Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/11168
DOI URL: http://dx.doi.org/10.21474/IJAR01/11168

RESEARCH ARTICLE

LEVEL OF AGRICULTURE DEVELOPMENT IN MIZORAM

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Manuscript Info

Manuscript History
Received: 10 April 2020
Final Accepted: 12 May 2020
Published: June 2020

Key words:-
Agriculture, Development, Disparity

Abstract

Agriculture is the mainstay of economy in the state of Mizoram; more than 60 per cent of the total population depends on agriculture and allied activities. It is the backbone of economy, provided employment opportunities and meet the ever requirement of pressure of population. Even though the total net sown area has been increasing during the last decades, sharing of GSDP is only 14 per cent. In-depth analysis of agriculture sector is an urgent call as disparity of agriculture development is one of the main threats to inequality. To study the level of agriculture development, secondary information was collected from Statistical Abstract of Mizoram, 2011, 2013, 2015 and 2017 to analyze 32 variable indicators in the selected eight districts with the help of Z-score techniques from Statistical Package for Social Sciences (SPSS). Kolasib district with a score value of 9.70 falls under very high level of development, followed by three districts of Aizawl (9.25), Champhai (8.89) and Lunglei (6.95) categorize as high level of development. Mamit district score a value of -5.29 which is categorize under medium level of development. Serchhip and Lawngtlai districts falls under low level of development with a score value of -7.31 and -7.92. Saiha district score the lowest value of 14.28 which falls under very low level of development. The study reveals that the geographical attribute, administrative and social aspect play a significant role as west, north and north eastern region scores the high value whereas the small tribal ethnic areas of south and south western region scores the low value.

Introduction:-

The science, art or practice of cultivating the soil, producing crops and raising livestock for human being may be defined as Agriculture. Agricultural development is a pre-requisite of economic growth in the state. It is also important not only to meet ever growing and ever pressing demand for food and fibers for human consumption but also for providing forage for animals, raw materials for non-agricultural sector, employment opportunities to rural population and improves their standard of living.

Agriculture is a major contributor to Gross Domestic Product (GDP) in Asia, with shares ranging from 11 per cent to more than 40 per cent. In Africa, agriculture accounts for between 37 and 93 per cent of the labour force and the contribution to GDP is as high as 57 per cent (World Bank, I997). It is an important sector of Indian economy as it

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contributes about 17 per cent to the total GDP and provides employment to over 60 per cent of the population (Arjun, 2013). It is not only an occupation for people but also a way of life. Most customs and cultures in the world revolve around agriculture (Kowalczyk, 2019).

According to Mizoram Economic Survey (2014-15), more than 60 per cent of the total population depends on agricultural sector as it is the biggest source of livelihood for rural areas. Shifting Cultivation, Wet Rice Cultivation (WRC), Terrace and Permanent farming are the major methods of cultivation. Various kinds of crops like rice, maize, pulses, oilseeds, fruits and vegetables, pineapple, orange, mangoes, lemons, carrot, lady‘s finger, cabbage, and pea etc., are grown in different parts of the state. The agriculture sector contributed to the Gross State Domestic Product (GSDP) was 30 per cent in 1994, 14 per cent in 2009 due to economic growth of other sectors (Birthal, 2010). Agriculture and allied activities sharing only 14 per cent at GSDP in 2014 is a serious threat (GOM, 2015). Therefore, analysis of agriculture development for sustainable development is an alarming rate to improve disparity in various scales. The main aim and objective of the study is to analyze the level of agriculture development in Mizoram. Most of the world's poor people earn their living from agriculture, so if we knew the economics of agriculture we would know much of the economics of being poor (Shultz, 1979).

Location and background of the study area:
Mizoram is located in the geographical coordinatesof 21°56' N to 24°31' N and 92°16' E to 93°26' E longitudes with covering an area of approximately 21,087 square kilometers (Pachuau, 2009), proportionate to the total area of India is 0.64 per cent. The geological structure, its complexities and geomorphological diversities of the present relief feature embraces lofty young fold mountain. Both endogenic and exogenesis forces have been consistently operating the landforms of this region as it extends in the eastern Himalayan ranges. The topography and physiographic expression is imparted by north-south trending steep, mostly anticlinal, parallel to sub-parallel hill ranges and narrow adjoining synclinal valleys with series of parallel hummocks or topographic highs. The elevation between valley floors and hill tops varies greatly from 200 meters to 1200 meters. The steep hills ranges occur are more towards the eastern part of the state.

The state is drained by a number of rivers and streams mostly found in a parallel system. The surface soils are thin with dark, highly leached and poor in bases, rich in iron and have low pH values ranging from 4.5 - 5.5. Soil textures are loam to clay with content increasing in depth. The pH and organic carbon content decreases with the increase in depth. They are capable of providing substantial oxygen supply for plant growth and retaining moisture for sufficient supply of oxygen throughout the year. According to Kumar (2012) ‘on ridge tops soils generally exhibit organic matter with heavy and coarse texture varying from high to medium. Lower slopes have shallow texture, poor, and light and contain low organic matter with increasing amount of silt and sand’.

Due to fairly altitudinal high and alignment of hill ranges, Mizoram enjoys a favorable moderate climate throughout the year. The region falls under the influence of the South West Monsoon and Jet Stream on the onset of burst of monsoon generally from the later part of April to the part of September and dry period from October to March which influences the ranges of temperature and humidity in the region. The state is well-endowed with vegetation from tropical evergreen forest to montane sub-tropical alpine type. The characteristics of its terrain, soil, rainfall and temperature provide immense potential for development and growth of plants. Meanwhile, high pressure of population, rapid urbanization, over exploitation of forest resources, improvement in transport and communication and practicing primitive form of cultivation endorse the development and backwardness of agriculture sector in various parts of the state and also promote certain degree of disparities. However, the total net sown area has been increasing during the decades of 2006-2016 from 94.187 thousand hectares to 218.608 thousand hectares. The state has recorded year-wise net sown area from 2006 only. It is found that the net sown area in Mizoram recorded less than 100 thousand hectares for the period of 2006-2008. From 2008-2009, the total cultivated area increases to 103.835 thousand hectares, and, about 130 thousand hectares recorded five consecutive years from 2009-2010 to 2013-2014. In 2014-2015, the rapid increases of total net sown area recorded in the state from 103.835 thousand hectares to 214.184 thousand hectares. The state recorded the highest net sown area i.e., 218.608 thousand hectares in 2015-2016 (table-2).

Data Based and Methodology:-

Level of agriculture development can not be measure in a single indicator. To study the district-wise development, secondary information were collected from Statistical Abstract of Mizoram, 2011, 2013, 2015 and 2017 and Directorate of Agriculture (Crop Husbandry) in the eight districts with the help of Z-score or Standardized score

techniques from Statistical Package for Social Sciences (SPSS). Z-score is a linear transformation of the original data in such a way that its mean becomes zero and its standard deviation become unity. It has been used to develop a composite score in order to arrive at the level of development. In standardized method, the collected data were converted into variables and standardize to form a score value of development:-

Data obtained from secondary source were transformed into variables, used as developmental indicators.
To transform data matrix into scale free matrix, variable indicators were standardized by subtracting the mean from each individual variables and divided by their standard deviation as the formula:-

$$Z_i = (X_{ij}-X_j)/SD_j$$

Where,

Z_i is the Z-score for the i^{th} unit,
X_{ij} is the x variable in the i^{th}unit and j^{th} variable,
$X_j$is the mean of the j^{th} variable and
SD is the standard deviation of the j^{th} variable

After obtaining Z-score for every indicator, composite score was obtained by adding up all individual standardized data:-

$$C_i = \sum Z$$

Where, C_i is the composite score and
$\sum Z$ is the summation of Z-scores or standardized scores.

Variable Indicators:
Based on the availability of data, there are 32 variable indicators which can broadly be classified into five sectors such as:-

1. Average yield of important agriculture crops (2014-201515) with yield kilogram per hectares of Paddy, Maize, Pulses, Oil seeds, Sugarcane and Potato.
2. Number of district-wise project completed and Area irrigated up to March 2015 for enhancing productivity and provides adequate supply of water. Under this sector, five more indicators like number of MI project completed, number of farmers benefitted by the projects, gross command area, culturable command area and net irrigated area.
3. Number of agricultural holdings (2010-11) in terms of marginal, small, semi-medium, medium and large ascertains to provide actual depiction.
4. Area under cash crop plantation (area in ha) 2016-17 in selected crops like Rubber, Coffee and Broom and production of various horticulture crops.

Kolasib district has recorded the highest average Paddy yield kilogram per hectares (1,850 kg per hectares) among the districts of Mizoram, and then followed by Lawngtlai district (1,750 kg per hectares) and Serchhip district (1,743 kg per hectares). Mamit district produce the lowest number of Paddy with 1392 kg per hectares. The average production of Paddy in three districts like Aizawl, Lunglei and Saiha recorded as 1,610 kg per hectares, 1,523 kg per hectares 1,503 kg per hectares during 2014-2015. In the average yield of Maize, the highest yield district found in Lunglei district with amount of 3,101 kg per hectares. The average yield of Maize recorded below 2,000 kg per hectares in the rest of the districts. The highest yield per hectares of oil seeds recorded in the district of Champhai (9819 kg per hectares) while the lowest yield found in Lawngtlai district with sum of 532 kg per hectares. Sugarcane is found in the entire state with an average yield recorded as 27,899.38 kg per hectares. The three district of Aizawl, Serchhip and Saiha districts average yield of Sugarcane is 35,000 kg per hectares. Mamit and Lunglei district yield of sugarcane recorded as 30,000 kg per hectares. Kolasib and Lawngtlai district average yield of sugarcane recorded as 25,000 kg per hectares and 20,000 kg per hectares. The highest yield of Pulses recorded in Aizawl district (1,862 kg per hectares) while the lowest yield found in Lawngtlai district (650 kg per hectares). Out of eight districts in the state, four districts sown potato which is recorded as 7,038 yield kg per hectares in Kolasib district, Lawngtlai district (5,133 kg per hectares), Saiha district (4,692 kg per hectares) and Mamit district (4,470 kg per hectares).

In the study of district-wise project completed and area irrigated up to March 2015, Champhai district recorded as the highest in variable indicators of number of MI projects completed, number of beneficiaries, gross and cultivable command area with net area irrigated while Saiha district recorded as the lowest one. Agricultural holdings are divided into five categories such as marginal, small, semi-medium, medium, small and large. In this respect, Champhai district with an area of 20,200 hectares and 4,120 hectares in Saiha districts recorded as the largest and

smallest area during agricultural year of 2010-11. In 2016-17, the two districts of Maimit and Saiha were certified as highest and lowest area under different cash crop plantation like Rubber, Coffee and Broom.

In case of the production of horticulture crops, 12 variables were taken as an indicator. Lawngtlai and Serchhip districts recorded the highest and lowest average yield (metric ton per hectares) with average yield of 10.78 per hectares and 6.44 per hectares in different crops like Orange, Banana, Grape, Cabbage, Passion fruit, Tomato, Birdeye Chilly, Chow Chow, Turmeric, Ginger and Roses.

Result and Discussion:-

The agricultural development in Mizoram have been categorize into five level such as very high, high, medium, low and very low level of development.

i) *Very high level of development*: Kolasib district score a value of 9.70 with highest rank amongst the district which falls under very high level of development. It is located in the northern part of the state having a state boundary with Assam. It is the important corridor of the state from the mainland India which provides better road transportation facilities, trade and commerce hub and market oriented agricultural crops. Geographically, the area is suited for plantation and commercial crops like rubber, oil palm, arecanut etc., Serlui B hydel project in Kolasib district is also fruitful for fisheries and agricultural purposes.

ii) *High level of development*: Three districts of Aizawl (9.25), Champhai (8.89) and Lunglei (6.95) fall under high level of development. Aizawl is the capital city of the state and its hinterland produces enormous agricultural crops for the sustenance of their respected villages and the city-core region of the district. Champhai district located in the eastern part of the state having an international boundary of Myanmar offers trade and commercial activities which brings earnest space for agriculture related activities in the riverine area. It is endowed with largest paddy fields in the state, and, the region is also dominated by grape, passion fruits and maize cultivation. Lunglei is the largest area and second most populous district in the state. It has a large agricultural holding with high production but not high yield in some crops.

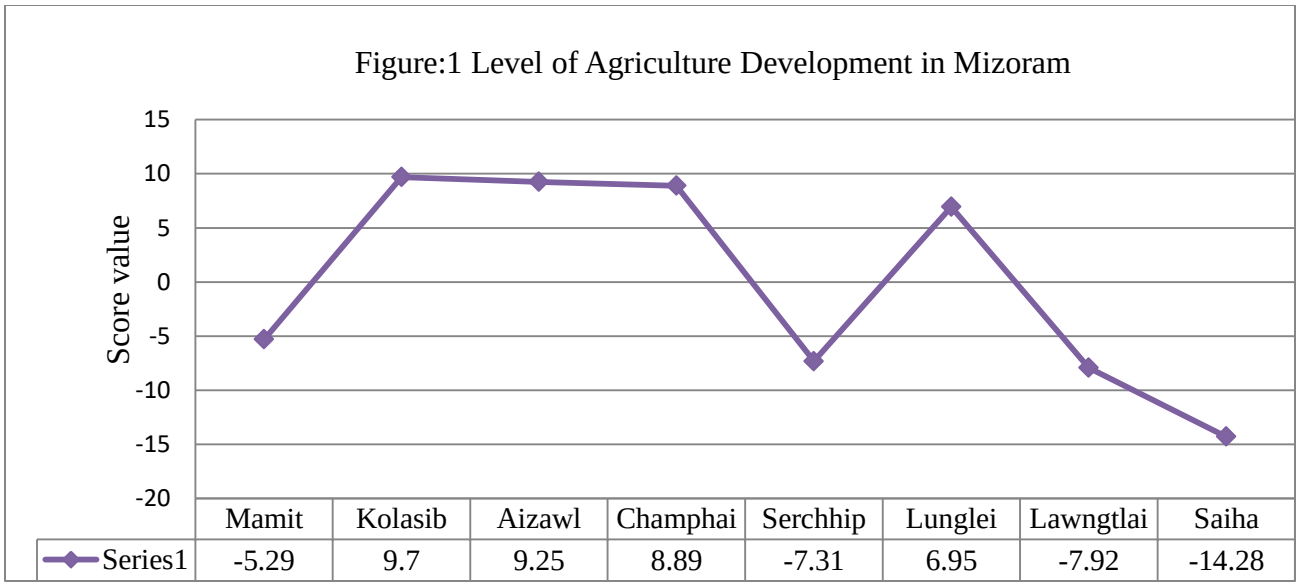
iii) *Medium level of development*: Mamit district is located in the north western part of the state which is bounded on the north and west by Assam and Tripura. It has also international boundary with Bangladesh in the west. Mamit district is suitable for plantation of rubber, arecanut and broom.

iv) *Low level of development*: Serchhip and Lawngtlai district with a score value of -7.31 and -7.92 falls under this category. These two districts are rich in alluvial soil in some patch of land but not yet utilized. Many farmers in Serchhip town and its vicinity have been sowing commercial crops in Mat riverine area. Lawngtlai is located in the south western part of the state which is drained by Chhimtuipui, Khawthlangtuipui, Tuichawng, Sekulh and Ngengpui River, with high potential for agriculture development.

v) *Very low level of development*: Saiha district score the lowest value of -14.28, categorized under very low level of development. It is found in the southern part of the state with certain low network of transportation facilities.

Table 1:- Level of Agriculture Development in Mizoram

Sl No	District	Score value	Rank	Level	Score	District
1	Mamit	-5.29	5			
2	Kolasib	9.70	1	Very high	9.5 Above	Kolasib
3	Aizawl	9.25	2	High	5.5 to 9.5	Aizawl, Champhai, Lunglei
4	Champhai	8.89	3	Medium	-5.5 to 5.5	Mamit
5	Serchhip	-7.31	6	Low	- 5.5 to - 9.5	Serchhip, Lawngtlai
6	Lunglei	6.95	4	Very low	Below -9.5	Saiha
7	Lawngtlai	-7.92	7			
8	Saiha	-14.28	8			



Conclusion:-

The present study found that disparity of agriculture development existed in the state of Mizoram. It reveals that the physical structures, administrative and social attribute play a significant role as west, north and north eastern region score the high value whereas the small tribal ethnic areas of south and south western region scores the low value.

Table 2:- Net Sown Area in Mizoram (2006-2016)

Sl No	Year	Net area Sown(Area in '000)
1	2006-07	94.187
2	2007-08	92.813
3	2008-09	103.835
4	2009-10	130.226
5	2010-11	130.121
6	2011-12	131.230
7	2012-13	130.821
8	2013-14	130.049
9	2014-15	214.184
10	2015-16	218.608
Source: Directorate of Agriculture (Crop Husbandry), Govt. of Mizoram		

Table-3 Indicators of Agriculture Development in Mizoram (2011-2017)

Sl No	District	Average yield of important Agriculture Crops (2014-15)						District-wise Project Completed and Area irrigated upto March 2015					Number of Agricultural Holdings (2010-11)					Area under different cash crop Plantation (area in ha) 2016-17		
		Paddy	Maize	Pulses	Oil Seeds	Sugar Cane	Potato	No of MI Projects completed	No of Farmers benefited by the projects	Gross Command area	Culturable Command Area	Net Irrigated Area	Marginal	Small	Semi-Medium	Medium	Large	Coffee	Rubber	Broom
		Yield (Kg Per Ha)	Yield (Kg Per Ha)	Yield (Kg Per Ha)	Yield (Kg Per Ha)	Yield (Kg Per Ha)	Yield (Kg Per Ha)													
1	Mamit	1392	1400	1638	451	30000	4470	41	553	1764	1639	1639	4304	3294	2069	633	138	10	541	14
2	Kolasib	1850	1240	1229	1326	25000	7038	78	1378	4101	3745	3827	2183	1451	1566	615	110	2	307	164
3	Aizawl	1610	1572	1862	1318	35000	0	63	1178	2561	2379	2698	9861	5286	1124	52	6	3	21	174
4	Champhai	1561	1441	1394	9819	13195	0	88	2392	3923	3806	3939	9629	8724	1657	190	0	1	0	55
5	Serchhip	1743	1240	1087	1425	35000	0	51	951	2680	2528	2549	4130	2041	1086	165	10	15	85	20
6	Lunglei	1523	3101	1488	921	30000	0	60	768	2644	2129	2159	9083	5216	1424	31	0	46	259	107
7	Lawngtlai	1750	1394	650	532	20000	5133	33	561	1406	1387	1387	8275	2931	476	0	0	5	105	56
8	Saiha	1502	1793	821	1333	35000	4692	25	249	696	516	615	2745	810	520	45	0	16	0	11
Source: Directorate of Agriculture (Crop Husbandry), Govt. of Mizoram @ Statistical Abstract of Mizoram (2015 &2017)																				

Table 4:- Indicators of agriculture production (horticulture crops) in Mizoram (2016-17)

Sl No	District	Orange	Banana	Grape	Cabbage	Passion Fruit	Tomato	Birdeye Chilly	Chow Chow	Turmeric	Ginger	Anthurium	Rose
		Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)	Yield (MT/ Ha)
1	Mamit	1.73	11.56	0	13.25	1.07	9.27	1.84	16.56	10.83	14.15	0	6.51
2	Kolasib	1.75	12.59	6.00	13.25	1.90	9.29	0.72	16.59	15.96	6.72	11.19	0
3	Aizawl	2.47	14.01	7.08	15.25	2.35	9.61	1.00	18.08	2.49	6.45	13.11	2.74
4	Champhai	2.42	12.54	8.84	15.70	2.63	9.78	1.08	16.54	1.95	6.22	0	4.58
5	Serchhip	3.61	12.13	5.87	04.07	2.98	9.13	0.74	16.60	3.09	5.60	13.45	0
6	Lunglei	2.98	12.94	7.62	13.63	1.73	12.35	0.83	16.27	2.22	7.13	47.12	0
7	Lawngtlai	4.03	13.29	8.78	59.30	2.02	9.21	0.79	17.05	6.33	8.61	0	0
8	Saiha	2.66	13.99	4.98	12.94	1.63	9.12	1.38	16.58	1.94	9.12	0	0
Source: Directorate of Agriculture (Crop Husbandry), Govt. of Mizoram @ Statistical Abstract of Mizoram (2017)													

Reference:-

1. Arjun, KekaneMaruti (2013) Indian Agriculture-Status, Importance and Role in Indian Economy,International Journal of Agriculture and Food Science Technology, Volume 4,Number 4, pp. 343-346
2. Birthal (2010) Unlocking the potential of Agriculture in northeastern hill region of India, Ind. Journal of Agri. Econ,Vol 65, No. 3, July-Sept, pp 335
3. GOM (2013) Agriculture Statistical Abstract 2012-2013, Directorate of Agriculture (Crop Husbandry), Government of Mizoram (2013).
4. GOM, Statistical Abstract 2011, 2013, 2015, 2017, Directorate of Economic and Statistics, Government of Mizoram.
5. GOM (2015) Mizoram Economic Survey (2014-15), Directorate of Economic and Statistics, Government of Mizoram.
6. Kowalczyk, David J (2019), The Importance of Agriculture, http://www.bluefingeralliance.org.uk/the-importance-of-agriculture/, retrieved on 20th June, 2020.
7. Kumar, G (2012) Dynamics of Development and Planning: Mizoram a comprehensive Regional Analysis,Kalpaz Publications, Delhi.
8. Pachuau, Rintluanga (2004) Mizoram - A study in Comprehensive Geography, Northern Book Centre, New Delhi.
9. Schultz, T. (1979), The Economics of Being Poor, The Journal of Political Economy, Vol. 88, No. 4, pp. 639-651.
10. World Bank (1997), World development indicators, International Bank for Reconstruction and Development, The World Bank, Washington, DC.