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# A study on the population growth and its effect on environmental resources in Nagaland

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**Abstract**

*The rapid growth of population in Nagaland has affected various dimensions, straining the natural resources, including land, water and the ecosystem. Growth has been shown to present positive opportunities for preserving cultural practices and social advancement in the region; at the same time, it also poses pressing challenges, exacerbating issues such as water scarcity, natural disasters, soil degradation, and deforestation. The paper examines demographic trends, resource consumption patterns and environmental effects caused by population growth. The findings of the study identify major issues such as inadequate infrastructure, environmental degradation, cultural rigidity to change, poor waste management, lack of awareness and the need for sustainable resource management strategies, offering relevant insights to the policy makers, researchers and community of the region to ensure the well-being of the population and environment in Nagaland.*

**Keywords:** *population growth, environmental resources, natural disasters, soil degradation, deforestation*

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## 1. Introduction

Population growth refers to an increase in the number of people within a particular area over a specified time interval. It is an important demographic factor affecting economic progress, social organisation, resource allocation, and environmental sustainability. While moderate population growth may lead to a dynamic labour force and socio-economic development, uncontrolled and high population growth has typically resulted in poverty, unemployment, food shortages, stress on natural resources, and a burden on infrastructure.

In India, it has been a defining demographic feature ever since Independence. With more than 1.4 billion citizens in 2023, India has overtaken China to become the world's most populous nation (World Bank, 2020; United Nations, 2019). The speed of the growth is fuelled by high birth rates in previous decades, improved life expectancy, and reduced mortality rates due to medical progress (World Bank, 2020; Census of India, 2011). Even though the pace of growth in recent years has slowed on account of family planning measures, rising literacy, and urbanisation, the sheer numbers of the population still create problems in terms of employment, health, shelter, and environmental control (Census of India 2011; NPP 2000). India's population growth is also characterised by significant regional differences, with fertility rates being higher in some states than others, resulting in uneven development and resource distribution (Census of India, 2011).

The Northeastern region of India, which comprises eight states, namely, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim, which are known for their rich ethnic diversity, are home to roughly 3.8 % of India's population. Population growth in the region is affected by migration, fertility levels, and socio-cultural traditions (census, 2011; Sharma & Haokip, 2019). States such as Assam and Tripura are more densely populated because of migration and agricultural settlement than Arunachal Pradesh and Mizoram, as these states are sparsely populated with reference to relatively low population density because of geographical constraints and rugged terrain. High rates of population increase in certain areas in the region have resulted in issues such as land pressure, ethnic tensions, and resource competition (Devi, 2016), which make population management an essential component of regional development planning.

### *1.1. Background of the study*

Nagaland demographic trends reflect both national and regional shifts in population growth patterns. Historically, the state experienced moderate growth during the early decades after its formation in 1963, but in the 1980s and 1990s, the growth rate accelerated due to improved healthcare, declining mortality rates, and better connectivity with the rest of India (Census of India, 2011).

While the decadal growth rate slowed to 0.58% between 2001 and 2011, a rare trend in India, this apparent decline has been attributed partly to migration and data discrepancies rather than a genuine reduction in population pressure (Planning and Coordination Department, Nagaland, 2016).

Environmental resources in Nagaland are closely tied to the state's hilly terrain, forest ecosystems, and river systems. Approximately 78% of the state's geographical area is under forest cover, though much of it consists of secondary forests affected by shifting cultivation (Forest Survey of India,2021). Traditional practices like jhum have historically been sustainable due to long fallow periods; however, population growth has shortened these cycles, leading to land degradation, reducing soil fertility, and biodiversity loss (Jamir & Ao, 2019).

Water resources in Nagaland are facing mounting pressure due to increased demands for irrigation, domestic consumption, and small-scale industry, as people and natural resources in Nagaland are interdependent. Population growth has a direct or indirect impact on the environment. Fragile ecosystems are endangered due to the growing demand for fuelwood, timber, agricultural land, and water, which is made worse by climate change.

Understanding the context of population growth and its impact on environmental resources, it is essential for assessing the current issues and problems, and also identifying the effective strategies for sustainable resource management. There is a need for balanced population policies that preserve both ecological integrity and community well-being.

### *1.2. Objectives*

1. To study the effects of population growth on environmental resources in Nagaland.
2. To identify challenges in combating population growth in Nagaland
3. To examine the impact of population growth on environmental changes in Nagaland
4. To suggest possible measures to mitigate population growth and its environmental effect

## 2. Literature Review

**Jagannath et al (2025)** investigated on shifting cultivation in Nagaland: Crop cycles, crop selection, and management, aiming to understand how traditions, market pressures, and environmental factors influence crop cycles, crop choices, and land management. Using qualitative fieldwork through focus group discussions, the study engaged farmers, elders, and community elders to explore practices and adaptations. The findings revealed that while shifting cultivation was once sustainable, but now, with the rapid increase of population and shrinking land has reduced the fertility of the soil.

**Pathan and Atomi (2024)** studied the Assessment of land use/land cover change and NDVI analysis. Their study was to evaluate land use transitions and vegetation changes in Wokha District from 1993 to 2022. Using

Landsat satellite imagery and applying land use/land cover classification alongside Normalised Difference Vegetation Index (NDVI) analysis, the study revealed a notable reduction in forest cover and high vegetation density. And grasslands, built-up areas, barren land, and water bodies were also found to be expanded. These shifts were directly associated with population-driven land demand, reflecting the environmental impacts of demographic growth.

**Jamir, C.K. (2021)** analysed on the population, poverty, and environmental degradation, aiming to explore the linkages between them. The study employed a qualitative descriptive methodology that drew on census reports, government publications, and secondary environmental data, and the study revealed that increasing population density accelerates the depletion of forests, land, and water resources.

**Maja and Ayano (2010)** reviewed and assessed the major natural resources that are affected by population pressure, altered consumption patterns, and misuse of the resources. A semi-systematic methodology approach was employed to search and synthesize information in relevant literature using different search engines, aiming to collate knowledge on the critical link between rapid population growth, natural resource consumption, climate change, and its adaptation in the context of the sustainability of ecosystems in low-income regions. The study reveals that rapid population growth poses an immense threat as efforts to meet demands degrade the environment and exacerbate climate change, which further challenges the sustainability of ecosystem services.

**Pimental and Pimental (2006)** studied to find out the availability of freshwater, energy, and the population impacts on natural resources globally. It was found that many regions of the world faced a shortage of freshwater supply, which supports the survival of every plant and animal on earth. Agriculture in industrialised nations uses enormous quantities of fossil energy for fertilizers, pesticides, and the operation of farm machinery, which depletes fossil energy, due to which all renewable energy must be investigated for use. As the population growth rate becomes higher, more people will indeed use the basic resources, and if the resources are not conserved, the shortages will have negative impacts on human life.

## 3. Methodology

This chapter describes the research design, participants, data collection procedures, and analysis techniques adopted in the study. The methodology was developed to ensure that the objectives of the study were met systematically and credibly.

### *3.1. Research Design*

The study employed a qualitative exploratory research design, which was deemed appropriate for obtaining in-depth insights into the complex relationship between population growth and environmental resource usage in Nagaland.

### *3.2. Sampling and Population*

The target population comprised parents residing in both rural and urban areas of Nagaland, as they were directly involved in family planning decisions and resource utilisation. A total of 50 participants were selected from districts representing both urban and rural settings.

### *3.3. Data Collection Method*

An interview method was used for the study, which focused on gathering in-depth, descriptive information from individuals.

### *3.4. Tools Used*

The study was conducted using a semi-structured interview schedule tool—a prepared list of open-ended questions to guide the interview, while still allowing flexibility for follow-up questions based on participants' responses.

*3.5. Data Collection Procedure*

For the present study, data were collected from primary and secondary sources. Primary source data was obtained through interviews with the parents of urban and rural areas. Secondary source data was obtained through books, articles, and documents.

*3.6. Data Analysis and Interpretation*

The data collected were analysed using thematic analysis. All responses from the parents were transcribed verbatim, identifying patterns and themes relevant to the objectives of the study. Codes were developed for each significant point, which were then grouped into broader categories.

## 4. Population growth and its effect on environmental resources in Nagaland

A rich tapestry of biodiversity and cultural heritage can be found in Nagaland, a small hill state in northeastern India, which has seen consistent population growth over the decades, despite having a relatively small geographic area of 16,579 square kilometres. According to the 2011 Census of India, Nagaland's population reached 1.97 million, a significant increase over previous decades (Census of India, 2011).

Population growth presents significant obstacles to environmental sustainability, particularly in ecologically vulnerable areas like Nagaland, even though it can boost socio-economic development by increasing the labour force and market demand.

The pressure of a growing population often translates into intensified land use, such as deforestation, overexploitation of water resources, and loss of biodiversity (Jamir & Ao, 2019). In Nagaland, shifting cultivation, locally known as jhum cultivation, coupled with rising demand for agricultural land and timber, has significantly altered forest cover (Ao, 2017). Moreover, the expansion of human settlements, infrastructure development, and unsustainable extraction of natural resources have led to soil erosion, declining water quality, and habitat fragmentation. These environmental impacts not only threaten ecological balance but also undermine the traditional livelihoods of the state's predominantly agrarian and tribal population.

This study seeks to examine the intricate relationship between population growth and environmental resource depletion in Nagaland. It will explore the rate and patterns of population growth, assess the resulting pressures on key natural resources such as forests, soil, and water, and highlight the socio-economic policy implications. By understanding these dynamics, the study aims to provide insights into sustainable resource management and the need for balanced population policies that preserve both ecological integrity and community well-being. Using thematic analysis, the investigator has highlighted population growth and its effects on the environmental resources in Nagaland.

**Table 1: Thematic Analysis on Population growth and its effects on environmental resources in Nagaland**

| Themes | Sub themes | Key findings | Supporting verbatim |
|---|---|---|---|
| Environmental Degradation | Deforestation | The reduction of forests significantly contributes to soil erosion and loss of species in Nagaland. | "Overpopulation has caused excessive cutting down of trees for agriculture, business, and residential areas" (Participant 4) |
| | Excessive use of Pesticides | Excessive application of pesticides by farmers has increased rapidly in Nagaland to meet the demands of the population, posing a serious risk to human health and the | "For high crop yielding and economic purpose farmers use pesticides" (Participant 1) |

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|---|---|---|---|
| | | environment. | |
| | Depletion of natural resources | Overconsumption and injudicious use of resources undermine economic stability and threaten ecological balance. | "Overuse of natural resources has caused depletion of natural resources that were once in abundance "(Participant 20) |
| Urban Environmental Management | Poor drainage system | Overpopulation in some parts of Nagaland significantly contributes to an inadequate drainage system, causing floods and water-borne diseases. | "In Dimapur, the of rapid growth of unplanned urbanization and overpopulation leads to floods and waterlogging "(Participant 3) |
| | Heightened pollution<br>Lack of civic sense | Increased pollution levels are closely linked to poor road conditions and a lack of civic responsibility. | "Poor road conditions and open burning of domestic waste have posed a serious health risk to the population" (Participant 13) |
| | Poor decomposition method | A lack of awareness of effective decomposition methods for organic waste exacerbates environmental degradation. | "In my opinion, people these days lack a sense of responsibility towards their environment and community." (Participant 15)<br><br>"I find we Nagas are ignorant about the significance of proper waste disposal and its benefits. We to need to be mindful and sustainable in our daily lives. (Participant 1) |
| Cultural influences on family planning | Traditional belief<br>Patriarchal mindset | Strong traditional beliefs and attitudes often become a barrier to accepting effective family planning. | "Nagas believe in the saying, the more the merrier, and of course, with the advancement of time, people are coming out of that mindset, yet in many village areas, people still don't encourage small families" (Participant 16) |
| | Practice of a large family | The prevalence of large families is influenced by cultural norms, causing an unstable economy and overuse of resources. | "Our culture gives high importance in maintaining patriarchal lineage, which can cause pressure to the couple to have many children, particularly sons, leading to larger families and higher birth rates" (Participant 3) |

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|---|---|---|---|
| Community engagement and population awareness | Less community involvement<br>Ignorance about population growth | Lack of interest and involvement of communities in population growth significantly contributes to ignorance about the importance of population growth and its effects. | "I find that communities are more focused on surviving than preserving" (Participant 2)<br><br>"I think people, including me, tend to overlook the consequences of population growth" (Participant 19) |
| | Lack of awareness | In some parts of Nagaland, especially in rural areas, a lack of awareness of population issues and sustainable practices remains a major barrier. | "People in rural areas are not aware of sustainable development and its benefits; they are accustomed to their traditional way of life." (Participant 21) |
| | Insufficient facilities<br>Inactive policies | Inactive policies and inadequate facilities result in unmet needs for public health and education, affecting the quality of life. | "Most government policies on environment and sustainable development are not in action; they are active only on paper and in the media" (Participant 20) |
| Education for sustainable population management | No proper subject on population education | A need for dedicated formal subject to population education in school curriculum was pointed out to widen students' understanding of demographic issues. | "I think population education is crucial not only for our environment but for overall wellbeing of the society as much as it possible it should be part of school curriculum as early possible" (Participant 15) |
| | Early awareness at school | Early awareness programmes and knowledge on family planning and responsible reproductive choices at the school level are crucial to combat population growth. | "Theoretical education on environment and population growth, I think, is quite in relevant in your educational system. I believe that the practical aspects of it are often ignored for some reasons; if this can be addressed, it will be beneficial. (Participant 3) |
| | Need for practical education | Promotion of practical education and methodologies that relate to the sustainable environment. | |

*Source: Data collection through interviews*

## 5. Suggestion

- Promote afforestation by implementing strict regulations involving local communities to protect existing forests.
- Training and resources for farmers on sustainable farming techniques should be advocated to decrease reliance on chemical pesticides and promote ecological balance
- The construction and maintenance of a proper drainage system should be made compulsory to improve waste management and prevent floods.
- Promote awareness programmes, especially in rural areas, that challenge traditional beliefs, emphasising the importance of family planning and reproductive health to shift patriarchal attitudes.

- Organisation of forums to promote communication about population growth, to address community needs, and conscious decision-making related to the environment.
- Partnership between the local government and the community should be encouraged for the active implementation of policies and the proper allocation of resources.
- Inclusion of comprehensive population education with practical methods in school curricula that provide students with an understanding of demographic and sustainable environment.
- Integrate extracurricular activities that reflect population growth, community outreach programmes, interactive sessions, and environment-friendly initiatives to foster the application of population education in real life.

## 6. Conclusion

The relationship between the environment and population growth is interrelated and complex. As the population growth continues to increase in India, the strain on the environment continues to intensify its multifaceted effects on mankind and its resources. Pressing environmental issues in Nagaland include floods, poor waste management, and increased pollution levels. Another challenging factor in Nagaland, because of population growth, is that unemployment has increased. The increased population has caused limited economic diversification and inadequate infrastructure, which necessitates the need for skill development. Addressing various effects of population growth requires a collaborative action that includes the government, public, and education. Fostering awareness and developing a sense of responsibility towards the environment is a must in mitigating its effects and promoting a sustainable environment.

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