

ENERGY GENERATION AND LOCAL DEVELOPMENT IN BANGLADESH: AN EXPLORATION OF THE ROOPPUR NUCLEAR POWER PLANT IN PABNA DISTRICT

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Abstract

In recent years, energy crisis is acute in Bangladesh. Although the energy sector of the country puts on top a varying range of products such as electricity, petroleum products, natural gas, coal biomass, solar and other renewable sources, policy makers has been mostly concerned with electricity as the most commonly used form of energy. Therefore, energy plant is a common development programme in Bangladesh. Particular attention has been given on nuclear power plants as these are specially equipped to produce electricity at low cost. This article explores the case of the Rooppur nuclear power plant (RNPP), which the Government of Bangladesh (GoB) has initiated with the Russian aid, at the Padma River bank near Ishwardi of Pabna district. It critically examines the effects of the power plant on local people and their environment, and tries to understand whether such form of development benefits all homogenously. From the perspective of ‘anthropology of development’, the article argues that development as a modernization project, despite making an overall progress, may not always bring desirable consequences for local cultures.

Key words: Development, Nuclear power, Sustainability, Local development, Bangladesh

Introduction

Although Bangladesh is predominantly an agrarian country, increasingly local livelihoods are getting shaped as non-agriculture-based occupations, particularly in the era of modernization and industrialization (Toufique & Turton 2002). New technologies are being invented to change local life styles. These technologies help to accelerate the economy in short time. In this process of industrialization, electricity is the most important element to run machines (The Daily Star, December

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9, 2023). For producing electricity, some basic raw materials are required i.e. oil, water etc. that cost a lot for a developing country like Bangladesh. Therefore, the country needs to find alternative paths to manage electricity (ADB 2021). Energy plants is a better option in this regard. Such plants use uranium, natural resources like river water, sunlight to produce electricity, which costs much less than oil (Mihaela 2019). As energy plants produce much more electricity than required, these may allow the country to export it to other nations. With the surplus income from the export, the Bangladeshi government can plan other development programs aimed at the welfare of the nation (Dhaka Tribune, 5 June, 2024). From this standpoint, constructing energy power plants is considered as a ‘modern’ economic development agenda of Bangladesh (ADB 2021).

Background

The Bangladeshi government, emphasizing on science and technology sector to drive economic growth, has started a development project named “Rooppur Nuclear Power Plant” with the Russian aid, on the east side of the river Padma near Ishwardi in the Pabna district of Bangladesh (GoB:2024). According to the Government of Bangladesh report, though the RNPP project was initiated in 1961, in 1969-70, the then-Pakistani Government decided not to implement it. After the Liberation War of 1971, from 1977 to 1986, Rooppur was reconsidered as a site for constructing the power plant. In 1987-1988, two companies from Germany and Switzerland validated the site for constructing the nuclear power plant. Between 1997 and 2000, the then Bangladesh Atomic Energy Commission (BAEC) Chairman Dr. M. A. Wazed Miah took initiative to construct a nuclear power plant with a capacity of 600 MW. In 2000, the Bangladesh Nuclear Power Action Plan was approved by the Government of Bangladesh. From 2008 to 2012, the Awami League’s manifesto focused on the atomic energy act. On January 15, 2013, the first phase of the construction of the RNPP was inaugurated. Since then, in different phases, the project site underwent several visits by the experts and in March 2024, the first unit of the RNPP is set to begin producing 1200MW of electricity, by mid-2025, the second unit is also expected to start producing a similar amount of power (ibid, 2024). The project aims to provide low cost electricity and create new jobs in Bangladesh (Zahid, 2014). It is believed that the new plant can increase the power production of the country and will enable it to achieve self-sufficiency in the energy sector. The Bangladeshi government thinks this project to be a role model of development for their country, as it will lead Bangladesh to appear in the world stage to become the 33rd nuclear power producing nation (Karim et al 2019).

Research Questions and Objectives

In this article, a critical investigation will be made on the impact of the construction of the RNPP on the local environment, culture, health, professions and new habitants. As the aim of the article is to understand the process of development from the perspective of the ‘anthropology of development’, a beginning will be made with the discussion of the key concept ‘development’. Development, generally speaking, can be defined as a procedure that enhances growth, advancement or the act of changing to an improved state (Pearson, 1992). The goal of development is to raise the standard of living for the populace while protecting the environment’s resources and creating or expanding employment opportunities locally and regionally. Development contains a component of quality change and the setting up of conditions for the continuance of that change, and it is visible and helpful (ibid, 1992). Although, in the fifties and sixties ‘economic development’ and ‘development’ were used interchangeably, in recent years an important distinction has been drawn between the two terms (Ahuja, 2008). While ‘economic development’ refers to an increase in a country’s real output or income, ‘development’ emphasizes on an upward movement of the entire social system in terms of income, savings and investment as well as changes in institutions and other socio-economic structures (Jhingan, 2011). The latter is more concerned with the increase in the welfare of the people. As a concept, ‘economic development’ is quantitatively measured using GDP (Gross Domestic Product) and GNI (Gross National Income) but ‘development’ is measured qualitatively by HDI (Human Development Index), human poverty index, literacy rates and other indicators that bring about qualitative changes in the economy (Tadaro & Smith, 2011).

There are two opposing perspectives on development in anthropology. The first is development anthropology, while the second is anthropology of development. Development anthropology is the multidisciplinary area of development studies that applies anthropological viewpoints. It views foreign help and development as its main goals. The term “development” in this area of anthropology refers to the social action taken by various agents, such as institutions, businesses, states, or unaffiliated volunteers, who seek to alter the economic, technical, political, and social life of a specific location in the world in underdeveloped, formerly colonized regions. Development anthropologists are committed to both criticizing and advancing Western initiatives that aim to increase the economic well-being of the most vulnerable population (Cochrane, 1971). Anthropology of development sees development as an object. The term “anthropology of development” refers to a field of anthropological research that takes a critical stance toward development.

From a sociocultural, economic, and political vantage point, development is examined as the primary criteria being designing and implementing development plans without endangering local cultural and environmental values (Gow, 1996). .

Besides understanding the difference between development anthropology and the anthropology of development, to critically examine the Bangladeshi development programs, it is important to look into the fact whether these programs comply with the principles of 'local development' and attain 'sustainability'. 'Local development' is a process of changing the local economy and society with the goal of overcoming obstacles and current challenges (Pike et al 2007). It aims to improve the quality of life for the local population by coordinating the efforts of various social, public, and private local agents in the direction of an effective and long-term use of the available endogenous resource (ibid, 2007). The concept of 'sustainable development' (SD) is better understood as the development that 'satisfies present-day wants without jeopardizing the potential of future generations to satiate their own needs' (Schaefer & Crane, 2005). It offers a way for the civilization to connect with the environment without endangering the resource's long-term health. As a result, it is both a development paradigm and a concept that advocates raising living standards without endangering the planet's ecosystems or causing environmental problems like deforestation and water and air pollution (Benaim & Raftis, 2008; Browning & Rigolon, 2019)

The construction of the RNPP is viewed as a development project in Bangladesh since it is believed to speed up the nation's economic growth. However, development cannot be assessed using a single scale. Anthropologists cannot at least classify something as local development if the environment is harmed, people's lives are made harder, traditions or cultures are destroyed, and only the economic wheel is speeding up. When a development project can be carried out indefinitely or for the predetermined amount of time, it is said to be sustainable (Dernbach, 1998). The main purpose of this article hence is to find out what exact factors are happening with the economic enhancement, initiated by the RNPP project in Pabna district of Bangladesh. As Bangladesh is densely populated country, there can be social changes, traditional changes, radiation problem, habitant problem, environment damage, professional change, air pollution, water pollution, communication road problem, infrastructural losses, break ups in family bondage, technical risk, temperature increasing etc. after the construction of the nuclear power plant project. Having so many problems associated with this development project, this research will try to find out whether it can be considered as a sustainable development or not.

Methodology

The research is basically qualitative in nature, based on an ethnographic study of the adjacent areas of Rooppur power plant, Ishwardi, Pabna district of Bangladesh. This study has been conducted from 15 October 2021 to 5 November 2021. Those areas around the nuclear power project (RNPP) where people live most and some places where people gathered most were selected to get information easily. The areas were Rooppur, Shahpur, Bheramara, Pakshey. Most of the employee and labor were from these places so they could give authentic information according to my researched questions. 25 informants were selected for this research as the sample size. A non-probability sample called a purposive sample was chosen based on demographic characteristics and the study's goal. Due to time constraints, semi-structured interviews and observation to gather data were employed. Semi-structured interviews could provide the benefits of both structured and unstructured interviewing since they blend the two. They gave the ability to examine subjects pertinent to that particular candidate while also enabling the objective comparison of candidates (Bernard, 2006). Additionally, key informant interviews were used to quickly acquire important data.

In key informant interview, one native informant is especially chosen who is more eager to give time and information, more knowledgeable about the local culture. His/her information can delve into very in depth issues in research (Bernard, 2006). In this research, a 30 years old man was taken as the key informant. He was a habitant in Rooppur and was working in Rooppur nuclear power plant since 2018. As a senior worker and experienced person in knowledge about nuclear power plant, he had been selected. He completed his Higher Secondary School and was much more confident than other respondents. He helped me with much useful information during the research.

Informal focus group discussions and case studies were conducted to acquire in-depth information. A case was selected to analyze because it demonstrated several viewpoints on the problem, process, or event of interest. It might also have been a straightforward, approachable situation that was exceptional. A thorough description of the case was derived from the data collected, then an interpretation or claims regarding the situation was made. People were brought together to discuss a particular topic of interest who had comparable backgrounds or experiences. Participants were given the opportunity to freely converse with other group members while being questioned about their views, attitudes, beliefs, opinions, or ideas. It entailed conducting group interviews

with a small group (often 8 to 12 individuals) about a variety of interesting subjects in order to promote conversation with other participants (Bernard, 2006). In this research, informal focus group discussions were used because people usually did not show interest in doing formal discussion voluntarily. Throughout the research, the ethical guidelines were maintained, as pointed out by Bryman and Bell (2007). Full consent of the respondents was taken before interviewing them and the confidentiality of their information was maintained. Pseudo names were mostly used for them and attempts were made not to upset their existing social settings.

Findings

The RNPP is located in Ishwardi, a sub-district town in Bangladesh's Pabna District, which is part of Rajshahi Division and is about 282 kilometers from Dhaka City. In 1974, this subdivision was created. Its name literally means "God's place." Ishwardi City is situated on the bank of the Padma River in the plain region of Bangladesh. It has 27 Mahallahs (small cluster-based areas of people) and 9 wards. It serves as the administrative center for Bangladesh Railway's western zone.



Map 1: Ishwardi, Pabna (Banglapedia, 2003)

According to the Bangladesh Bureau of Statistics (BBS) 2011, all of the upazila's wards and unions of Ishwardi had access to power through the rural electrification network. However, power was available in 37.74% of the homes (Daily Star, 29 October 2021). The majority of Ishwardi's men and women perform day labor on farms, while some of the younger members of the community work in the neighborhood bazaar. A relatively small percentage of people work in projects, businesses, and other occupations (BBS, 2011).

Below are some characteristics of the respondents in the field:

Table 1: Gender of the respondents

Gender	Respondent number	Percentage (%)
Male	16	64
Female	9	36
	Total: 25	Total: 100

Source: (Field work, 2021)

In this research, most respondents were male because men were found outside easily. Company hired male workers for completing their project. They hired women too but for doing chores. For better understanding of the impacts of RNPP on local lives, informants of varied age ranges were taken. In this research 25 people were selected as respondents within the range of 36-40 years.

Living area of the respondents

Rooppur being an important place in Pakshey, according to the field data, informants from Rooppur were 24%, Shahpur were 28%, Pakshey were 12%, Bheramara were 36%. Though Bheramara is located in Kushtia district nearby the Padma River, people from there had more interest to work in the Nuclear power plant.

Profession of the respondents

There were many types of professions before the construction of the RNPP took place. There was a large paddy field land on the place which is now converted to the nuclear power plant project. The construction of the two units of the RNPP spreads over 1,062 acres of land (GoB, 2024).

As the field data suggests, the profession of the respondents included wage earning from the RNPP 36%, farmer 20%, grocer 16%, rickshaw puller 4% and others 24%. A shift in the livelihood diversification was observed at the RNPP site as

most agricultural lands got used for the power plant project. Previously, people of Rooppur and its nearby areas were engaged with many types of traditional professions and they somehow managed their family expenses. However as wage earners at the RNPP project, they could earn more to earn a better living. 88% of the informants were satisfied with their changed professions because they could avail the opportunity to earn more but 4% were unsatisfied because they thought they might have earned more working in any overseas country. 8% remained indifferent. The field data revealed that majority of the local people were economically satisfied for having the RNPP in their area.

Ideas on river condition due to the construction of the RNPP

River is a great source of fish. Many people were dependent on the rivers for their livelihood choices. Farmers also irrigated with river water in dry seasons. But the nuclear power plant, had to rely on the rivers for waste disposal. Therefore, 4% of the respondents thought that river condition would be fine after the RNPP. They trusted the engineers who were giving them hope that the river would not be harmed. But 96% respondent informed that it would have negative impact on river. Fishes might die if wastes of the RNPP were disposed in the rivers. With impurities, river would dry out and most fishermen would have to encounter uncertainties in the quest of new livelihood opportunities.

Displacement caused by the RNPP

People shift from one place to another for many reasons. But when people have to leave from some place permanently, it is called displacement (Mihaela 2019). Due to the radiation of the RNPP, people from three kilometers area around the project had to displace. As the field data suggested, 92% people considered displacement as harmful but 8% people considered displacement as beneficiary. People who had to displace would get monetary benefits from the government for their land, home and area. Some people were satisfied with this money but most were unhappy to leave their home land which had many memories and emotional attachments.

Thoughts on the impact of RNPP

Since the construction of a nuclear power plant is a macro plan for a country and many generations have to reap its consequences. So it is important to understand how construction of a nuclear power plant might have impacts on local people's lives and environment. In the field, it was noticed that 80% of the respondents considered the RNPP as a blessing because they could find job there with handsome

salary. They could fulfill their wishes after their basic needs with this handful salary. For 20% it was a curse because they lost their cultivable land now acquired by the RNPP project. Many joint families depended on these agricultural lands. After the construction of the RNPP, such families broke down into nuclear family units. The respondents outlined that the RNPP might allow them to earn more individually but the peace of living in joint families was indescribable.

Consideration of NPP as Development

According to the field data, 24% of the respondents considered the RNPP as development, 4% did not know, 72% did not consider it as development. They thought that as the power plant would force them to displace, harm environment, stop them from using bridge, it could not be called development. Those who considered it as development, they thought as the displaced people would get enough money to buy land, house and required essentials, the RNPP was not that unsatisfactory.

Perception of 'local development' at Rooppur

Being an agricultural country, almost 80% people are involved in agriculture in Bangladesh (Ali, 2018). Rooppur and its adjacent areas have similar situation. However, the Bangladeshi government has taken a large amount of agricultural land to build the nuclear power plant there. To modernize and promote economic growth, there is hence a shift of the local economy from agricultural to industrial (Dhaka Tribune, 2024). Local people of the area expressed that when agricultural society turned to industrial, farmers' professions also became diversified. According to them, to be industrial labor it required some skills. Industry is basically run by machines, technologies and modern vehicles (Mihaela, 2019). When agricultural society shifts to industrial, people need to learn the knowledge to deal with these technologies (ibid, 2019). People who used to live traditional life in Rooppur area before the nuclear power plant had started were then changing their lifestyles and professions that suited the industrial life. They learnt modern vehicle driving like crane, bulldozer, excavator and others because these vehicles were used in power plants. Drivers of these vehicles received high range of salary. They were learning technologies. Some were learning to cook new products for sale in local markets. Due to these changing circumstances, many elderly men were getting unemployed.

Local people were also threatened about the safety of the nuclear power plant because of a rumor that Bangladesh do not have experts to control nuclear emissions and it might cause accident anytime. They heard about the Japanese incidents of

nuclear weapons during the Second World War and thought that similar situation might occur at Rooppur. So, their perspective on this development program was associated with fear and uncertainties. According to them, after the commencement of this power plant, there would be radiation problem and people living within 3 km. areas around the plant would have to be displaced for it. This information made them unhappy and they were unsatisfied with this development program.

Another controversial factor is that while local development focuses on local people's wellbeing, modernization focuses on macro strategy in national and international way (Ali, 2018). In this study, some local people stated that they expected to live in their traditional cultural and social setting, managing to get the best for their survival. But, after the RNPP project got started, their social life had changed, where they were being forced to work for the national economy, not for their own. They, therefore, admitted that this development program at Rooppur was unsuitable for them and expressed their unwillingness to accept this development program as the 'local development'.

Impact of the RNPP on local lives

The RNPP has a variety of impacts on the local population as well as their culture and environment. Due to its relatively big generation capacity over a longer service life, it primarily provides certain specific economic benefits as part of the modernization process (Karim et al., 2018). It offers residents work opportunities and tax income, all of which contribute to Ishwardi's flourishing economy. Nearly 14,000 Bangladeshi laborers have been directly employed as a result of the project (ibid, 2018). The local economy has received a significant boost from the increase in jobs. Additionally, it has developed a sizable number of manufacturing and infrastructure capabilities. It looks at internal dynamics while referring to social and cultural structures and the adaptation of new technologies (GoB 2024).

Culturally, the RNPP has brought considerable changes in local lives. Previously, they arranged sports event like *Gollasut*, *hadudu*, *gadon*, marble run, sewing with niddle-thread set, pillow passing, *hari vanga*, *lathi khela* etc. Most people lived in extended or joint families in harmony, where the elder male person was the leader of the family. But, local cultural settings have changed into modernity as livelihood diversification has taken place for economic betterment. They have started to learn using machines, technology to cope with the industrial economy. Kinship pattern has also changed. Families are gradually becoming nuclear as many people are leaving their ancestral places for the sake of modern, consumer lives. Traditional

entertainments are replaced by the technology based entertainments such as social media, games, dramas and movies available in online platforms. Many elderly people also expressed their grief as they pointed out how the modernization process brought by the RNPP has undermined the traditional religious beliefs and cultural traits of the rural lives in recent time.

The social impact of Rooppur nuclear power plant is evident in the words of two of my respondents. According to one of the respondent who was 42 years old, wellbeing, which was once communal has turned into selfishness, As he said, previously wealth was considered “our” but now for this modernization money or wealth is considered as “mine”. Another respondent, who was 26 years old complained about the radiation effects of the RNPP that caused displacement of his family members from their ancestral lands. He feared that due the construction of the RNPP and its nuclear radiation, there would not be a single home to live within the round range of 3 km area of the project. He sadly uttered, “we have to buy lands in Sirajgonj and build house. We will miss the village neighbors and have to adjust with new people, new culture and new environment. Earning more is not more important than the place we grew up.”

From the case studies above, it is clarified that the RNPP has certain social impacts on the local people. For instance, the displacement is not only going to change their traditional social life, but it will also revise the understanding of wellbeing and good life. Working at the power plant, many women from needy households have started to earn their own living. This has brought significant impact on intra household power relations at Rooppur area. This is evident in the case of a cleaner working for the RNPP. According to her, once she had started to earn, her opinions got evaluated and she experienced better treatment within the family and the society at large. She considered the RNPP as a blessing. The opportunity to earn provided her with the bargaining capacity too, which was otherwise muted by her position as merely a housewife.

How sustainable is the Rooppur nuclear power plant?

Though the RNPP project may enhance the local economy, it has its costs, preferably environmental. Most nuclear power plants are located along lakes, rivers or sea coasts because the facilities use water to cool the reactors (Mihaela 2019). The RNPP is no different than this. Local people at the project areas believe that the cooling water discharged from the plant can affect the ambient habitat conditions for aquatic species (Nowinska, 2000).

Water, if becomes too hot or too cold can harm or kill aquatic species, affect their health or impact their habitats. Fish may not swim in rivers with altered temperature that can compromise their spawning activities (Paschoa, 2008). Changes in water temperature can also have an impact on prey or other food sources, limiting the variety and availability of prey (ibid, 2008). The potential for a radioactive leak into the environment is another issue. The health, reproduction, and nutrition of aquatic animals can be impacted by even a little amount of exposure to radioactive pollutants (Korenik, 1998).

In light of the aforementioned settings, this is to contend that the construction of the RNPP project does not at all seem to satisfy the definition of “sustainable development.” A development can be called sustainable when it satisfies the demands of the present generation without jeopardizing the capacity of future generations to satisfy their own needs (Schaefer & Crane, 2005; Lynn & Eda 2014). In other words, it should be a call for raising living standards without endangering the planet’s ecosystems or bringing about environmental problems like deforestation and water and air pollution that lead to issues like climate change and species extinction (Benaim & Raftis, 2008; Browning & Rigolon, 2019). However, the RNPP project has a detrimental impact on a large number of people and depletes local resources for future generations. For instance, it will bring about many negative impacts on local cultures and environment. Moreover, there will be crisis in local subsistence due to the acquisition of agricultural lands required for the project. Indigenous knowledge related to subsistence farming and fishing will also be lost as livelihood diversification will take place. Local people, even the political organizations cannot intervene the project as it is part of the government policy to improve the energy sector of the country.

Conclusion

It is true that construction of an energy plant is a common development program in many developing countries like Bangladesh. The Bangladeshi government has taken the initiative to construct the RNPP project so that a low cost production of electricity is possible (GoB, 2024). It can be justified from the perspective of Bejan et al (2020). Formulating a model of periodic economic growth, they suggest that as the world is shifting to industrial economy, all countries need to use electricity to run their machines and vehicles. So it is better to build energy plant in own country which will help to reduce the production cost, enhance the GDP (gross domestic product) and promote the economic growth. According to them, energy

plant is made for the welfare of a country for economic growth (Bejan et al, 2020). However, such a physics does not consider how an energy plant would affect local lifestyles, nor has it guaranteed local involvement in the project's conception and implementation. When viewed from the anthropology of development perspective (Gow, 1996), the RNPP project is hence found to be designed to follow a top-down approach to development, in which an executive decision maker or other top individual has made the decisions of how something should be done and has disseminated under their authority to lower levels in the hierarchy, who are, to a greater or lesser extent, bound by them (Brol 1998). The project's social, cultural, political, and environmental effects on the local population have not been taken into account because of the focus on economic expansion.

It is understandable that modernization favors a gradual shift from traditional to modern civilization and thinks that traditional societies would advance as they take on more contemporary behaviors (Korenik, 1998). However, adopting new machines and technologies to promote the economy with modern era should not undermine existing local resources. if it has to attain sustainability. If development is equated with 'freedom' (Sen 1999), then how can be the RNPP project considered as development for the local people of the Rooppur area depleting tangible (agricultural lands) and intangible resources (traditional livelihoods, culture, indigenous knowledge)? It is true that for some people the RNPP has brought new scopes of livelihoods and unfurled many opportunities to adapt modern ways of life, but for many others the project has turned into a matter of despair. Though the worst accidents at nuclear power plants and the actual damage is still being debated, there is no doubt about the environmental risk of such projects on local lives (Mihaela, 2019). This article, therefore, argues that development is not a uniform experience for all and it has varying effects on its stakeholders. The Government of Bangladesh should be cautious about this reality while planning and executing any form of development, such as the RNPP, so that the development can be considered as the local people's development.

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