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A Study on Agricultural Production and Productivity in Wokha District of Nagaland

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Abstract

Agriculture sector still plays a dominant role in food security and economic development of a country. Growth and development of agriculture and allied sector directly and indirectly affects the welfare of a society and rural prosperity. The practice of agriculture also forms an important resource base for a number of agro-based industries and agro-services that led to the development of towns and cities. Human populations that exist today could not have evolved without the practice of agriculture. Wokha district is known as "Land of Plenty" for its richness in mineral, resources, fertile land and favorable climatic condition. More than 80 percent of the people depend on agriculture for their livelihood. Rice is the major food crop and occupies around 68 percent of the total cultivable area. The paper discusses the progress of agriculture sector with a view to ascertain the trend in area, production, yield of principal crops and major vegetables, and changes in cropping pattern of Wokha district in the state of Nagaland.

Keywords: Agricultural progress, principal crops, major vegetables, area, production and yield, Wokha.

Introduction

Agriculture and allied sector continues to play a dominant role in the food security and economic development of a country. The practice of agriculture enabled people to establish permanent settlements and expand urban based societies. Domestication of plants and animals transformed the profession of the early humans from hunting and gathering to selective hunting, herding and settled agriculture. Human populations that exist today could not have evolved without the practice of agriculture (Gupta, 2004). Growth and development of agriculture and allied sector also directly and indirectly affects the well-being of a society and rural prosperity.

Wokha district in the state of Nagaland is the homeland of the Lotha (Nagas) with an area of 1628 sq.km. It accounts around 9.82 percent of the total geographical area of the state with a population of 1,66,343 (2011 census). The district is situated in the mid western part of Nagaland State, adjacent to Golaghat and Jorhat districts of plain in State of Assam. It is bounded by Mokokchung district in the North, Kohima district in the South, Zunheboto district in the East and the State of the Assam in the West. The topography of the district is hilly, more or less similar with that of other districts in the state. The district is divided into three broad mountain ranges- Wokha Range or Upper Range, Sanis Range or Middle Range, and Bhandari Range or Lower Range. The climate is warm

in the lower plain areas, moderately warm in the middle and upper region during summer, and cold in winter. The annual rainfall varies from 200 cms to 250 cms and the type of soil is mostly comprised of alluvial soil. The district is known as "Land of Plenty" for its richness in mineral, resources, fertile land and favorable climatic condition.

Objective of the Study

The study was conducted with the following objectives:

1. To study the problems and prospects of agriculture sector in the district.
2. To analyze the trends in area, production and productivity of principal crops in the district.

Data source and Methodology

The study was conducted under Wokha district of the state of Nagaland. For primary data, altogether 150 farmers were surveyed from 25 villages randomly. The information so was collected with the help of schedule questionnaire, informal interview and discussions with the cultivators and officials of the department of agriculture. Secondary data were collected from published reports of the Department of Agriculture Government of Nagaland, Statistical Handbooks of Nagaland, Nagaland Basic Facts, NEDFi Databank and Journals. Statistical tools such as percentages and pie chart were used to draw meaningful results. For the estimation for area, production and productivity of principle crops, compound growth rates have been used by fitting a semi logarithmic trend function of the form:

$Y = e^{a+bt}$

Where, Y = Area/Production/Productivity

a = Constant

b = Growth Rate
t = Time

Analysis and Discussion

Agriculture and allied activities are the principal means of occupation and livelihood residing in rural areas with more than 80 percent of the people depending on agricultural sector. Rice is the major food crop and occupies 68 percent of the total cultivable area. The total cropped area in the district in 2018-19 was 48828 ha, net sown area of 31,765 ha and area sown more than once of 17063 ha with a cropping intensity of 130 per cent (NEDFi Data Bank, 2020). Major crops such as rice, maize, millet, wheat, nagadal and beans are grown during Kharif season, and groundnut, rapeseed, sugarcane, cotton, pea, rajmash (Kholar), jute are grown during Rabi season. Horticultural crops grown in the district includes pineapple, orange, ginger, mossambi, banana, guava, potato, yam, plum, cucumber, passion fruit and jack fruit are abundant and commercially cultivated. Farmers in the district still follows traditional method of cultivation- spade, hoe and small agriculture implements as the topography of the district is mostly hilly terrain. Adoption of machineries such as tractors, power tillers, bullocks or buffalo drawn plough are seen in the lower range of the district- plains of Merapani, Doyang valley and Baghty valley for wet rice cultivation. The cropping pattern in the district is similar to that of the state with cultivation of food grains occupying the major portion of the total cropped area. As shown from the table (1.1), more than 75 percent of the total cropped area is devoted to the cultivation of food grains throughout the period. Rice being the staple food of the district, the cultivation of cereals (Jhum and TRC/WRC) occupies the largest share with almost 68 percent of the total cropped area. The area under oilseeds cultivation to total cropped area has

been steadily declining over the years from 15.76 percent in 2010-11 to 14.49 percent in 2019-20. This is due to the gradual increase in area under commercial crops cultivation from 6.67 percent to 9.93 percent in 2019-20.

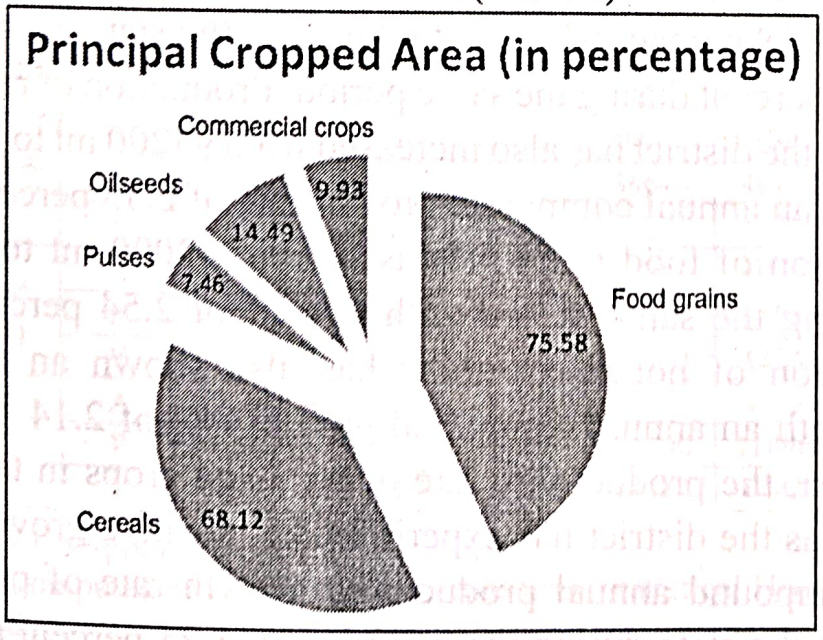
Table 1.1: Cropping pattern in Wokha District (2010-11 to 2019-20)

Year	Principal crops				
	Cereal	Pulses	Foodgrains	Oilseeds	Commercial crops
2010-11	70.26	7.31	77.57	15.76	6.67
2011-12	68.80	7.67	76.47	16.21	7.17
2012-13	68.11	7.33	75.44	16.06	8.50
2013-14	68.97	7.41	76.38	15.93	7.69
2014-15	68.66	7.29	75.95	15.58	8.47
2015-16	68.78	7.30	76.08	15.44	8.49
2016-17	69.08	7.40	76.48	15.06	8.46
2017-18	69.10	7.59	76.69	14.92	8.39
2018-19	68.25	7.48	75.73	14.56	9.71
2019-20	68.12	7.46	75.58	14.49	9.93

Source: Computed based on data collected from Statistical Handbooks of Nagaland

The following pie chart shows the area under principal crop to total cropped area in the year 2019-20.

Figure 1.1: Area under principal crops to total cropped area under Wokha district (2019-20)



Source: Table 1.1

In the year 2019-20, the total area under cereal, pulses, oilseeds and commercial crops cultivation in the district was 28040 ha, 3069 ha, 5965 ha and 4087 ha respectively. The percentage area under food grain to total cropped area was 75.58 percent of which area under cereal cultivation accounts to 68.12 percent in 2019-20. The area under the cultivation of oilseeds (14.49 percent) occupied the second largest followed by commercial crops cultivation (9.93 percent) and pulses (7.46 percent).

Trend in Area, Production and Productivity

The area under principal crops cultivation has witnessed an increasing trend over the last 10 (ten) years in the state as well as in Wokha district. The total area under the cultivation of principal crop in the district has increased from 36110 ha in 2010-11 to 41161 ha in 2019-20 with a CAGR of 1.32 percent. The area under food grain cultivation in the district was 28010 ha in 2010-11 which has increased to 31109 ha in 2019-20 with a Compound Annual Growth Rate (CAGR) of 1.05 percent. Similarly, the area under non-food grain has also showed an upward trend from 8100 ha to 10052 ha with an annual growth rate of 2.18 percent which is higher than the state growth rate of 1.70 percent during the same period. Production of principal crops in the district has also increased from 94200 mt to 118965 mt with an annual compound growth rate of 2.36 percent. The production of food grain increased from 52090 mt to 66918 mt during the same period with CAGR of 2.54 percent and production of non-food grains has also shown an upward trend with an annual compound growth rate of 2.14 percent. However, the productivity rate of principal crops in the state as well as the district has experienced a negative growth rate. The compound annual productivity growth rate of principal crops in the state during the period was -1.25 percent and the

district was -2.19 percent. The decline in the productivity rate of principal crops was mainly due to the decline in the annual growth productivity growth rate of commercial crops in both the state (-1.25 percent) as well as the district (-2.19 percent). Therefore, there is a need to improve productivity rate by taking up measure such as adoption of modern technology, pest control, improved seeds and fertilizers, scientific rotation of crops according to agro climatic conditions.

Table 1.2 Area, Production and Productivity of Principal Crops of Nagaland and Wokha district for the past 10 (Ten) years

(A= Area in Hectare, P= Production in metric tonnes (mt), Y= Yield, Kg per hectare)

Principal Crops	Factors	Nagaland			Wokha		
		2010-11	2019-20	*CAGR	2010-11	2019-20	*CAGR
Cereal	A	264400	301970	1.34	25370	**28040**	1.01
	P	531860	702090	2.82	49440	**63418**	2.52
	Y	2012	2325	1.49	1949	**2262**	1.49
Pulses	A	34430	40310	1.59	2640	**3069**	1.52
	P	36460	46780	2.52	2650	**3500**	2.82
	Y	1059	1161	0.91	1004	**1140**	1.32
Food Grain (A)	A	298830	342280	1.37	28010	**31109**	1.05
	P	568320	748870	2.80	52090	**66918**	2.54
	Y	1902	2188	1.43	1860	**2151**	1.46
Oil seeds	A	65840	68950	0.46	5690	**5965**	0.47
	P	67530	71300	0.54	5470	**5827**	0.63
	Y	1026	1034	0.08	961	**977**	0.21
Commercial crops	A	29400	43756	4.06	2410	**4087**	5.42
	P	392170	486674	2.18	36640	**46220**	2.35
	Y	13339	11123	-1.80	15203	**11309**	-2.91
Non- food grains (B)	A	95240	112706	1.70	8100	**10052**	2.18
	P	459700	557974	1.96	42110	**52047**	2.14
	Y	14365	12157	-1.66	16164	**12286**	-2.71
Principal crops (A + B)	A	394070	1091150	10.72	36110	**41161**	1.32
	P	1028020	1306844	2.43	94200	**118965**	2.36
	Y	16267	14345	-1.25	18024	**14437**	-2.19

*CAGR= Compound Annual Growth Rate
Source: Computed based on data collected from Statistical Handbooks of Nagaland

Major findings of the study

1. The primary system of cultivation in the district is jhum method of cultivation with 95 percent of the respondent practicing traditional method of cultivation and only 24 percent of the respondents attended training relating to the practice of agriculture.
2. The study shows that women in the age group of fifty or more occupies a dominant role (65 percent) in agricultural activities with predominance of marginal and small farmers (below 2 hectares).
3. It is also found that mono-cropping of paddy is widely practiced with limited use of High Yielding Variety Seeds (HYVS), fertilizers and pesticides in the field.
4. It is also observed that agriculture production in the district is not demand oriented. Farmers produce on a small scale and the surplus being sold directly to the consumers in the village roads and on the state highways.
5. It is also found that the number of participation of youth in agricultural activities in the district is very low (35 percent). A vast range of scopes exist in this sector which await exploration by youth as they have the desired innovativeness and creativity needed for reshaping agriculture (Sukanya Som *et al.*, 2018).
6. The study also found that there is a lack of organised market and regulated marketing system for marketing the agricultural products.
7. The study revealed that lack of finance, absence of cold storage and processing facilities, problem of transportation, post harvest losses are the common problems of the farmers in the district.

8. Majority of the respondents (65 percent) in the study area appeared to be unaware of agriculture credit facilities and depends on indigenous money lenders or financed by themselves.

Conclusion

Agriculture in the district is mainly rain fed and organic by default. Due to the topography of the district which is mostly hilly, Jhum system of cultivation is widely practised with limited use of fertilizer and also the scope of farm mechanisation is limited. The practise of Wet Terrace Cultivation are mostly found in the lower range of the district, in the plains of Baghty and plains of Merapani. The area, production and yield of agriculture sector in the Wokha district have shown an increasing trend over the years even though at a slow pace. The area under the production of principal crops has increased from 36110 ha in 2010-11 to 41161 ha in 2019-20, registering an increased rate of 12.27 percent. The production of principal crops has also increased from 94200 mt to 118965 mt, a percentage increase of 20.82 percent over the period. Agriculture in the district is characterized by predominance of small farmers, hilly terrains, traditional method of cultivation, non-application of HYV seeds, limited use of fertilizers and pesticides which results in the low production and productivity of crops. There are also various problems in the marketing of agriculture produces in the district. Non-existence of agro-based units, absence of organized and regulated marketing facility, lack of storing facility in the villages and lack of finance makes it difficult for the farmers to dispose their produce as most of the agricultural produce are non-durable. Thus, co-operative farming and contract farming are to be encouraged in the district as it will not only bring the farmers under an umbrella but also will encourage

large scale cultivation and also strengthens them to make effective agricultural marketing. On the basis of availability of raw material, labor and other support mechanism there is a scope for agro-based industries – potato and banana chips processing units, juices (orange, plum, pineapple, and passion fruits) and packing units, food processing units etc. There is also an urgent need for awareness and delivery of credit and other assistance to the right person at the right time for the development of agriculture in the district. In order to bring fruits of labor to the farmers, the overall environment prevailing in the agriculture sector in the district needs to be improved.

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