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Nuclear Power Projects: A cause of Displacement

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ABSTRACT

The country is currently experiencing energy shortages. Even now, a huge portion of the population lacks access to power. To fulfill the increased demand, the country will also need to create even more power as the economy grows as well as the population grows. Energy resources are at a premium in order to meet present demand. The country's generating capacity is now underperforming due to a lack of fuel supplies. According to the Energy Policy Plan, conventional fuel reserves will be depleted by the middle of the century. All of this suggests that, in order for India to satisfy its expanding demand, nuclear as well as solar power could guarantee long-term energy security. Nuclear safety is a very complex matter that can be properly understood in a holistic way. The present paper discussed about the displacement due to Nuclear Power Projects. It also includes factors affecting the growth of Nuclear Power in India.

Keywords: permanent ground displacement; nuclear safety; design basis; safety functions; Nuclear power plants.

INTRODUCTION

As the deadline for entering the next millennium approaches and we begin serious preparation for the twenty-first century, it is critical that humans nuclear professionals reassess the importance of the role in public contacts. Even conservative population growth predictions suggest that by 2050, the world's population will have nearly doubled, and energy demand will have more than doubled, as developing countries aspire to achieve the same standards as the developed nations. If this energy expansion cannot be fulfilled without increasing greenhouse gas emissions, we may be on the verge of a worldwide environmental disaster. Given the urgent need for our fellow residents on Planet Earth to make informed decisions about the energy sources that will be required, it is incumbent upon us to assist them in overcoming the roadblocks that have caused our technology to stall. Recent history around the world serves as a stark reminder, that fundamental changes in the social-political sector are required if nuclear power has to play a meaningful role in the global energy solution.

Energy is essential for human progress and is the driving force behind economic prosperity. The need for energy will continue to climb as the world's population grows and the economy expands. Because agriculture, services, and industry are all powered by electricity, there is an ever-increasing demand to create more electricity. One of the Department of Atomic Energy's most significant missions is to utilise nuclear energy as a safe, ecologically friendly, and economically feasible source of electric power to meet the country's ever-increasing energy demands. This will be accomplished through a determined effort to operate current nuclear power plants (NPPs) more efficiently, to construct new power projects, and to develop/adopt novel nuclear power production and fuel cycle processes for future deployment. (Warsaw et al., n.d.)

With a land size of 3.3 million square kilometres and a population of over 1.2 billion people, India is the world's sixth largest country (the second most populous country after China). Currently, a large portion of this population lacks reliable electricity as well as other clean fuels,

and those who do have access to energy frequently experience power outages. As per the Central Electricity Authority, peaking shortages range from 1.3 percent to 26.1 percent in various parts of the country. As the economy develops and more people gain access to energy, the demand-supply mismatch will widen even further. By 2050, India's population is predicted to reach 1.5 billion people. At the same time, India's economy is rapidly expanding, with GDP increasing at a rate of roughly 6–8% each year. Maintaining current economic growth rates is critical to achieving the country's key goals of poverty reduction and improved quality of life. In order to meet the needs of its rising population, more emphasis must be paid to energy supply, particularly electrical supply. (Ujah, 2015)

However, introducing new technologies for societal benefit was always difficult in human history. The ability to cope with the dread of the unknown, as well as the perception of man-made and natural calamities associated to new technologies, has had an impact on the development of society and nations. Despite failures caused by extreme occurrences associated to new technology, technologists, governments, professional societies, as well as non-governmental groups in rising and progressive countries have demonstrated increased maturity in dealing with risk and threat perceptions. They were able to re-establish public trust in promising new technology by demonstrating safety, assuring long-term growth potential, and demonstrating comparable economic advantages. (Devitt, 2015)

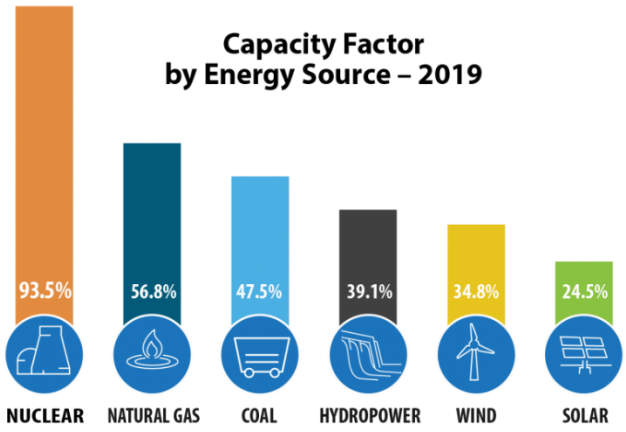

Figure 1: Capacity Factor by Energy Source- 2019

Factors affecting Nuclear Power Growth

Nuclear power plants in India require a 1.5-kilometer exclusion zone around the facility, which necessitates a large amount of land. The Atomic Energy Regulatory Board (AERB) code establishes an exclusion zone surrounding the reactors with a radius of 1.5 kilometres where no human settlement is authorised. This region is a part of the project which is included in the land that was purchased. (Basu, 2010)

The government's intentions for land purchase to create these nuclear energy parks have sparked widespread resistance and local protests, potentially delaying their development and pushing the NPCIL to seek alternate places. In India, land acquisition is a hot topic, as well as the BJP administration is striving to get its Land Acquisition Bill through Parliament. The measure exempts five types of projects from needing to gain the permission of 80% of landowners when

land is purchased for private projects and 70% of landowners when land is taken for public-private partnership projects. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act of 2013 established these improvements. For government projects, meanwhile, landowner approval is not needed. (Buelles, 2012)

Displacement Due to Nuclear Power Projects

Widespread social, economic and environmental changes stem from development induced displacement. These changes follow well identified patterns that may differ in severity according to the type of project or industry responsible for the displacement. According to a commonly used model to explain these patterns — the Impoverishment Risk and Rehabilitation Model — supported by large academic consensus, population displacement generally results in the impoverishment of a majority of resettlers. The most visible risks, such as the loss of land and other potential impoverishment risks, threaten sustainability. Unemployment, homelessness, marginalisation, food insecurity, destruction of common lands and natural resources, higher health risks, social disintegration, loss of human and civil rights, and disruption of formal schooling activities are some of the other risks. Involuntary displacements around the world are frequently mentioned as evidence of this "new poverty". (Babu, 2019)

Nevertheless, compensation by itself generally falls short of adequately restoring and improving the income levels and livelihood standards of resettlers; rather, it is a means to help ensure a sustainable outcome.(Peterson et al., 2010)

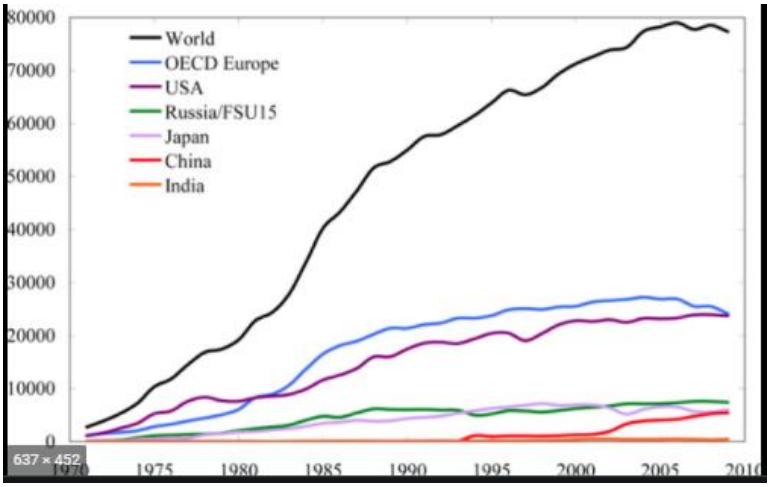

Figure 2: Number of deaths due to nuclear power from 1971 to 2010

The largest displacements associated with the nuclear industry are related to evacuations following accidents. Within the first two days after the Chernobyl accident, 115 000 local people were evacuated from the town of Pripyat and the surrounding settlements. Subsequently, a further 220 000 people were resettled. In the aftermath of the Fukushima Daiichi accident, an estimated 160 000 people were evacuated. Accident related evacuations have had a significant impact on societal sustainability through the loss of physical assets such as homes, cultural sites or income earning assets, but also non-physical assets such as social structures, networks and ties.

Considerations related to Nuclear Energy

From a safety perspective, the nuclear energy sector has managed to store spent fuel safely for more than half a century. Nonetheless, there is currently no final disposal facility for the long lived HLW resulting from nuclear power generation. Consequently, it is the responsibility of current generations to identify and develop sustainable, long term disposal solutions. Geological disposal matches these requirements and thus appears to be an appropriate candidate. (Terminski, 2013)

Irrespective of the sustainability benefits of nuclear power, its contribution to sustainable development might be severely constrained in the absence of public support. Nuclear energy involves complex technologies that may be beyond the understanding of lay people. Consequently, the associated risks tend be exaggerated, in particular where tailored information, openness and public involvement are absent. Nonetheless, more research is needed to better understand the morally most acceptable choices people would consider, in particular when altruistic and/or biosphere considerations conflict. (Naika, 2016)

The sustainability of nuclear energy is also challenged by long standing public concerns about safety, security and proliferation. Furthermore, nuclear power must not only be safe and secure but must also be used solely for peaceful purposes. Unlike other energy forms, nuclear energy was first harnessed for weapons. Safeguards implementation can, therefore, be described as information driven. (Siddiqui, 2012)

LITERATURE REVIEW

(Mohan, 2018) India's Nationally Determined Contribution (NDC) to the UN Framework Convention on Climate Change (UNFCCC) indicates the country's intention to expand its clean-energy capacity. Simultaneously, India's energy poverty continues to be a major issue, as well as the country's development goal is dependent on providing access to energy to millions of individuals who stay disconnected from the power grid. Although successive governments have long pushed nuclear power as a panacea for India's energy needs, real results have only served to deceive. In the recent decade, India's exemptions from the Nuclear Suppliers Group and agreement with the International Atomic Energy Agency (IAEA) have resulted in only minor breakthroughs. This report analyses the issues that will be essential to India's civil nuclear objectives and gives forecasts for nuclear power expansion in India through 2050.

(Bhuvandas, 2014) evaluated Industrial revolution has provided economic stability; nevertheless, it has also resulted in increased population, urbanisation, and visible stress on basic life support systems, while also pushing environmental effects closer to the threshold limit. In industrial development process, environmental sustainability is becoming very significant with the growing industrial growth and relatively low land masses. Increasing data suggests that converting existing industries into eco-industrial networks through successful application of green techniques is a potential alternative for preserving the region's natural resources while also enhancing the regional economy on a long-term basis. On the basis of ground realities, the empirical knowledge on affected area helps in understanding the local context and developing context. The study was performed in Pondicherry on the current industrial pollution and environmental setting. Severe impacts of industrialization on local environment are indicated

through a causal chain analysis. Moreover, this study also highlights the immediate and root causes. The findings serve as a foundation for proposing long-term remedies to the region's rampant pollution, as well as analogous problems around the world.

(Kakodkar & Singh, 2013) Nuclear energy specialists must comprehend and address the catastrophe syndrome, which appears to be at work in the public imagination in the context of nuclear energy as of late. Traditionally, nuclear power reactor design and system evolution were founded on the logic of reducing risk to an acceptable level and quantifying it using a deterministic model, which was then followed by a probabilistic evaluation. Nonetheless, despite risk minimization, the causes of worry and trauma in the public psyche that persist in the aftermath of serious incidents must be identified and addressed. To reduce radioactive leak and avoid major public damage, the margins between maximum credible accidents incorporated in the design and the maximum strength withstanding capacity of key systems must be increased and guaranteed. For this aim, a more realistic basis for managing an accident in the public domain must also be quantified. There is a need to be able to honestly demonstrate and certify to the public that the penalties will be kept to a level that will not cause trauma. The Chernobyl investigations reveal substantial psychological consequences and linked health conditions as a result of large-scale emergency evacuation of people, which might have been minimized by an order of magnitude without causing major additional safety risks.

(Bhavan, 2013) In India, nuclear power plants have a total installed capacity of 4780 MWe (20 operational reactors) as well as plants with a total capacity of 5300 MWe (7 reactors, including PFBR under BHAVNI) are currently under construction. By 2020, a nuclear power programme has been devised to boost power generation from the current level of nuclear energy to 20,000 MWe. Furthermore, the Indian government's 2006 Integrated Energy Policy foresaw the possibility of reaching a nuclear power capacity of 63000 MWe by 2032. The Government of India has given its “in-principle” approval for the construction of four additional 1000 MWe LWRs in Kudankulam, Tamil Nadu, and six additional 1650 MWe LWRs in Jaitapur, Maharashtra, for which Environmental Clearances (ECs) have been acquired as well as other pre-project activities are underway.

(Freer, 2012) The current Commission's focus – the future of nuclear energy in the United Kingdom – is especially relevant in the current perspective, where questions about suggested new nuclear power plants, the UK's ability to satisfy its carbon targets, energy security, as well as fuel poverty are all high on the national agenda. The Commission's mandate was not to produce yet again another document on the benefits and drawbacks of nuclear energy; rather, it was to analytically analyze the existing situation and prospects in the UK in light of current government support as well as policy, and to determine what remains to be improved to ensure that this strategy is implemented in the short and long term.

(Baird, 2008) evaluated Dam construction is invariably followed by large-scale displacement and resettlement, resulting in complex socioeconomic consequences for the host community. The purpose of this study is to look into the social effects of dam-induced relocation and resettlement in China using a qualitative approach study that looked at both the control group & experimental group. Data was gathered using a combination of questionnaires, archival files,

and in-person interviews. The findings demonstrate that dam-induced displacement & resettlement aided in improving living conditions but also promoting rural collaborative medical insurance adoption. However, it had a negative effect on economic growth, family income and income sources, as well as overall happiness. In the end, there are implications for theory and practice.

CONCLUSION

The absence of public support for commercial nuclear power in many regions of the world is extremely concerning. As nuclear professionals, humans understand the huge public benefit that a well designed, developed, and regulated nuclear power industry can provide. The truth is that no other power source on the horizon has the capacity to effectively regulate the next millennium's rising population. However, unless public support for nuclear power is significantly increased in the near future, the nuclear infrastructure may crumble, ultimately rendering this technology ineffective. The humanitarian ramifications of such a scenario are almost too awful to consider. As a result, technical professionals must develop more effective methods of communicating the benefits of our technology to a skeptical public. The most successful technical approach is to insist on the highest level of honesty when reviewing all pertinent facts pertaining to low-level radiation's health impacts.

With the experience of dependably providing around a sixth of worldwide electricity production, nuclear power technology has matured. The demand for effective use of energy resources, particularly nuclear, has increased in growing economies due to economic development and growth, as well as limits related to climate change challenges.

There are many other methods to increase electricity, and the government should not construct these plants since they endanger people's lives and cause tragedy. Governments should consider the people, or else they will be reliant on the electricity they require. To summarise, the current communication gap and interaction between the power plant team as well as the general public can be greatly reduced by realising the importance of public safety. Furthermore, with many public campaigns and programmes, knowledge regarding power plants, their relevance, and safety precautions may be widely disseminated and educated to the public, allowing both the public and the government to put a stop to the problem. The committee's involvement is critical in providing a conclusive report that will satisfy all stakeholders involved in nuclear power plants. Before mindlessly opposing the project, the public can see how practical it is and how important it is to the state.

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