



A Study On Agricultural Production In Serchhip District, Mizoram

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Abstract:

Agriculture production is one of the economic indicators of Mizoram and Serchhip District occupies an important place for agriculture production in Mizoram. The study provides an overview of agricultural production in Serchhip District, Mizoram. The study highlights the importance of Serchhip District agriculture production for the state of Mizoram. The study reveals that Serchhip District in Mizoram has emerged as a hub for agricultural production, setting remarkable records in various crops. The district has showcased its potential in agriculture by achieving impressive milestones in the cultivation of different crops. The farmers of Serchhip District have demonstrated their expertise and dedication, leading to high yields and exceptional quality of agricultural produce. Utilizing the rich soil and favourable climate of the region, Serchhip District has become a shining example of agricultural success in Mizoram. Through their hard work and innovation, the farmers of Serchhip District have made significant contributions to the agricultural sector. Paddy is the most abundant crop in Serchhip District, making it the third highest producer of Paddy in Mizoram. Additionally, it ranks as the second largest producer of Maize, Pulses and Oilseeds, while also holding the top position for Sugarcane production in Mizoram.

Keywords: Agriculture, Serchhip, Mizoram, Production, Paddy, agricultural.

Geographical identification

Serchhip District, positioned centrally within Mizoram, serves as an administrative region with its headquarters situated in Serchhip town. Covering an expanse of 1421.0 square kilometers, it encompasses 40 villages. The district is bordered by Aizawl District to the North and North-West, Champhai District to the East, Hnahthial to the South, and shares a minor portion of its boundary with Myanmar in the South-East. Noteworthy is the fact that Serchhip is approximately 110 kilometers away from Aizawl, the capital city of the state.

Thenzawl town is situated on the Tropic of Cancer, resulting in a consistently pleasant climate. The average annual temperature ranges from 4°C to 34°C with a moderate yearly rainfall of approximately 1680mm. The yearly temperature for the district is about 24.74°C (76.53°F), which is slightly lower than India's overall averages by -1.23%. Serchhip receives an average of approximately 312.77 millimeters (12.31 inches) of precipitation each year, spread over about 210.65 rainy days, accounting for around 57% of the time annually.

A brief note on the study area

The majority of the populace continues to engage in agricultural pursuits. Owing to the industrious character of its people, the district boasts one of the lowest rates of BPL families, and there is little difference in living standards between rural and urban areas. In terms of cleanliness and sanitation, this region could be considered one of the most hygienic in Mizoram, with villages such as Ngentiang, Baktawng, and Chhiahtlang gaining national acclaim. Additionally, it achieved first place in the Mizoram Cleanliness Competition 2023. The villages of Leng and Sialsir were also honored with National Water Awards in 2019 and 2021 respectively.

According to the 2011 census, the Serchhip District has a total population of 64937. The urban and rural populations are 32019 and 32918 respectively, with 62889 belonging to ST and 32 belonging to SC. The sex ratio is recorded at 977 females per every 1000 males, while the population density stands at an average of 46 persons per square kilometer.¹ Additionally, the district boasts a literacy rate of 97.91%, significantly surpassing the state's average of 91.33%. In fact, it holds the highest literacy rate in Mizoram.

In Serchhip District, over 60% of the population relies on agricultural output. The district achieved a total rice production of 7782 Metric Tons in the area spanning 4242 Hectares during 2022-2023, marking significant progress from the previous year's yield of 7625 Metric Tons in 2021-2022. As per the Census of India conducted in 2011, the total number of workers is 32397 persons which was 49.89 per cent of the total population and was higher than the state percentage of 44.36. The total number of cultivators was 21804 persons and its average was 67.30 against the state percentage of 47.17. The District population are involved and keenly interested the agriculture activities and more than half of the total workers are involved in agriculture and its activities.

Contribution of Serchhip to Agriculture Production of Mizoram

Serchhip is renowned for its abundant supply of fresh vegetables throughout the year within the state. Middlemen from various locations in Mizoram procure produce directly from farmers in Serchhip District. Agriculture serves as the primary livelihood for the residents of Serchhip District, with the Mizoram Statistical Abstract 2021 reporting 21,804 cultivators and 1,284 agricultural laborers in the area. The district's total workforce amounts to 32,397 individuals, with cultivators and agricultural laborers collectively constituting 71.2% of the workforce. Serchhip district is geographically divided into three subdivisions: Serchhip, North Vanlaiphai, and Thenzawl, as well as two blocks: Serchhip and East Lungdar.

Among the district's total population of 64,937, 30% reside in Serchhip Town, while the remaining 70% inhabit rural areas, primarily comprising farming communities.

Agriculture is the primary livelihood in the district, and the predominant agricultural method involves cultivation in river valleys and terracing on hillsides. Many rural farmers continue to practice shifting cultivation to produce crops such as paddy, maize, banana, pineapple, mandarin orange, passion fruit, chillies, cabbages, and sugarcane

Table 1: Total Area, Production and Production percentage of Serchhip District from the whole of Mizoram.

Sl/n	Year	Total CropArea in hectare	Total Production in Metric tonnes	Production Percentage out of Mizoram
1	2018-2019	7925	31007	24.2
2	2019-2020	7926	31619	24.3
3	2020-2021	7935	31611	24.8
4	2021-2022	7886	31361	26.1
5	2022-2023	7886	31359	23.9

From 2018 onwards, the agricultural yield in Serchhip District constituted 24.2% of Mizoram's overall crop production, with this figure steadily rising until 2021. But in 2022-2023, the District's total production percentage decreased to 23.9 from the previous calculation of 26.19(i.e. 2021-2022). This is because in 2022-2023 there is an uneven distribution of rainfall and the outbreak of Fall armyworm which affects the production of Maize in the District.

Agriculture Production in Serchhip District

Serchhip District has the potential to produce various crops. The major crops produced in the district during the last five years are as shown below:

Paddy

Rice cultivation dominates the agricultural landscape encompassing 40% of the total cropped area. Moreover, over 60% of the district's cultivators are involved in rice production. Jhum cultivation and WRC(Wet Rice Cultivation) are the methods of farming practice in the district and the total production of paddy in Jhum and WRC in 2022-2023 is 5472 metric tonnes. Most of the WRC producers are tenant farmers and their production is limited to generating their income as they have to pay the cost of cultivation to the landlord after harvesting. The individual farmers operate approx. 2.6 hectares of land.

In Serchhip District, Paddy is grown both under shifting and permanent agriculture(WRC). The study finds that 76% of the workers engaged in paddy production and they used to cultivate different varieties of paddy. The old tradition of clearing and burning systems is still practiced in jhumming areas whereas a lot of agriculture equipment and machinery are utilized in WRC areas. Serchhip District has famous WRC areas like Zawlpui, N.Vanlaiphai, Chekawn etc. These areas are landmark production areas for the state of Mizoram.

The production of paddy by Serchhip District in the last five years has been under Table 2: Area, Production and Yield of Paddy in Serchhip District.

Table 2: Area, Production and Yield of Paddy in Serchhip District.

Sl.no	Year	Area in hectare	Production in metric tonnes	Yield
1	2018-2019	2352	5333	2.26
2	2019-2020	2353	5492	2.33
3	2020-2021	2365	5510	2.32
4	2021-2022	2389	5472	2.29
5	2022-2023	2389	5472	2.29

According to the latest production statistics for 2022-2023, Serchhip District is the third largest producer of paddy in Mizoram next to Champhai.

Maize

Maize, also referred to as corn in North America and Australian English, is another prominent crop in the district, covering 9.33% of the total cultivated area. Maize, a tall and sturdy grass, yields cereal grain. Serchhip District is renowned for its maize production, with much of it utilized as animal feed, either in grain form or as whole plants, which can be baled or converted into silage for better palatability. Farmers typically sell maize in local markets or supply it to the Veterinary Department for further processing into animal feed. Varieties with high sugar content, known as sweet corn, are grown for direct human consumption and are marketed accordingly. In recent years, there has been notable success in maize cultivation on jhum lands, significantly contributing to the sustainability of jhum farmers. The Agriculture Department in Serchhip District has taken proactive measures to meet the growing demands for maize production.

In 2021, a new open-pollinated variety called Suraj 251 was introduced. It is capable of yielding 40-50 QTL per ha. A quantity of 3300 kg of maize seeds has been distributed to 550 households engaged in jhum farming, covering an area of 137.5 ha. The initial harvest of maize cobs began in October and most of the harvested cobs were dried and used as animal feed. The total production from this first harvest amounted to 2800 QTL, which sold for Rs 20 per kg, resulting in a total revenue of Rs 56,00,000.

The overall maize yield in 2022-2023 reached 3162 metric tons, representing 10% of the district's total agricultural output. Mizoram's total maize production amounted to 19322 metric tonnes, with Serchhip contributing 16.36% to the state's yield. Serchhip District ranks as the second highest producer of maize in Mizoram. The district has consistently maintained notable levels of maize production over the past five years:

Table 3: Production of Maize in Serchhip District

Sl./r	Year	Area in hectare	Production in tonnes	Yield
1	2018-2019	1593	3071	1.92
2	2019-2020	1593	3167	1.98
3	2020-2021	1593	3148	1.97
4	2021-2022	1532	3162	2.06
5	2022-2023	1532	3162	2.06

Pulses

Pulses are a significant crop in Serchhip District, alongside rice cultivation. These leguminous plants are grown annually and produce grains or seeds of various sizes enclosed in pods, which serve as both food and feed. India is the world's largest producer (25% of global production), consumer (27% of world consumption), and importer (14%) of pulses. Pulses occupy approximately 20% of the area allocated for food grains and contribute 7-10% to the country's total food grain production. While pulses are cultivated in both Kharif and Rabi seasons, Rabi pulses contribute more than 60% to the overall production. In Serchhip, pulses are primarily used for oil extraction and local consumption in markets. In the 2022-2023 period, the total state production of pulses amounted to 4,513 metric tonnes, with Serchhip District contributing 870 metric tonnes, accounting for 19.2% of the state's pulse production.

The production statistics of Pulses in Serchhip during the last five years are as under Table 4: Production of Pulses in Serchhip District

Table 4: Production of Pulses in Serchhip District

Sl./n	Year	Area in hectare	Production in tonnes	Yield
1	2018-2019	784	820	1.04
2	2019-2020	784	851	1.08
3	2020-2021	784	851	1.08
4	2021-2022	800	871	1.08
5	2022-2023	800	870	1.09

The average production of pulses is 1.09 metric tonnes per hectare and the statistical data collected by the Department of Agriculture shows that Serchhip District is the second largest producer of Pulses in Mizoram.

Oilseed

Mustard, soybean, and oil palm are important crops grown in the region. They are mainly cultivated to produce edible oils, while the extracted meals and press cakes provide a substantial amount of protein, typically ranging from 50% to 70%.²

India is among the leading producers and importers of oilseeds, playing a significant role in the global vegetable oil market as the fourth largest economy, following the USA, China, and Brazil. Oilseed crops

cover 13% of the Gross Cropped Area, contribute 3% to the Gross National Product, and represent 10% of the total value of agricultural commodities.³

In the 2022-2023 period, the total production of oilseeds in the district reached 1,065 metric tonnes, contrasting with the state production of 4,698 metric tonnes. Serchhip District accounted for 22.6% of the state's oilseed production. Serchhip is well-known for its cultivation of oilseeds such as mustard and soybeans, which many farmers grow to sustain their livelihoods. It ranks as the second-largest producer of oilseeds in Mizoram. The table below presents the total production area, yield per hectare, and overall production of oilseeds in Serchhip District over the past five years:

Table 5: Production of Oilseeds in Serchhip District.

Sl./n	Year	Area in hectare	Production in tonnes	Yield
1	2018-2019	792	1083	1.36
2	2019-2020	2922	1201	-2.43
3	2020-2021	1532	1203	-1.27
4	2021-2022	792	1065	1.34
5	2022-2023	792	1065	1.34

From the above table, it shows that during 2019-2020 and 2020-2021, the total Oilseeds production is declining and is in a negative output. The negative output during 2019-2021 is claimed to have been due to the outbreak of Covid-19 and for some other reasons, due to the extensive decrease in the production of Oil Palm in the District. When Oil Palm was introduced in Serchhip District, many farmers enrolled and the total area covered during 2019 was 2130 hectares which is more than all other areas of oil seeds production. In 2019, the overall production of oilseed crops except Oil Palm covers an area of 783 hectares, while Oil Palm only occupies an area of 2130 hectares. The total production of other Oilseed in 2019 was 1116 metric tonnes and it seems that Oilseed production was profitable for Serchhip farmers, it is estimated that 1.4 metric tonnes were produced in one hectare. However, the production of Oil Palm in the District was only 85 metric tonnes and the area covered was 2130 hectares. This huge decline in Oil Palm production in Serchhip has brought a negative result on Oilseed production in the District in 2019. The same result happened in 2020 also. This continuous fall in Oil Palm production in Serchhip District clearly shows that Oil Palm is not profitable in Serchhip and this further led to abandoned Oil Palm cultivation by many farmers in Serchhip.

Sugarcane

Serchhip is renowned for its sugarcane production, a crop that holds significant economic value in India. It offers farmers a relatively lower risk and provides a degree of assurance regarding returns even in adverse conditions. Across India, the sugar industry has played a crucial role in rural socio-economic development by leveraging rural resources, creating employment opportunities, and augmenting farm income.

However, in Serchhip District, sugarcane production is not primarily intended for sugar manufacturing. Instead, sugarcane is consumed locally in Mizoram by extracting juice or drying it to make jaggery, ⁴ known as 'Kurtai' in Mizo. Khawlailung and Hmuntha villages are particularly renowned for their cultivation of sugarcane. In the 2022-2023 period, the district achieved a total production of 18,480 metric tonnes of sugarcane across a cultivation area of 520 hectares. Serchhip stands as the leading producer of sugarcane in Mizoram, contributing 44.6% of the state's sugarcane production in 2022. Villages specializing in mass production of sugarcane, such as Khawlailung and Hmuntha, traditionally celebrate 'Kurtai Kut,' a festival dedicated to sugarcane

Table 6: Production of Sugarcane in Serchhip District.

Sl./n	Year	Area in hectare	Production in tonnes	Yield
1	2018-2019	520	18408	35.4
2	2019-2020	520	18634	35.83
3	2020-2021	520	18634	35.83
4	2021-2022	520	18480	35.54
5	2022-2023	520	18480	35.54

The above table shows that Serchhip District is famously producing Sugarcane and in 2022 it produced 35.54 metric tonnes per hectare.

Cabbage

Cabbage, a winter crop widely grown in Serchhip, holds the top position as the largest producer in Mizoram. It is scientifically referred to as 'Brassica oleracea var. capitata' and stands as the fourth most commonly cultivated vegetable crop in India. In ancient times, both Romans and Greeks valued cabbage for its medicinal properties and used it to remedy ailments such as gout, headaches, and mushroom poisoning.

Today, cabbage is primarily recognized as a popular fresh market vegetable; however, current research aims to uncover its potential health benefits especially in cancer prevention along with other cruciferous vegetables.

Cabbage is a valuable source of vitamin C and contains significant amounts of glutamine, an amino acid known for its

anti-inflammatory properties. Its low calorie content makes it a suitable addition to weight management plans. Moreover, cabbage, along with broccoli and other cruciferous vegetables, contains indole-3-carbinol, a compound that supports DNA repair in cells and appears to inhibit the growth of cancer cells.^{[5],[6]} The substance is also employed as a supplementary treatment for recurrent respiratory papillomatosis, an illness affecting the head and neck due to human papillomavirus (usually types 6 and 11) that results in growths in the airway which can be fatal. Boiling diminishes its cancer-fighting attributes.⁷ Cabbage cultivation has been practiced in Serchhip since the 1990s, but it wasn't until 1995 that regular cultivation began with the establishment of the Growers Association of Serchhip on February 26, 1995. Prior to this, only a few families grew cabbage for personal consumption rather than for commercial purposes. In 1995, several cabbage and crop growers came together to form the "Serchhip Vegetable Growers Association" to regulate their activities more effectively. According to a report from the Agriculture Department, the total cabbage production in Serchhip during 2020-2021 was recorded at 13458.7 metric tonnes, accounting for approximately 15.2 percent of the state's overall production which amounted to a total of 88530 metric tonnes during this period.

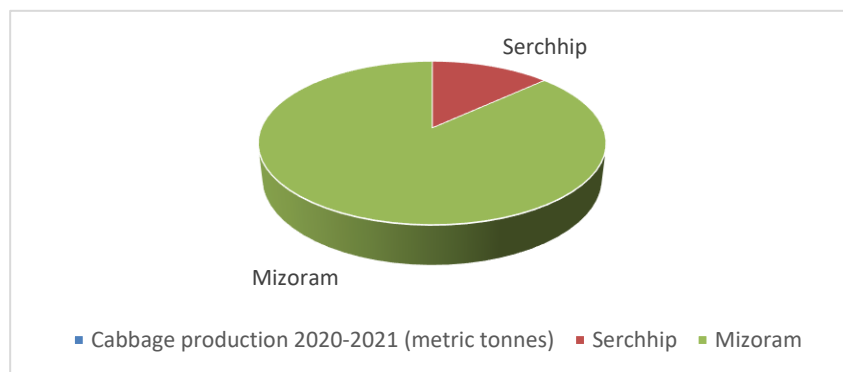


Figure 1: Cabbage Production Comparison of Mizoram and Serchhip 2020-2021

Studying the overall agricultural output and cultivated land in Serchhip District over the past four years (2018-2023) reveals a fluctuating pattern, with production levels oscillating between increases and decreases. The most recent assessment for 2022-2023 indicates a decrease of 2 metric tonnes in total production. Last year's notable decrease in production can be linked to the irregular distribution of rainfall throughout 2021-2022.

Results

From the above discussion, it shows that Serchhip District is one of the important districts in Mizoram for its agricultural crop production. The comparison of some agriculture crops of Serchhip District to Mizoram in 2022-2023 are as follows:

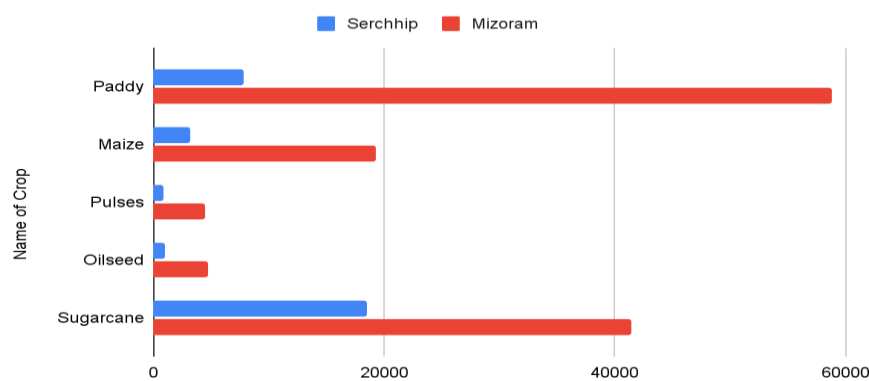


Figure 2: Agriculture Crop Production of Serchhip and Mizoram in 2022-2023

The above Figure shows the comparison of some agricultural crop production in Serchhip District and the whole of Mizoram.

The study found that in the Serchhip District, Paddy production is the largest among other crops. A sample survey has been conducted on Paddy Production in Serchhip District. As a result of this survey, the average production and cost of cultivation are as under -

Table 7: Average production and economic contribution of Paddy Crop In Serchhip

Particulars	2018	2019	2020	2021	2022
Average Production (in tonnes)	1.914	1.974	1.963	1.97	2.02
Cost of Fertilizer(in Rs)	816.7	911.7	918.3	1011.7	956.7

Labour cost	10530	11876	12971	12656	15940
Cost of Machinery	2153	7540	7643	8377	8520
Total Expenditure	18523	20328	21533	22045	25417
Net Income	52122	54082	56362	66428	72040

From the above table, it is obvious that agriculture production in Serchhip District is increasing annually. Average farmers in the District produce 1.914 tonnes of paddy in one year. Most of the production is meant for their farmers' family consumption and only a small proportion of their income is put for sale. In Mizoram, it is known that most of the paddy farmers cultivate a good variety and they are not interested in the ideology of producing more quantities. They rather produce quality rice and sell it at a higher rate. The local market rate of harvested paddy is around Rs 60 per kg. Some farmers used fertilizers and pesticides for their cultivation. But some others do not use fertilizers. Among the surveyed farmers, only 37% use fertilizers and farmers spend an average of Rs 2517 for buying fertilizers for their crops every year. 63% of Farmers do not use fertilizers and rely on the natural fertility of the soil.

Paddy cultivation is not possible for only a single farmer. Every farmer needs to hire labour. From the survey, only 2% of farmers do not hire labour from outside their family and the other 98% hire labour from outside in their fields. During the last five years, the cost of labour has been increasing continuously, this is due to the high wage rate and inflation. Every farmer paid an average of Rs 13709 annually for the cost of hiring labour.

In Jhumming areas, tools and machines are not used because of not availability of road transport. However, in WRC areas agriculture tools and machines are extensively used for cultivation from the starting point to the finishing line. The Agriculture Department subsidizes various agricultural tools and these tools are benefited by the farmers.

For production, every farmer needs to pay a certain amount for the seeds, tractor hire charge, fertilisers, labour cost machinery cost etc. From the survey the average cost of cultivation for a single farmer on one field is an average of Rs 21565 during the last five years i.e 2018-2022.

Conclusion

The study focused on agricultural production in Serchhip District, Mizoram. The research provides a comprehensive analysis of local farmers' engagement in different agricultural practices to support food security and contribute to the regional economy. Despite challenges related to topographical constraints and limited access to technology, farmers have shown resilience and adaptability. Potential strategies for enhancing agricultural production include providing better access to modern farming techniques, improving irrigation infrastructure, and investing in research for crop varieties more resistant to pests and changing weather patterns.

This study serves as a baseline for future research aimed at understanding and supporting the agricultural systems in Serchhip District. It is recommended that policymakers and stakeholders collaborate closely with the local farming community to implement the proposed strategies, thereby ensuring sustainable agricultural growth and the well-being of the population relying on this sector.

Further investigation is needed to explore the long-term impacts of the proposed interventions and to assess the scalability of successful farming practices throughout Mizoram and similar regions. By building on the knowledge gained from this study, it is hoped that Serchhip District can continue to develop its agricultural production in a manner that is both sustainable and economically viable.

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