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Present scenario of agriculture in Manipur: Existing problems and opportunities

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Abstract

This study aims to investigate the issues surrounding agricultural growth in Manipur through the use of specific criteria, such as worker distribution, area under cultivation, crop yield, land usage, land holdings, etc. It also makes an effort to deal with the long-term problems related to Manipur's agriculture. According to the study, Manipur's traditional agriculture can be transformed into a modern one by implementing science-based technology, creating an effective pricing system within the industry, offering financial incentives, giving agriculture priority, lowering the frequency of general strikes and bandhs, making the best use of human resources, fostering communication and knowledge dissemination among farmers, establishing a welcoming social structure, and ensuring financial inclusion. Because modern agriculture promotes economic growth and lowers poverty, it will quicken the speed of economic development. This study aims to investigate the issues surrounding agricultural growth in Manipur through the use of specific criteria, such as worker distribution, area under cultivation, crop yield, land usage, land holdings, etc. It also makes an effort to deal with the long-term problems related to Manipur's agriculture.

Keywords: Agriculture and allied sectors, land holdings, farmers

Introduction

Manipur is nestled in the northeast corner of India. It is bound by Myanmar (Burma) on the east, Nagaland on the north, Assam on the west and Mizoram on the south. The state lies between 92°58′E and 94°45′E long. and 23°50′N and 25°42′N lat. Altitude varies from 40 m (Jiribam) to 3114 m (Mount Iso) amsl. The hill and valley terrains in the state represent a distinct geographical entity. Various studies on agriculture indicate that underdeveloped economies are often characterized by substantially underutilized manpower, and dependence of a major proportion of the population on agriculture 1. Combined with the inhibiting socio-economic factors, problems of agricultural development in these countries is complex and formidable and agricultural development programmes are closely related to development in other sectors of the economy. Showed how agricultural development ignites economic growth and poverty reduction at larger scales. Mellor (2017) [9] argues that small commercial farmers are the key engines of economic growth and poverty reduction. Traditional agriculture could be transformed rapidly into a modern sector through the adoption of science-based technology, thereby making a large contribution to overall growth (Schultz, 1964) [21]. Schultz believes that the lack of economic incentives, lack of competitive farm input prices, and priorities given to industrialization are the principal reasons for agricultural backwardness in the less developed countries. He suggested three remedies: (i) an efficient system of pricing within the agriculture sector, (ii) a need for supplies of "high payoff agricultural inputs," and (iii) the development of sources of supply for these inputs. Thus, agriculture plays an important role in accelerating the pace of economic development in which systematic agricultural marketing is vital in the development process.

Profile of agriculture: It is said that Manipur lives in

villages. The rural population constitutes about 70.79 percent of the total population according to census data (2011). Agriculture plays a vital role in the economy of Manipur by contributing a major share to the State Domestic Product (SDP) and more than half of the total workers in Manipur are being engaged as cultivators and agricultural labourers. Performance of agriculture in Manipur mainly depends on the monsoon. Rice is the staple food of the people and it is widely grown in both hill and plain areas of the State. Cultivation is generally practised in the valley districts while terrace cultivation is practised in some pockets of the hills (where jhuming or shifting cultivation is widely adopted in most of the hills). According to Economic Survey of Manipur (2020-21), Manipur is a suitable place for the development of horticulture and there is need to develop horticultural marketing for the promotion of healthy growth of horticulture in Manipur. There is great potential for bringing more land under fruit cultivation in the hill area and the soil conditions are conducive to production of citrus fruits, banana, guava, peaches, apricot, papaya etc. in the valley. Moreover, there is sufficient scope for cultivation of pineapples in the hills of Manipur. The major fruits grown in the State are pineapple, orange, lemon, banana, guava, peaches etc., and very recently, apples are also grown in the hills of Manipur.

Review of Literature

In a research published in 2013, Koirala *et al*. looked at the factors influencing the technical efficiency and productivity of the Philippines' agricultural sector, which is still working to produce enough rice to feed its people even after 50 years of the green revolution. According to the study, "both levels of productivity and technical efficiency levels of rice farmers are affected by fuel cost, fertilizer cost, land rent, time of planting, and land area" (Koirala *et al*., 2013: 10) [8]. They found that the mean technical efficiency score was 0.54-lower than in comparable studies pertaining to underdeveloped nations. Giang *et al*. (2019) [22] measured productivity using total factor productivity (TFP) derived from fixed and random effects models in a different study on agriculture productivity in Vietnam. According to Vietnam Giang *et al*. (2019: 1) [22], they looked at the impact of eight elements that determine TFP: land "size and age, share of state and foreign ownership, export, accessibility to Internet and bank loan of firms." According to the study, the TFP value associated with farm age is minimal and statistically insignificant. Although it made up 30.7% of the total, the state ownership component had a negligible and unfavorable TFP. Comparatively speaking, foreign ownership made up only 3.8% of the total, but it had the most effect on TFP of all the variables. Furthermore, the 4.5% of agricultural exporters did not produce a noteworthy total factor productivity (TFP). The study also found that bank loans had a noticeably favorable impact on TFP.

Numerous studies have quantified and acknowledged the productivity advances in Indian agriculture. They credited the use of contemporary technology, as well as the Research and Extension (R&E) of both public and private investment, for the rise in TFPG. Researchers Rosegrant and Evenson (1992) [23] and Evenson *et al*. (1992) [23] look at how R&E affects agricultural output in India. Evenson *et al*. (1992) [23] noted that the development of rural infrastructure, the extension of irrigation coverage, and public agricultural R&E services were the primary drivers of agricultural productivity growth in India between 1956 and 1987. They also noted that private companies could only realize a portion of the true value of these improved inputs through higher prices. During 1956–1987, private sector agricultural research contributed over 10% to the rise of total factor productivity (TFPG). From 1966–1975, when India was more receptive to foreign technology, private research accounted for 22% of the growth in productivity. TFP growth was facilitated by investments in agriculture that improved rural markets, improved crop technology through irrigation, sophisticated chemical inputs that supplemented high-yielding varieties, and served as a conventional input.

Major problems faced by most of the paddy growers include lack of irrigation water, diseases and pest, poor infrastructures, high cost of inputs and availability of credits. Lack of processing facilities, poor extension contact, lack of credit facilities, high cost of agro-inputs, delay in supply of improved rice varieties and lack of inorganic fertilizer are great problems being faced by farmers. High temperature during crop production, scarcity of labour during peak periods, diversion of farmers from rice cultivation, involvement of middlemen and distress sale were also found important production constraints faced by rice cultivation farmers (Affia Phenica *et al*., 2018) [1]. Lakshmichand (2018) [1] studied terraced rice field in Ukhrul district of Manipur. According to his findings, agriculture is the mainstay of nearly 72 percent of the entire population of 1, 83,998 people of Ukhrul district. An area of 22,000 hectare of the district has been brought under cultivation and agriculture is basically (upland and rain-fed) carried out under both permanent (settled) and shifting cultivation. Rice is the principal and staple crop of the district and it occupies the major average share of 16,490 hectare producing 38,590 tonnes with an average yield of 2,340 Kg/ ha during the Kharif season (2011-2012) (Statistical Yearbook Ukhrul District 2014) [2]. The average yield of rice in Ukhrul is comparatively low as compare to that of valley districts. Manipur has been one of the most predominantly agricultural States in India. Even after six decades of planned development which brought about a lot of structural changes in Indian economy, Manipur still remains agriculture-dominated. According to findings of this study, nearly one half of the total workers earning their livelihoods from agricultural activities received only a little above one-fifth of the income earned by all the workers in the State. A study by Khaidem, M.S (2016) [24] pointed out that inherent weaknesses such as lack of logistic support coupled with technology, lack of awareness and poor marketing linkages and credit support are the key problems of agricultural development in Manipur. The study highlighted the urgent need for creation of market yards, collection centres, and storages/warehouses at a centralised place. There is not yet any organised Agricultural Produces Market Committee (APMC) in Manipur. Therefore, there is a felt need for the enactment of Agriculture Market Act. Who studied on the agricultural policy in Manipur identified some of the main problems of agricultural development in Manipur.

Problems and prospects in the better utilization of land

Land use is the study of issues that come up while dividing up land into various uses in order to maximize benefits. The pattern of land use varies dramatically in response to the shifting demands of society brought about by factors such as urbanization, shifts in the relative importance of sector-specific development, population growth, changes in the occupational sector, and so forth. Despite a favorable climate, exceptionally fertile land that has been given to the region by nature, and ongoing development efforts made during the five-year plans as part of national policy, the agricultural productivity per acre in this state is still too low when compared to other states for unknown reasons. The goal of this paper is to provide a thorough examination of Manipur's land use issues and future opportunities. The lack of cadastral surveying in hilly areas means that land use figures for the entire State of Manipur are unavailable. The Manipur plain makes up almost 10% of the country's total land area, or 2,238 square kilometers. Since land records are only available for the cadastrally surveyed area of the Manipur Valley and a very small area of the hills, it is impossible to establish a firm understanding of the state's land utilization. Additionally, no comprehensive and ongoing land utilization survey has been conducted by the relevant authorities, including the departments of agriculture, horticulture, settlement, land records, and revenue.

The Surveyer General of India estimated the entire geographical area in 2000–01 to be 2,23,000 hectares. Since 2000–2001, no additional forest data for the valley areas have been released. As a result, the analysis must be based on data for the year 2000–01. It should be noted that, according to the village paper, the overall geographical area varied annually between 1991 and 2000–01. In 1990–91, the projected total area was 1,89,231 hectares; in 1995–96, it increased to 1,91,509 hectares; and in 2000–01, it was predicted to be 1,90,442 hectares. Regardless of the discrepancies between the Surveyer General of India and village paper reports, it is crucial to acknowledge that the amount of land that was not suitable for cultivation significantly decreased, falling from 31,844 hectares in 1990–1991 to 26,900 hectares in 2000–2001. Barren and uncultivable land also decreased in size, from 1,225 hectares in 1990–1991 to 940 hectares in 2000–2001. Fallow land excluded, other uncultivated land also saw a decline, going from 10175 hectares in 1990–1991 to 855 hectares in 2000–2001. During the same time period, the amount of cultivable waste land fell from 1440 hectares to 740 hectares. However, from 1, 46,693 hectares in 1990–1991 to 10575 hectares in 2000–01, the net area seeded rose. In actuality, between 2000 and 2001, the total cultivated area rose from 1, 52,458 hectares to 1, 65,862 hectares.

Conversion of non-cultivable regions, fallow lands, and other arable areas into cultivable ones is the primary cause of the rise in the net sown area. Nevertheless, because of the state's recent population growth, the increase in net sown area is still insufficient to fulfill the expanding need for food, pulses, vegetables, etc. The following highlights the state's primary challenges with improved utilization:

Extensive Destruction & Deterioration: The tremendous destruction and degradation of agricultural land is the state's most noticeable land utilization issue. The siltation and salinization have stripped the fertile soil from vast stretches of land. Increased salinization and siltation are mostly ascribed to flooding, which is brought on by extensive deforestation in the valley and hill regions. Deforestation and the loss of vegetation cover cause ecological and environmental imbalances, which in turn cause (1) droughts and (2) floods during the unseasonal monsoon. As Manipur's agriculture is mostly dependent on the monsoon, the previous two to three decades have seen instability in the agricultural sector's output, primarily of rice and maize, as a result of the monsoon's premature arrival.

Soil erosion is exacerbating the issue further. Because of extensive deforestation, especially during the monsoon season, water pours directly into rivers with eroded fertile soils, swallowing the riverbeds and basins and resulting in unexpected floods. On the other hand, all rivers dry up during an early monsoon since there is no store water in the forested hill regions, which leads to dryness. In recent years, the state has seen an unseasonably early monsoon as a result of extensive deforestation and the elimination of natural cover. Since irrigation facilities are not available on the majority of cultivable lands, agricultural production is questionable. Consequently, the state experiences a regular occurrence of food scarcity. As far as the state forest department's survey records and the Statistics Department's figures go, the amount of forest land is essentially unchanged. The Economic Survey Report (2011) states that during 1995–1996 until the present, the forest area has been consistent, including 17,416 sq kilometers. 2. In contrast, the Forest Survey of India (FSI) Dehradun's Forest Report 2009 states that the estimated area of Manipur covered by forest in 2009 was 17,280 sq km, compared to 17,219 sq km in 2003 and 17,086 sq km in 2005–06.3. This research states that there are periodic fluctuations in the forest acreage. As a result, there are many differences between the two sources and they cannot be reconciled. Nevertheless, given the state's shifting physical and natural makeup over the past two to three decades, it is impossible to dispute the extent of deforestation that has occurred there. According to state records, there is no evidence of deforestation, which is quite irrational. Deforestation can be readily explained by changes in the state's physical characteristics, such as the degree of industrialization, urbanization, and so forth.

According to the 2009 Forest Report, there is irregular movement in the forest land area, indicating indications of deforestation during some periods, especially from 2003–2004 to 2005–2006 (the forest area decreased from 17,219 sq kms in 2003–04 to 17,086 sq kms in 2005–06). Actually, the data released by the Manipur government's forest department cannot be compared to the data released by other sources. Despite the disparities in the statistics, it is evident that deforestation is occurring.

Urbanization: Rapid urbanization is another major issue that puts the state's better use of land at risk. The most significant societal change to occur in recent memory is urbanization, which involves a shift in the pattern of human settlement. Manipur is becoming more urbanized, and as a result, there are issues with land invasions on productive agricultural areas. This is due to the fact that, in a free market, urban land uses continuously compete with rural

land uses for the benefit of higher land rent. Once more, a higher degree of urbanization would inevitably result in a larger share of land used for non-agricultural purposes.
It is evident that the state's number of towns grew from one in 1961 to 33 in 2001.From 1961 to 2001, the number of people living in rural and urban areas in the state expanded in tandem with the state's population growth, rising from 7.12 lakhs to 17.18 lakhs and from.68 lakhs to 5.76 lakhs, respectively. The population growth rates in rural and urban areas differ significantly, despite the fact that both populations grew in absolute terms and that the size of the rural population was greater than the urban population. The rural population grew by around 15.0% between 1961 and 2001, or from 7.12 lakhs in 1961 to 17.81 lakhs in 2001. During the same era, however, the urban population grew by roughly 74.7%. Put simply, the population of an urban area grows by around 7.5 times when the population of a rural area grows by roughly 1.5 times. This has a significant effect on the state's pattern of land use, which in turn affects agricultural output. It also indicates that over the past four or five decades, there has been a noticeable shift in the occupational composition of the Manipur population. By repurposing agricultural lands for non-agricultural uses, non-agricultural activities have been growing while rural activities have been decreasing.

Technological issues: Better agricultural technology is the most crucial component of crop production strategy in the post-green revolution era. High-yielding plant types, intensive farming, higher fertilizer use, improved irrigation methods, and improved harvesting, plowing, and plant protection strategies are examples of this technology. As for Manipur, research conducted in 2009–10 revealed that the state's valley regions were the primary locations for the application of HYVs of paddy. The area under HYVs paddy was found to be 34.81 thousand hectares, or 20.55 percent of the total area under paddy in the state, out of the 169.37 thousand hectares under paddy. The remaining 0.62 thousand hectares were found in the hills, whereas 34.19 thousand hectares under HYVs were located in the valley. In summary, traditional cultivation still occupies around 80% of the state's total cultivated land. The primary cause of the widespread failure of HYV seed introduction in the state's valley region was the absence of suitable irrigation infrastructure. The state's agricultural system is unique in that it depends virtually solely on the monsoon. It is practically noticeable that tube wells are not used to supply water for agricultural purposes. In contrast, Punjab was one of the states where tube wells were widely employed and the green revolution began in the early 1970s.
Furthermore, the irrigation capabilities made possible by the large and little projects that the state has undertaken over the past four or five decades are essentially nonexistent. The majority of the government's large irrigation projects are still unfinished and inoperable. 50.07 thousand hectares of the predicted 169.37 thousand hectares were found to be irrigated, making up 34.88 percent of the area planted with paddy in 2009–2010. It indicates that during seven or eight months, 110.30 thousand hectares are left fallow. Lack of widespread acceptance of contemporary technologies, such as the usage of tractors and harvesting machines, is another issue facing the state. Over 70% of the farmers farmed using conventional or traditional methods. When a tractor is owned, for example, one can use it more freely and so benefit from it more than when one hires one, particularly in the Punjab where farmers rent out their tractors. Usually, the owner will only rent out his machine after meeting his own needs. In addition to losing some of the timeliness benefit, the farmer renting a tractor would have to modify the scheduling of his vocations. Additionally, the uncertainty of the tractor's availability throughout the year could influence the farmer's cropping choices.

Economic Issues: The underdevelopment of suitable financial institutions in the rural area is another issue. The majority of nationalized banks have little interest in setting up shop in rural areas or lending money or other financial support to farmers, especially small-scale farmers. In actuality, the state's agricultural banking system is appalling, especially in the hilly regions. The number of bank account holders associated with Agricultural and Allied Activities fell from 10,291 in 1999 to 6,720 in 2004, as shown in table no. 3.2. The sector's share of the total sanctioned loan amount dropped from 21.4% in 1999 to 17.3% during the same period, while the services and other sectors received more attention. The sector's loan advances fell from Rs. 2612.84 lakhs to Rs. 2766 lakhs. whereas in 2004 the total amount of loans sanctioned rose from Rs. 3,855.47 in 1999 to Rs. 10, 049 lakhs. During the same time period, the percentage share also rose, rising from 48% to 64.9%. This implies that the agriculture industry has also received a great deal of neglect. The primary funding source for this industry is the extortionate interest rates charged by Mahajans and rural moneylenders. The agriculture industry develops slowly as a result of this.
The growth rate of credit advances in these sectors between 1999 and 2004 was found to be 71.60%, compared to 2.45% in agricultural and related operations. This indicates a disregard for and devaluation of agriculture and related activities. As a result, village moneylenders and Mahajans continue to be the primary source of agricultural financing, with interest rates that are far higher than those of rural banks.
This turns into one of the key reasons why new strategies for agricultural development fail to be introduced. Agriculture's ability to succeed or fail is largely dependent on the availability of funding.

Opportunities
Given the ideal environment and abundant supply of natural resources, including soil minerals, aquatic plants, and wildlife, the state has a good chance of improving its land use. The state will be able to feed the growing population as well as any new industries that may establish themselves there by wisely utilizing the resources that are now available in conjunction with the development of various crops.
Since the amount of land cannot be increased, the state should adopt new agricultural strategies and change the way that land is used, among other effective methods, to increase agricultural production. As was previously said, the amount of arable land has shrunk and become more limited as a result of urbanization and economic growth. The majority of the paddy fields have been utilized for brick fields, road and bridge construction, building construction for schools and

colleges, and the establishment of new marketplaces. In addition, they have been turned into areas for homesteads, the construction of settlements, etc. There is no stopping the normal process of development and urbanization that occurs everywhere in the world. However, we are unable to give up all arable land in favor of urbanization. Food is another need that humans cannot exist without. We now have a difficulty in trying to resolve the contradictory circumstances.

The current system of land usage needs to be overhauled. The state's current property ownership structure is particularly strange in that the Meiteis, or valley people, are not allowed to purchase land in the hilly regions. The valley people are not permitted to reside on the hills and make use of the natural resources that are there because the hill areas are solely owned by the tribal people. The state's agricultural development is unbalanced as a result. There is very little permanent habitation and farming in the hilly regions since cadastral surveys are not conducted there. Every state region with hills has a significant population of shifting cultivators. This results in the widespread destruction of forest regions, which is the primary cause of the soil's declining fertility. Given the aforementioned information, the state urgently needs to establish a new agricultural development plan.

The Green Revolution, which is based on the adoption of semi-dwarf, highly productive cultivars that respond to irrigation and chemical fertilizers, is said to have peaked, and there doesn't seem to be much room for further production growth. Put differently, it appears that the technique of seed-water fertilizer has reached a point of declining returns and has likely reached the end of its useful life.

There are several opportunities to increase agricultural output in both hilly and valleyous regions in this way. In recent years, new HYV Seeds have been introduced. Certain HYV seed varieties are suitable for widespread use, especially in valley regions, as long as enough fertilizer and irrigation facilities are made available. In areas with only one crop, additional double and triple cropping should be implemented in order to increase productivity.

A new land policy should also be developed to ensure that the conversion or use of productive cultivable land for non-cultivable uses is monitored. It is best to develop waste and fallow lands and turn them into cultivated land. They ought to be made available for use in other non-agricultural endeavors if it is not appropriate or feasible.

The creation of roads and other communication infrastructure will contribute to the utilization of territory that is currently off-limits to the mainland. Classifying and allocating land capacity to various applications may facilitate the use of land in a way that is desired by society.

There are several opportunities for the growth of animal husbandry and horticulture in Manipur. Numerous horticulture products, including oranges, bananas, papayas, and pineapples, can be grown in the state, but their cultivation has not been put to use because there are insufficient facilities for processing and distributing them.

The match industry, sawmills, paper and pulp industries, chip board and hard board facilities, etc., can all find a home in Manipur's woods. Forests are vital natural resources from an economic, biological, and scientific standpoint. They can significantly affect the state's economic rebuilding if they are appropriately utilized. Farm level cultivation may also be promoted.

Last but not least, by engaging in double or repeated cropping, every effort should be taken to make the best possible use of the cultivable land that is currently accessible. Finding crop varieties that are appropriate for various seasons and locales is necessary for double cropping or repeated cropping to be effective. Mixed cropping also requires careful consideration in addition to double cropping. In addition, other related programs like small-scale irrigation, dairying and animal husbandry, sericulture, agricultural education, and research must also receive adequate attention. It should be noted here that the eastern region has a significant portion of its irrigation potential untapped. It goes without saying that irrigation plays a significant part in raising total yields in this area. First, we talk about how feasible it would be to extend irrigation, especially in Manipur in the east.

Cropping pattern

This component of the study will provide an explanation of cropping patterns and how they have changed throughout time. The notion of cropping pattern pertains to the efficient use of land, irrigation water, and other agricultural inputs. It is defined as the percentage of area under different crops at a given period. A region's cropping pattern may alter, and depending on the extent of these changes, this could result in either a concentration on a small number of crops or a diversity of crops. The percentage share of land planted to food grains, coarse cereals, and paddy will be the first point of explanation. Fruits and vegetables, oilseeds, and spices will come next.

Table 1: Percentage of area under paddy, coarse cereal and food-grain to total sown area, 1990-92 to 2013-15

States/Year	Item	1990-92	2000-02	2005-07	2010-12	2013-15
Arunachal Pradesh	Paddy	47.6	48.6	45.56	44.0	46.6
	Coarse Cereal	22.9	23.9	24.44	24.3	26.5
	Food grain	74.2	76.9	74.29	72.8	78.4
Assam	Paddy	65.5	64.2	60.00	61.2	60.7
	Food grain	72.9	69.5	64.87	66.0	65.7
Manipur	Paddy	80.6	72.9	72.83	54.0	61.5
	Food grain	84.4	78.1	78.72	69.5	77.7
Meghalaya	Paddy	43.4	38.3	39.70	32.1	33.6
	Food grain	55.4	48.2	49.07	39.2	42.0
Mizoram	Paddy	59.5	62.2	57.28	28.6	32.0
	Food grain	70.8	74.0	73.56	38.5	40.8
Nagaland	Paddy	60.0	42.3	41.37	38.6	39.0
	Food grain	83.4	67.8	72.00	63.6	62.9
Sikkim	Paddy	13.0	12.7	12.08	8.4	8.0
	Coarse Cereal	35.3	38.6	38.95	33.8	33.8
	Food grain	68.1	62.7	63.04	49.4	46.5
Tripura	Paddy	57.1	86.1	88.09	55.5	54.1
	Food grain	62.3	90.4	92.14	58.0	58.2
All-India	Paddy	23.0	23.9	22.64	22.1	26.4
	Food grain	73.9	65.4	63.65	63.3	74.8

In the northeastern states of India and on average throughout the country, food grains are the most important crops. Table shows the percentage of area planted to food grains, coarse cereals, and paddy over the last three years. During 1990–1992, 73.9% of the gross sown area was made up of food

grains. Food grain crops accounted for more than 55% of the seeded area in all of the northeastern states. At the other end of the spectrum, Manipur had 84.4% of seeded land under food grain, while Meghalaya had the lowest average percentage at 55.4%. Food grain dominance in cropping pattern dropped from 1995–1997 (i.e., 1995–6 to 1997–98) and further decreased to a lower level in 2000–02 and 2010–12, amounting to 67%, 65.4%, and 63.3%, respectively. But during the course of three years, the average proportion of land planted to food grains relative to the total sown area increased once more, reaching 74.8% in 2013–15 (i.e., 2013–14 to 2015–16). The country's draught conditions in 2000–02 and 2010–12 may have had an impact on the shift in the proportion of area. Manipur has the greatest average percentage of land under food grain among the northeastern states between 1990 and 1992-84.4%. In descending order, Nagaland came in second with 83.4%, and Meghalaya came in last with 55.4%. Over time, the average percentage contribution of food grains to total sown area has decreased in the northeastern states, with fluctuations. With the exception of Arunachal Pradesh, the percentage share of food grains in all northeastern states was lower in 2013–15 than it was in 1990–92. In descending order, the percentages of the various states are as follows: Manipur (77.7%), Assam (65.7%), Nagaland (62.9%), Tripura (58.2%), Meghalaya (42.0%), Sikkim (46.5%), and Mizoram (40.8%). In contrast, Arunachal Pradesh has a greater percentage of 78.4% in this case, making it the highest among the northeastern states from 2001 to 2015.

Paddy has the highest average percentage proportion of area coverage to gross sown area among food grain crops. In Manipur, it reached a peak of 80.6% between 1990 and 1992. In fact, it's been referred to as paddy monoculture. In descending order, Manipur is followed by Assam (65.5%), Nagaland (60%) Mizoram (43.3%), Tripura (57.1%), Meghalaya (43.4%) and Arunachal Pradesh (47.6). When compared to the All-India average, the average percentage of sown area covered by paddy was higher in these seven states. An exception exists in Sikkim, where the average percentage of sown area covered by coarse cereal was higher in 1990–1992, at 35.3%, and remained at 33.8% in 2013–2015. In Arunachal Pradesh, coarse grains are significant.

Fruits and vegetables are economic crops that have the potential to raise agricultural income. Following the "Government of India launched a Technology Mission for North East for integrated Development of Horticulture in 2001-02"2 with the goal of improving the output of horticulture crops and strengthening farm households' financial support and nutritional security. The three-year moving average of the area under fruits and vegetables is shown in Table. From 6185.43 thousand hectares and 4157.83 thousand hectares in 2001–03 to 10201.10 thousand hectares and 6393.44 thousand hectares in 2015–17, respectively, the gross cropped area under vegetables and fruits coverage at the All-India level grew. With the exception of the acreage planted to vegetables in Arunachal Pradesh, all the northeastern states followed the same pattern. It was drastically decreasing in Arunachal Pradesh from 23.8 thousand hectares in 2008–09 to as little as 4.2 thousand hectares in 2009–10, and it continued to decline after that. The area planted to fruits and vegetables in Manipur grew from 34.67 thousand hectares and 35.50 thousand hectares in 1990–1992 to 49.76 thousand hectares and 48.70 thousand hectares in 2015–17, respectively.

Table 2: Average area under vegetables and fruits, 2001-03 to 2015-17

States/Years		2001-03	2005-07	2010-12	2013-15	2015-17
Arunachal Pradesh	Vegetables	20.50	22.60	4.00	2.37	2.78
	Fruits	43.60	54.63	52.37	81.77	54.35
Assam	Vegetables	222.73	326.43	268.27	296.10	306.17
	Fruits	98.97	117.93	143.67	145.20	145.28
Manipur	Vegetables	11.87	10.27	21.57	29.63	46.37
	Fruits	34.67	34.73	56.70	53.60	49.76
Meghalaya	Vegetables	35.50	42.07	40.60	45.23	48.70
	Fruits	21.03	28.43	31.90	36.07	35.59
Mizoram	Vegetables	5.60	2.33	31.40	43.43	39.49
	Fruits	19.13	24.13	40.13	57.63	60.25
Nagaland	Vegetables	14.97	9.83	23.23	40.23	45.63
	Fruits	15.60	10.80	29.70	39.43	38.60
Sikkim	Vegetables	14.80	18.50	24.83	26.97	28.09
	Fruits	10.77	9.07	15.20	10.23	18.47
Tripura	Vegetables	31.63	32.70	38.43	47.27	46.37
	Fruits	29.17	33.37	51.73	71.97	62.43
All-India	Vegetables	6185.43	7547.27	8896.47	9681.53	10201.10
	Fruits	4157.83	5578.30	6689.73	6542.23	6393.44

Appendix Table provides the three-year moving average area under oilseed, sugarcane, jute and mesta, and cotton. Every state in the northeastern region has grown oilseed, one of these crops. There have been ups and downs, but overall in India the average area under oilseed has increased little between 1990–1992 and 2013–2015. Arunachal Pradesh, Manipur, Meghalaya, and Nagaland are among the northeastern states that have shown population growth during the study years. In Arunachal Pradesh, Manipur, Meghalaya, and Nagaland, the area rose by 1.6 times, 11.8 times, 1.6 times, and 4.1 times, respectively, between 1990–1992 and 2013–2015. In these states, there has been a discernible upward trend since the mission for integrated horticulture development was launched in 2005–06.

Table gives the area covered by the crops for spices, aromatic-medicine plants, flowers, and plantations from 2014–15 to 2017–18. Between 2014–15 and 2017–18, the average area coverage at the All-India level increased by 16.9%. In the northeastern states of Arunachal Pradesh, Assam, Meghalaya, Mizoram, and Tripura, the area under spices-a crop that grows well there-increased by 12.5%, 3%, 6.7%, 18.7%, and 15.8%, respectively, between 2014–15 and 2017–18. It has stayed the same in the case of Manipur and increased little in the case of Nagaland. It indicates that, in comparison to the All-India level Average, only Mizoram has experienced a greater rise in the area covered by spices. At the All-India level, the area coverage of the remaining horticultural crops has similarly increased. In contrast, Assam's flower-growing area is the only one that has grown. The geographic coverage has decreased in the other states. The area covered by spices in the state of Manipur is unchanged, but the area covered by other crops has decreased. Spices, fragrant medicinal plants, flowers, and plantations don't have a local market; instead, they are intended for export outside of the northeastern region, which necessitates the development of strong transportation and

logistics infrastructure, both of which are deficient in the area.

Conclusion

The agriculture industry has remained essential to Manipur's economy. In the state of Manipur, the problems of agrarian structure, sustainable agriculture productivity and output, and employment in the agricultural sector continue to be significant concerns. Both in valley and hill regions, there is a widespread practice of agricultural production in general and food grain production in particular. Despite a high percentage of food grain area compared to all planted area, the state has been struggling to meet the growing demand for food grains due to a shortage in production. The data demonstrates that, across all states, the agriculture sector's contribution to the GSDP has decreased over time. Nonetheless, from the 1990–92 to 2014–16 study period, Manipur, Assam, Tripura, Arunachal Pradesh, and Nagaland continued to contribute more to the GSDP than the All-India average. It varies from 7.48 percent in Sikkim to 20.71 percent in Nagaland between 2014–16. In all eight of the northeastern states, the overall contribution to the labor force has decreased, with variations observed across the All-India average. Manipur and the other four states, excluding Assam, Sikkim, and Tripura, contributed more than 50.2% of the total labor force as primary workers in 2011. With the exception of Tripura, all of the northeastern states have substantially lower percentages of labor employed in agriculture when broken down down into individual census years when compared to the average for all of India. In actuality, Manipur and Meghalaya's share of agricultural laborers has decreased in 2011 compared to the rising average for all of India and the other six northeastern states.

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