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November 2014 Vol - 2 Issue- 11

## AN EVALUATIVE STUDY OF AGRICULTURAL PROGRESS IN NAGALAND

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### ABSTRACT

Considering the importance of agriculture for raising the standard of living, this article analyzed the growth in area, production and productivity of different crops in Nagaland by using the compound growth rate function. For this purpose only secondary data have been used to analyzed for a period of 32 years from 1981-82 to 2012-13 and cropping pattern was estimated for a period of 52 years i.e. 1961-62 to 2012-13. During the study period the growth in area under food grains was 2.37%, production and productivity growth of 5.02% and 2.59% respectively. The growth in area, production and productivity under oilseeds was 9.83%, 12.94% and 2.84% whereas productivity of commercial crops shows a negative growth rate of -1.83%. Cropping pattern has been shifting in favour of non-food crops. The study reveals that the productions of food grains in Nagaland have shown an upward trend even then it is not satisfactory. Therefore, there is a need to take up productivity enhancing measures, selection of appropriate crop according to agro climatic conditions, input supplies, R & D, marketing and credit facilities to achieved food requirement in the state.

**KEY WORDS:** Agriculture, Growth Rates, Productivity, Food Grains, Employment.

## **I INTRODUCTION**

Nagaland, the 16<sup>th</sup> state of Indian Union, covers 16579 sq.kms as to the geographical area out of which 7225 sq.kms (43.37%) are cultivable area of the state where at present 71.14% people are living in the rural area and 55.2% of the total population are cultivators. The state has a population of 1,978,502 as per census of India, 2011. The state is bounded by Assam in the west, Myanmar (Burma) on the east, Arunachal Pradesh and parts of Assam on the North and Manipur in the south. In Nagaland, agriculture is influenced by traditional knowledge, cultural, geographical and socio-economic factors. Agriculture is considered as the main source of livelihood of Naga life. It plays a vital role in the economy of Nagaland contributing 21 percent to the Net State Domestic Product in 2008-09 followed by industry, real estate, transport and communication. Thus, it is one of the significant contributors to the Net State Domestic product and is the largest employer of the work force in the state. The agriculture sector provides employment to 68 percent out of total work force of the state which is more than the national average i.e. 47 percent. Therefore, agriculture recognized as the major source of livelihood of Nagaland and is playing an important role in socio-economic development of the state. There is large variation in yearly productivity of agriculture in the state but the food grains production in the state has shown on upward trend during the period of 1961-62 to 2012-13. The food grains production of the state during the period of 1961-62 was only 63530 metric tonnes which increases to 598960 metric tonnes in 2012-13, which signifies the economic development of the state, even though the percentage of achievement of the sector is not very encouraging on the basis of national average rate of growth.

## **II METHODOLOGY**

The objective of the paper is to discuss the agricultural progress in Nagaland. For this purpose only secondary data have been used to analyze the picture of agriculture. The growth in area, production and productivity of different crops was estimated by using the compound growth rate function. Data used for the study was collected from various published sources from the Directorate of Economics and Statistics (DES), Kohima, Nagaland.

Chakraborty (1990) observed that significant increase in agriculture production has been achieved in India through many avenues like use of better seeds, enrichment of soil by fertilizers and fair irrigation systems. But comparatively less attention has, however, been laid towards the improvement and modernization of agricultural tools. Considerable increase in agricultural production can be achieved by better tools having improved mechanical properties and wear resistance. According to Kumar (1990) stated that agricultural mechanization has made a radical improvement in the production and productivity of Indian agriculture. The increase in agricultural production due to mechanization is quite wide spread in the plains, but the hilly areas have not realized the effect of mechanization due to variations in topography and different climatic and socio-economic constraints.

## **III TREND OF AGRICULTURAL OUTPUT AND PRODUCTIVITY**

The average area under food grains in the state during the study period was 143475 lakh ha (Table: 1.1). The growth in area under food grains in the state has recorded a 2.37 percent during 1981-82 to 2012-13. The state is producing 125009 metric tonnes which has increased to 598960 metric tonnes at the end of 2012-13 i.e 473.951 mt have increased within

the span of 32 years. The growth in the food grains output in the state is 5.02 percent. The state registered an annual increment of 2.59 percent growth in the productivity of food grains during 1981-82 and 2012-13. During the period the growth in area under pulses and oilseeds was highest comparing to growth in area under other crops in the state. Thus it can be said that the area under food grains in Nagaland state is moving from coarse food grains to pulses and oilseeds.

Rice is the staple food crops grown in the state. The area under rice (jhum paddy and TRC/WRC paddy) in the state is 106038 ha during 1981-82 which has increased to 183330 lakh ha in 2012-13. The area under rice has recorded an annual increment of 3.54 percent per annum. The production of rice in the state is 405.180 mt in 2012-13 forming about 67 percent of the food grains produced in the state. Rice production in the state is growing at around 9.16 percent per annum i.e. 5.05 percent jhum paddy and 4.11 percent TRC/WRC paddy. The state witnessed an annual increment of 2.54 percent productivity of rice. The state registered a significant increase in area under maize and pulses during the study period. The rapid expansion in area under these crops was mainly due to its important features like short duration, adaption to a wide range of soils and climatic conditions and high yield per hectare as compared to other food grains. In Nagaland, maize and pulses production was increasing at 7.74 percent and 9.21 percent per annum during 1981-82 to 2012-13.

Cropping pattern is the proportion of area under various crops at a point of as it changes over space and time. Cropping pattern is also depending on terrain, topography, slope, soils and availability of water for irrigation, use of pesticides, fertilizers and mechanization. In Nagaland, the cropping system is mostly based

on traditional, cultural, geographical and socio-economic factors. The land of this state is mostly owned by individuals, clan and the community. The cropping pattern in Nagaland is shown in the table below;

We find from Table: 1.2 that share of food grains is decreasing while non-food grains is increasing during the period under study. Rice is the main crop in the state covering around 45 percent of gross cropped area followed by maize (16.96 percent) and oilseeds (14.49 percent). In Nagaland, the food crops cereals and pulses predominates the cropping pattern i.e. 75 percent. However during the period 1961-62 and 2012-13, the share of food grains area declined from 92.18 percent to 74.89 percent because the farmers shift in favour of oilseeds and commercial crops. During 1961-62 and 2012-13 percentage of area under oilseeds increased from 1.79 percent to 16.49 percent and commercial crops increased from 6.03 percent to 8.62 percent in 2012-13.

Table 1.3 presents the progress of agriculture in terms of food grains in Nagaland during the period from 2001-2002 to 2012-13. In Nagaland, agriculture is still at subsistence level where the primary concern of the farmers is meeting their food requirements. Population is increasing in the state. It was 12, 09,546 lakh during 1991 census which has increased to 19, 78,502 lakh during 2011 census. The food grains production also increased but the state is yet to attain self-sufficiency in food grains production.

It is difficult to present the food grains area, production and productivity of all the districts in Nagaland because during the time of state hood 1963 there is only seven districts in the state and no proper records of government or by competent private agencies. Therefore only from 2008-2013 separate district

wise growth in area, production and productivity of food grains is analyze in the above table 1.3. In the period of 2001-02 to 2007-08, the CARG of agricultural area (1.23%), food grain production (4.53%) and food grain yield (3.30). Among all the districts Tuensang district is the highest compound annual rate of growth comparing to other districts in the state during 2001-02 to 2007-08. But significantly in the period of 2008-09 to 2012-13, for the Nagaland state the CARG of agriculture area (1.69%), production (3.06%) and yield (1.26%) have come down compared to the previous growth rate in production and yield while in area slight increase takes place. During the period 2008 to 2013, the districts Kohima, Mon and Peren registered a significant increase in area of food grains while Mokokchung, Wokha, Tuensang and Longleng show a negative growth. Mon district registered the highest significant annual growth rate in area, production and productivity i.e. 5.08 percent, 8.66 percent and 3.41 percent respectively.

#### **IV FINDINGS AND SUGGESTIONS**

1. In Nagaland, the food grains pre-dominates the cropping pattern but during the study period the share of area under food grains decreases sharply from 92 percent to 75 percent while the non-food grains increases even though in order to ensure food requirement in the state measures should be taken to increase area under food grains.

2. The area under pulses, oilseeds and commercial crops in the state is increasing year after year. However the productivity of commercial crops shows a negative growth rate of -1.83 percent. Thus there is a need to take up productivity enhancing measures like disease control, distribution of planting materials and selection of appropriate crop according to agro climatic conditions.

3. Some of the districts in the state possess larger percentage of area but production and yield comparatively less as compared to other districts having smaller percentage of area under food grains but production and yield is better. This would require identification of the constraints that lead to poor productivity.

4. Lack of transport, marketing and storage facility has been a major problem in the state. There is only one commercial centre in the state-Dimapur, which is the only rail head and the air connectivity. Other districts headquarters also have markets but has got only the aspect of marketing i.e. buying. The price spread between the producer and consumer is too wide due to absence of organized market. Thus proper road connectivity, marketing and storage facility to be created at the primary markets in rural areas and regulated markets in district level.

5. The slash-and-burn system of cultivation without proper conservation measures and rapid loss of tree cover from mountains has rendered the susceptible to accelerated soil erosion, landslides, loss of habitat and genetic diversity. But most of the tribes in Nagaland depicts their cultural festival from jhum cultivation and also provides not only food security but also household security. Therefore, instead of banning jhum cultivation, it needs a focused system based on R & D to improve the overall productivity and food security.

6. Credit facility is one of the main problems in the development of agriculture in the state. The government is trying its best to assist the farmer in many ways like distribution of seeds, fertilizers and provision of subsidies but on a close observation the assistance does not reach into the right time and right persons. Therefore, strategy should be evolved to

promote community-based collaterals for the effective credit delivery.

7. Another problem facing the state is lack of R & D and of appropriate extension services. Measures have to be devised whereby the farmers are acquainted with modern production technology through adequately trained personnel and provided facilities for soil testing and appropriate advice on up-gradation of production technology.

## V CONCLUSION

From the above analysis it is seen that the production of food grains in the state have shown an upward trend even then it is below the state requirement. The actual requirement of rice in the state is 3.70 lakhs metric tonnes whereas the state produced only 2.63 lakhs mt. Therefore, the shortfall is supplemented

through imports from outside the state. (P.K.Deka & S.R.Longkumer). The growth of area under food grains during 1981-82 and 2012-13 was 2.37 percent, production and productivity growth of 5.02 percent and 2.59 percent respectively. During the study period 1961-62 and 2012-13 the share of area under food grains decreases sharply from around 92 percent to 74 percent which means that the farmers shifts in favour of pulses, oilseeds and commercial crops. Even then the question of food security also needs to be addressed as rice remains the staple diet of the people. Thus, the Govt. and policy makers opt for appropriate measures in streamlining input supplies, marketing and credit facilities, research and extension or development agencies so as to achieve food security in the state.

**Table: 1.1 Trend in Area, Production and Productivity of Food grains, Oilseeds and Commercial crops in Nagaland**

Crops	Factors	1981-82	2012-13	CARG*
Jhum paddy	A	43947	94920	2.43
	P	37340	180820	5.05
	Y	0.85	1.90	2.54
TRC/WRC paddy	A	62091	88410	1.11
	P	61804	224360	4.11
	Y	0.99	2.54	2.99
Maize	A	17692	68670	4.33
	P	12385	134650	7.74
	Y	0.70	1.96	3.27
Wheat	A	3060	3270	0.21
	P	4500	5890	0.84
	Y	1.47	1.80	0.63
Other cereals & small millet	A	11555	11780	0.06
	P	6568	12790	2.10
	Y	0.57	1.08	2.02
Pulses	A	5130	36200	6.29
	P	2412	40450	9.21
	Y	0.47	1.12	2.75
Total(cereals pulses)	A	143475	303250	2.37
	P	125009	598960	5.02
	Y	0.87	1.97	2.59
Oilseeds	A	3320	66820	9.83
	P	1402	68900	12.94
	Y	0.42	1.03	2.84
Commercial crops	A	12120	34900	0.33
	P	278345	443750	1.47
	Y	22.96	12.71	-1.83

Source: Statistical Hand Books, Govt. of Nagaland, Kohima.

Note: Area in ha. Production in tones and Yield in tones per ha.

CARG=Compound Annual Rate of Growth



**Table: 1.2 Cropping Pattern in Nagaland**

Crops	1961-62	1971-72	1981-82	1991-92	2001-02	2010-11	2011-12	2012-13
Jhum paddy	48.44	37.42	27.65	35.03	28.51	24.50	24.05	23.44
TRC/WRC paddy	15.93	21.57	39.07	29.43	21.07	21.52	21.66	21.83
Maize	8.25	10.03	11.13	12.44	12.67	17.36	17.25	16.96
Wheat	N.A	N.A	1.92	0.27	1.90	0.79	0.79	0.81
Other cereals & small millet	16.93	20.06	7.27	6.99	6.34	2.91	2.89	2.91
Pulses	2.63	2.78	3.23	6.99	11.08	8.74	8.79	8.94
Total Food grains	92.18	91.86	90.27	91.97	81.57	75.82	75.43	74.89
Oilseeds	1.79	1.92	2.09	5.92	15.99	16.71	16.69	16.49
Commercial crops	6.03	6.20	7.62	2.90	2.42	7.46	7.86	8.62
Total non-food grains	7.82	8.12	9.71	8.82	18.41	24.17	24.55	25.11

Source: Statistical Hand Books, Govt. of Nagaland, Kohima.

**Table 1.3 Progress of Agriculture (Food grains) in Nagaland**

District	Factors	2001-2002	2007-2008	CARG*	2008-2009	2012-2013	CARG*
Kohima	A	58980	43140	-4.36	19070	23820	4.55
	P	84340	72050	-2.22	44660	46690	0.89
	Y	1.43	1.67	2.24	2.34	1.96	-3.48
Phek	A	40000	34550	-2.07	27840	28570	0.52
	P	57290	58670	0.34	51930	58080	2.26
	Y	1.43	1.69	2.41	1.86	2.03	1.76
Mokokchung	A	30980	33400	1.08	23260	22950	-0.27
	P	42130	54490	3.74	41150	43940	1.32
	Y	1.36	1.63	2.62	1.77	1.91	1.53
Wokha	A	38180	32850	-2.12	27540	27060	-0.35
	P	51250	53640	0.65	47920	52320	1.77
	Y	1.34	1.63	2.84	1.74	1.93	2.09
Zunheboto	A	29690	25640	-2.07	24980	26430	1.13
	P	38090	40120	0.74	43090	49550	2.83
	Y	1.28	1.56	2.87	1.72	1.87	1.69
Tuensang	A	30020	46460	6.44	34450	33520	-0.54
	P	40540	78540	9.91	58070	60340	0.77
	Y	1.35	1.69	3.26	1.68	1.80	1.39
Mon	A	29650	30060	0.19	24090	30870	5.08
	P	39630	48790	3.01	38400	58160	8.66
	Y	1.43	1.62	1.79	1.59	1.88	3.41
Dimapur	A	N.A	34400	N.A	48240	55890	2.99
	P		75420		99910	127760	5.04
	Y		2.19		2.07	2.28	1.95
Peren	A	N.A	N.A	N.A	15750	20110	5.01
	P				31370	41790	5.90
	Y				1.99	2.08	0.89
Kiphire	A	N.A	N.A	N.A	19430	21600	2.14
	P				34390	38800	2.44
	Y				1.77	1.79	0.22
Longleng	A	N.A	N.A	N.A	14250	12430	-2.70
	P				24220	21530	-2.33
	Y				1.69	1.73	0.47
Nagaland	A	257500	280500	1.23	278900	303250	1.69
	P	353270	481720	4.53	515110	598960	3.06
	Y	1.37	1.72	3.30	1.85	1.97	1.26

Note: Area in ha. Production in tones and Yield in tones per ha.

CARG=Compound Annual Rate of Growth

Source: Statistical Handbooks, Govt. of Nagaland, Kohima.

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