur_power_plant.pdf

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