

Original Research Article

## Trend and Growth of Rural Industrialization in Arunachal Pradesh: An Analytical Study

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**Abstract:** In recent years, the process of rural industrialization has become a significant way for achieving balanced regional development, job creation, poverty reduction and economic diversification in rural regions. Rural industrialisation is an important component in rural transformation in Arunachal Pradesh, a mainly agrarian and tribal state in which the traditional occupation of people is agriculture and the lack of non-farm jobs is a serious concern. The state has rich natural resources of bamboo, cane, forests products, medicinal plants, horticulture and traditional handicrafts which can build a solid foundation for rural industry. This article aims to explore the trends, growth pattern, opportunity and challenges in the process of rural industrialization in Arunachal Pradesh. Secondary data gathered from government reports, research articles and policy documents were used for the study. The results show that the rate of industrialisation is rather low, but the growth of Micro, Small and Medium Enterprises (MSMEs), agro-based industries, handicrafts, handloom activities and village enterprises has played a significant role in the economic development of rural areas. Nevertheless, infrastructural limitations, market constraints, lack of adequate finance and technological constraints are still a major constraint in growth of the sector. The study finds that if enabled by proper policy, institutional, technological and market integration measures, sustainable rural industrialization can be a game-changer in the economic development of Arunachal Pradesh.

**Keywords:** Rural industrialization, MSMEs, Rural development, Entrepreneurship, Non-farm employment.

## INTRODUCTION

Industrialization has always been considered as a driver for economic development and structural transformation. Industrialization in rural areas helps diversify livelihoods and provides alternative livelihoods in these areas where most of the activities are centred on agriculture. Rural industrialization is the process of developing and growing the industries and enterprises in the countryside based on local resources, local labour and indigenous knowledge systems.

The state of Arunachal Pradesh in the north-eastern part of India has rugged topography, scattered habitation and predominantly tribal population. Most of the rural households are mainly engaged in agriculture. Population pressure on land, however, has been accentuated by changing aspirations and a need for sustainable livelihoods, thus making it necessary to give rural industrial development greater significance. The rural industries such as handloom weaving, handicrafts, bamboo and cane products, food processing, horticulture-based industries and village industries have now emerged as contributors to the rural economy of the State (Koka & Kaurinta, 2022). The role of MSMEs has further enhanced the rural industrialization process with the promotion of entrepreneurship and employment generation from within the rural areas.

The process of rural industrialization has become a key policy option for the development of employment, income diversification, entrepreneurship and regional growth in less developed regions. Rural industries like handloom and handicrafts, bamboo and cane making, food processing, forest-based industries and Micro, Small and Medium Enterprises (MSMEs) have an important role in the economic transformation of Arunachal Pradesh as agriculture is the main livelihood

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source and industrial development is relatively less in the state. Rural industrialization has undergone a long transformation. Rural industrialization has experienced an evolutionary process.

The rural industrialization process in Arunachal Pradesh has been a gradual one, owing to its peculiar geographical, socio-cultural and economic conditions. In contrast to the industrialization in industrially developed states, industrial growth in Arunachal Pradesh has been mostly resource dependent and rural based. Rural communities traditionally relied on farming, swiddening, hunting, fishing, weaving, handicrafts and forest products as their means of livelihood. The growing demand for diversification of employment led to the growth of activities and small-scale enterprises in rural non-farm sectors, over time.

Bhagirathi Panda (1999) noted that there was a change in the trend of the rural economy from farm to non-farm sector from 1971 to 1991 in Arunachal Pradesh. The study revealed that transport, communication, construction, trading and small manufacturing emerged as important employment generating activities in the rural areas. Rural industrial activities and entrepreneurship were encouraged by agricultural growth which stimulated demand for goods and services. It was a structural shift in the rural economy of the State as industrial and service activities began to complement agriculture-based livelihoods.

## LITERATURE REVIEW

The early studies on the rural non-farm activities revealed that with the passage of time rural industries and entrepreneurship have become a very important activity in Arunachal Pradesh. Panda (1999) found a significant shift in the state's rural economy from agriculture towards rural non-farm employment during 1971–1991. The study highlighted that manufacturing, trade, construction, transport and communication sectors are great contributors to the generation of employment and diversification of the economy in the rural areas. Author stated that rural non-farm activities may help mitigate poverty and unemployment in rural areas.

Deb (2012) highlighted that rural entrepreneurship is a key factor in the development of Arunachal Pradesh and noted that the over reliance on government jobs had restricted the development of productive economic activities. It was suggested that the village industries, development of entrepreneur and innovation based rural enterprise can create employment opportunity, reduce disparity in various regions of the country and make rural people self-reliant. Deb also continued to explain how the industrialization of rural areas is a sustainable alternative in economic development of the state.

Mandal (2014) studied the condition of handloom and handicrafts sector in Arunachal Pradesh and observed that the traditional industries like handloom and handicrafts are one of the most significant sources of livelihood among the tribal people in the state. The study pointed out that there is a wide availability of indigenous skills, bamboo, cane and forest resources in the rural areas which lay a strong base for the rural industrialization. But lack of marketing support, weak infrastructure and lack of institutional support limited the growth potential of these industries, the author said.

Koka and Kaurinta (2022) carried out a study on the performance of MSMEs in Arunachal Pradesh and found that MSMEs play a significant role in employment generation, development of entrepreneurship and economic growth of the region. The study revealed that MSMEs have contributed to narrowing down the disparities at the regional level by providing livelihood opportunities in the rural areas. However, problems like lack of connectivity, credit access, technological backwardness, lack of infrastructure facilities and weak market linkages are still stunting the sector's development.

Rai and Mall (2024) had explored the impact of MSMEs on the economy of the state and their role as one of the important tools in industrialization and employment generation in rural areas. The study highlighted the role of MSMEs in supporting industry, entrepreneurship and income generation of the rural households. The authors pointed out, however, that the financial, technological, marketing, and managerial constraints were the significant factors that act as barriers to sustainable industrial growth.

The handlooms and handicrafts industries have been the subject of recent research which has shown that they are still relevant to rural development. Sharjo and Garg (2025) noted that handlooms and handicrafts are one of the highest employments generating cottage industries and have great potential in encouraging women entrepreneurs and tribal entrepreneurs and exportation. The study highlighted emphasizing the expansion of the market, diversification of products and skills development to ensure sustainability.

Rural industries have also increasingly been acknowledged as a driver of economic development by government initiatives. The creation of Arunachal Pradesh Bamboo and Cane Technology Centre is a clear indication of the importance of the bamboo and cane industry in the policy planning of the Government of Arunachal Pradesh with a thrust on resource-

based industrialisation, promoting entrepreneurship and creation of employment opportunities in the bamboo and cane industry. These initiatives should enhance value addition and market-oriented production in rural areas.

A range of livelihood promotion programs, self-help groups (SHG) and entrepreneurship development programs implemented by state and central governments have tried to boost industrial development in rural areas and provide better access to markets for rural producers. The rural industrialization efforts reflect the growing policy emphasis on rural industrialization as a means of inclusive development and economic self-reliance of the State of Arunachal Pradesh.

In general, the available literature indicates that both industries and MSMEs in the rural areas of Arunachal Pradesh have significant potential to generate employment, improve income, promote entrepreneurship and contribute to balanced regional development. But a number of structural and institutional constraints remain to prevent their growth and competitiveness.

### **Research Gap**

The individual aspects of rural industrialisation like MSEs, handloom and handicrafts and rural non-farm employment have been studied. But in-depth analysis of these aspects, that would provide an overall pattern and evolution of rural industrialization in Arunachal Pradesh, is limited. This study seeks to fill this gap by providing an integrated analytical assessment of rural industrial development in the state.

Thus, in-depth analytical research on the trend and growth of rural industrialization in Arunachal Pradesh is required to close these research gaps and offer policy inputs based on evidence for sustainable rural economic development.

### **Objectives of the Study**

The study aims:

1. To understand the conceptual framework and importance of rural industrialization in Arunachal Pradesh.
2. To explore the trend and growth of rural industries and contribution of rural industrialisation for employment and economic development.
3. To understand the problems of industrial development in rural areas.
4. To recommend policy options to support the process of sustainable rural industrialization.

### **Conceptual Framework of Rural Industrialization**

Rural industrialization does not necessarily refer to manufacturing activities but to a wide variety of non-farm economic activities. The International Labour Organization (ILO) definition of rural industrialization is the process by which industrial and service activities provide productive jobs using local resources outside of the agricultural sector. Industrialisation in rural areas is the process of establishing industrial and business activities in rural regions based on the available resources and human resources in the region. It includes small-scale manufacturing, agro-processing, handicrafts, handloom production, forest-based industries and service enterprises.

Some scholars have focused on a few aspects of rural industrialization:

- Employment generation;
- Economic diversification;
- Entrepreneurship development;
- Use of local resources;
- Poverty reduction;
- Balanced regional development;
- Social inclusion.

The theoretical basis of rural industrialization is derived from structural transformation theory which states that economic development takes place through the shift of labour from lower to higher productivity activities in the agricultural sector into the industrial and service sector (Lewis, 1954). From rural economies, industrialization is an indicator that enables them to become less dependent on the agriculture sector and increase their resilience towards agricultural shocks.

Rural industrialization is also relevant for Arunachal Pradesh as it opens an opportunity to utilize the local resources like bamboo, cane, timber substitute, medicinal plants, fruits, spices and traditional skills in the process of value addition.

Panda (1999) reported that non-farm activities have gained significance in the rural areas of Arunachal Pradesh, as they have taken up to curb the unemployment and boost income of the households.

### **Trend Analysis and Growth of Rural Industries**

The growth of transport services, construction, trade and manufacturing has played an important role in the rural non-farm growth in the state.

Rural industrialization helps diversify the economy, helps curb rural-urban migration, and helps to foster inclusiveness, providing opportunities for marginalized groups, particularly women and tribal people.

### **Rural Industrial Base in Arunachal Pradesh**

The state of Arunachal Pradesh has the significant natural resource base to support rural industrialization. The state's industrial activities are largely centered around:

- Handloom and handicrafts
- Industrial uses of bamboo and cane. Uses of bamboo and cane in industry.
- Food processing units
- Horticulture-based enterprises
- Forest-based industries
- Traditional weaving

Initiatives in village industries and khadi production: The agro-climatic conditions are favourable for the growth of plantation crops (such as fruits and vegetables), spices, medicinal plants, and agro-processing industries which provide raw materials. The chances for rural industrialisation are further enhanced by the state's traditional crafts and indigenous skills.

Rural non-farm enterprises have seen growth. Rural non-farm enterprises have expanded.

Arunachal Pradesh is closely linked to rural industrialization, which was in turn linked to an increase in the rural non-farm sector. The development of non-farm businesses has emerged as an important way to minimize reliance on agriculture and to seek other means of livelihood.

Research has shown that the rural households are more and more actively involved in small scale manufacturing, food processing, transport, retail and handicraft, construction etc. activities. These enterprises create jobs and help to reduce poverty and enhance livelihood security. Panda (1999) suggested that rural non-farm employment has become an important area in the development strategy of the state as it provides the necessary way to absorb surplus labour and to reduce seasonal unemployment in agriculture. Many districts have seen a proliferation of rural businesses due to the development of roads, telecommunications, rural markets, and government-sponsored development initiatives.

### **Increase in MSMEs & Rural Entrepreneurship**

Micro, Small and Medium Enterprises (MSMEs) are the backbone of industrialization in rural areas of Arunachal Pradesh. The majority of industrial units in the State are categorized as MSME and mostly located in the rural and semi-urban areas.

Rai and Mall (2024) observed that MSMEs contribute to over 80% of the total industrial enterprises in Arunachal Pradesh and are vital to job creation, income generation, export promotion, and entrepreneurial development. The authors point out that MSMEs are the second biggest source of employment in the state after agriculture.

The increased growth of MSMEs can be credited to:

- Federal and state government funding programs; and
- Entrepreneurship development programmes;
- Prime Ministry's Entrepreneurship Enhancement Programme (PMEP); and
- Startup Arunachal initiatives;
- Credit-linked subsidy programmes;
- Extension of credit facilities in rural area.

This has helped the educated youth, women entrepreneurs and self-help groups among the rural population most of all in creating entrepreneurship.

The Handloom and Handicraft Industries are experiencing growth. Handloom and Handicraft Industries are on the upswing.

Handloom and Handicrafts are one of the most active industries of Rural Industrialization in Arunachal Pradesh. Nearly every tribe has its own unique cloth weaving and handicraft practice that has been passed down from one generation to the next.

According to Mandal (2014) handloom and handicraft industry is one important source of livelihood to the people of rural areas. The products include woven textiles, bamboo crafts, cane products, carpets, masks, wooden artefacts and decorative items which are a reflection of the rich cultural heritage of the tribal population of the state. Handicrafts, especially cane and bamboo-based ones play a pivotal role in the rural economy.

Recent research additionally shows that there is an increasing demand in the market for indigenous products. According to Sharjo and Garg (2025), the handloom and handicraft industry offers significant employment opportunities to women, tribal communities, and at the same time helps to preserve the culture and regional economy.

The Arunachal Pradesh Handloom and Handicrafts Policy 2025 is a testament to the government's dedication to the sector, aiming to boost market access, skill enhancement, design innovation, and institutional assistance.

### **Handloom and Handicrafts to Rural Economic Growth**

The empirical evidence indicates that handloom/handicrafts play a significant role in rural economy in terms of employment generation and income generation.

The industries generate employment, generate income for the household, improve household standard of living and support economic growth in the rural areas of Arunachal Pradesh, Parida and Tada observed. The sector is especially significant since the investment needed is low, but the use of local raw materials and indigenous skills are important. Weaving is a labour-intensive sector where women are the main labours, therefore, it can stimulate women's economic empowerment.

### **Bamboo and Cane-based Industries:**

The state of Arunachal Pradesh has one of the best bamboo resources in India. Traditionally the bamboo and cane industries have been linked to the rural livelihoods but recent policy initiatives have turned these into commercially viable industries.

Arunachal Pradesh Bamboo and Cane Technology Centre launched in 2026, is a significant step towards rural industrial development. The centre's objective is to encourage value addition, entrepreneurship, employment generation, skill development and sustainable utilization of the bamboo resources. Chief Minister, Pema Khandu, said bamboo is one of the best resources in the state which can support sustainable economic development.

The sector has great potential for production of:

- Furniture;
- Construction materials;
- Handicrafts;
- Household products;
- Packaging materials;
- Eco-friendly industrial products.

With the global demand growing for sustainable products, there is a great potential for bamboo-based enterprises to grow.

### **Agro-Based Industrial Development**

Over the last few years, state has seen a gradual growth in agro-processing units as there is a rise in production of fruits, vegetables, spices, medicinal plants and horticultural crops.

Argo-processing industries have a number of significant roles:

- Reducing post-harvest losses;
- Creating value addition;
- Increasing farmers' incomes;
- Generating rural employment;
- Encouraging entrepreneurship.

The government support with credit schemes, Farmer Producer Organizations (FPOs), and food-processing has helped to establish small-scale processing units in rural areas. The financial ecosystem now provides a robust support for rural enterprises through recent agricultural credit programmes.

### Self Help Groups and their role in Rural Industrialization

SHGs have become as important institutions encouraging industrialization and entrepreneurship among the rural people. Women-led SHGs are involved in activities such as weaving, handicrafts, food processing, herbal products, bamboo crafts, etc., micro-activities.

SHGs is a key to make Arunachal a "Viksit Arunachal" and urged the rural women entrepreneurs to sell the "Made in Arunachal" products in the country and in the world, the Governor of Arunachal Pradesh said. The government has also been promoting the development of specific marketing hubs and markets for SHG products.

Women's involvement in increased through the SHGs has led to improvement in financial inclusion, livelihood diversification and social empowerment.

### Emerging Trends in Rural Industrialization

The current state of rural industrialization in Arunachal Pradesh has a number of emerging trends which can be summarized as follows:

#### Digital Marketing and E-Commerce

It has been observed that in the rural areas, the entrepreneurs are now using online platforms for promoting their products and selling them. Artisans and producers are able to reach a broader market with the use of digital technologies beyond local market boundaries.

#### Cluster-Based Development

Government is encouraging industrial clusters for handloom and handicrafts, bamboo processing and agro industries. Clusters offer economies of scale and competitiveness in the marketplace.

#### Skill Development and Design Innovation

There are collaborative efforts between design organisations, educational institutions, and governmental organisations that aim to create modern versions of traditional products, while maintaining traditional knowledge systems. Various consultations with stakeholders have been held recently to map artisans, identify skill gaps and develop targeted interventions.

#### Engage in sustainable and green industries: Participate in sustainable and green industries.

The rising awareness of the environmental sustainability has contributed to the rise in demand for products like bamboo furniture, organic food, herbal products and traditional crafts.

**Table 1: Manufacturing Sector — Persons Engaged & Factories (2015–2022)**

| Year | Manufacturing Factories (Units) | Persons Engaged in Manufacturing |
|------|---------------------------------|----------------------------------|
| 2015 | 78                              | 3,132                            |
| 2016 | 82                              | 3,210                            |
| 2017 | 89                              | 3,280                            |
| 2018 | 95                              | 3,405                            |
| 2019 | 102                             | 3,560                            |
| 2020 | 115                             | 3,322                            |
| 2021 | 109                             | 2,355                            |
| 2022 | 211                             | 4,424                            |

**Source:** Ministry of Statistics & Programme Implementation (CEIC database)

**Explanation:** The table 1 shows the year wise increase of manufacturing factories and also the number of persons engaged in the factories in Arunachal Pradesh.

**Table 2: Industrial Output & Employment Indicators (Manufacturing Sector, 2022)**

| Indicator                       | Value (2022) |
|---------------------------------|--------------|
| Factories (Units)               | 211          |
| Workers Employed (Persons)      | 3,247        |
| Total Persons Engaged (Persons) | 4,424        |
| Wages Paid (INR million)        | 493.8        |
| Gross Output (INR million)      | 11,292.1     |
| Net Value Added (INR million)   | -2,291.9     |

**Source:** Derived from CEIC data

**Explanation of Table-2:** The total value of manufacturing output is accounted for by gross output. The net value added in the manufacturing process can be negative due to high raw material and operating costs and depreciation, which is commonly found in newly developed industry areas.

**Table 3: Main Workers by Industrial Category (Census 2011)**

| Industrial Category             | Description      | Implication for Rural Industrialization                        |
|---------------------------------|------------------|----------------------------------------------------------------|
| Agriculture, Forestry & Fishing | Primary Sector   | Still dominant as rural livelihood (major share of workforce). |
| Manufacturing                   | Secondary Sector | Small but emerging non-farm employment role.                   |
| Construction                    | Infrastructure   | Growth reflects rural infrastructure demand.                   |
| Trade & Retail                  | Services         | Informal trade significant in non-farm rural work.             |
| Transportation & Storage        | Logistics        | Emerging role in rural economies tied to market linkages.      |
| Public Admin & Services         | Government Jobs  | High dependency observed in rural districts.                   |

**Source:** Census-based industrial classification for Arunachal Pradesh

**Interpretation of the Table 3:** In the table, detailed information from the 2011 census about the category of industries and their implication for rural industrialization in the primary, secondary and tertiary sectors has been shown.

**Table 4: MSME Participation (Estimated)**

| Indicator                                  | Estimate |
|--------------------------------------------|----------|
| Number of MSMEs (approx.)                  | ~23,000  |
| People Employed in MSMEs                   | ~41,000  |
| % of Industrial Units Constituted by MSMEs | ~60%     |
| Contribution to Manufacturing Output       | ~35%     |
| Contribution to Service Sector             | ~30%     |

**Source:** Based on MSME council & local reports

**Interpretation:** In Arunachal Pradesh, MSME's (micro, small and medium-sized enterprises) impact on the industrial and service sector indicates the increasing importance of rural enterprise clusters as a part of the economic development of the state.

**Table 5: Rural Non-Farm Activity Share (East Siang Data Example)**

| Income Source            | Estimated Income Share                                            |
|--------------------------|-------------------------------------------------------------------|
| Farm Agricultural Income | ~50–65%                                                           |
| Non-Farm Income          | ~35–50%                                                           |
| Non-farm Sources Include | Small business, wage labor, crafts, agro-based industry, services |

**Source:** From a regional non-farm income study

**Interpretation:** Table 5 shows the sources of income of rural mpeople from the farm and non-farm. Understanding the market potential of rural households to non-agricultural income sources is a good way to indicate rural industrialisation and the diversification of the economy.

### Overall Growth Pattern

Industrialization of rural areas in Arunachal Pradesh is showing a positive trend albeit a gradual one. Although the large industries are not developed due to geographic limitations, the small industries have been developed through MSMEs, handicrafts, handloom, bamboo industries, agro-processing units and self-help groups.

The growth pattern shows that there are three phases:

1. Traditional Rural Economy (Pre-1990s) – pre-dominance of agriculture and subsistence-based crafts.
2. Rural Non-Farm Expansion Phase (1990s – 2010s) – Expansion of trade, construction, transport and small businesses.
3. Entrepreneurship and MSME Expansion Phase (2010s- Present) – Surging of MSMEs – value added processing, digital marketing, bamboo industries, women entrepreneurs.

Rural industrialization is gradually gaining importance in the economic transformation of Arunachal Pradesh as reflected in the following developments.

**Challenges faced by Rural Industrialisation:** Although there is a lot of potential, a few obstacles are blocking the development of rural industries.

**Inadequate Infrastructure:** The lack of road links, transportation facilities and power supply, and communication network are raising production and marketing costs.

**Low levels of access to finance:** Market access for institutional credit is one of the challenges that is likely to be encountered by many rural entrepreneurs because of a lack of collateral and financial literacy and banking outreach.

**Technological Backwardness:** The low productivity and competitiveness in most rural industries are largely due to low productivity in the traditional production methods.

**Marketing Constraints:** Remote geographical location and inadequate market linkages restrict access to national and international markets.

**Skill Deficiencies:** Lack of technical skills and managerial skills restricts innovation and enterprise development.

**Small Scale of Operations:** Most of the rural businesses work at subsistence level and have low capital investments and production capacity.

According to Rai and Mall (2024), infrastructural constraints, financial constraints, marketing constraints and technological constraints continue to be significant hindrances for the growth of MSMEs in Arunachal Pradesh.

### Policy Implication for Sustainable Rural Industrialization

The following measures are recommended to facilitate the development of rural industries:

1. Improving infrastructure in rural areas, including roads, electricity and digital connectivity.
2. Improving access to institutional finance & credit facilities.
3. Promotion of Entrepreneurship development & skill training programmers.
4. Improving market access through ecommerce and online marketing.
5. Promoting value added of horticultural, bamboo and forest-based products.
6. Development of Industrial clusters for Handicraft, Handloom and agro-processing industries.
7. Promoting public-private partnerships in rural industrialization.
8. Enhancement of self-help groups, cooperatives and Farmer Producer Organizations.
9. Encouraging research, innovation and technological modernization.
10. To scale up branding and GI- tagging of indigenous products.

## CONCLUSION

Rural industrialization has become an important tool for economic transformation and sustainable development in Arunachal Pradesh. The establishment of MSMEs, handicrafts, handloom activities, bamboo industries, agro-processing units and village enterprises has greatly helped in the creation of employment, earning diversification, development of entrepreneurship and reduction of poverty. Despite the rich natural resources that the state has, as well as its huge industrial potential, there are still several problems, including lack of infrastructure, limited financial resources, technologically underdeveloped, and the markets.

Rural industrialization has the potential to be a formidable force for inclusive and sustainable development in Arunachal Pradesh, if policy actions, infrastructural development, technological modernization and institutional support are put in place. Development of rural industries will prove to be of immense importance in the context of improving livelihoods as well as the vision of self-reliant and economically vibrant Arunachal Pradesh.

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