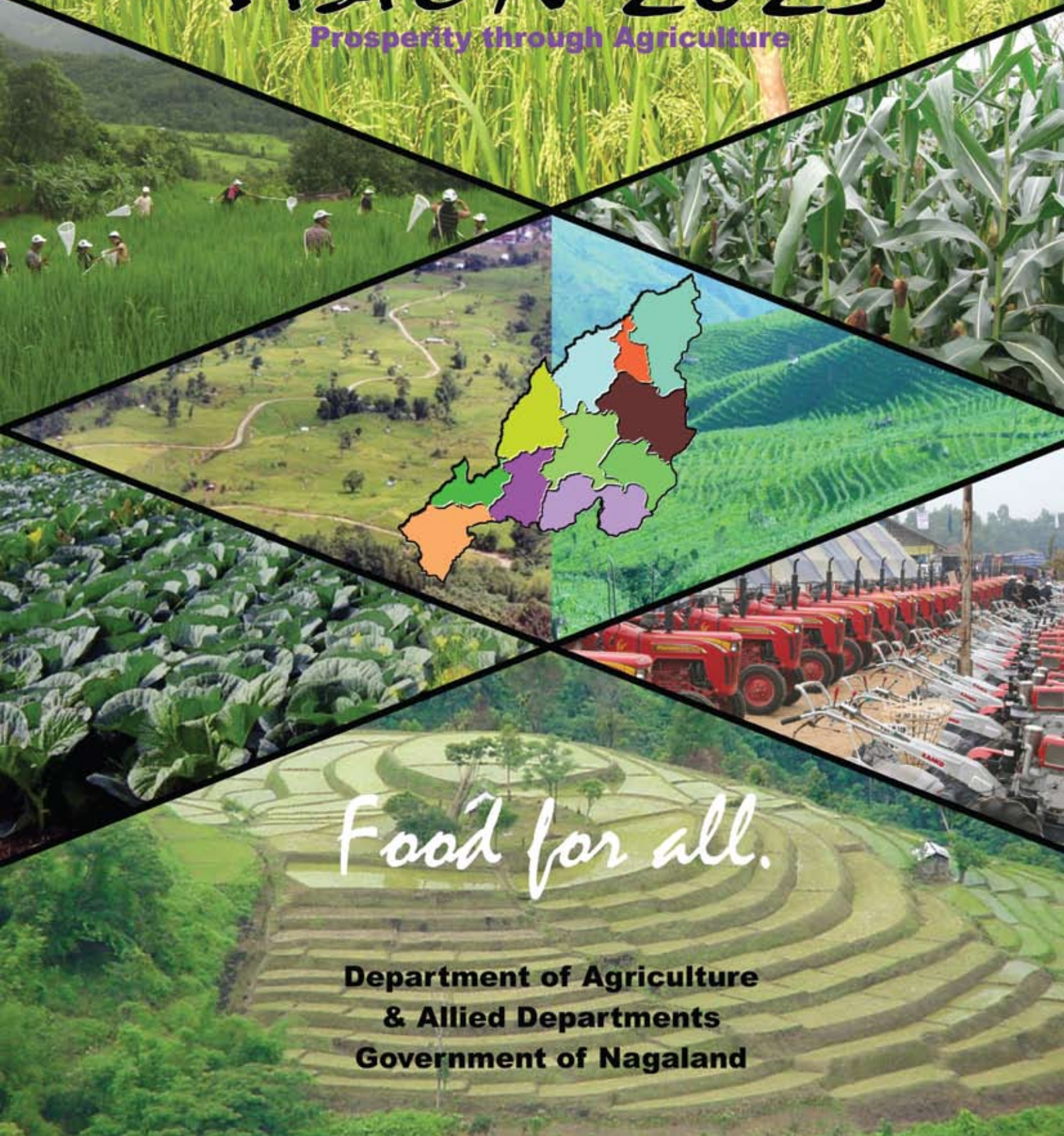




VISION 2025

Prosperity through Agriculture



Food for all.

**Department of Agriculture
& Allied Departments
Government of Nagaland**

.....

VISION 2025

FOOD FOR ALL

.....

Prosperity through Agriculture

DEPARTMENT OF AGRICULTURE
& ALLIED DEPARTMENTS

GOVERNMENT OF NAGALAND



VISION 2025

FOOD FOR ALL

First Published July 2012

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And Allied Sectors
Government of Nagaland

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Department of Forest, Ecology, Environment & Wildlife

While every care has been taken to present accurate data, oversights may have occurred.
Please convey errors, if any to the Department of Agriculture, Government of Nagaland.



GOVERNOR
NAGALAND, KOHIMA



NIKHIL KUMAR

MESSAGE

25th June, 2012

A Vision Document – 2025 “Food for All” is being brought out by the Department of Agriculture & its allied departments. It should serve as a guide to ensure food security to all by 2025. Agriculture is the most important economic activity in Nagaland and it is, therefore, necessary to improve land productivity, and consequently foodgrain production, through sustainable and scientific management practice without impairing the ecological and environment status. For this, clear and forward looking planning is necessary that should help the State achieve food security and prosperity.

I am confident that ‘Vision 2025’ will serve this purpose.

I convey my best wishes for its success.

(Nikhil Kumar)



CHIEF MINISTER
NAGALAND, KOHIMA



NEIPHIU RIO

MESSAGE

29th June, 2012

Our State is predominantly a hilly State with varied farming system such as Jhum and wet terrace cultivation and agriculture the main stay of the population. It is, therefore, a matter of pride that Agriculture and the allied departments are jointly bringing out the vision document aimed at achieving food for all by 2025 and alongside, for also ensuring food security for all; the most appropriate step indeed towards building up a self reliant and an economically viable State.

I am sure the Vision 2025 document will guide the State of Nagaland and all the stakeholders towards achieving prosperity not only in the State in particular but also in the country too.

I wish the Vision 2025 document a great success.

(Neiphiu Rio)



MINISTER
AGRICULTURE
NAGALAND, KOHIMA



DR. CHUMBEN MURRY

MESSAGE

28th June, 2012

It is indeed a happy occasion for the Departments of Agriculture and Allied Sectors to be bringing out a Vision 2025 document – “Food for all”, focusing on food security by 2025.

Global demand for food is expected to be doubled by 2050, so will be the pressure on production, which will have to keep pace. Nagaland as an agrarian State with higher population growth is no exception to this finding, it will have view its food production seriously. Focus will have to be on optimum land use, various forms of scientific interventions and quality inputs. Agriculture in its totality will continue to be the most important economic activity providing not only livelihood but also employment. Therefore, it is critical that clear vision and concrete steps are taken through the envisaged contents that will truly make agriculture in the State a progressive one.

The stark reality of the effects of climate change already being perceived on one hand and our dwindling natural resources on the other hand should be the motivating factors. All aspects of agriculture must be dealt with, with vision, zeal and in mission mode.

Therefore, Agriculture & Allied Departments coming up with the Vision 2025 Document is in the right direction. I congratulate the Departments involved in the mammoth effort and wish that their efforts will result in good economic returns through agriculture for the State in the years to come.

(Dr. Chumben Murry)





AGRI PRODUCTION
COMMISSIONER
& PRINCIPAL SECRETARY
(AGRICULTURE)

Mission Director
NEPED – NBDA

Administrative Head
NBRM – NBHM



H. K. KHULU, IAS

FOREWORD

Agriculture & Allied activities mainly crops, animal husbandry, fisheries and forestry continue to be the main stay for the overwhelming majority of the people of Nagaland. It has been a major contributor to GSDP of the State and employs 65% of the total work force. In the recent years the Government has assigned significant priorities to the development of agriculture and agri business in the region. Apart from food grains there has been increase of production in fruits, vegetables, condiments and spices and also pulses and oils. Despite the improvements and increase in production there are a lot of gaps which are required to be filled in order to achieve self sufficiency and to improve productivity to achieve economically and commercially viable levels. With a view to achieve this objective, an effort has been made by the Agri & Allied Departments to bring out the vision document, VISION 2025 – “Food for All.” It is hoped that this vision document will serve as a guide not only for Agri & Allied Departments but for the people of the State in general and in order to achieve this goal in the years ahead and to improve the economy of the State and people making Nagaland a better place to live in.

I take this opportunity to express sincere appreciation to all those who have worked hard to bring out his document.

(H.K. KHULU) IAS,
APC & Principal Secretary (Agriculture)



ACKNOWLEDGEMENT

The Vision 2025 – Food for all Document is an initiative of the Department of Agriculture, Government of Nagaland and prepared with inputs from the Agri and Allied Sectors, Government of Nagaland.

Globally Managed Services (GMS) would like to acknowledge with thanks the support and co-operation of Dr. Chumben Murry, Minister of Agriculture for his astute observations, critical analysis and guidance on the drafts, over several rounds of review meetings towards the conceptualization and preparation of the document. Shri. H.K Khulu, IAS, Agriculture Production Commissioner & Principal Secretary who provided valuable inputs, support and co-operation for the formulation and preparation of the document. Shri. A.Y Ovung, Director, Department of Agriculture and his subordinate officers for their co-operation and their contributions. Extensive discussions and reviews were held with the Sub-Committee on Vision 2025 comprising of Shri. E.H Lotha, Additional Director, Shri. Bendangyanger, Joint Director and Shri. Ikuto Zhimomi, Deputy Director. They tirelessly reviewed the drafts over several sittings and provided critical inputs on the factual accuracy for the finalisation of the document.

Globally Managed Services would also like to acknowledge the valuable contributions and inputs from all the District officers of the Agri and Allied Sectors of Nagaland during the field trips on information and data collection. These findings collected invariably formed the basis of the Report. We also wish to thank all the Deputy Commissioners of the various districts for their co-operation and support extended to the GMS teams in co-ordinating meetings and providing logistic support during the field exercises.

Valuable data has been provided by the Departments of Horticulture, Veterinary & Animal Husbandry, Irrigation and Flood Control, Forests, Ecology, Environment & Wildlife and Fisheries which has been incorporated in the Vision and finalisation of the document.

Globally Managed Services
Guwahati 2012



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OVERVIEW

Land and water are the two most vital natural resources for development of sustainable agriculture and economy. It is absolutely necessary to improve the productivity of land through scientific management practices without impairing the ecological and environmental status.

Global food demand is expected to be doubled by 2050, whereas, production environment and available natural resources are continuously depleting and deteriorating. Across the larger part of the world, inadequate attention to agriculture has led to food scarcity, steep rise in food prices and increased food riots.

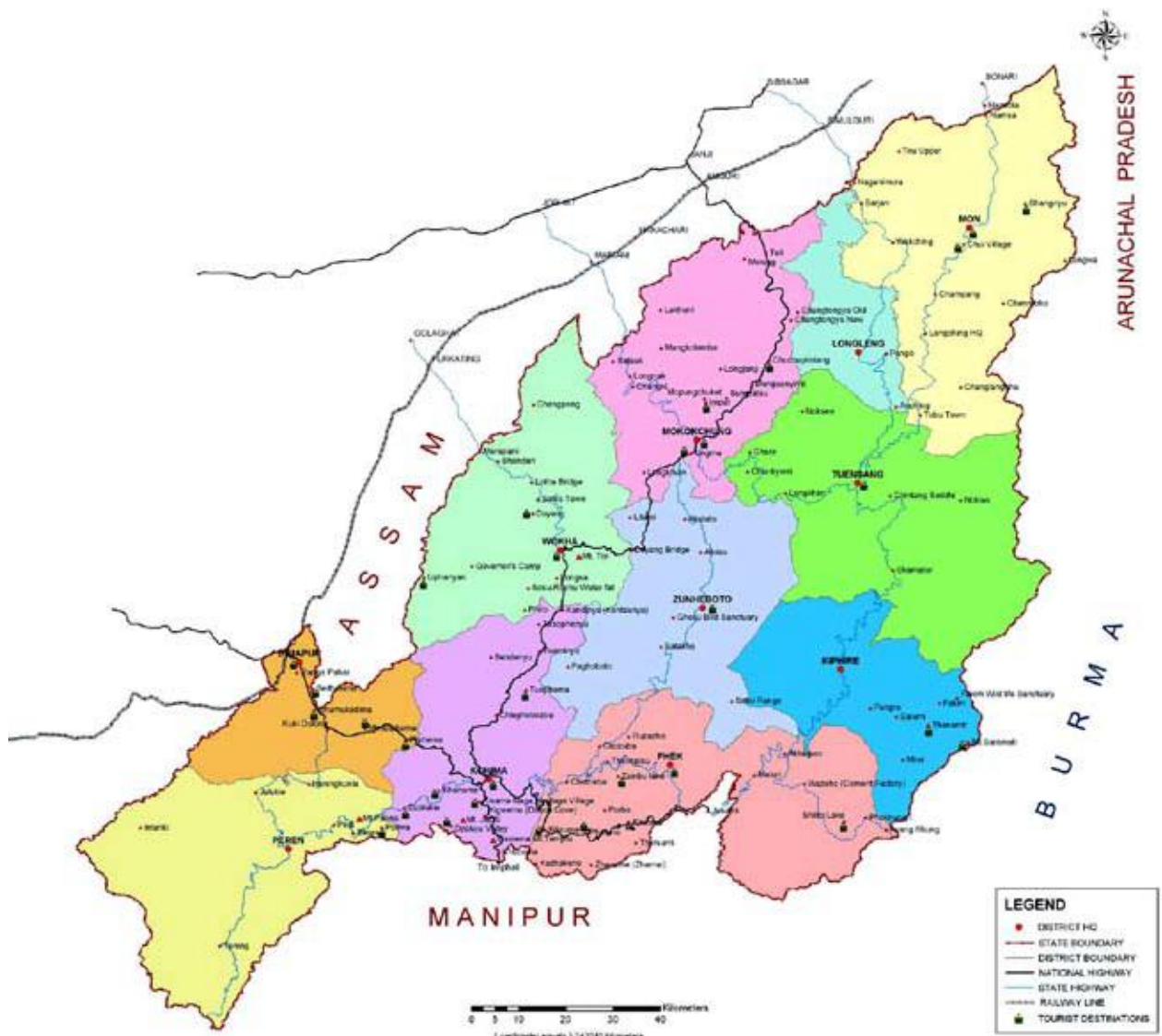
Predominantly an agrarian State, the economy of Nagaland is dependent on development of agriculture. In order to bring agriculture to the fore front and prioritize its development, it is important and necessary to utilize all available resources sensibly with application of modern technology to achieve the optimum level of development, in order to meet the goal of food security.

Nagaland is a hilly and mountainous State. Agriculture has traditionally been and continues to be the mainstay and economic activity of Naga life- the numerous festivals revolve around the agriculture calendar and have their roots in cultivation practices. Seventy one percent of the population are engaged in agriculture. Rice is the staple food which occupies about seventy percent of the total cultivated area and constitutes about seventy five percent of the total grain production in the State. The average consumption of rice in Nagaland is estimated at 540 grams per day per head. Urban consumption averages 485 grams per day per head and rural constitutes an average of 596 grams per day per head. Other principal crops include maize, pulses, oilseeds, sugarcane, potatoes and fibres.

The production system in Nagaland has been close to proto-agriculture, which has enabled close links between nature and people through generations. These traditional practices have been formalised through experiences, empirical observations, and deeply rooted with socio-cultural and traditional values. The traditional land use pattern of cultivation i.e. Jhum or shifting/slash and burn, is the method that is widely practiced and continues across Nagaland.



Rice. The staple diet.



Map of Nagaland



Variety of rice grains cultivated in Nagaland

Other sectors related to food security are animal husbandry, dairy and fishery. Forestry is another sector which has an inverse role in the matter of global warming affecting agriculture production. Nagaland’s gross State domestic product for 2011 is estimated at \$2.38 billion (₹11,900 crores). However, Nagaland still depends on the import of food supplies from other States.

The reasons behind this are:

1. Traditional methods of cultivation and inadequate application of modern technologies for production.
2. Lack of mechanization in agriculture.
3. Poor transportation and communication facilities.
4. Inadequate marketing infrastructure for agricultural produce and as such uncontrolled price stabilization.
5. Non commercial attitude towards agriculture.
6. Lack of proper storage facilities.
7. Lack of agro based industries.
8. Reluctance of educated youth to involve

in agricultural activities.

9. Widespread practice of Jhum cultivation which has led to soil erosion and loss of fertility, particularly in the eastern districts.
10. Improper utilization of land and less involvement of people in animal husbandry and dairy sectors.

The Vision Nagaland 2025, aims at addressing this entire gamut of issues to make Nagaland a prosperous State surplus in food production by 2025, by adopting the following measures:-

1. Capacity building of farmers as well as extension personnel.
2. Use of quality seeds, fertilizers and other agro-chemicals and make them available to the door step of the farmers.
3. Establishing Agro Service Centres in each block by imparting training to the educated unemployed youth for providing easy access of farm mechanization, and other services to the farming communities.

4. Construction of all weather roads to connect production centres to markets.
5. Creation of commodity specific production zones for easy marketing of perishable horticultural commodities by establishing agricultural market hubs with internet facilities.
6. Encouraging development of agri-preneur as organic producer of high value fruits and vegetables to attract the educated youth for self employment through agriculture.
7. Ensuring easy availability of farm credit.
8. Construction of rural warehouses and cold storages.
9. Entrepreneur development for establishment of fruits and vegetables processing industries with a purpose of value addition.
10. Encouraging maximum possible settled cultivation (as terrace cultivation) of suitable agri-horti crops, such as rain fed cereals, fodders, vegetables and fruit crops etc. in hilly terrains in areas traditionally under Jhum. (shifting cultivation)
11. Adopting steps to increase piggery, goatery, cattle rearing, poultry, duckery, etc. for maximizing meat production through breed improvement.
12. Increasing the availability of chicks of layers and broiler birds in the state by establishing hatchery units.
13. Increasing commercial cattle rearing for the development of dairy sector.
14. Utilizing available water bodies and low lying areas for fish production.
15. Assured availability of fish seed with onset of fish production season.

In order to increase productivity and production of the cereals, especially rice, it is proposed to increase the irrigated area in the State for introduction of summer rice, HYV and hybrid. It is targeted to achieve increase in rice productivity from 2 MT to 3.5 MT per ha by the end of 2025 by introduction of SRI in rabi rice, areas with assured irrigation, use of chemical fertilizers, proper crop management in the kharif rice during monsoon. Apart from increasing irrigation potential, the emphasis is to be given on the Integrated Land Development Project in the State with objectives like Land Development with terracing through people’s participation and in rolling terrain by using heavy machineries.

The vision 2025 also emphasizes on utilizing the water resources of the State towards sustainable agriculture by means of rain water harvesting and creating irrigation potential. In combination of all these measures, the State of Nagaland can invariably be brought to the status of a State surplus in food production by the year 2025.



MID-TERM APPRAISAL OF THE 11TH FIVE YEAR PLAN

PLANNING COMMISSION, GOVT. OF INDIA

An important aspect of inclusive growth of the 11th Five Year Plan is its target of 4% per annum growth in GDP from agriculture and allied sectors. This target is not only necessary to achieve the overall GDP growth target of 9% per annum without undue inflation, but is an important element of ‘inclusiveness’. The global experience of growth and poverty reduction shows that GDP growth originating in agriculture, is at least twice as effective as GDP growth originating outside agriculture.

It has been observed that there may be a shortfall in achieving the targeted 4% per annum growth rate of GDP in agriculture, but the agricultural growth rate has accelerated compared to the two earlier plan periods.

ECONOMY OF THE INDIAN STATES FOR THE YEAR 2011

Rank	State/Union Territory	Region	Indian Rupee (Ten Million)	US Dollar (Billion)	Growth Rate (YoY)	%age of Total GDP	Per-capita Income (INR)
1	2	3	4	5	6	7	8
1	Maharashtra	West	1,029,621	\$224.12	14.23%	14.09%	83,471
2	Uttar Pradesh	North	588,467	\$128.09	13.42%	8.05%	26,051
3	Andhra Pradesh	South	567,636	\$123.56	19.44%	7.77%	60,458
4	Tamil Nadu	South	547,267	\$119.13	17.94%	7.49%	72,993
5	Gujarat	West	481,766	\$104.87	12.21%	6.59%	63,961
6	West Bengal	East	443,644	\$96.57	10.76%	6.07%	41,469
7	Karnataka	South	398,893	\$86.83	15.73%	5.46%	59,763
8	Rajasthan	North	303,358	\$66.03	18.76%	4.15%	39,967
9	Kerala	South	268,183	\$58.38	16.44%	3.67%	59,179
10	Haryana	North	257,793	\$56.12	18.82%	3.53%	92,327
11	Madhya Pradesh	North	240,239	\$52.29	11.07%	3.29%	27,250
12	Punjab	North	221,332	\$48.18	10.97%	3.03%	67,473
13	Bihar	East	213,073	\$46.38	31.26%	2.92%	20,069
14	Orissa	East	186,356	\$40.57	10.53%	2.55%	36,923
15	Chhattisgarh	East	129,718	\$28.24	34.66%	1.78%	44,097
16	Jharkhand	East	106,696	\$23.23	-2.85%	1.46%	29,786
17	Assam	North-East	104,218	\$22.69	12.70%	1.43%	30,413
18	Uttarakhand	North	77,580	\$16.89	24.70%	1.06%	68,292

19	Himachal Pradesh	North	52,426	\$11.41	21.26%	0.72%	58,493
20	Jammu & Kashmir	North	47,709	\$10.39	10.23%	0.65%	33,056
21	Goa	West	29,873	\$6.50	15.42%	0.41%	132,719
1	2	3	4	5	6	7	8
22	Tripura	South	16,328	\$3.55	11.80%	0.22%	38,493
23	Meghalaya	North-East	14,645	\$3.19	17.14%	0.20%	48,383
24	Nagaland	North-East	10,933	\$2.38	25.85%	0.15%	21,434
25	Manipur	North-East	9,198	\$2.00	22.51%	0.13%	29,684
26	Arunachal Pradesh	North-East	7,263	\$1.58	6.12%	0.10%	51,644
27	Mizoram	North-East	6,179	\$1.35	9.69%	0.08%	45,982
28	Sikkim	North-East	5,652	\$1.23	19.24%	0.08%	48,937

India’s Total GSDP 6,666,455 \$1,451.12 91.23%

India’s Total GDP 7,306,990 \$1,590.55

Data Source: Data exclusively compiled by the VMW Analytic Services and provided by the Federal State Governments. India’s financial year starts from 1st Apr through 31st Mar. VMW have used exchange rate of INR 47.3617/USD for FY10 and ₹. 45.94/USD for FY11. *Three UTs do not announce their respective economies, hence VMW Analytic come out with the rough estimates.

The remaining years of the Plan will test its strategy for agriculture, which aimed at improving farmers access to technology in order to improve sustainable production, enhancing the quantum and efficiency of public investments, increase system support while rationalising subsidies and encourage diversification towards higher value crops, and live stocks, and protection against food securities concerns. It further seeks to achieve inclusiveness through a more decentralised decision making that focuses on solving specific local problems and foster group approach by which, the poor get better access to land, credit, skills and scale.

The 11th Plan acknowledge that slow down in agriculture growth after mid 1990s was due to multiple factors. So, Plan emphasized on increasing productivity through balanced use of fertilizers, increased irrigation potentialities, application of micro nutrients, increase in seed replacement rate and speedy dissemination of improved and potential technology. The issues related to technology can be put in two categories. First of all, where productivity level is high and has moved to economic potential. Secondly, where productivity level is low and far below the economic potential.

Nagaland being placed in the second category requires an extension and a favorable policy environment like supply of inputs, remunerative prices and infrastructure back up.



TABLE SHOWING PROJECTED GROWTH RATE OF NAGALAND AND ALL INDIA FROM 2007 - 2020

	Growth rate of GSDP				Growth Rate of Per capita GSDP			
	2007-12	2012-17	2017-20	2007-20	2007-12	2012-17	2017-20	2007- 20
Nagaland	8.50	8.50	8.50	8.50	7.22	7.28	7.41	7.28
India	9.0	9.0	9.0	9.0	7.51	7.67	7.80	7.61

Source: NIPFP estimates

CENTRALLY SPONSORED SCHEMES GIVEN PRIORITY AFTER MIDTERM APPRAISAL BY THE GOVT OF INDIA

The centrally sponsored schemes are the main instruments of promoting growth in agriculture covering the entire gamut of activities ranging from land and water development, seed production, extension, crop production, soil health, mechanization and post production issues. Some of the important centrally sponsored schemes are Rashtriya Krishi Vikas Yojana, National Food Security Mission, and Agriculture Technology Management Agency (ATMA). The Rashtriya Krishi Vikas Yojana (RKVY) a centrally sponsored scheme for development of agriculture and allied sector is operating in Nagaland since 2007-08. A higher growth rate in production and productivity is observed in the agriculture and other departments like Animal Husbandry, Fishery, Horticulture and Soil Conservation. The public sector has to depend on extension system to disseminate its technologies. Extension is the responsibility of the State Government but due importance is yet to be given to this. There are large unfilled vacancies and the numbers of extension workers are not sufficient to address this need. An urgent need to innovate extension model built on

Public Private Partnership (PPP) mode, to provide farmers the latest information on an array of technology and letting them to choose the best needs to be encouraged. The concept of *Mitra Kishan* as an extension functionary is one of the possible means to achieve this objective. To reform the extension service, ATMA is operating in the State under Centrally Sponsored Programme in order to provide desired impact in the extension system beyond the Block level. Under this scheme new strategies adopted to strengthen the system are:-

- Provision for one Farmer’s Friend in each two census village.
- Specialist and supporting staff at district and block level.
- Revision of cafeteria of activities.
- Support to SAMETIs for creating essential infrastructure.
- Farm Advisory Committees at State, District and Block levels.
- Delegation of powers to SLSCs set up under RKVY for approving SEWP.
- Convergence in research and extension with KVK/ICAR institute

In order to increase productivity of rain fed agriculture and thus meet food security demand by 2025, an increased thrust has been given to rain fed areas through greater emphasis on a reformed water shed development programme. The National Rained Areas Authority was set up in November 2006, which has issued a new set of common guidelines for watershed development projects in February 2008, applicable to all water shed development projects in all Departments / Ministries of the Government.

CROP INSURANCE

Appropriate strategies are required for agricultural risk mitigation management particularly in view of increased capitalization of farming and enhanced perceived risk due to climatic change. After the introduction of the National Agricultural Insurance Scheme (NAIS) introduced in 1999-2000, in 2008-2009, 1,347 lakh farmers have been covered over an area of about 2010.09 million hectares insuring a sum amounting to ₹.1,48,250 crores under the scheme.

AGRICULTURAL MARKETING

An Act was formulated in the year 2003, which provides for constituting a State Agricultural Produce Marketing standards bureau for promotion of grading, standardization and quality certification of agricultural produce. Under the central sector, there is a provision for credit link back-ended subsidy scheme for strengthening and development of marketing infrastructure.

RECOMMENDATIONS OF THE PLANNING COMMISSION OF INDIA: (After Mid-term Appraisal of the 11th Plan)

In order to accelerate agriculture growth by increasing growth in crop sectors, the following recommendations were given by mid-term appraisal of 11th Plan:

1. Raise public expenditure on Agri R&D to 1% of Agri GDP, re-energize the public institutions (especially State Agriculture University) with adequate funding and commensurate institutional reforms to incentivize the research system, including ICAR institutions
2. Introduction of hybrid seed in cereals and vegetable is the priority of the Govt. to increase the production of food vertically, without much depletion of forest cover.
3. Higher investment in irrigation of all types, from check dams and water sheds to drip and ground water banking (recharging) to medium and large scale storages and irrigation schemes.
4. In order to raise resources in agriculture R&D and irrigation and to promote efficiency, rationalizing and containing the subsidy regime is required. Fertilizer subsidy on nutrient basis, if possible, is to be given directly to the farmers. If this is not feasible, flat rate per unit subsidy on fertilizer produced should be given to fertilizer plants abolishing the retention price scheme and freeing fertilizer industry from price controls, and opening fertilizer imports to the private sector at low import duty.

- 5. Incentivize states to carry out institutional and pricing reforms in water and energy to promote efficiency in their use and to give support to the resource poor farmers of the State. To provide agricultural marketing support to the growers, Government is proposing to develop Market Hubs, Agri-corridor, connecting the production centre with market, and establishing the processing centre for value addition of the produce. Government is also proposing to create a cold storage chain for exporting and efficient marketing of the produce of perishable products.
- 6. To overcome the adverse climatic and pest problem thrust on crop insurance will be given.
- 7. Increase the area under forest cover by increasing purchased forest in deficit districts and also by massive afforestation to augment the outcome of the impact of global warming.

IMMEDIATE ACTION POINTS TO STRENGTHEN FOOD GRAIN SECURITY

- Significantly higher investments are needed in modern bulk handling storage of basic food grains, preferably under the private sector or under the PPP mode. The current storage capacity with state agencies is much lower than the stocks that they often carry, leading to large wastages (8-10 per cent) reassessment of the optional level of storage of food grains in the wake of increasing volatility needs to be taken up on a high priority.
- Special focus groups including reputable agri-business leaders on eastern India need to be set to harness ground water to help raise rice, wheat, and maize yields with a combination of incentives and infrastructure investments.

ACCELERATING AGRI- GROWTH THROUGH THE HIGH VALUE SEGMENT
(Horticulture, Livestock, and Fisheries)

- Incentivize the State to ensure that APMC is reformed and notified for buying from farmers; encouraging ‘Clustering’ of farmers in groups through NGOs, CGOs, SHGs, be it in the form of cooperatives, farmers clubs, or contract farming.
- Promote a model land lease act to free up the lease market.
- Encourage NABARD to refinance SHGs at a 7per cent interest rate with the condition that they will not charge more than 11 per cent from the farmer.
- Encourage organized logistic players, processors, and modern retailers (both domestic and foreign) by freeing them from any restrictions and supporting them to form links directly with cluster of farmers.
- Rationalize taxes and commissions by abolishing them on fresh produce and replacing them by taxes only on value addition.

THE VISION

“ Vision is the future as we foresee”.

Agriculture being the priority sector of development, participatory development in agricultural arena is to be adopted to uplift the productivity of agricultural and horticultural crops. To overcome the detrimental effects of Jhum cultivation on the environment, although it is an integral part of the cultural identity of the people of Nagaland, effective measures to improve the technology of Jhum cultivation and to popularise settled cultivation invariably is to be undertaken. In this arena, specific importance may be drawn to Horticultural crops like strawberry, Naga King or Raja chilli, kiwi, passion fruit, pineapple and vegetable cultivation. Once the farmers realize the benefits of settled cultivation over shifting cultivation, sustainable agriculture could be achieved.

AIMS OF THE VISION 2025: FOOD FOR ALL BY 2025

Objectives of the Vision 2025

- By increasing production and productivity in a sustainable way.
- Employment generation by establishing agro-based food product and animal feed product industries, so as to increase the per capita income of the farmers and thus achieve food security as a whole.
- Attract educated youth toward agricultural activities by utilizing the potential for earning through value addition both for domestic and export markets.
- Protect existing forest cover to counter Global Warming by means of awareness generation programmes, and cultivation of fast growing species of trees to meet the requirement of fuel and fodder.

To meet the requirement of food for the growing population of the State, the following steps should be taken:

A. Infrastructure Development:

- Establishment of rural markets back linked with marketing chains.
- Construction of warehouses and cold storage facilities
- Development of seed farms and nurseries.
- Development of soil testing laboratories.
- Development of quality control laboratories.
- Establishment of nurseries for mass production (tissue culture) of horticultural crops, especially medicinal & aromatic plants
- Construction of green houses and poly houses.



- Establishment of farm implements/tools production units.
- Establishment of fruits and vegetable processing units.
- Establishment of feed production unit for livestock and fisheries.
- Construction of model organic farms including facilitating organic certifications
- Construction of organic fertiliser and pesticide production units.
- Construction of hatcheries for poultry
- Establishment of hatcheries for fish fingerlings.
- Establishment of pre-processing and packaging units for cut flower and fruits.

B. Technology generation and dissemination

- Strengthening of research on improved seed and livestock. (State Agricultural University and Research Centre will be entrusted with the task)
- Revitalizing the extension machinery through capacity building for dissemination of the modern production technology. New extension policy of Public Private Partnership (PPP) will be involved to disseminate the modern technology to the farmers.
- Organic production of crop and animal husbandry products for export.
- Making available the farm credit to the farmers for commercialization.
- Crop insurance to provide support in case of any loss due to adversity.
- Watershed development and emphasis on rain fed agriculture for meeting the food security, particularly in the area under Jhum cultivation.



Cattle breeding



Areca nut plantation



Maize plantation



Sesamum



In order to usher green revolution in a sustainable manner the following points are of vital importance:-

1. Increase in cropping intensity by introduction of short duration high yielding varieties, replacing the existing long duration local varieties followed by cultivation of other crops like oil seed, pulses, wheat, vegetables, etc. Proper nutrient management practices along with crop protection measures to be undertaken to increase production and productivity of crops.
2. Natural advantages such as topography, climatic conditions are to be best utilized by cultivating wide range of horticultural crops like fruits, spices, medicinal and aromatic plants. Exotic crop like strawberry, avocado and kiwi having very high demand in local, national and international markets can bring in much needed cash.

In order to generate employment opportunities in agriculture and allied sectors and to increase purchasing power of the farming community, the following measures are proposed;

1. Promotion of horticultural crops such as fruits and vegetables, through CIGs or SHGs.
2. Promotion of commercial farming of cattle, poultry, dairy etc. to increase the employment generation and farm income, through individual or group of entrepreneurs and co-operatives.
3. Commercial fish farming in low lying areas and existing available water bodies through CIGs or SHGs and co-operatives.

In order to protect the existing forest cover, the following measure is proposed:
To release the pressure on the existing forest, Agro-forestry should be encouraged in waste land and other marginal lands.

Forward Integrations:

1. Linked to market i.e. Agriculture Hub, linkage to production units, MNCs and agro marketing companies.
2. Selected products for export oriented units
3. Value of products to the farmers

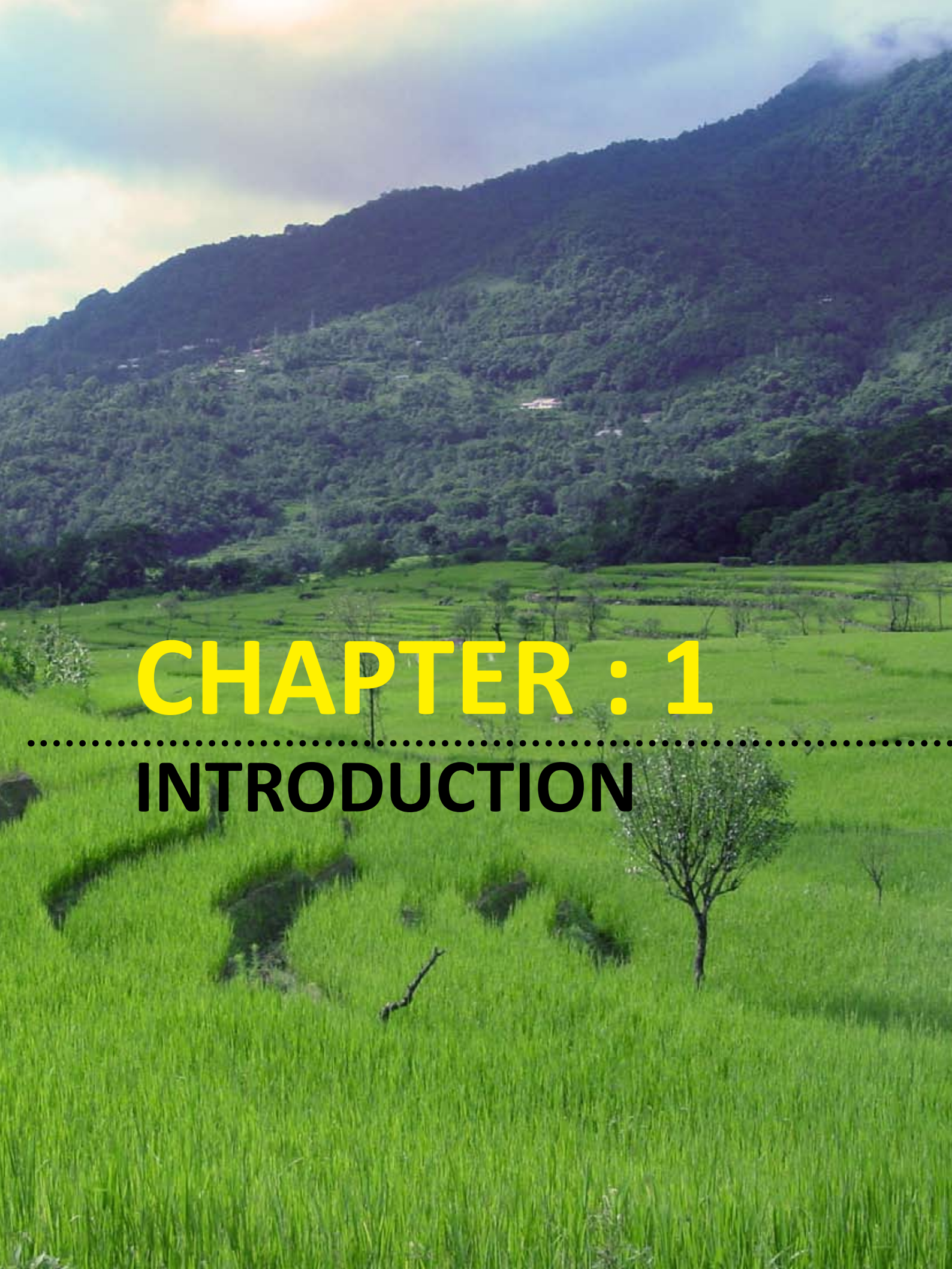
The Mission of Nagaland Agriculture

To converge all activities of agriculture and allied departments to achieve food security by the end of 2025.

The Vision: Nagaland Agriculture 2025- Food for All.

To attain the status of a State that is surplus in food production by the year 2025.





CHAPTER : 1

INTRODUCTION

Nagaland is the 16th State of the Indian Union. The State was formed with amalgamation of the erstwhile Naga Hills District of Assam and Tuensang Areas on 1st December 1963. The total geographical area of the State is 16,579 Sq. Kms. and lies between 25° 60' and 27° 40' North Latitude and 93° 20' and 95° 15' East Longitude. Altitude ranges from 111m to 3840m MSL. The State shares boundaries with parts of Assam and Arunachal Pradesh in the north, Arunachal Pradesh and Myanmar in the east, Manipur in the south and Assam in the west.

Nagaland, situated in the north-east of India comprises of 11 districts namely Dimapur, Kohima, Mokokchung, Wokha, Tuensang, Zunheboto, Mon, Phek, Kiphire, Longleng & Peren. Although it is one of the less developed States, Nagaland has achieved extraordinary changes, especially in governance and development out-reaches, which have taken place with remarkable rapidity. Nagaland is ranked 11th among the States as per the human development index (1991). The State can legitimately aspire to emerge as a front runner among the States in the near future, if its natural wealth, such as land, water, forests, environment, oil, minerals are sustainably exploited and marketed.

By 2025, it is possible to see a developed Nagaland—with the population under control, the economy growing at accelerated pace through growth of agriculture and allied sector, infrastructure such as transport, communication and power improved to modern levels.

Some Basic Information :

Area	16,579 Sq. Km
Population	1980602 (2011 census)
Density of population	119/ Sq. Km
Net sown area	2,99,480 ha.
Gross crop area	3,84,180 ha.
Net area irrigated	83,500 ha.
Cropping intensity	129 %

DISTRICT WISE POPULATION OF NAGALAND AS PER 2011 CENSUS.

District	Total population	Male	Female
Mon	250671	132062	118609
Mokokchung	193171	100229	92942
Zunheboto	141014	71169	69845
Wokha	166239	84429	81810
Dimapur	379769	198163	181606
Phek	163294	83684	79610
Tuensang	196801	101977	94824
Longleng	50593	26588	24005
Kiphire	74033	37758	36275
Kohima	270063	140118	129945
Peren	94954	49530	45424
Total	1980602	1025707	954895

PROJECTED POPULATION AND REQUIREMENT OF FOOD FOR NAGALAND UP TO 2025

Item	Population (as per 2011 census and Projected population)			
	2011	2015	2020	2025
Projected population	1980602	2186214	2473500	2798539
Cereals (MT)	361460	398984	451414	510733
Pulses (MT)	28917	31919	36113	40859
Oil (Kilolits)	21688	239v39	27085	30644
Vegetables	144584	159594	180566	204293
Fruits (MT)	72292	79797	90283	102147
Meat (MT)	83136	91766	103825	117469
Milk (Kilolits)	36146	39898	45141	51073
Egg (Lakh in No.)	2060	2274	2572	2910

Population growth assumed @ 2.5% per annum

PHYSICAL FEATURES:

Climate and rainfall – The climate of Nagaland varies from sub-tropical to temperate with heavy monsoon activity. The annual rainfall varies from 1500-2500 mm prevailing seven months from April to October. The temperature varies from 4° C in winter to 35° C during summer.

Agro climatic zone – The State falls under Mid Tropical Hill Zone category. The three distinct geographical regions are: (i) High Hill areas with lateritic soil and non laterised red soils. (ii) Lower hill ranges of brown forest soils and podzolic soil and (iii) Foothills and valleys with recent alluvial, old alluvial and mountain soils.

Soil– The systematic survey and classification of soils in Nagaland has revealed that the soil in the State is suitable for extensive crop cultivation. The following are the four orders of soil in Nagaland that constitute the 16.6 million hectares of geographical land of the State:

Inceptisols- The most important type of soil that covers about 66 percent of the land area of Nagaland are the Inceptisols. The soil textures consists of fine clay, clay loamy and the fine loamy clay. These soil types are predominant near the river beds.

Entisols- Entisols cover 7.3 percent of the land area and is found mainly in the north and the north-eastern parts of the State of Nagaland. This nascent category of soil comprises of the fine loamy and the fine categories of soil textures.

Alfisols- The light colored and mineral rich, Alfisols cover a meagre 2.9 percent of the land area of the State of Nagaland. The fine loamy and fine drained class of soil texture occur in the western extremity of the State near its border with Assam. Soils of Nagaland are derived from shale and sand stone of Uni ocean age. Due to variation of topography and climate a great variation of soil types are found in Nagaland. The soil is acidic in nature and pH ranges from 4.5 to 6.5. The soil is rich in organic carbon but poor in phosphate and potash content.

Ultisols- About 23.8 percent of the land area of Nagaland is enveloped by the Ultisols. The soil is characterized by its low base saturation feature. This soil type is found in different regions of the State and is prevalent mostly in the forested regions of the State which receive a high amount of rainfall. The texture of the soil is clay.



Transportation and communication

The railway network in the State runs a minimal broad gauge line of 7.98 miles (12.84 kms). National Highway roads cover 227.0 miles (365.3 km), and State roads 680.1 miles (1,094.5 km). There is one airport in Dimapur with the second being proposed at Kohima, the State capital. Helicopter service operates out of Dimapur to a few district headquarters.

Railways:

Railway	North East Frontier Railway
Broad gauge	7.98 miles (12.84 km)
Total	7.98 miles (12.84 km)

[Data Source: N. F. Railway, CME Office, Guwahati-781011]

National Highways linked to towns:

National Highways	227.0 miles (365.3 km)
NH 61	Kohima - Tseminyu - Wokha - Mokokchung - Changtongya - Tuli
NH 39	Dimapur - Kohima - Mao - Imphal (134.2 miles/216.0 km)
NH 36	Dimapur - Doboka - Nagoan (105.6 miles/169.9 km)
NH 150	Kohima - Chakhabama - Pfutsero - Jessami (74.6 miles/120.1 km)
NH 155	Mokokchung - Tuesang - Kiphire - Jessami (206.9 miles/333.0 km)

State Highways:

680.1 miles (1,094.5 km)

Chakhabama - Mokokchung Via Chozuba and Zunheboto
Kohima - Meluri via Chakabama
Mokokchung - Mariani
Mokokchung - Tuensang
Namtola - Mon
Tuensang - Mon - Naginimora
Tuensang - Kiphire - Meluri
Wokha - Merapani Road

[Source: Office of the Chief Engineer, P.W.D., Kohima, Nagaland]



Dance troupe

Demography:

The State is predominantly of tribal population comprising 16 different tribes besides other communities hailing from the rest of the country. The major tribes being, Angami, Ao, Chakhesang, Chang, Khiamniungan, Konyak, Lotha, Phom, Pochury, Rengma, Sangtam, Sumi, Yimchungr, and Zeliang. As per the 2011 census, Nagaland has a population of 19,80,602, with a density of 119 persons per sq. km. There are 11 districts and 1278 villages. The State has a high literacy rate of 80.1% and is placed 15th position in the national index. Female literacy of the State is 76.7% with male literacy at 83.3%. More than 80% percent of the people live in rural areas. The Angami, Ao, Konyak and Sumi are the larger Naga tribes. Collectively the Naga tribes speak 60 different dialects belonging to the Sino-Tibetan family of languages. Each tribe has its own dialect and within the same tribe multiple dialects. Nagamese, a variant patois drawn from Assamese and Hindi is the language of communication between the multiple tribes. However, English is the official language of the State.



Dimapur railway station



Working the land





Terrace Rice Cultivation

CHAPTER : 2

STATUS OF AGRICULTURE & ALLIED SECTORS IN NAGALAND

AGRICULTURE SECTOR

The major crops grown in the State are rice, corn, millet, pulses, oilseeds, sugarcane, potatoes and fibres. Rice is the major crop and also the staple diet of the people. Besides rice, farmers grow maize and millet as cereal crops. Oil seeds like rapeseed and mustard are grown in wide areas in addition to soybean in certain areas. The important vegetables are cole crops such as cabbage, cauliflower, knolkhol; cucurbitaceous crops such as pumpkins, sweet gourd, ridge gourd, cucumber, squash, spinach leaf, carrot, tomatoes, brinjal, potatoes and yam. Indigenous vegetables in particular, tree tomato having high commercial value in the local market may be exploited for export. The major fruits are banana, pineapple, citrus, plum, pear, passion fruit and guava. Kiwi, strawberry and cashew nut are a few promising fruit crops in Nagaland. Tea and coffee are grown as plantation crops in the State. Ginger, turmeric, large cardamom, garlic, chillies are the main spices grown in the State.

More than 80% of the gross cropped area is under rice cultivation. A sizeable population of the State grows oil seeds which includes rapeseed and mustard.

BASIC DATA OF AGRICULTURE

Sl. No.	Crop	Area	Productivity (MT /ha)	Production (MT)
1	Paddy, Maize etc.	224779	1.40	314691
2	Pulses	23662	1.00	23662
3	Oilseed	48222	0.83	40024

PROJECTED REQUIREMENT OF FOOD CROPS IN NAGALAND

Item	Population (as per 2011 census and Projected population)			
	2011	2015	2020	2025
Projected population	1980602	2186214	2473500	2798539
Cereals (MT)	361460	398984	451414	510733
Pulses (MT)	28917	31919	36113	40859
Oil (Kilo ltr)	21688	23939	27085	30644

N.B. Calculating on the basis of cereal 500 gms, pulse 40gms, and oil 30ml per day per head

JHUM IMPROVEMENT

The two methods of cultivation practiced by the Naga tribes are Jhum or shifting cultivation and terrace cultivation. The current area (2010-2011) under Jhum cultivation is about 93,000 hectares while terraced cultivation is about 83,500 hectares. Jhuming has its obvious disadvantages as large tracts of land are required for cultivation. The shifting cultivation is a traditional agricultural practice with high incidences of soil erosion and loss of fertility, due to the reduction of periodicity in the Jhum cycle. In the past, Jhum was not so detrimental because the long periodicity of the cycle allowed the soil to regain its lost fertility. But now with the increased population pressure the Jhum cycle has been reduced to 5-9 years, as a result soil is becoming unproductive. Therefore, proper planning and management of Jhum

cultivation is urgently required, while a gradual shift towards settled cultivation is the need of the hour to feed the ever growing population. It is not possible to eradicate Jhum cultivation because of its links to socio-customary agrarian practices by the people in the State. However, a more eco-friendly method is that of preparing terraced fields for cultivation. Shifting cultivation in the history of human civilization is regarded as the first step in transition from food gathering and hunting to food production. The system is known by several names such as 'Podu' and 'Jhuming' in India, 'Kalingn' in Philippines, 'Chena' in Sri Lanka, 'Lua' in Vietnam, 'Milpa' in Mexico, 'Conway', 'Troza', 'Monte' and 'Cadong' in Indonesia. This slash and burn method of agriculture

continues to be practiced in India (North-Eastern Hill Region, Andhra Pradesh, Bihar, Madhya Pradesh and Orissa), Amazon basin, South America, highland areas of Manchuria, Korea and South-West China, Philippines, Malaysia, Burma and Sri Lanka. At present, nearly 30% of the world's exploitable soils

are under shifting cultivation and responsible for meeting the food requirement of about 8 % of the world's population. In India, about two million people cultivate nearly 11 m ha. of land under this practice with the majority located in the North-Eastern hill regions.



Terrace Rice Cultivation



Jhum Cultivation

FEATURES OF SHIFTING CULTIVATION

The main features of shifting cultivation are the following:

- Selection of site on the hill slope
- Allocation of the plot to each family
- Clearing of the site
- Burning of the cut vegetation
- Preparation of the land for sowing
- Sowing of a mixed crop
- Continuous inter culture
- Guarding the crops
- Harvesting
- Poor yield

- Excessive soil erosion
- No use of power
- No modern inputs are used
- Rotation of fields
- Poor regeneration
- Destruction of valuable flora and fauna
- Use of simple implements
- Non development of draught animals
- Dehumanising labour
- Wastefully labour Intensive
- Create ecological Imbalance

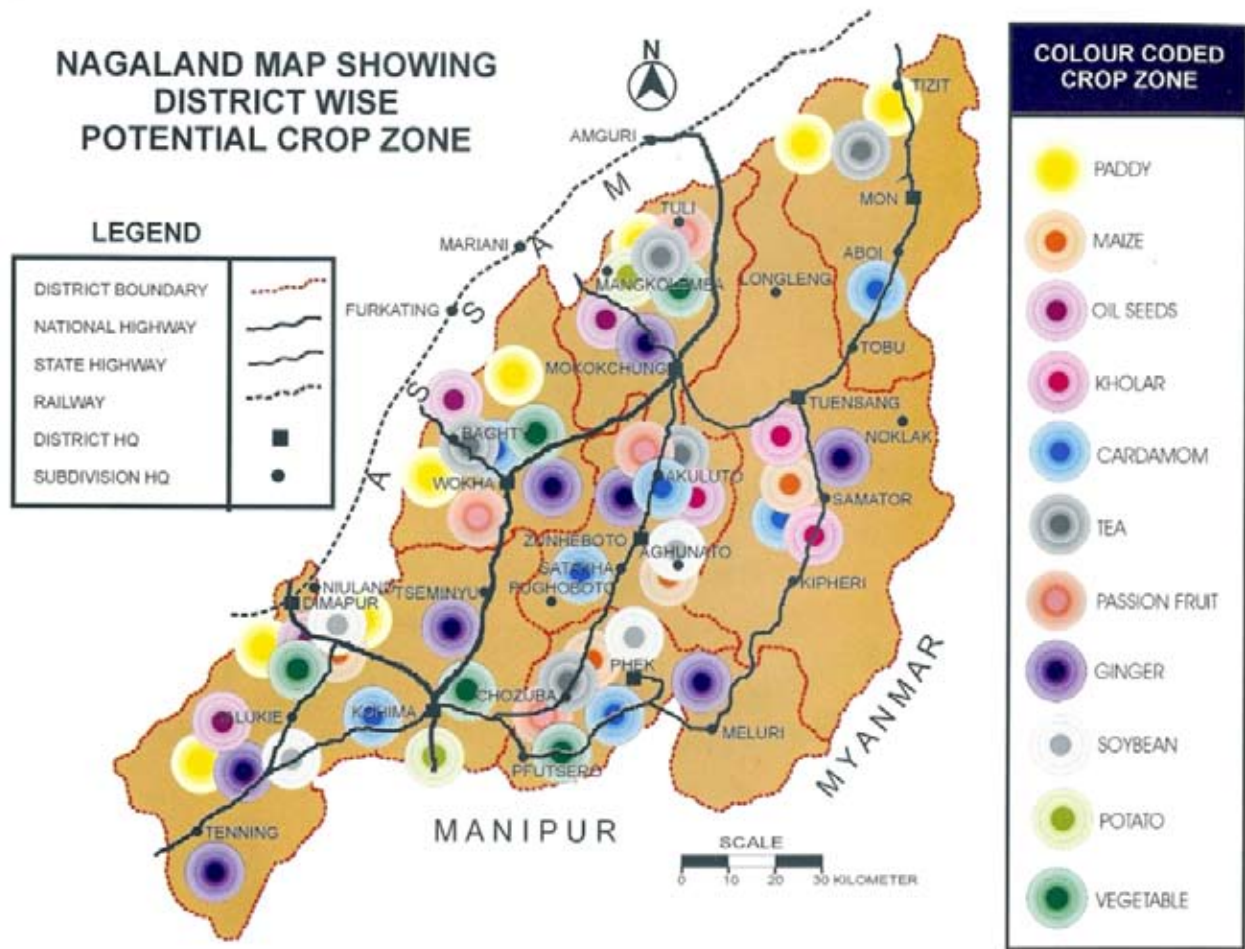


Perspectives for Alternatives of Jhum Cultivation

Looking at other alternatives for shifting cultivation, it is important to take into consideration the nature in particular, the topography of the Jhum field. Jhum is generally situated on hill slopes and therefore vulnerable to soil erosion rendering the land unstable. Soil being the storehouse of moisture and the plant nutrients, it is very essential to preserve it at any cost in order to have a stable agriculture. By preserving the moisture and the nutrients we can ensure the crop growth and a stable income. The following are the important areas where we must give attention before we actually adopt any alternatives to shifting cultivation:

- Permanent farm land
- Permanent soil conservation
- Water conservation
- Permanent structuring of the land
- Establishment of perennial crops
- Multiple cropping
- Crop rotations
- Mulching and organic matter recycling

CROP ZONE MAP



Use of Agrochemicals

There is minimum use of agro-chemicals in crop production, which in turn is beneficial for organic farming. Organically produced fruits, vegetables & cereal crops are in great demand in the international and domestic markets. Organic cultivation which is followed by the farmers of the State as traditional practice needs to be improved upon in a scientific manner for commercialization.

SEED REPLACEMENT

Use of poor quality seeds results in requirement of almost twice the normal quantity of seed per unit area in order to maintain the optimum plant population. If the germination percentage of the seed is improved, it will reduce the requirement of seeds.

Seed replacement ratio is progressing in a slow pace because of non availability of quality seed. At present there are 3 seed farms for seed production in Nagaland. These are:

1. **State Seed Farm Merapani:** The farm has an area of 534 ha. and is engaged in production of improved varieties of seeds for paddy, other cereals, pulses oilseeds and spices.
2. **Seed Farm Tizit:** The farm with an area of 70 ha. is presently producing improved varieties of paddy seeds. Besides paddy, the farm is also producing mustard, linseed, gram seeds
3. **Regional Potato Seed Farm Helipong:** The farm has a total area of 180 ha. and presently producing disease and virus free potato seed.

At present, all these farms are contributing only a little quantity of quality seeds to the farming community. But with the development of infrastructure and proper management practices, these farms would be in the position to produce better quality seeds. The State government must further establish such seed farms for quality seed production and as multiplication units.

FERTILIZERS AND MANURES

Fertilizers are the inorganic source of supplying essential plant nutrients, mostly N, P and K, which are removed by crop plants in large quantities. It is not possible for most of the soils to supply the required amount of plant nutrients, which is why chemical fertilizers are supplemented. Such heavy removal of plant nutrients from soil leads to depletion of soil fertility, which shows up in decline of crop yield and lowered productivity. Thus, chemical fertilizers has been and will continue to be the catalytic input for Nagaland in achieving self sufficiency in food grain production.

Source of plant nutrients may be organic such as FYM, green manuring, compost and vermicompost, which are low in essential micro nutrient content required in bulk to meet the requirement. But on the other hand they improve the soil micro environment. Inorganic fertilizer (chemical fertilizer) which is easily available to the crop can compensate the loss of nutrients easily.



Vermicompost unit

PLANT PROTECTION

In recent years, due to climate change, it has been observed that there is a huge upsurge of pest (insect, rodent, and plant diseases) population which has caused extensive loss to the crop yield for example, up to the tune of 50 percent during 2010 (*Nagaland Revised Annual Plan*). In order to overcome such situations, it is of utmost need to use plant protection measures with judicious use of agro chemicals. Use of pesticides in the state of Nagaland is less compared to neighboring States. But more thrust for yield maximization will definitely invite more pest problems and hence, farmers are to be encouraged to continue indigenous pest control methods with bio-organic pesticides and go for Integrated Pest Management.

Farm Machinery

Agricultural operation in the State continues to be labour intensive. Use of farm machinery, equipment and implements are still limited to a few progressive farmers because of low purchasing power resources of the poor farmer. Mechanization is also difficult due to the hilly terrain. But without farm mechanization it is not possible to go for intensive agriculture. Farm mechanization aims at achieving timely farm operation, efficient use of

inputs, improvement in quality of produce and safety, comfort of farmers and reduces loss of production.

Cold storage

Cold Storage is a special kind of requirement to preserve the perishable commodities of food items for a longer period with retention of the original colour, flavour and taste. However, each commodity or item has a

certain life and cannot be stored even in a cold storage for an indefinite period of time. Hence, cold storages are used for high value items or when prices crash due to bumper crop, or for such items which are grown during one season but with demand around the year or for products like meat, fish and dairy products which are perishable items. The state of Nagaland has enormous potential for producing off season fruits and vegetables like, tomato, cabbage, cauliflower, which are having high demand and prices in

the warmer districts of the State and also in the adjoining States. But due to lack of proper storage and post harvest handling, there is a loss estimated up to the tune of 40 percent. The government has now decided to construct a few cold storages in the major production and market centres for safe storage of perishable commodities. During the entire period up to 2025, the Department of Agriculture is to construct a network of cold storages covering all districts.

RISK MANAGEMENT STRATEGY

Crop Insurance

Appropriate strategies are required for agricultural risk mitigation and management, particularly, in view of increased capitalization of farming and enhanced perceived risk due to climate change.

The National Agricultural Insurance Scheme (NAIS) was introduced in the country from the rabi season of 1999-2000. Agricultural Insurance Company of India Ltd (AIC), which was incorporated in December 2002, started operating from April 2003, took over the implementation of NAIS. The benefits of the modified NAIS scheme is available to both loanee and non-loanee farmers. It covers all food grains, oilseeds and annual horticultural /commercial crops for which, past yield data are to be made available for an adequate number of years. Among the annual commercial and horticultural crops, sugarcane, potato, cotton, ginger, onion, turmeric, chillies, coriander, cumin, jute, tapioca, banana and pineapple, are covered under the scheme. The scheme is on the basis of both ‘area approach’ for widespread calamities, and ‘individual approach’ for localized calamities such as hailstorm, landslide, cyclone, flood and wild fire. The State of Nagaland is yet to take advantage of the Crop Insurance Scheme, so for effective risk management the Government is to introduce the said scheme in the State for the benefit of the farmers.

Disaster management programme

In order to overcome the loss of crop due to natural disasters such as drought, land slide and heavy rainfall, wild fires, or to protect the crop from attack of pests like rodent and insect pests which may cause significant loss of crop yield, the Department of Agriculture is planning to keep aside a buffer fund to meet such disaster.



RESEARCH AND DEVELOPMENT

Agricultural science is developing day by day and farming systems are rapidly modifying to produce maximum with limited land resources. In other words, the production of crop is increasing vertically. Agriculture in the State is also undergoing rapid transformation and hence, speedy development of agricultural sector is essential for a State like Nagaland, dependent on agrarian economy. The State Agricultural Research Station, Yisemyong, Mokokchung, was established with the intention to evolve the best practices which are within the reach of farmers of the State. The SARS is working closely in number of collaborated research works with agencies like NEPED Research, TPS with International Potato Centre, ICRISAT, ICAR, AICRIP, Spice Board of India and ICRAF.

The State government is to provide more funds for research during the years to come for extensive and intensive research, to bring further improvement in sectors like Agriculture, Animal Husbandry, Fishery and Dairy. A special requirement in agriculture is the development of high altitude rain fed varieties, suitable for Jhum cultivation in areas where settled cultivation is not feasible.

The Department of Agriculture, Government of Nagaland, proposes to establish three numbers of tissue culture laboratories.

IRRIGATION SCHEMES IN NAGALAND

There is no major irrigation project so far constructed in the State. The irrigation works are mostly meant to divert small hill streamlets to irrigate valleys used for rice cultivation. The total area under irrigation covers 83,500 hectares. The Department of Irrigation & Flood Control’s main activity is the Minor Irrigation, which is being implemented through AIBP (Accelerated Irrigation Benefit Programme) under the flagship of Bharat Nirman Programme. AIBP has been implemented in the State from 1999-2000 onwards and since its inception; the Department has implemented a total of 1133 nos. of Minor Irrigation Schemes throughout the State, creating irrigation potential in more than 45,000 ha. of agricultural land. During 2010-2011, the Department has identified 177 numbers of New Minor Irrigation Projects with irrigation potential of nearly 8000 ha. covering the entire State of Nagaland.

Construction of 256 number of surface flow irrigation schemes at different villages under all the districts of Nagaland, which were destroyed due to landslide and storm and other natural calamities has been proposed. The proposed construction envisages to pond up the rivers/

natural streams by providing Head Works/weir spillway and taking water to the command area through regulators and distributing water through canal system. On completion of the schemes, irrigation potential of 7598.90 ha. will be restored.

Agriculture Marketing

Nagaland produces a number of crops including several fruits, vegetables, and pulses. Agriculture is a major source of income for rural masses constituting 71% of the State’s population. It is a major contributor to the State’s economy. However, there has been an ever increasing trend in cost of production of all crops but stagnation in prices for farm produce. There is a high level of post harvest losses and an uncertainty of market price due to market glut. These factors have reduced the farm income to a great extent. In these circumstances, the farmers of Nagaland, like the rest of the country, have very few options but to improve their post harvest management practices so that, the present high levels of post harvest losses of 25-30 percent could be brought down to a reasonable level of 5 percent. And secondly, they have to add value through processing to their farm produce for better remunerative prices. These steps can lead to better returns with increased market demand for agricultural produce and better chances of marketing. The State Government has identified post harvest management, food and agro processing, agri-business and agriculture marketing, specialized storage, as some of the thrust areas in the coming years. Agricultural Produce Marketing Committees (APMC) can play a vital role in marketing of agricultural produces.

NAGALAND AGRICULTURE CORRIDOR

It is proposed to construct 40 (forty) numbers of agriculture corridors connecting different villages under the districts of Nagaland, for the benefit of the rural cultivators to transport agricultural products from the field to market place. On completion of this scheme, farmers will be able to sell their products to the markets directly without depending on the middleman. Moreover, these roads will also help in rural communication and carriages to the local communities.

HORTICULTURE SECTOR

At present, horticulture has been a backyard activity for most farmers as they are generally busy throughout the year in cultivation of field crops, with little time for development of horticultural crops on a commercial basis. Because of the long period required from planting to harvesting of fruit crops, its cultivation has been generally confined to small backyard gardens developed by almost every household. It is only in the past decade, that there has been a more focused attention to the development of horticulture in the State.



The horticulture sector plays an important role in the development of the rural economy of the State. Endowed with diverse agro climatic conditions, varied soil types and abundant rainfall prevailing in the State, these ideal conditions enables the cultivation of several horticultural crops covering fruits, vegetables, spices, flowers, medicinal and aromatic plants. The geographical conditions offer tremendous scope for horticulture development in the State.

The total area covered by horticulture is estimated at around 60,000 ha. (2010-11) which represents 9.95% of the gross cropped area (3.04 lakh ha). The State has about 58370 ha. under cultivable wasteland, 157210 ha. under permanent fallow out of which, about 29,000 ha could be developed under horticultural crops. In addition to this, with proper exploitation of potential surface water resources, about 10 percent of the additional area brought under irrigation could be devoted to high value horticultural crops, vegetables, floriculture, medicinal and aromatic plants. Based on the elevation, sub-tropical fruits such as pineapple, banana, citrus, guava, passion fruit, papaya and temperate fruits such as plum, peach, pear, various nuts, kiwi, strawberry and apple have potential for exploitation. Important vegetable crops grown are potato, cassava, colocasia, cabbage, cauliflower, peas and cucumber while onion, garlic, ginger, chillies, cardamom, black pepper make up the major spice crops. Amongst the plantation crops, areca nut, coconut, tea and rubber offer the best potential for cultivation on a commercial scale. Among the fruit crops, pineapple, mandarin orange and passion fruit are already produced on a commercial scale. Based on climatic suitability, topography and market potential, the Horticulture Department has identified the crops in Nagaland for commercial development as shown in the following table:

BASIC DATA OF HORTICULTURAL CROPS

Sl. No.	Crop	Area(Ha)	Productivity(MT/Ha)	Production(MT)
1	Vegetables	19603	3.50	68611
2	Fruits	29565	3.50	103478
3	Others	1556	1.20	1867

SOME IMPORTANT FRUITS, VEGETABLES, FLOWER, SPICES, MEDICINAL AND AROMATIC CROPS AND PLANTATION CROPS

Sl. No.	Type of Crop	Potential crops
1	Fruits	Banana, Pineapple, Orange, Passion fruit,

2	Vegetables	Cole crops , Peas, Tomato, Brinjal, Colocasia, Cucurbita- ceous crops, Squash (chow-chow) and Potato
3	Flowers	Gladioli, roses, liliun, orchids and anthurium
4	Spices	Chilli, Onion, Garlic, Turmeric, Ginger, Cardamom, Black pepper.
5	Medicinal& aromatic	Patchouli, Neem, Agar and Ginseng
6	Plantation crops	Areca, Coconut & Cashew nut

Source: Dept of Horticulture, Nagaland.



Local market

PROJECTED POPULATION AND REQUIREMENT OF FRUITS AND VEGETABLES UP TO 2025 FOR NAGALAND

Item	Projected population and requirement of food.			
	2011	2015	2020	2025
Projected population	1980602	2186214	2473500	2798539
Vegetables (MT)	108438	119695	135424	153222
Fruits (MT)	72292	79797	90283	102147

Population growth rate assumed at 2.5% per annum on the basis of 2011 census data



Fruit crops

As per the latest available data (2010-11), the total area under fruit crops in the State was 30,000 ha with an annual production of 1,05,000 MT. These include both temperate and tropical fruit crops. The Horticulture Department has identified pineapple, orange, passion fruit and banana as the fruit crops for commercialization.

AREA PRODUCTION AND PRODUCTIVITY OF IMPORTANT FRUITS IN NAGALAND

Sl. No.	Name of crop	Area (Ha.)	Production (MT)	Productivity (MT/Ha)
1	Citrus	8565	33,180	4
2	Pineapple	8450	73,500	10
3	Banana	5625	37,800	7
4	Passion fruit	5575	6,300	2
5	Others	1365	1,365	1
Total		29580	1,52,145	-

Spice crops

Among the spices, ginger, garlic, black pepper, cardamom and chillies are the main crops for development. The growth of such crops are due to favourable agro-climatic conditions. Field surveys indicate that farmers are cultivating ginger and chillies on a large scale because of their commercial value and guaranteed markets.

Medicinal and Aromatic Plants

The State is a rich repository of bio-diversity. The peculiar climate of the region with gradations from humid alluvial valley through evergreen forests to the snow line produces an immense variety of flora and fauna. There are evergreen forests with dense floor cover of herbs and shrubs, many of which have medicinal or essential oil bearing properties. The State Government has identified a few medicinal and aromatic plants for commercial development. Citronella, patchouli, lemon grass, geranium, agar and ginseng are some of the plants identified for commercial cultivation.

COMMON MEDICINAL AND EDIBLE LOCAL HERBS OF NAGALAND

Sl. No.	Name of Plant	Distribution	Part used	Purpose
1	Wild Bhindi <i>Hibiscus ablesmoschus</i> L	Cold region	Seed	Extracted essential oil used in cosmetics and for stomach disorder
2	Sweet flag <i>Acorus calamus</i> L	Warm swampy areas	Dried rhizomes	Oil extract of rhizomes are used against cough, influenza and T.B etc.



3	Beal fruit <i>Aegle marmelos</i> L	Warm region of Nagaland	Ripe & unripe fruits, leaves , roots.	For various stomach ailments.
4	Amaranth <i>Amaranthus</i> sp.	Warm region of Nagaland	Whole plant	Stems are cooked and eaten.
5	Devils tongue <i>Amorphophallus bulbifera</i>	Cold region of Nagaland	Leaves and corm	Anti-helmentic
6	Wild asparagus <i>Asparagus racemosus</i> Wild	Cold region of Nagaland	Root	Used with milk as stimulant.
7	Blue bell barleria <i>Barleria cristata</i> L	Cold region of Nagaland	Whole plant	Tonic, diuretic and blood purifier.
8	Birds eye chilli <i>Capsicum</i> sp.	Warm region of Nagaland	Fruits	Sore throat, cough, cold and as spices.
9	Bush yellow <i>Combredum albidum</i> G Don	Warm region of Nagaland	Leaves and barks	Plant extracts is considered as having antibacterial and anti cancer property.
10	Spike ginger lily <i>Hedychium spicatum</i> Buch.-Ham	Cold region of Nagaland	Rhizome	Liver disorder, body ache, carminative, expectorant and tonic.

ANIMAL HUSBANDRY AND DAIRY SECTOR

The climate and topography of the state is suitable for animal husbandry and hence the sector has tremendous potential in development of the state’s economy, as well as for generating employment in the rural sector. This will reverse the recent trend of rural migration to urban areas.

Livestock and poultry farming is the integral part of the livelihood of the Naga people. Since time immemorial, the people have reared animals for food, engage for barter trade and as a



Animal trophies of merit on display



Local Butchers



symbol of prosperity and merit. Animal husbandry is playing a pivotal role in supplementing the dietary requirement of protein as well as additional income to the family. Moreover, the excreta and other organic wastes fulfil the requirement of manures for cultivation of staple food and other agricultural crops. Animal power is as important as drought power in the State. But this branch of agricultural activity continues to be practiced in the traditional way and in the present day scenario, it is not possible to meet the requirement of the growing population.

PROJECTED POPULATION AND REQUIREMENT OF ANIMAL HUSBANDRY PRODUCTS FOR NAGALAND UP TO 2025

Item	Projected population and requirement of food.			
	2011	2015	2020	2025
Projected population	1980602	2186214	2473500	2798539
Meat (MT)	57834	63837	72226	81717
Milk (Kilo ltrs)	36146	39898	45141	51073
Egg (Lakh in No.)	2060	2274	2572	2910

Population growth @ 2.5% per annum

Meat is the most popular food of the State besides rice. The requirement of meat is very high in the State. Present production of meat, milk and egg cannot meet the rising demand of the State so about 45 percent of the total requirement has to be imported from outside the State.

Stall fed goat rearing



Open grazing goat rearing



The major advantage of the State is its varying climatic zones that allow rearing of animals in tropical to temperate regions. The topography of the State is also suitable for rearing of animals like pig, goat, mithun, sheep, and cattle, different types of small animals such as rabbit, dog, and birds of traditional species and exotic breeds. An added advantage is the non-existent caste barrier and similar food habits of the people. This plays an important role in flourishing the animal husbandry sector in the State. An encouraging trend of growth in this sector is reflected in the livestock census report.

TREND OF ANIMAL HUSBANDRY IN NAGALAND

Sl. No.	Type of animal	14th L.C 1987	15th L.C 1992	16th L.C 1997	17th L.C 2003	18th L.C 2007	Growth %
1	Cattle	202977	330661	383308	451017	469818	4.17
2	Buffalo	15248	34397	36131	33757	33920	0.48
3	Mithun	12796	25988	33345	40452	33355	-17.54
4	Sheep	815	3027	2339	4187	3649	-12.85
5	Goat	72148	148724	160761	174929	178072	1.80
6	Dog	61917	102893	90986	141373	161617	14.32
7	Rabbit	-	-	20207	38408	41922	9.15
8	Pig	314027	526201	571176	644214	697790	8.32
9	Horse & Pony	270	6458	1133	893	799	-10.53
10	Duck	11378	192168	80467	116586	120131	3.05
11	Poultry Birds	1061812	1973061	2363058	2672554	3282196	22.81
	Total	1753424	3343578	3842911	431860	5023269	23.17

Livestock census (LC)

PRESENT STATUS OF PRODUCTION IN ANIMAL HUSBANDRY SECTOR

As per sample Survey Report 2010-2011, the total production of livestock sector is 59% of the domestic requirement with a shortfall of 41%. In monetary terms the total requirement worth translates to ₹ 928.32 crores leaving the shortfall amounting to ₹ 221.67 in monetary term.



Local poultry market



Abattoir in Dimapur

REQUIREMENT AND AVAILABILITY OF MEAT, MILK, AND EGG IN NAGALAND (2010-11)

Item	Requirement in '000 Tons	Availability in '000 Tons	Monetary value (₹ Crore)	Shortfall	Total import	Monetary value of Import (₹ Crore)
Meat ('000 MT)	101.21	65.67	748.64	35.54	19.05	153.16
Milk ('000 Kltrs)	154.71	77.84	155.68	76.87	3.35	64.99
Eggs in Lakh No.	3614.77	800.00	24.00	2714.77	141.00	3.52
TOTAL	1571.65	943.51	928.32	505.23	163.40	221.67

The Department is focused in its attention to increase the meat production with development in Piggery and Poultry sector, and enhancement in milk yield by improving the local strains through artificial insemination with high milk yielding breed.

Out of the total deficit i.e. 35.54 MT of meat, the State had imported 19.05 MT during 2010-11 however, the district wise import cannot be ascertain because the import are monitored only from the Inter-State Check Post. There is no inter-district check post except Chumukedima in the State.

To meet the deficit, it is estimated that the State had imported 3.35 MT of powder milk during 2010-11.

The level of production of Animal Husbandry products has shown a steady growing trend since the 10th Five Year Plan. The internal production and import cost with per capita availability of Meat, Milk, Egg, is shown in the tables below.

TABLE (A) - INTERNAL PRODUCTION AND IMPORT COST OF MEAT

Sl. No.	Year	Import cost (₹ Crores)	Internal product (₹ Crores)
1	2001-02 (base level)	375.00	230.52
2	2002-03	365.00	240.00
3	2003-04	360.00	245.00
4	2004-05	334.00	271.00
5	2005-06	227.00	315.00
6	2006-07	222.00	384.00
7	2007-08	220.00	562.68
8	2008-09	220.04	615.17
9	2009-10	221.97	637.71
10	2010-11	221.67	928.32

TABLE (B) - PRODUCTION OF MEAT, MILK AND EGG

Sl. No.	Items	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
1	Milk (Kltrs)	50.00	54.00	58.00	61.00	62.30	64.60	67.00	70.00	74.67	77.80	77.84	129.00
2	Meat ('000 MT)	25.50	28.00	34.25	48.00	51.00	53.00	54.00	55.21	63.26	65.58	65.67	101.00
3	Eggs (Lakh in No.)	540	544	685	691	740	782	800	802	832	833	800	1000

TABLE (C) - PER CAPITA AVAILABILITY OF MEAT, MILK AND EGG

Sl. No.	Items	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
1	Milk Per head	77 Kg/ annum	78 Kg/ annum	80 Kg/ annum	85 Kg/ annum	93 Kg/ annum	101 gms / day	107 gms / day	110 gms / day	112 gms / day	166 gms / day	167 gms / day
2	Meat Per head	14 Kg/ annum	16 Kg/ annum	17 Kg/ annum	24 Kg/ annum	28 Kg/ annum	60 gms / day	65 gms / day	76gms / day	80gms / day	116 gms / day	117 gms / day
3	Eggs No. Per head	28	29	30	35	37	43	46	48	35	46	47



FISHERY SECTOR

Nagaland is endowed with rich and unique natural water bodies and resources which provides immense potential for aquaculture development. In spite of the available resources, aquaculture so far has not made much impact in the State. The meagre production of the State is still far from self-sufficiency. This can be attributed to a number of constraints such as land locked hilly terrain, insufficient funds, lack of professional support and non-availability of critical inputs.

But of late, there have been some remarkable changes in the State’s aquaculture scenario, especially during the last plan periods with local farmers coming forward to take up aquaculture practices. In spite of the constraints, the Department of Fisheries is making serious efforts to assist, guide and educate the people about the importance of aquaculture development and sustainable fisheries.

Certain villages/communities in Nagaland are taking stringent measures to conserve their river/stream systems in accordance to their customary laws. Today we find many rivers/streams being protected under this law. The numbers of fish farmers are increasing year after year and production has increased considerably. The above given account goes to prove that in spite of major hurdles and constraints, the Department has been able to make sufficient progress in achieving its aims and objectives. It has also induced the rural mass to take up fish culture practices by whatever technical assistance and guidance the Department could provide with limited

funds. In this regard, the Department is credited with the initiative and pride of ushering in a revolution in fish culture, by way of transfer in scientific technology through extension service by fishery personnel in the State.

The resources

The State is endowed with hill streams and rivers which abound in several interesting and endemic fish fauna. However, fishery resources of the State are meagre, comprising of about 30,000 hectares of lentic and 1600 kms. of lotic resources. Out of this, the utilisation percentage is remarkably low, being about 4.50% of lentic resource.



Government fish farm

The data presented below indicates the potential area available for development of fishery activities in the State.

Sl. No.	Type of Resources	Resource potential			Percentage of Area utilized till date	Total average productivity level (Kg/Ha/yr)
		Estimated potential total area (Ha)	Utilized area uptill 2010-11 (Ha)	Unuti-lized area (Ha)		
A	Inland Culture Fisheries					
	(a) Ponds/Tanks	30,000	2699	27,301	8.99%	1950
	(b) Integrated Fish culture	82,500	2835	79,665	3.44%	335-500
	Paddy-cum-Fish culture	-	-	-	-	-
	Livestock-cum-Fish culture					
B	Inland Capture Fisheries					
	(a) Lakes and Reservoirs	2500	2300	-	92%	158
	(b) Rivers/ Streams Fisheries	1600 kms	-	-	-	-
	(c) Marshy/ Swamps Fisheries etc.	1500	918	582	61%	-

YEAR WISE PROJECTED FISH PRODUCTION AND PER CAPITA CONSUMPTION

Sl. No.	Year-wise	Projected Target			
		Fish Production (Anticipated)		Population (Anticipated)	Per Capita Consumption (Anticipated)
		State Production	Fish Import		
1	2010-11 (Base Year)	6585	4000	19,80,602	5.34
2	2011-15	8542	3500	22,00,000	5.47
3	2016-20	15377	1500	25,00,000	6.75
4	2021-25	22653	-	28,00,000	8.09

N.B. Fish production in M.T., and per capita consumption in Kgs



Doyang fish



Catch from the Fish farm

State/ Centrally Sponsored Schemes

Besides the Fisheries Department of the State, the agencies undertaking aquaculture activities in the State are: Ministry of Agriculture (Govt. of India), North Eastern Council and Indian Council of Agricultural Research. In addition, agencies like National Bank for Agriculture and Rural Development (NABARD), National Co-operative Development Corporation (NCDC) have contributed to some extent in the process by providing funds. An account of achievement in the Central Sector/CSS is given below.

The Department of Fisheries is implementing the following Centrally Sponsored Scheme as detailed below:

Development of fresh water aquaculture through FFDA.

Under this scheme, assistance is provided to fish farmers through various incentives/facilities like new pond/ponds construction and renovations. In order to promote intensive aquaculture. There are 8 (eight) FFDA units in the State at present, which is sanctioned by the Govt. of India, one for each district.

1981-82	1 (one) regional unit at Dimapur.
1985-86	1 (one) unit for Mokokchung district
1988-89	1 (one) unit for Tuensang district.
1993-94	5 (five) units for Phek, Kohima, Zunheboto, Wokha and Mon districts.

The expenditure on developmental programme is shared on a 75:25 basis between Central and State Government.

Fisheries Extension and Training

This scheme is shared on 80:20 basis between Central and State Govt. on capital expenditure. Under the scheme, funds are provided for establishment of training centres, training of fisheries personnel, and production of video films, publication of manuals and conduct of meeting/workshop/seminar.

Awareness programme

Under this scheme, the Central Govt. has provided 80% of their share for construction of one museum-cum-laboratory amounting to Rs.18.83 lakh during 1999-2000 and 2000-01. The Department now has a well-equipped Laboratory cum Awareness Centre at Dimapur which houses exotic aquarium fish.

National Scheme of Welfare of Fishermen.

This was undertaken by the Department during 1999-2000 for construction of housing for the fishermen, community hall and ring wells. The expenditure is shared on a 50:50

basis between Central and State Govt. During 1999-2000 and 2000-2001 a sum of Rs.43.75 lakh was spent for construction of 40 houses, 2 community halls and 5 nos. of ring wells.

Strengthening of Infrastructure of Inland Fish Marketing

This is a 100% central grant scheme provided for construction of cold storage and purchase of insulated van. The scheme was sanctioned by the Government of India during 1988-89, 1989-90. The Government of India sanctioned a sum of Rs.43.00 lakhs and the cold storage has been set up. The scheme has discontinued from the 9th Plan.

Production and release of quality fish seed

The Department of Fishery, has given prime importance in production and release of quality fish seed for high yield, to maximize utilization of all water bodies available in the State for aquaculture and attaining self sufficiency in quality fish seeds.



Laboratory cum Awareness Centre



Government Fish farm





FORESTRY SECTOR

Nagaland is endowed with a rich bio-diversity of animals, insects, and plant species. There are many medicinal and aromatic plants with tremendous potentials for economic generation. Out of the total geographical area, 13764 Sq. Kms. is under forests and tree cover. The land ownership in the state is unique in nature in that, 88.3% of the forest is either owned by clans, community or individual owners.

The forest may be classified under 5 categories as per Champion and Seth’s classification 1968 - Tropical Semi Evergreen forest, Tropical Moist Deciduous forest, Sub tropical Broadleaved Hill forest, Sub-tropical Pine forest and Montane Wet Temperate forest. The evergreen forest with valuable timber and bamboo is most important for economic exploitation.

DISTRICT WISE FOREST COVER 2007 (AREA IN SQ. KM)

District	Geo-graphical area	Very Dense forest	Mode-rate dense forest	Open forest	Total	% of Geo-graphical area	Change	Scrub
Dimapur	758	0	126	275	401	52.90	7	0
Kohima	3283	285	921	1659	2865	87.27	50	0
Mokok-chung	1615	3	535	857	1395	86.38	-50	0
Mon	1786	33	501	760	1294	72.45	-32	1
Phek	2026	279	683	749	1711	84.45	49	0
Tuensang	4228	585	1193	1562	3340	79.00	-122	1
Wokha	1628	1	511	902	1414	86.86	-50	0
Zunheboto	1255	88	427	529	1044	83.19	-53	0
Total	16579	1274	4897	7293	13464	81.21	-201	2

Source: Forest Survey of India, Published in 2009

FOREST COVER CHANGE MATIX (AREA IN SQ. KM)

Type of forest	Area 2007 Data Dec 2006-Jan 2007	Area 2005 Data of Jan-Feb 2005	Net change
Very Dense Forest	1274	1280	-6
Moderate Dense Forest	4897	5072	-175
Open Forest	7293	7313	-20
Scrub	2	9	-7
Non Forest	3113	2905	-208

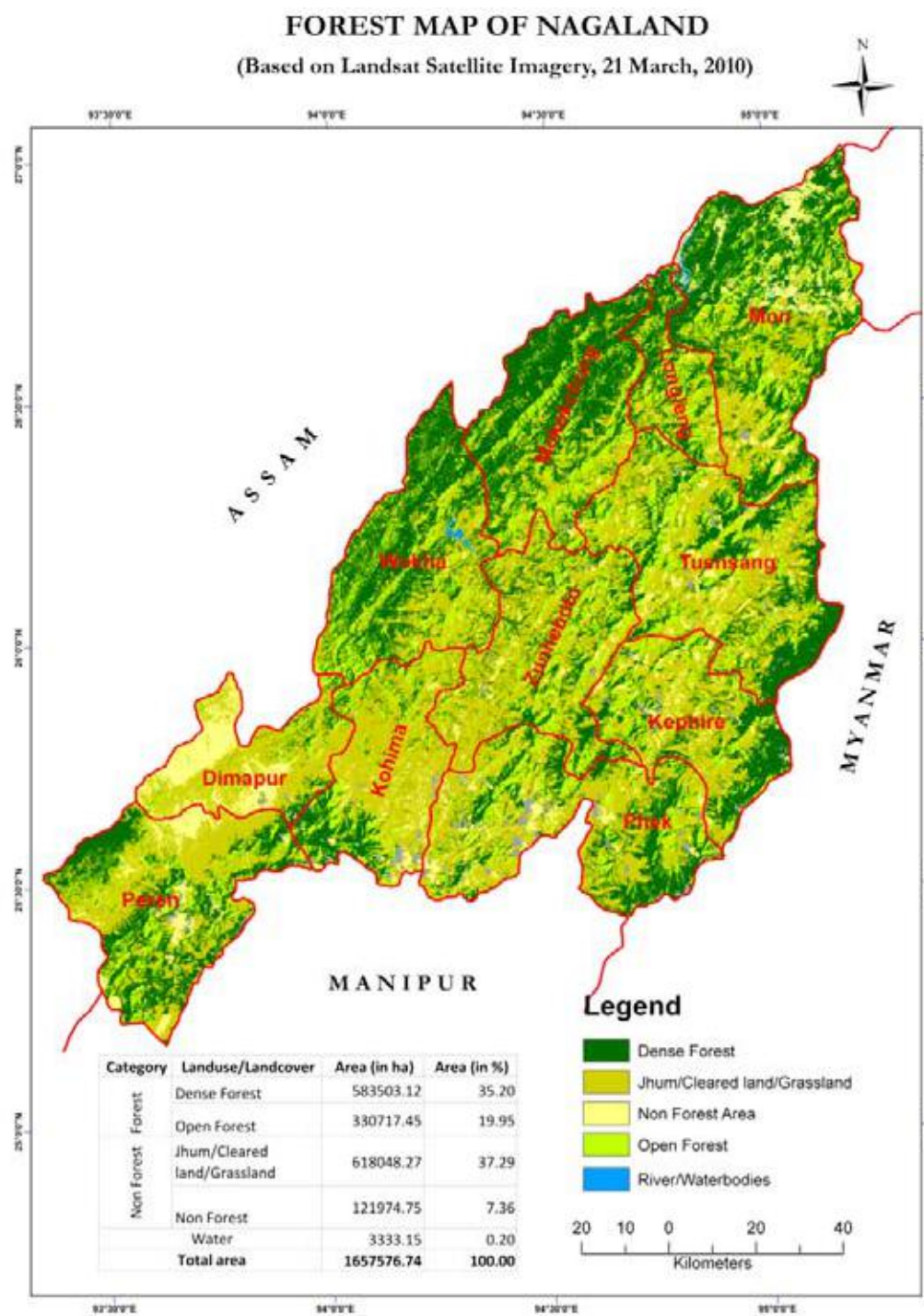
Source: Forest Survey of India.

ALTITUDE ZONE WISE FOREST COVER

Altitude	Very Dense forest	Moderate dense forest	Open forest	Total
0-500 M	0	1233	1930	3163
500-1000 M	22	1349	2648	4019
1000-2000 M	636	2052	2569	5257
2000-3000 M	611	250	141	1002
Above 3000 M	5	13	5	23
Total	1274	4897	7293	13464

Source: Forest Survey of India.





STATUS OF FOREST IN NAGALAND

Type of Forest	Area in Sq. Km	% of Total Forest	% of Geographical area
Government Owned Forest	1008.23	11.7%	6.00
Private owned Forest	7621.07	88.3%	46.00

Classification of forests

The details of various classes of forest types in the State during 2000-2001 are as under

FOREST AREA UNDER GOVERNMENT CONTROL (RESERVED FORESTS)

Kohima Division (Rangapahar)	6,226.00 ha.
Mon Division (Singphan)	2,357.00 ha.
Total	8,583.00 ha.

Wildlife Sanctuaries and National Parks

a) Intangki, Peren District	20,202.00 Ha
b) Puliebadze, Kohima District	923.00 Ha
c) Fakim, Kiphire District	642.00 Ha
d) Rangapahar, Dimapur District	470.00 Ha
Total	22,237.00 Ha

DISTRICT WISE PROTECTED FOREST

Peren District	
• Jaluki Protected Forest	414.40 Ha
Phek District	
• Shilloi	8,857.80 Ha
• Sangtam	8,402.00 Ha
• Athumza	1,472.00 Ha
• Chipoketmi	2,000.00 Ha
• Shilloi	8,857.80 Ha
• Sangtam	8,402.00 Ha
• Athumza	1,472.00 Ha
• Chipoketmi	2,000.00 Ha
Zunheboto District	
• Aotsakilime	62.16 Ha
• Lizutomi	146.00 Ha
• Xamunuboto	266.77 Ha
• Suruhoto	138.57 Ha
• Sapotami	32.00 Ha
Mokokchung District	
• Tzubi	134.68 Ha
• Minkong	275.32 Ha
• Longsa	18.00 Ha

Wokha District

• Wokha	323.75 Ha
• Aitepyong	233.10 Ha
• Yikhum	42.00 Ha

Tuensang District

• Chessore	160.58 Ha
• Saramati	362.60 Ha
• Konya	450.00 Ha

Purchased forest

Since the area under Government control in the State is very limited and quite inadequate for a mountainous State like Nagaland, the Department has purchased forest lands from private owners to take up plantations.

The total land purchased by the Department is 192.47 Sq. Kms. In order to increase district-wise area of land under forest cover and counter global warming, it is proposed to increase the forest areas in the deficit districts of Nagaland viz. Wokha, Zunheboto, Phek, Dimapur and Kohima. To minimize the impact of global warming, it is suggested to increase the purchased forest areas in the districts wherever found feasible, particularly in Dimapur, Wokha, Zunheboto and Phek. It has been observed that areas under purchased forest is less and these districts are highly vulnerable to the effects of global warming.

PURCHASED BY THE DEPARTMENT UP TO 2006-2007 IS INDICATED BELOW

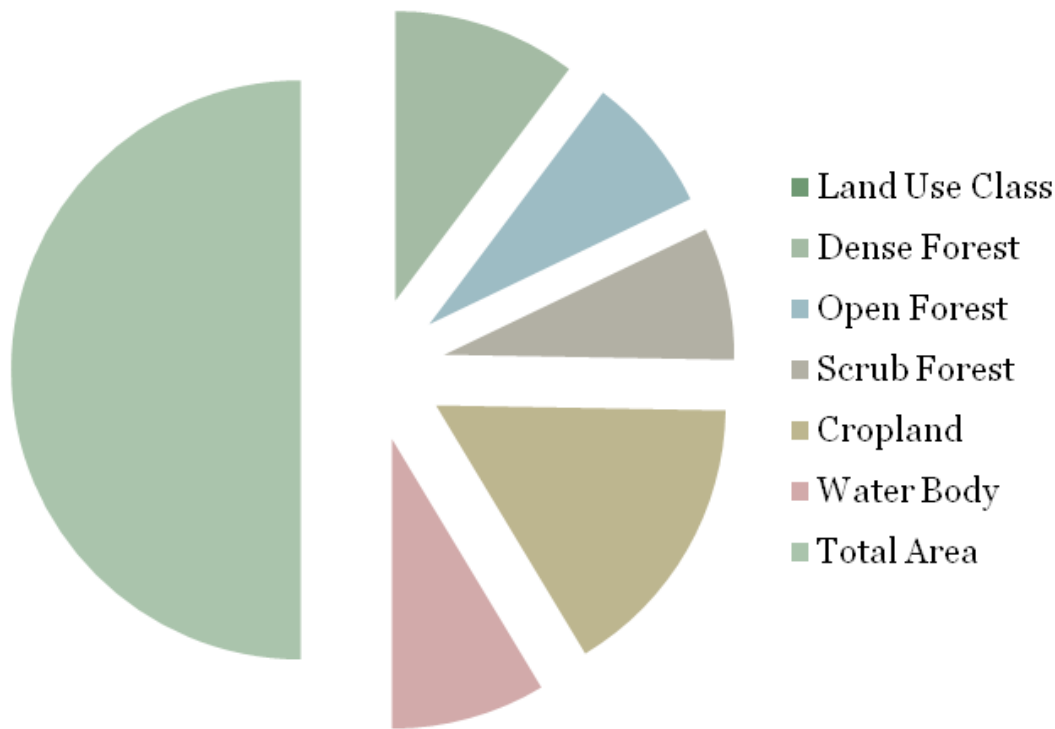
Name of district	Area in Sq. Km.
Dimapur District	8.1238
Mokokchung District	45.4879
WokhaDistrict	6.9312
Zunheboto District	0.4000
Phek District	7.6159
Tuensang District	85.6969
Mon District	73.4505
Kohima	39.2601
Total	192.4673

Source: Annual Administration Report 2010-11, Nagaland.

FOREST LAND USE PATTERN IN NAGALAND YEAR 2009

Land Use Class	Area in sq. km
Dense Forest	3391
Open Forest	2534
Scrub Forest	2456
Cropland	5342
Water Body	2856
Total Area	16579

DIAGRAMMATIC REPRESENTATION OF FOREST LAND USE PATTERN IN NAGALAND IN 2009



CHAPTER : 3

CLIMATE CHANGE IN NAGALAND

In recent years due to massive deforestation coupled with climate change, the climate of Nagaland has changed tremendously. The annual average rainfall has abruptly changed giving rise to the surface temperature in the State.

An attempt has been made by the GSI to understand the climate change and its impact on forest cover and land use / land cover pattern of the State. A predicted model of temperature change in the year 2018 and 2026 is also done through this study. The findings of this study are as follows:

TEMPERATURE CHANGE IN NAGALAND

In this study, the kriging method was used to understand the present and future surface temperature changes in the State of Nagaland. Kriging is a group of geo-statistical techniques to interpolate the value of a random field (e.g. the surface temperature of a location) at an unobserved location from observations of its value at nearby locations. This method was used to understand the changes in surface temperature in Nagaland. Surface temperature data was collected from the thermal band of MODIS (TERRA) satellite developed by NASA.

Although kriging was developed originally for applications in geo-statistics, it is a general method of statistical interpolation that can be applied within any discipline to sampled data from random fields that satisfy the appropriate mathematical assumptions.

The result shows a massive increase of temperature from 2011 to 2018 and estimates up to 2026 in the state. These changes in temperature will be mainly due to the massive decrease of forest cover in the state from 1987 to date. The following figure shows the present surface temperature and future surface temperature in the State of Nagaland.

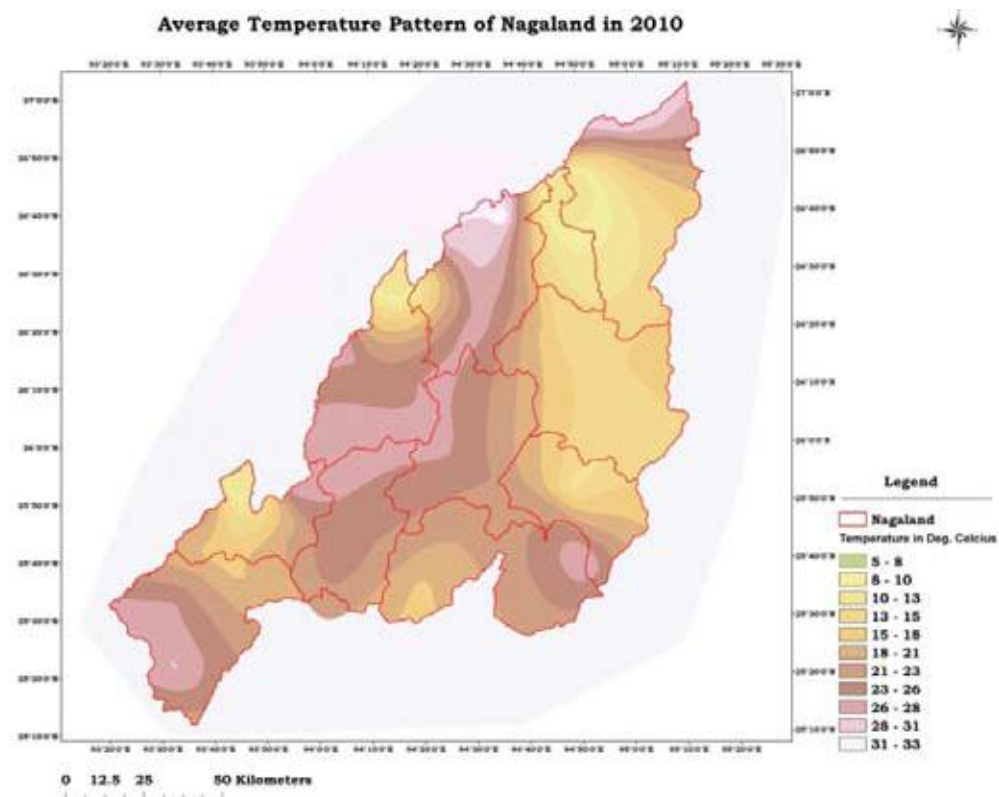


Fig 1. Average temperature pattern in the year 2011.

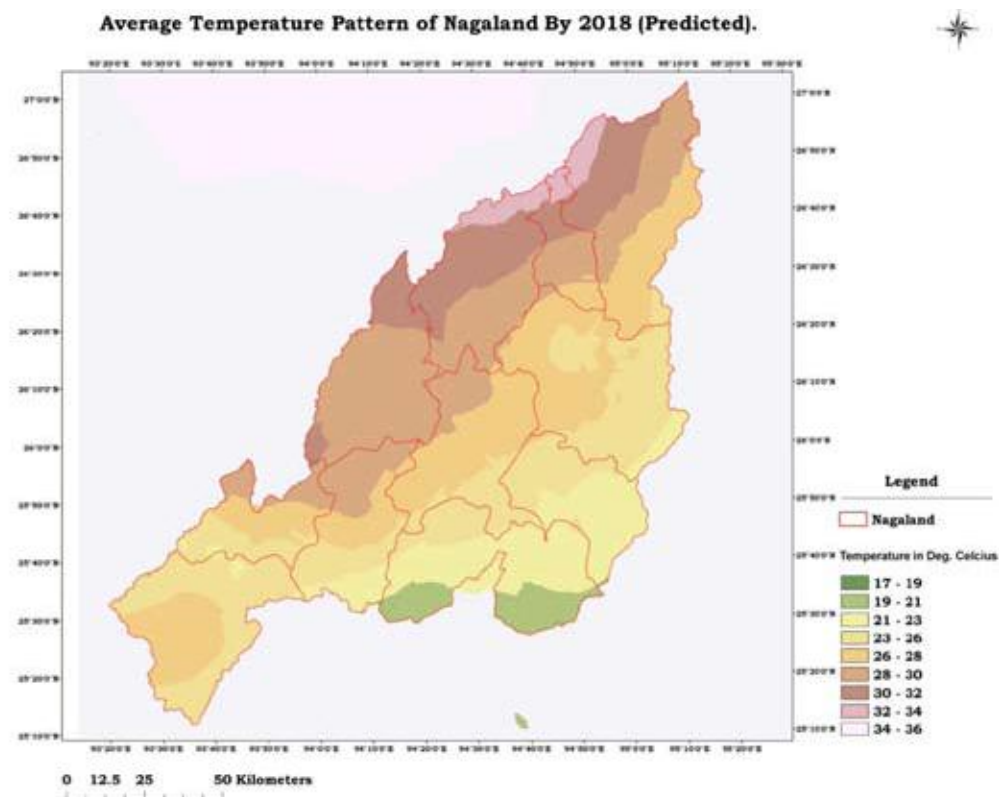


Fig 2. Predicted average temperature pattern in the year 2018.

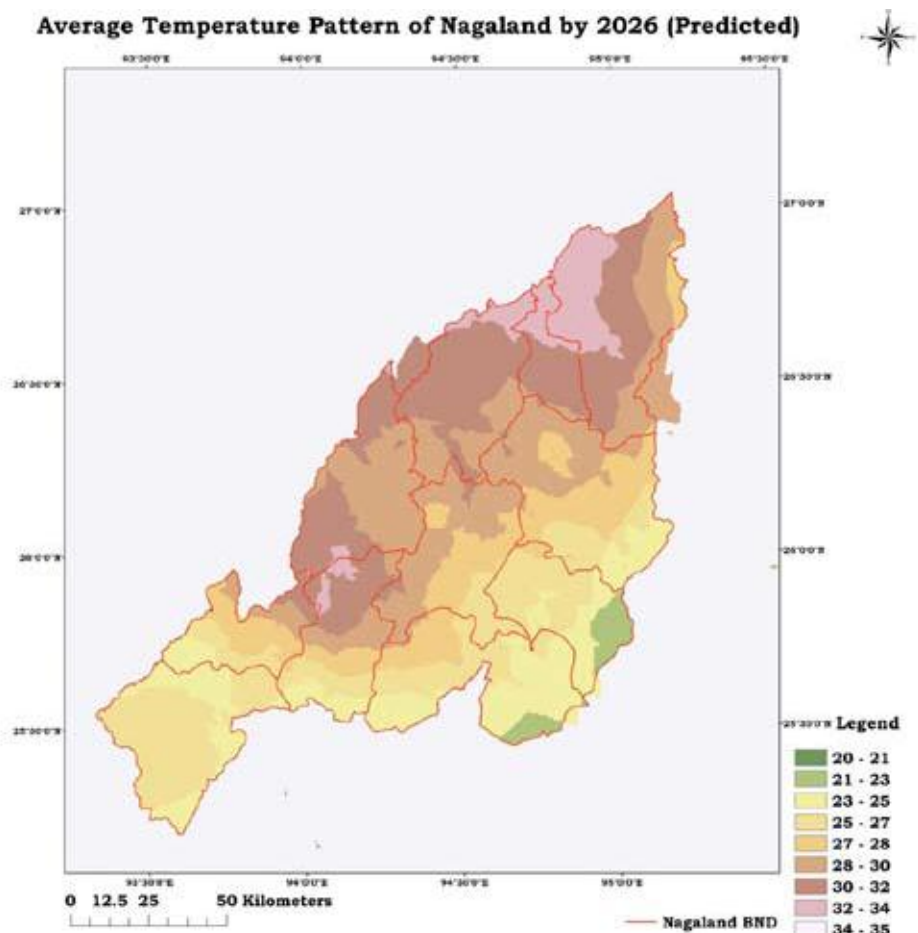


Fig 3. Predicted average temperature pattern in the year 2026

From Fig-1. it is evident that the minimum temperature in the state of Nagaland is 5° Celsius and highest temperature is 33° Celsius. This is the present temperature pattern of the state.

Fig- 2. shows the predicted average temperature in the year 2018. Here in this figure one can see that the minimum temperature of the state will be 17° Celsius and the maximum will be 36° Celsius. This indicates that the effect of climate change in the State of Nagaland will be quite significant in the year 2018. This change will affect the forest cover of the state and also the livelihood pattern of the people of the state by 2018.

Fig- 3. shows the minimum temperature of the state will rise up to 20° Celsius and the maximum temperature of the state will be 35° Celsius.

The above figures shows that there will be a substantial increase of minimum temperature in the State from 5° Celsius in the year 2011 to 17° Celsius in the year 2018, and again up to 20° Celsius in the year 2026. But the increasing trend of maximum temperature in the State is not so significant. It indicates that the minimum temperature will increase and this will affect the plants and animals of the State.

FOREST COVER CHANGE IN THE STATE:

Information on land use / land cover in the form of maps and statistical data is vital for spatial planning, management and utilization of land for agriculture, forestry, pasture, urban-industrial, environmental studies and economic production. Today, with the growing population pressure, low man-land ratio and increasing land degradation, the need for optimum utilization of land assumes much greater relevance. Anthropogenic changes in land use and land cover are being increasingly recognized as critical factor influencing global climate change (Nagendra, H et. al, 2004). While land cover and land use are often assumed to be identical, they are rather quite different. Land cover may be defined as the biophysical earth surface, while land use is

often shaped by human, socio-economic and political influences on the land (Nagendra, H. et.al, 2003). Remote sensing, integrated with Geographic Information System (GIS), provides an effective tool for analysis of land-use and land cover changes at a macro, meso and micro level. GIS techniques have been used to study the land use / land cover change in the State of Nagaland using satellite imagery of 1973, 1987, 1999 and 2009. Satellite imagery of Landsat MSS of 1973, Landsat TM of 1987, Land sat TM of 1999 and IRS P6 LISS III of 2009 were used to understand the forest cover change in the state. A predicted map of forest cover of Nagaland by 2026 was also developed using geo-statistical tools.

RESULT AND DISCUSSION OF LAND USE / LAND COVER CHANGE IN NAGALAND:

Table1: Land use / land cover change in Nagaland

Land Use Class	Area in sq. km				Net Change in sq. km		
	1973	1987	1999	2009	1973-1987	1987-1999	1999-2009
Dense Forest	4876	3876	3457	3391	-1000	-419	-66
Open Forest	3499	2865	2654	2534	-634	-211	-120
Scrub Forest	2209	2345	2498	2456	136	153	42
Cropland	3015	4617	5227	5342	1602	610	115
Water Body	2980	2876	2743	2856	-104	-133	113
Total Area	16579	16579	16579	16579			

The table shows the changes of land use / land cover change in the State of Nagaland. From the table one can see the changes in forest cover from the years 1973 - 2009. From 1973 - 1987 there is a drastic decrease of dense forest in the State. During that period 1000 sq.kms area of dense forest was deforested. Similarly from 1987 - 1999 a total area of 419 sq.kms was deforested and finally from 1999 - 2009 a total of 66 sq.kms area was deforested. This deforestation of dense forest was mainly due to the Jhum cultivation practices and timber extraction. Similarly, in the case of open forest from 1973 to 1987 a total area of 634 sq.kms

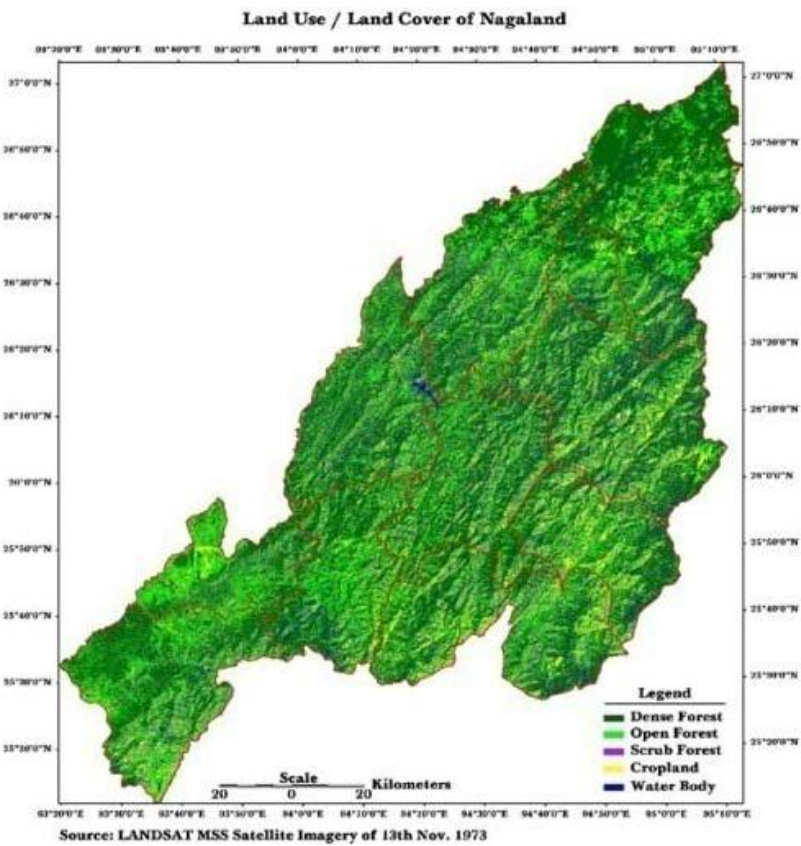


Fig 4- Year 1973

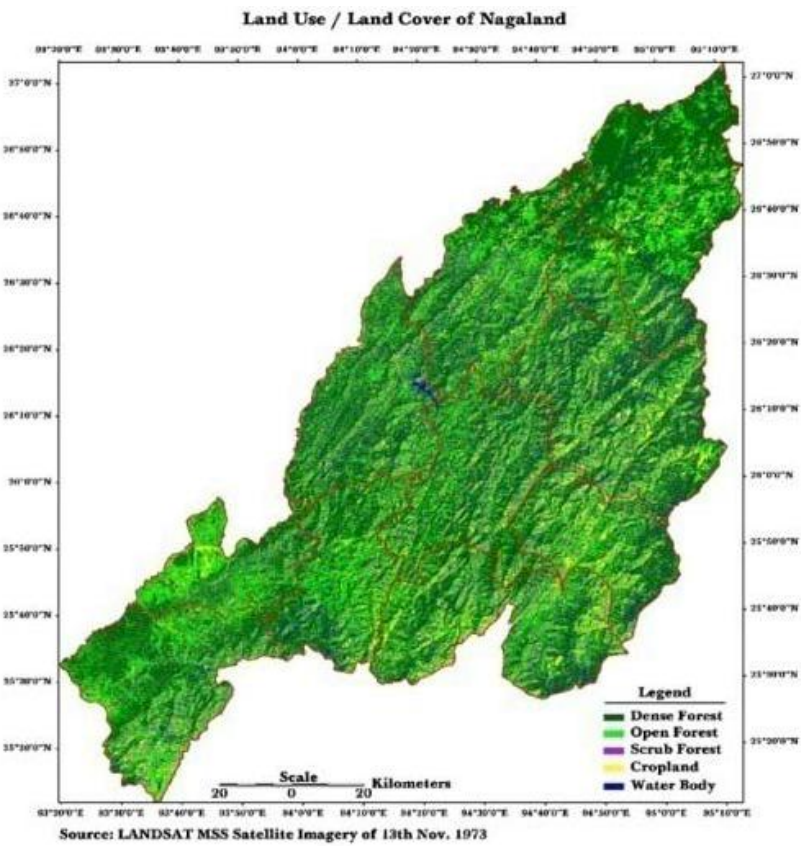


Fig 5- Year 1987



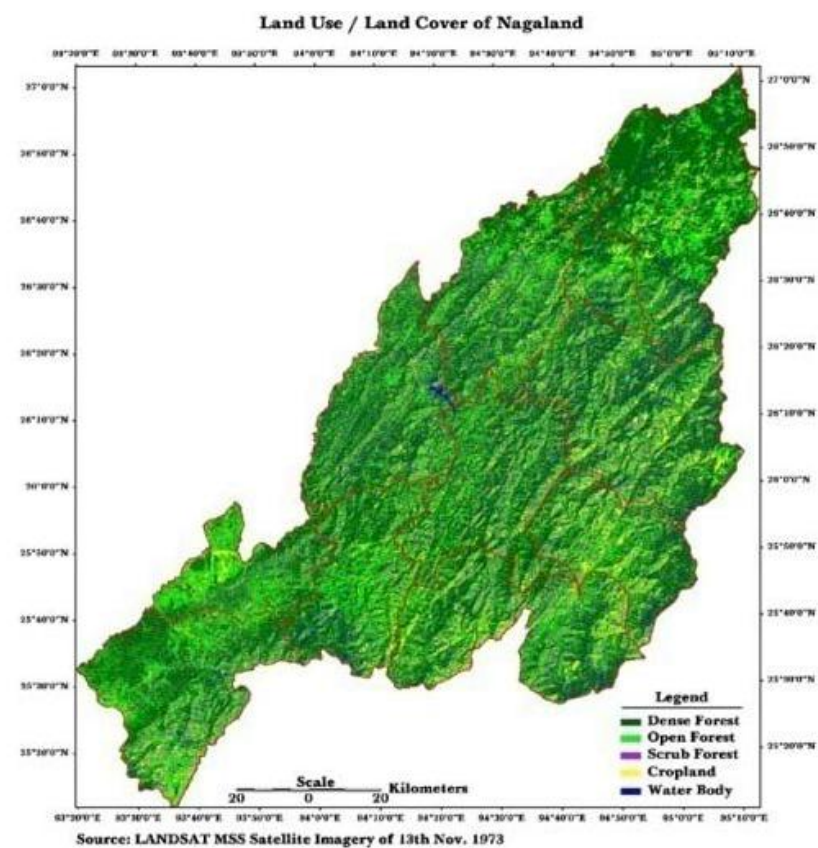


Fig 6- Year 1999

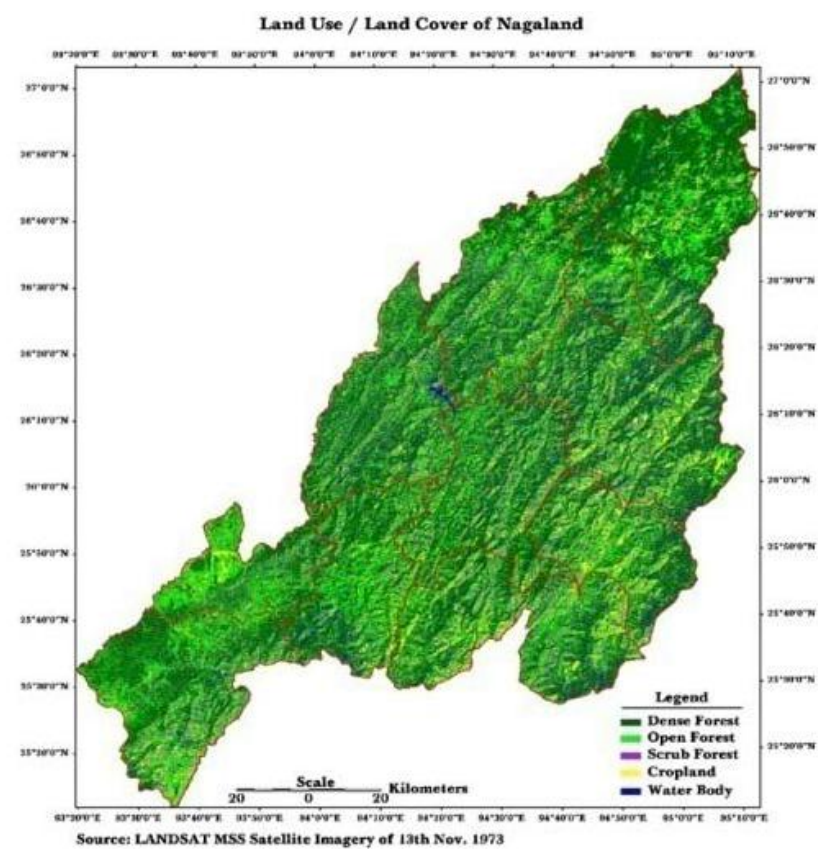


Fig 7- Year 2009

was deforested. Likewise, from 1987 - 1999 a total 211 sq.kms was deforested. Finally from 1999 - 2009 a total of 120 sq.kms was deforested in Nagaland.

The cropland or agricultural land of the State has increased from 1973 - 2009. From 1973 - 1987 a total area of 1602 sq.kms was increased. This escalation was mainly due to the conversion of forest land to agricultural lands. Similarly from 1987 - 1999 a total area of 610 sq.kms of cropland was increased. From 1999 - 2009 an area of 115 sq.kms was increased. This increase of cropland indicates the anthropogenic pressure in the State.

Predicted forest cover pattern of Nagaland by 2026: An attempt was made to understand the forest cover condition by the year 2026 using geo-spatial tools. The results shows a significant change in forest cover in the State by 2016. Table 2 and Fig. 8 shows the forest cover of Nagaland by 2026.

TABLE: 2 FOREST COVER PATTERN OF NAGALAND BY 2026

Class of forest	Area in Sq. Km.
Dense Forest	2398
Open Forest	1543
Scrub Forest	1763
Cropland	4321
Water Body	2309
Barren Land	4245
Total Area	16579

Table 2 shows that by 2026 a total area of 4245 sq.kms. will be converted to barren land which will be treated as waste land. Due to climate change the forest cover of the State will be reduced drastically and fertility of the land will also decrease. By 2026, the water bodies in the State will shrink to 2309 sq.kms. This will adversely affect the plants and animals, including human habitation. Barren land will increase mainly due to the rise of temperature in the high altitude areas. Figure 9 shows the altitude zones of Nagaland.

This study indicates that climate change will affect Nagaland significantly by 2026. Temperature rise will affect the bio-diversity of the state and will affect the land use / land cover pattern. Based upon the current study the following suggestions and recommendations are made to reduce the impact of climate change.

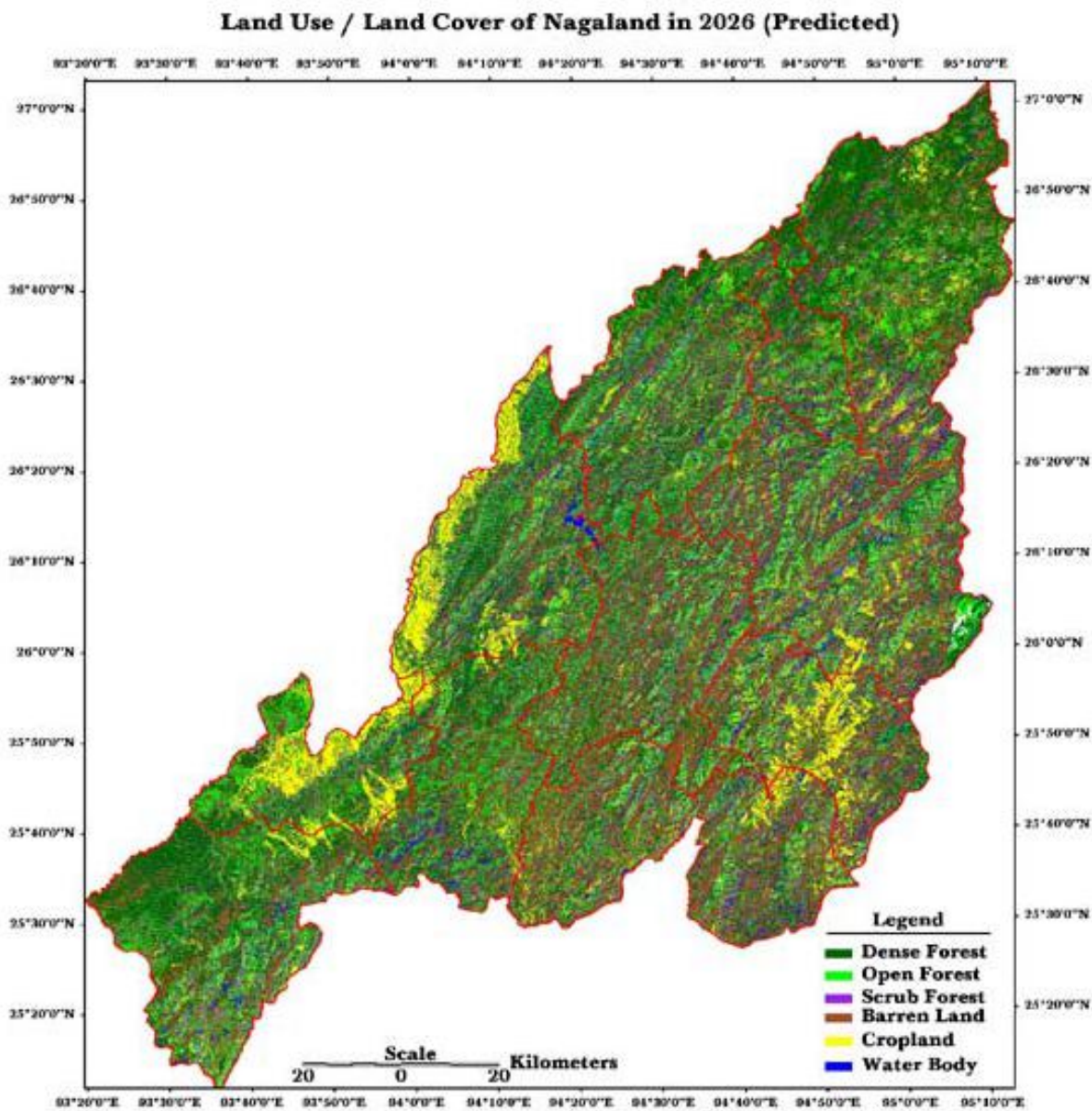


Fig 8. Forest cover pattern of Nagaland by 2026.

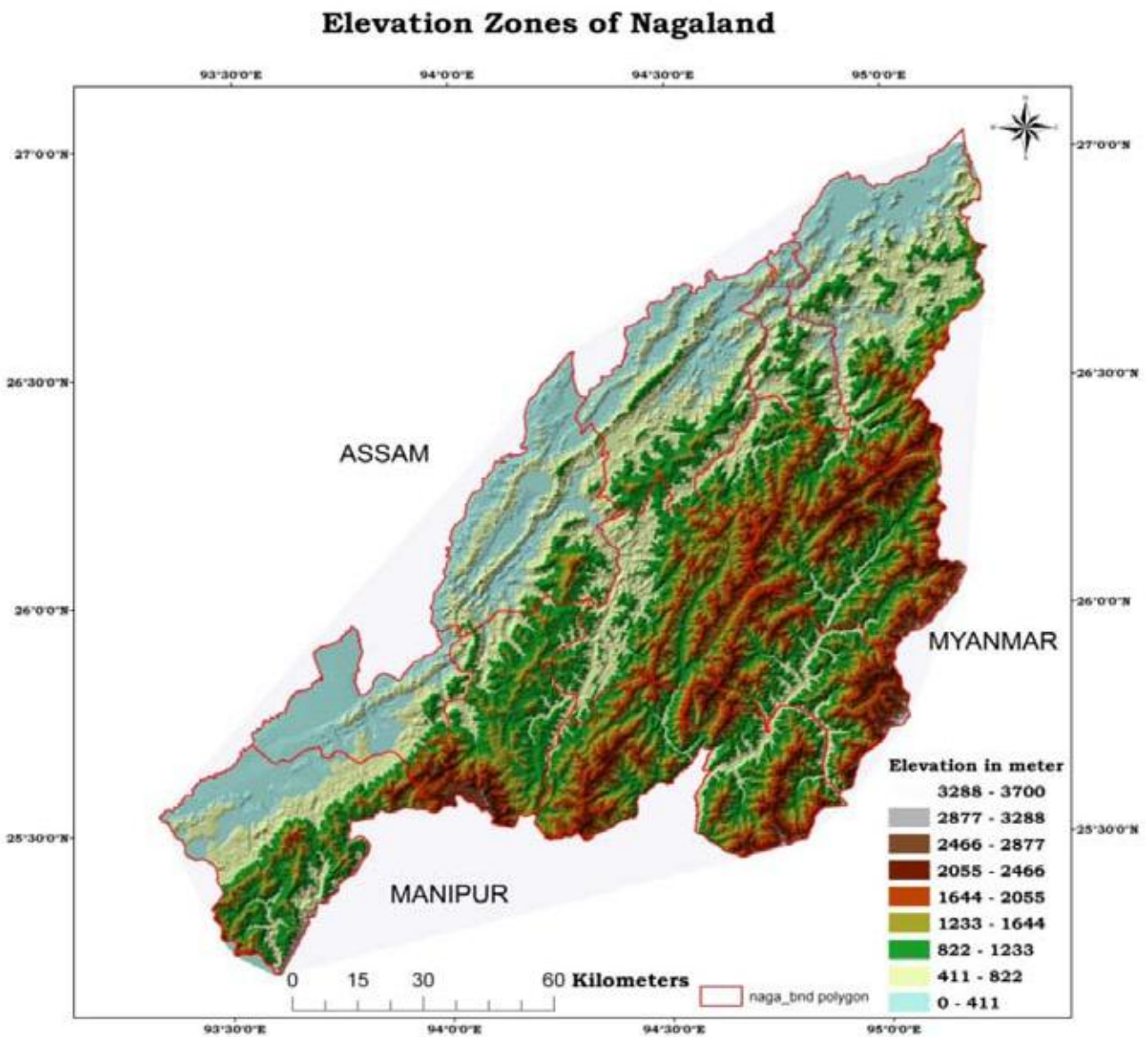


Fig 9. Elevation zones of Nagaland

Suggestion and Recommendations:

1. Massive afforestation programmes should be implemented without delay.
2. Practice of Jhum cultivation to be reduced.
3. Illegal felling of trees to be banned.
4. Encourage, involve Community participation in tree plantation programmes.
5. Encourage application of traditional manure practices in crop fields to maintain sustained soil fertility.
6. Create mass awareness, dissemination of information on climate change and its consequences to the stakeholders.

CHAPTER : 4

ORGANIC FARMING

Organic farming is the form of agriculture that relies on techniques such as crop rotation, green manure, compost and biological pest control to maintain soil productivity and control pests on a farm. Organic farming excludes or strictly limits the use of manufactured fertilizer, pesticides (which include herbicides, insecticides and fungicides), plant growth regulator such as hormones, livestock antibiotics, food additives, and genetically modified organism.

Organic agricultural methods are internationally regulated and legally enforced by many nations, based in large part on the standards set by the International Federation of Organic Agriculture Movements (IFOAM), an international umbrella organization for organic farming organizations established in 1972. IFOAM defines the overarching goal of organic farming as:

“Organic agriculture is a production system that sustains the health of soils ecosystem and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.”

Modern, intensive agriculture causes many problems including the following:

- Chemical fertilisers and herbicides are easily washed off from the soil and pollute rivers, lakes, water courses.
- The prolonged use of chemical fertilisers results in soils with a low organic matter content, easily prone to erosion by wind and rain.
- Dependency on fertilisers creates the requirement for larger amounts in subsequent years to produce the same yield of crops.
- Chemical pesticides retain in the soil for long periods entering the food chain where it builds up in the bodies of animals and humans causing health problems.
- Chemicals destroy soil micro-organisms resulting in poor soil structure, aeration and decreasing nutrient availability.
- Pests and diseases become more difficult to control as they become resistant to chemical pesticides. The numbers of natural enemies decrease because of pesticide use and habitat loss.



Organic farming

Although organic farming is prehistoric in the widest sense, Sir Albert Howard is widely considered to be the “father of organic farming” in the sense, that he was a key founder of the post-industrial-revolution organic movement. Further work was done by J.I. Rodale in the United States, Lady Eve Balfour in the United Kingdom, and many others across the world. The modern organic movement is a revival movement in the sense that it seeks to restore balance that was lost when technology grew rapidly in the 19th and 20th centuries.

Modern organic farming has made up only a fraction of total agricultural output from its beginning until today. Increasing environmental awareness in the general population has transformed the originally supply-driven movement to a demand-driven one. Premium prices and some government subsidies attracted farmers. In the developing world, many producers farm the land according to traditional methods, which are comparable to organic farming but are not certified. In other cases, farmers in the developing world have converted for economic reasons.

Benefit of organic farming:

Organic farming provides long-term benefits to people and the environment.

Organic farming aims to:

- Increase long-term soil fertility.
- Control pests and diseases without harming the environment.
- Ensure that water stays clean and safe.
- Use resources which the farmer already has, so the farmer needs less money to buy farm inputs.
- Produce nutritious food, feed for animals and high quality crops to sell at a good price.



Naga King Chilli

Genetic diversity

Within a single crop there can be many differences between plants for example, they may vary in height or ability to resist diseases. These differences are genetic. Traditional crops grown by farmers contain greater genetic diversity than modern bred crops. Traditional varieties have been selected over many centuries to meet the requirements of farmers. Although many are being replaced by modern varieties, seeds are often still saved locally. Crops which have been bred by modern breeding methods tend to be very similar. If one plant is prone to disease, all the other plants are infected as well. Although some modern varieties may be very resistant to specific pests and diseases, they are often less suited to local conditions than traditional varieties. It can therefore be a risk to rely too much on any one of them. In organic systems, some variation or ‘genetic diversity’ between the plants within a crop is beneficial. Growing a number of different crops rather than relying on one is also very important. This helps to protect against pests and diseases and acts as an insurance against crop failure in unusual weather conditions such as drought or flood. It is important to remember this when selecting which crop to grow.

“An organic farm, properly speaking, is not one that uses certain methods and substances and avoids others; it is a farm whose structure is formed in imitation of the structure of a natural system that has the integrity, the independence and the benign dependence of an organism”



To be productive an organic farmer should :

- Grow a mixture of crops in the same field (mixed cropping, intercropping, strip cropping)
- Grow different varieties of the same crop
- Use as many local crop varieties as possible
- Save the seed of local and improved crop varieties rather than relying on buying seed from outside the farm every year. Exchange of seed with other farmers help to increase diversity and ensures the survival of traditional crop varieties being lost in the replacement by modern varieties.
- Strip cropping onions and tomatoes to prevent pest and disease attack.

Careful use of water.

In rain fed hilly areas the careful use of water is as much a part of organic farming akin to any other technique. As with other resources, organic farmers should try to use locally available water avoiding wasteful usage. There are many ways to use water carefully including:

- The use of terracing, rain water basins or catchments and careful irrigation
- The addition of organic matter to the soil to improve its ability to hold water
- The use of mulches to hold water in the soil by stopping the soil surface from drying out or becoming too hot.



Harvested Pineapple



Ginger harvest

TABLE SHOWING THE PROPOSED PROGRAMME OF ORGANIC CULTIVATION OF DIFFERENT CROPS DURING THE PERIOD FROM 2011-2025 IN NAGALAND

Sl. No.	Name of cop proposed	2011-15		2015-2020		2020-2025	
		For the period (Ha)	Cumulative total (Ha)	For the period (Ha)	Cumulative total (Ha)	For the period (Ha)	Cumulative total (Ha)
1	Passion fruit	100	100	200	300	100	400
2	Kiwi fruit	100	100	200	300	100	400
3	Pineapple	1000	1000	2000	3000	1000	4000
4	Baby Corn	-	-	500	500	500	1000
5	Vegetables	100	100	200	300	300	600
6	Ginger	400	400	800	1200	400	1600
7	Turmeric	300	300	800	1100	300	1400
8	Cardamom	200	200	300	500	200	700
Total		2200	2200	5000	7200	2900	10100

Animal husbandry

- In an organic system the welfare of the animals is considered very important.
- Animals should not be kept in confined spaces where they are unable to carry out their natural behaviour such as, standing and moving around within an inadequate confined space. However, care should be taken that animals do not damage crops.
- Food for animals should be grown organically.
- Breeds should be selected to suit local needs, conditions and resources. These factors help to ensure that livestock are healthier, resistant to diseases and provide good yields to the farmer.



International standards

The International Federation of Organic Agriculture Movements (IFOAM) has produced a set of international organic standards, laid down by people from many countries. These give guidelines about what organic farming is and how it should be practised on the farm. International standards are also used to help countries set their own standards, which take into account different farming systems. Many countries have an organic standards authority that lays down national standards and awards a symbol to farms which have followed the standards. This symbol then allows farmers to market certified organic produce. This is important, as it ensures that people know that the food which they buy is organic. The main principles of organic farming were laid down by IFOAM in 1992.

- To produce food of high nutritional quality in sufficient quantity.
- To interact in a constructive and life enhancing way with all natural systems and cycles.
- To encourage and enhance biological cycles within the farming system, involving micro-organisms, soil flora and fauna, plants and animals.
- To maintain and increase long term fertility of soils.
- To use, as far as possible, renewable resources in locally organized agricultural systems.
- To work, as far as possible, within a closed system with regard to organic matter and nutrient elements. This aims to reduce external inputs.
- To work, as far as possible, with materials and substances which can be reused or recycled either on the farm or elsewhere.
- To give all livestock living conditions which will allow them to perform the basic aspects of their innate behaviour.
- To minimize all forms of pollution that may result from agricultural practices.
- To maintain the genetic diversity of the agricultural system and its surroundings, including the protection of plant and wildlife habitats.
- To allow agricultural producers a living according to the UN human rights; to cover their basic needs and obtain an adequate return and satisfaction from their work, including a safe working environment.
- To consider the wider social and ecological impact of the farming system. Organic food is becoming popular in Europe and America. However for food to be sold as organic it must bear a symbol that proves that it is truly organic. This is obtained through a certification organization. This is quite a complex procedure and is potentially expensive.

The major advantage of Naga farmers to practise organic cultivation is because farmers in the State seldom use or totalling avoid using fertilizers, which has made the soil free from chemicals. Also, climatic conditions are suitable for growing different types of crops ranging from temperate to subtropical. With this in mind, the Government is encouraging organic farming in the State.

At the initial stage, implementation for organic farming should be in a phase wise manner so as to discourage a uniform decrease in production level. Inevitably after a few years, production will increase and attain a sustainable level. The Government should therefore plan to initiate a partial organic cultivation in the State. Major thrust will be given in the Horticulture sector especially for crops like fruits, vegetables and spices. Importance to organic production of milk and meat will have to be given attention for creation of export potential. The main aim of organic cultivation will be to grab the huge international market (**of US \$ 55.9 billion in 2009**) which is still in the initial stage.

In the second phase, it is important to encourage production of organic cereals of indigenous variety with high yielding and exceptional quality.

In order to promote organic product, Government is to provide subsidy in case of production as well as certification fee initially for 10 years. Also for market promotion, an organic market is to be established at Dimapur, which is well connected by road, rail and air. It is important to encourage the selected organic growers to participate in national and international trade fairs in order to promote and market their products. The major thrust will be to produce high value low volume crops



Harvested Radish



CHAPTER : 5

ACTION PLAN FOR ACHIEVING THE VISION

In order to achieve the vision of food for all in Nagaland by 2025, all the enterprises in agriculture and allied sectors contributing to the food production are to be developed by strategic interventions based on the existing production systems in each sector.

PRODUCTION SYSTEM OF DIFFERENT ENTERPRISES IN NAGALAND

AGRICULTURE SECTOR:

1. Cereal production system-

- a. Paddy - Two types of production systems as given below are followed by the farmers of Nagaland for paddy production.
 - i. Jhum (shifting) cultivation of traditional varieties in rain-fed condition in hills and slopes.
 - ii. Wet Rice culture (WRC) of traditional varieties and HYV in both rain-fed and irrigated conditions in plains and terraces
- b. Maize - It is extensively cultivated as a mixed crop in Jhum cultivation under rain-fed condition and also as mono crop in settled cultivation in some areas.
- c. Millet - Millets are mainly cultivated as a mixed crop in Jhum cultivation under rain-fed condition.

2. **Pulse production system-** Kholar (Rajmah) is the predominant pulse in the State. Besides this, other pulses such as lentil, green gram, pea are also cultivated. Pulses are generally cultivated as a mixed crop in Jhum.

3. **Oilseed production system-** Rape and mustard is the predominant oilseed crop grown in Jhum as well as in settled cultivation under rain-fed condition. Besides this, soybean, linseed, niger, and sesamum are also grown in the State.

HORTICULTURE SECTOR:

- 1. **Fruits-** fruits like pineapple, citrus, banana, passion fruit are grown along the hill slopes and terraces. Some temperate fruits like kiwi, strawberry, apple are gaining popularity in the high altitude regions.
- 2. **Vegetables-** vegetable like cole crops, leafy vegetables, sweet potatoes, cucurbitaceous vegetables, colocasia are grown in hill slopes and terraces.
- 3. **Commercial crops-** commercial crops like potato, tapioca are extensively grown under rain-fed condition.
- 4. **Medicinal and Aromatic crops-** at present, a number of edible herbs, shrubs and indigenous fruit trees having medicinal value and aromatic properties are found in the wild. Identification of these crops to standardise their production system and improved technology for their commercial exploitation is the way forward.

SWOT ANALYSIS OF AGRICULTURAL AND HORTICULTURAL SECTOR:

Strengths	Weakness
• Sufficient land for area expansion. Abundant water resources • Favourable agro climatic condition. • Availability of germplasm of good quality for crop and livestock. • Availability of indigenous fruits having good commercial potentiality. • Indigenous technological know how (ITK) • Availability of family labour. • Crop from sub tropical to temperate. • Agriculture college and icar. • Eight numbers of KVK. • Railway connectivity and air port at Dimapur.	• Undulating topography • Lack of irrigation facility. • Lack of organised markets. • Transport and communication problems. • Lack of agro based industries. • Non availability of quality planting materials and agro inputs. • Rigid mindset of farmers. • Dependence on migrant labour.

Opportunities

- Promotion of organic production for export to other states and international market.
- Scopes for establishing agro-based industry.
- Eco tourism.

Threats

- Pests & diseases outbreak.
- Natural calamity like, hailstorm, wildfire.
- Dependence on import.
- Migration of man power from rural to urban.

Focus area for agriculture development:

- 1. Increase in cropping intensity by introduction of short duration high yielding varieties by replacing the existing long duration local varieties followed by cultivation of other crops like oil seed, pulses, wheat.
- 2. Proper nutrient management practices along with crop protection measures to be under taken to increase production and productivity of crops.
- 3. Maximum utilization of available water sources for irrigation purpose and creation of extensive rain water harvest structures to reduce the runoff loss and soil erosion.
- 4. Farm mechanization, wherever possible, in order to meet the crisis of agricultural labour and to reduce the time required for agricultural operations.

Focus area for horticulture development:

- 1. Natural advantages such as topography, climatic conditions are to be best utilized by cultivating wide range of horticultural crops like fruits, flowers, spices, medicinal and aromatic plants. Exotic crops like strawberry having very high demand in local, domestic and international markets can accelerate income.
- 2. Promotion and commercialization of horticulture by means of value addition through CIGs or SHGs.
- 3. The protection of existing forest areas through awareness programmes and planting of fast growing species of fruit trees in Jhum areas. To release the pressure on existing forests, cultivation should be encouraged in waste land and other marginal lands.
- 4. Development of high value and specialised tissue culture laboratories to enhance food production capacity and benefit farmers by supplying the required quality seedlings for horticultural crops.



TECHNOLOGICAL INTERVENTIONS IN AGRICULTURAL CROPS

Sl. No.	Crop	Problem	Technology Intervention
1	Paddy	Low productivity	1. Use of HYV certified seeds, increase seed replacement rate. 2. Use of organic manures & bio fertilizers. 3. Judicious use of balance dose of chemical fertilizer, popularization of concept of INM. 4. Use of modern method of crop management such as System of Rice Intensification, maintenance of plant population, weed management. 5. Cultivation of summer hybrid rice.
		Pest and disease management	1. Judicious use of pesticides, IPM measures. 2. Adoption of bio control measures. 3. Seed treatment by organic and inorganic methods.
		Post harvest management	1. Construction of rural godown, threshing and drying facilities, metallic seed and storage container.
2	Maize	Low yield	1. Use of composite and hybrid varieties. 2. Use of organic manure and green manure. 3. Application of balance dose of fertilizers.
		Pest and disease management	1. Bio control measures. Use of bio control agents. 2. Need based use of chemical pesticides and fungicides.
3	Pulse	Low productivity	1. Introduction of new high yielding varieties, 2. Use of bio fertilizers, organic manures and chemical fertilizers.
4	Oil seed	Low productivity	1. Use of HYV 2. Application of manures and fertilizers.
		Lack of processing units	1. Processing units should be set up at village level.

TECHNOLOGICAL INTERVENTION IN HORTICULTURAL CROPS:

Sl. No	Crop	Problems	Intervention
1	Fruits	Non availability of quality planting materials	1. Creation of scion bank for production of quality planting materials. 2. Development of nurseries for mass production of planting materials. Establishment of plant tissue culture laboratory 3. construction of Tissue culture Laboratory
		Pests & diseases	1. Use of resistant varieties. 2. Bio-control measures. 3. IPM
		Non availability of storage & processing facilities	1. Encourage establishment of small scale processing units and cold storage.
2	Vegetables	Low Yield	1. Use of HYV and Hybrids
		Pest and disease	1. Use of Bio-pesticides. 2. Adoption of Bio-control agents. 3. IPM
		Marketing and Storage	1. Cold storage. 2. Proper planning to avoid market glut through CIGs, value addition.
3	Spices	Low yield Processing Marketing	1. Introduction of crops with export demand. 2. Establishment of processing units. 3. Marketing through formation of CIGs.



Pumpkin crop



Litchi fruit



PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS IN NAGALAND:

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of Cereal crop					
			2015			2020		
	Area (Ha.)	Prod. MT	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Cereal	216535	305419	224947	389908	1.7	234913	504783	2.15
Requirement		341699		376115			424072	
Surplus(+)		-36280		+23793			+80711	
Deficit (-)								+113140

Action Plan to achieve the projected production requirement of Cereals:-

1. Area expansion (4% ➡ 4% ➡ 2.4% of the existing area over a period of 5 x 3=15 years)
2. Application of fertilizer in judicious dose.
3. Adoption of environment friendly PP measures.
4. Replacement by HYV (40% ➡ 60% ➡ 70% of the existing coverage over a period of 5 x 3=15 years)
5. Introduction of hybrid varieties. (5% ➡ 15% ➡ 20% of the existing coverage over a period of 5 x 3=15 years)
6. Adoption of INM
7. Adoption of IPM.
8. Introduction of SRI. (10% ➡ 20% ➡ 30% of assured irrigated area of Rabi rice over a period of 5 x 3=15 years)
9. Popularizing the post harvest management practices.

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN NAGALAND:

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of Pulse crop					
			2015			2020		
	Area (Ha.)	Prod. MT	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Pulses	22417	22417	24718	28663	1.16	26419	35405	1.34
Requirement		20925		23003			25893	
Surplus(+)		+1492		+6660			+9512	
Deficit (-)								+14743

Action Plan to achieve the projected production requirement of Pulses:-

1. Area expansion (10% ➡ 7% ➡ 7% over a period of 5 x 3=15 years)
2. Application of fertilizer in judicious dose
3. Adoption of environment friendly PP measures
4. Replacement by HYV (5% ➡ 100% ➡ 15% over a period of 5 x 3=15 years)
5. Adoption of INM.
6. Adoption of IPM
7. Application of bio fertilizer. (30% ➡ 60% ➡ 90% over a period of 5 x 3=15 yrs\
8. Establishment of pulse processors at village level.



PROJECTED REQUIREMENT AND PRODUCTION OF OILSEED CROPS IN NAGALAND:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
				2015			2020		
	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Oil seed	39737	33447	0.84	45212	54542	1.21	49297	67832	1.38
Oil(35%)		11706			19090			23741	
Requirement		18514			20365			22942	
Surplus(+)		-6809			-1276			+803	
Deficit (-)									+3332

Action Plan to achieve the projected production requirement of oilseeds:-

1. Area expansion (14% ➡ 9% ➡ 7% of the existing area over a period of 5 x 3=15 years)
2. Application of balanced fertilizer & micronutrients such as sulphur & borax
3. Adoption of eco friendly PP measures
4. Sprinkler irrigation at critical stage
5. Sowing at proper time
6. Replacement by HYV (40% ➡ 60% ➡ 80% over a period of 5 x 3=15 years)
7. Adoption of INM.
8. Adoption of IPM.
9. Application of bio fertilizer
10. Establishment of oil expellers at village level.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN NAGALAND:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Vegetables					
				2015			2020		
	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Vegetables	18188	60547	3.33	19928	84580	4.24	21902	116645	5.33
Requirement		94576			104156			117517	
Surplus(+)		-34033			-19575			-872	
Deficit (-)									+19188

Action Plan to achieve the projected production requirement of Vegetables in Nagaland:-

1. Area expansion (10% ➡ 10% ➡ 9% over a period of 5 x 3=15 years)
2. Application of fertilizer in balanced dose.
3. Sprinkler Irrigation.
4. Adoption of IPM measures
5. Replacement by HYV (20% ➡ 40% ➡ 60% over a period of 5 x 3=15 years)
6. Introduction of hybrid varieties.(20% ➡ 40% ➡ 60% over a period of 5 x 3=15 years)
7. Adoption of INM
8. Creation of cold storage facilities.
9. Establishment of vegetable preservation units to ensure marketing through value addition.



ADDITIONAL AREA TO BE BROUGHT UNDER CULTIVATION OF SELECTED FRUIT CROPS (AREA IN HA.)

Sl. No.	Name of crop proposed	2011-15		2015-2020		2020-2025		Remarks
		For the period	Cumulative total	For the period	Cumulative total	For the period	Cumulative total	
1	Banana		500	500	1000	500	1500	Promotion of marketing and value addition through formation of CIGs by providing specialized transport vehicles and cold storage facilities to minimize post harvest loss.
2	Pineapple	1500	1500	2000	3500	2000	5500	
3	Passion fruit	150	150	200	350	250	600	
4	Orange	2000	2000	2000	4000	2000	6000	
5	Apple	100	100	150	250	350	600	
6	Kiwi fruit	100	100	150	250	300	550	
7	Strawberry	50	50	100	150	150	300	

VETERINARY, ANIMAL HUSBANDRY AND DAIRY SECTOR

Cattle and Goat Production System:

Free grazing of cattle and goat is mostly practiced by the farmers except during the paddy cultivation period. Stall fed system also followed by a few farmers.

Poultry Production System

Farmers commonly practice backyard poultry rearing but some organized poultry rearing systems also exist.

Pig production system

Pigs are generally reared in free grazing system. However in many parts of the state it is made mandtory for stall fed system with kitchen waste and locally available feeds like colocasia, rice polish and wheat bran. The Veterinary department also provides animal health care by organising camps and training for the farmers.

PROJECTED POPULATION AND REQUIREMENT OF LIVESTOCK PRODUCTS UP TO 2025 FOR NAGALAND

Item	Population (as per 2011 census and Projected population@2.5% annual increase)			
	2011	2015	2020	2025
Projected population	1980602	2186214	2473500	2798539
Meat (MT)	93980	114233	145793	186073
Milk (Kltrs)	65063	71817	81254	91932
Egg (in Lakh No.)	2168.76	2636.14	3364.46	4293.99

Population growth rate as 2.5% annum and based on 2011 census



Chick rearing



Stall fed piggery



SWOT ANALYSIS OF ANIMAL HUSBANDRY SECTOR

Strength • High demand in local markets. • Family labour can be utilised. • Regular income. • Large area for grazing	Weakness • Secondary source of income. • Lack of improved breed. • Non availability of farm credit. • Problem in animal health care.
Opportunity • Vast potential for large scale production of meat and milk for export to the neighbouring states.	Threats • Avian influenza for poultry industry. • Swine fever for pig rearing. • Dependency on the outside source for feed.

Focus area for development of Animal Husbandry and Dairy sector:

In order to achieve the vision of self sufficiency in animal food, the Veterinary Department is to adopt the following approaches:

1. Development of piggery and poultry including small ruminants for meat production and dairy cattle for milk by encouraging revived and improved backyard farming.
2. Encouragement to each household in the rural area for rearing 3 nos. of pig, 50 nos. of poultry birds, and 1 dairy cow in every 10 household.
3. Implementation of programmes such as, induction of quality dairy cattle, community cattle rearing, rural dairy farming, and artificial insemination to materialize white revolution in the State.
4. Establishment of Dairy co-operatives/CIGs/SHGs for easy marketing.
5. Establishment of small scale milk product processing industries for value addition
6. Initiation of new programme through Public Private Partnership for specialized commercial farming under livestock and poultry production programmes.
7. Adoption of 10 villages by each Departmental farm to provide farmers with seed stock, vaccines, medicines and technical know-how.

8. Consolidating the existing livestock and poultry breeding farms, so as to evolve suitable crossbred in sufficient numbers from departmental farms for breeding and propagation.
9. Setting up of Nagaland composite pig farm including satellite breeding farms to feed the pig processing plant.
10. Intensification of fodder development. Setting up of fodder bank and grassland reserve in all districts, identification of local fodder plants and their preservation, distribution of Bhusa Block making, hay and silage making units to meet the requirement of fodder in lean period.
11. Mass immunization programme to be brought to the farmers door step.
12. Consolidating entire animal health care programme.
13. Human resource development by organizing study tours, workshops, seminar and training.

TECHNOLOGY INTERVENTION IN ANIMAL HUSBANDRY

Sl .No.	Animals /birds	Problem	Intervention
1	Cattle	Diseases Low yield	Vaccination Breed improvement
2	Pig	Diseases Low yield	Vaccination Introduction of high meat yielding breed
3	Poultry	Diseases Low productivity	Vaccination Improved layers and broiler birds



PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF MEAT

	2011	2015	2020	2025
Projected population	1980602	2186214	2473500	2798539
Production'000 MT	76.42	106.98	149.78	209.72
Requirement '000 MT	83.06	91.77	103.82	123.32
Surplus/Deficit(+/-)	-14.65	+15.21	+45.96	+86.4

PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF MILK

Sl. No.	Year	Internal production In K Ltrs	Requirement In K Ltrs	Surplus/ deficit
1	2010-11	56193	65063	-8870
2	2011-15	69432	71817	-2385
3	2015-20	85315	81254	+4061
4	2020-25	99645	91932	+7713

PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF EGG

Sl. No.	Year	Internal production In Lakh nos.	Per capita availability/year (Nos.)
1	2010-11	2483.7	125.40
2	2011-15	2980.3	136.32
3	2015-20	3874.4	156.64
4	2020-25	5036.7	179.98

Action Plan to achieve the projected production requirement of Animal Husbandry product in Nagaland:-

1. Proper animal health care (To cover 30% ➔ 60% ➔ 90% animal population over a period of 5 x 3=15 years)
2. Breeds improvement of pig, birds, etc. (To cover 20% ➔ 40% ➔ 60% animal population over a period of 5 x 3=15 years)
3. Feed supplements and fodder cultivation.
4. “Value Addition” to the surplus produces of milk and also provides an assured market through organized “Marketing Network”
5. Milk processing and chilling plants in all District head quarters and selected locations for providing easy Marketing Avenue to the farmers.
6. Strengthening existing Dairy Co-operative Societies, milk processing and chilling plants in all District head quarters and selected location for providing easy Marketing Avenue to the farmers.
7. Mass immunization of animals and birds against economically important diseases.



Smoked Fish

FISHERY SECTOR

The State has the potential for developing several reservoirs in future, which is under study and consideration by the Government. This will boost more avenues in sport fishing, fish culture and production in the State. At present, Doyang reservoir having a total water area of 2258 hectares is a fishery asset of the State. Lakes and reservoirs in the state have a total area of about 3528 hectares. Doyang reservoir has been contributing to the total fish production in Nagaland by about 300 MT and above per annum, and has proved immense potential for sustainable fish production. The Department of Fisheries has been ranching the reservoir annually, in order to increase the total fish production which in turn benefits the surrounding villages comprising more than 400 fishermen households. The Department had stocked 4 lakhs fingerlings in the first phase stocking on June 4th in 2010-11. The second phase of fingerling stocking was successfully conducted by the Fisheries Department where about 4 lakh fingerlings were released into the reservoir. During 2010-11, the stocking of fingerlings at Doyang Reservoir has been duly implemented by the Department under the aegis of National Fisheries Development Board, Hyderabad. Meanwhile, the Department requested the surrounding villages of the reservoir to

prohibit fishing during closed season and avoid the use of explosives, poisons, and chemicals in the reservoir as per Rule- 9, 14 & 15 of Nagaland Fisheries Regulation (Rules), 2008. Moreover, the fish farmers have been informed to use prescribed mesh size of fishing nets and fishing crafts to avoid catching of under- sized fish, juveniles, fish dry, and spawn as per Rule- 5 & 8 of Nagaland Fisheries Regulation (Rules), 2008. Beels/Lakes in the State are mostly located at unapproachable terrain and lying in derelict condition. These natural water bodies are being considered for fishery developmental activities. Ponds/tanks are the main resources for fish production in the state, at present having a total area of about 49,737 hectares. But their average production is low due to non-implementation of a scientific approach.

Paddy-cum-Fish Culture is the second major resource for fish production in the state and is being practised in considerable areas. Presently, the total area of paddy fields that can be harnessed for integration with fish culture is about 75,700 hectares. There is still vast scope for developing more areas under this system that can be taken up through application of Scientific Technologies for augmenting fish production.

SWOT ANALYSIS OF FISHERY SECTOR IN NAGALAND

Strength • Low lands are available. • Sufficient rainfall. • More employment oriented.	Weakness • Acidic soil. • Lack of awareness among farmers. • Non availability of quality fish seed.
Opportunity • Good demand in neighbouring state.	Threat • Diseases. • Dependent on Migrant Labour.

Focus area for development of Fishery sector:

1. In order to increase fish production in the State low lying area to be brought under aqua-culture,
2. Paddy cum fish culture to be encouraged in low lying paddy fields.
3. Emphasis to be given for demand driven timely supply of quality fish fingerlings.
4. Creation of better communication facilities to the existing marshlands and water bodies in difficult terrain.

5. Specialized transport vehicles for transportation of fish to the distant markets.
6. Production of quality nutrition rich fish feeds to cater to the needs of fish farmers
7. Formation of Community interest Group (CIG) for getting remunerative price by direct marketing for the produces and eliminating the middle man.

TECHNOLOGICAL INTERVENTION FOR FISHERY SECTOR:

Sl . No.	Item	Problem	Intervention
1	Fish	Low productivity	• Quality fish seed • Feed & disease management • Composite fish culture, • Paddy cum fish culture. • Water amendment



Catch from Fishery pond

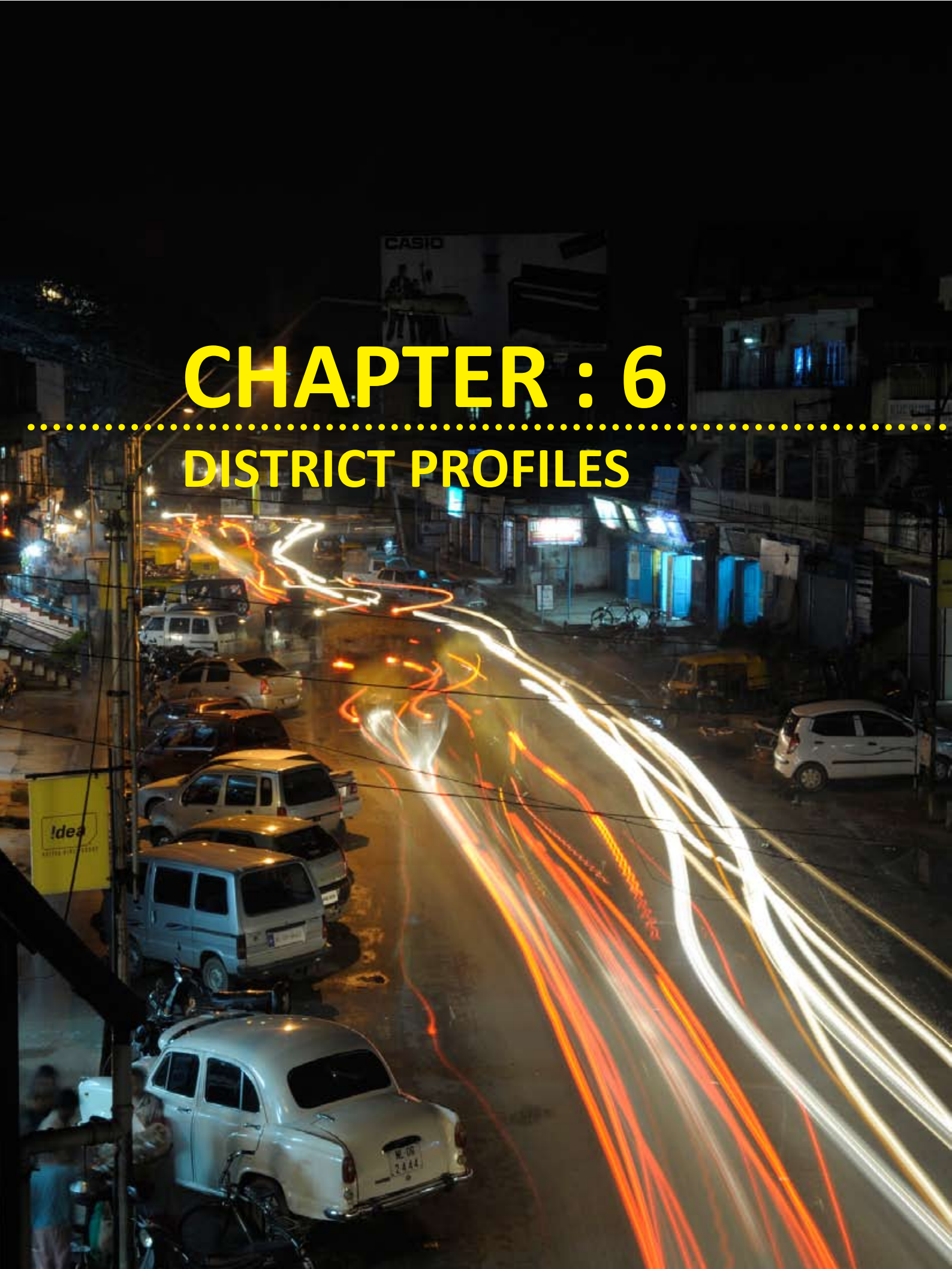
PROJECTED REQUIREMENT AND PRODUCTION OF FISH IN NAGALAND:

Sl. No.	Type of Resources	2010-11 (Base Year)			2011-15			2016-20			2021-25		
		Area (ha)	Volume (MT)	Productivity level (kg/ha/yr)	Area (ha)	Volume (MT)	Productivity level (kg/ha/yr)	Area (ha)	Volume (MT)	Productivity level (kg/ha/yr)	Area (ha)	Volume (MT)	Productivity level (kg/ha/yr)
0	1	2	3	4	5	6	7	8	9	10	11	12	13
A	Inland Culture Fisheries:												
	(a) Ponds/Tanks	2699	5262.00	1950	3700	8140.00	2200	4800	12240.00	2550	6000	18000.00	3000
	(b) Integrated Fish culture												
	(i) Paddy-cum-Fish culture	2835	960.00	335-500	3800	1660.00	380-650	4900	2750.00	440-800	6000	4250.00	500-1000
B	Inland Capture Fisheries												
	(a) Lakes and Reservoirs	2300	356.00	154.8	2300	358.80	156	2300	363.30	158	2300	368.00	160
	(b) Rivers/ Streams Fisheries	-	2.77	-	-	-	7.00	-	-	15.00	-	25.00	-
	(c) Marshy/ Swamps Fisheries etc.	918	4.23	-	1040	6.37	-	1170	8.70	-	1300	10.00	-
	Total :	8752	6585.00	-	10840	8542.00	-	13170	15377.00	-	15600	22653.00	-

Action Plan to achieve the projected production requirement of Fish:-

1. Area expansion (24% ➡ 50% ➡ 78% of the existing area over a period of 5 x 3=15 years).
2. To increase the productivity level by converting traditional culture practice into semi-intensive and intensive culture through diversification of modern technologies.
3. Increase in fish production (30% ➡ 134% ➡ 244% of the existing production over a period of 5 x 3=15 years)
4. Contemplating to conserve endemic or indigenous fish species of the State which are of ornamental value through Reverine/Stream/Flow-Through system Fisheries.
5. To tap the huge unutilized resources available in the State for the development of fisheries activities and to enhance fish production.

6. Efficient utilization of available resources by laying special emphasis on human resource development, diversifying fishery activities and by applying more technological inputs.
7. The Department plans to achieve the proposed targets through Capacity Building which will benefit the local fishermen to adapt with the latest technologies in fish culture practices.
8. To encourage development of more reservoirs in future. This will boost more avenues in sports fishery, capture fish production in the State.
9. The State has rich inland water resources in the form of rheophilic rivers/streams. The Fisheries Department is to go for development and conservation of rivers/streams through strategic ranching of rivers/streams at identified locations and encouragement of conservation among village communities for sustainable fish production.
10. The Department is to adopt and perfect the paddy-cum-fish cultural system by providing strong dykes/semi-permanent embankments so as to retain sufficient water for prolong cultural period at desired depth and to prevent escape of cultivated fish during floods. The new venture can tremendously contribute in enhancing fish production by augmenting the productivity level from 335-500 kg/ha to 500-1000 kg/h



CHAPTER : 6

DISTRICT PROFILES

DIMAPUR

Dimapur is the gateway of Nagaland. It is the 8th district of Nagaland established in December 1997. The district lies between 25° 48’ and 26° 00’ north latitude and 93° 30’ and 93° 53’ east longitude. The district borders Assam on its north and west, Kohima district in the east and Peren district in the south. The district has the distinction of being the ‘rice bowl of Nagaland’ where the famous ‘Ghaspani Nagaland Special’ is cultivated in Medziphima area.

The city of Dimapur comprises of a heterogeneous population and may be termed as a mini India. Out of the total population in the city, the majority comprises of all Naga tribes and the rest is made up of people from various parts of the country.

TABLE 1: BASIC INFORMATION OF DIMAPUR

Total Geographic area(Sq Km)	927
I) Plains Area(Ha)	37900
ii) Foot Hill Area(Ha)	31900
iii) High Hill area(Ha)	20900
iv) Plateau(Ha)	2000
Net Cultivable area	50325
i) Seasonal	48085
ii) Perennial	2240
Current Fallow Land	13157
Cultivable Wasteland	370
Forest Land Area	22862
Area under Tea Cultivation	200
Area under Jhum Cultivation	22862
Non Cultivable Area	281
Number of Farm Families	28761
I) Big	12248
ii) Small	16513

Agro- Ecological situations

Dimapur district is predominantly located in the plain region of the State except for one block. Three blocks share identical characteristics in topography, soil and rainfall. These blocks are Dhansiripar, Niuland and Kuhuboto. Medziphema block is at a higher altitude. The district can be divided on the following agro ecological situation-

AES-1 (Plains and foot-hill) 0 - 600 m MSL : Rice is the predominant crop in this AES, beside rice, maize , pulses, vegetables and oilseeds are grown.

AES-2 (Mid hill) 600-1200 m MSL. : Rice, maize, pulses, oilseed, vegetables and fruits are grown.

AGRICULTURE MARKETING

Marketing of the agriculture products is mainly done in the village market which are weekly in nature. Farmers get lower prices for their produces in these markets. To promote the marketing of agricultural produce efforts are made by the Agricultural Produce Marketing Committee (APMC) in the District. Under the supervision of APMC, Agricultural Produce Marketing Sub-Committee and Village Market Committee has been constituted. Ten APMSCs have been constituted and ten Sub Market Yards are also proposed. At present, there are two APMCs, one at Dimapur and the other at Niuland. Both are affiliated with Nagaland Agricultural Marketing Board.

Several farming organizations that can be utilized for marketing of agricultural and horticultural products in the district are:

NAMES OF FARMERS ORGANIZATION IN DIMAPUR:

Name	Activities	Resource obtained from
APMC	Marketing of agricultural produce	Agriculture & allied sectors Departments
Farmers club	Mobilization of small and marginal farmers	NABARD & Co-Operative Banks
Bolster SHG	Aloe vera soap making	ATMA
Renlok SHG	Soap making & Value addition	ATMA

Source – Dept. of Agriculture, Nagaland



Low lying agricultural land

STATUS OF AGRICULTURE IN DIMAPUR DISTRICT:

Rice is the major crop of the district cultivated under rain fed condition, terrace and irrigated system. Jhum is carried out in the higher elevation of the district. Maize is the second important crop. Some important pulses of Dimapur district are pea, arahar, black gram, and lentil. These are grown both in kharif and rabi season. Mustard is the main oil-seed crop cultivated in the district. Other oilseed crops are soybeans, sunflower and linseed. Sugarcane is another commercial crop of the district together with tea.

Farm mechanization: Large tracts of land are cultivated in the plain area of Dimapur district,making it feasible for maximum use of farm machineries and implements.Farmers are making ample use of tractors, power tillers, pump sets and plant protection equipments.

AGRICULTURAL STATISTICS OF DIMAPUR 2009-10: (FIELD CROPS)

Sl. No	Name of crops	Area covered (ha)	Production (in MT)	Productivity (MT)
1	Paddy (Jhum & TRC)	20880	41760	20
2	Maize	1824	32832	18
3	Mustard	4800	4800	1
4	Other Oilseeds	5385	4662	0.87
5	Arahar	230	161	0.7
6	Pea	400	400	1
7	Rice bean	140	210	1.5
8	Other Pulses	1110	888	0.8
9	Others	1510	39895	-
10	Tea	200	-	-
11	Sugarcane	2360	135880	575.76



AGRICULTURAL STATISTICS OF DIMAPUR 2009-10: (HORTICULTURAL CROPS)-

Sl.No.	Name of crops	Area (ha)	Production (MT)	Productivity (Qtl. / ha.)
Vegetables & Spices :				
1	Sweet Potato	46	50	11
2	Cabbage	246	40	9
3	Cauliflower	149	71	5
4	Brinjal	150	23	5
5	Chilly	229	170	7
6	Pea	96	54.6	6
7	Beans	119	90	13
8	Bhindi	104	310	45
9	Tomato	229	1500	66
10	Ginger	200	2740	37.5
11	Garlic	30	61	8.33
12	Radish	134	250	36
13	Colocasia	229	1050	46
14	Black Pepper	78	4	1
15	Turmeric	92	600	66
16	Leafy vegetables	458	450	10
17	Others	100	1000	100
Fruits :				
18	Orange	100	55	5.5
19	Lemon	500	150	3
20	Pomelo	40	90	22.5
21	Pomegranate	20	20	10
22	Papaya	42	43	10.24
23	Banana	243	160	37.21
24	Guava	30	140	46.67
25	Mango	30	10	3.33
26	Litchi	100	50	5
27	Jack fruit	210	70	11.67
28	Pineapple	400	5570	139.25
29	Others	180	300	100

PRODUCTION SYSTEMS IN AGRICULTURAL CROPS IN DIMAPUR:

1. Cereal production system-

Paddy –

Two types of production systems engaged by the farmers of the district for paddy production are given below;

- Jhum (shifting) cultivation of traditional varieties in rain-fed conditions in hills and slopes.
- Wet Rice Culture (WRC) of traditional varieties and HYV in both rain-fed and irrigated conditions in plains and terraces

Maize - It is extensively cultivated as a mixed crop in Jhum cultivation under rain-fed conditions and also as mono crop in settled cultivations.

Millet -Millets are mainly cultivated as a mixed crop in Jhum cultivation under rain-fed conditions.

2. Pulse production system-

Pulses such as lentil, green gram, pea, kholar are cultivated. The pulse is generally cultivated as a mixed crop in Jhum.

3. Oilseed production system-

Toria / mustard is the predominant oilseed crop grown in Jhum as well as in settled cultivation under rain-fed conditions. Besides this, soybean, linseed, niger and sessamum are also grown in the District.

Production systems in Horticultural crops-

1. **Fruits**- fruits like pineapple, citrus, banana, litchi, jackfruit, papaya and others are grown on the hill slopes and flat lands. Value added fruits like avocado are also grown in the region and has potential for commercialization.
2. **Vegetables**- vegetable like cole crops, leafy vegetables, sweet potatoes, tapioca, cucurbitaceous vegetables are cultivated.
3. **Commercial crops**- commercial crops like sugarcane, potato, tapioca, areca nut and coconut are extensively grown under rain-fed conditions.



SWOT ANALYSIS OF AGRICULTURE SECTOR IN DIMAPUR

Strength - Favourable agro climatic condition. - Knowledge of agricultural practices. - Fertile soil. - Less use of agro-chemicals. - Support from KVK, Agriculture College and allied Govt. Departments. - Mainly plain areas suitable for paddy cultivation. - Good transportation and communication with other districts and rest of the country.	Weakness - Fragmented land holding. - Lack of irrigation facilities. - Non availability of quality seed. - Lesser Number of Agro-input outlets - Non adoption of modern technology by the farmers. - Large mono cropped area. - Financial constrains. - Share cropping in the district. - Poor marketing infrastructure.
Opportunity - Scope for area expansion of cereals and pulses. - Scope for development of Agri –Market Hub. - Organic cultivation can be promoted.	Threat - Farmers shifting to other occupation from agriculture. - Pests and diseases. - Soil erosion caused by floods.



Horticulture produce



Avocado

SWOT ANALYSIS OF HORTICULTURE SECTOR IN DIMAPUR

Strength - Favourable agro climatic condition. - Fertile and hill slopes suitable for various horticultural crops. - Available land for cultivation. - Farmers use less agro chemicals so organic cultivation is possible. - Availability of family labour. - Scope for attracting educated youth towards cultivation. - Availability of Agriculture University and KVK.	Weakness - Non availability of quality planting materials. - Improper maintenance of orchards - Low capital investment. - Minimum use of modern practices of nutrient management. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Lack of irrigation facilities.
Opportunity - Good communication facilities with other part of the country. - Scope for intensification and diversification. - Scope for establishment of processing industry.	Threat - Unstable market price. - Farmers shifting to other occupations. - Soil fertility degradation. - Dependency on migrant labour

Focus area for development of Agriculture and Horticulture sector in Dimapur.

- Quality Seed production of agricultural crops.
- Promotion of establishment of Nurseries and Tissue culture laboratory for horticultural crops.
- Increasing the no. of input dealer so that farmers get input at their doorsteps.
- Establishment of market and agri-corridor to the market from the sites of production.
- Development of Water harvest structures to tap the available rain water resource and utilization of the natural water resources.
- Soil conservation measures to prevent soil erosions and soil fertility degradations.
- Development of hill slopes for settled cultivation of horticultural crops in traditional Jhum area.



TECHNOLOGICAL INTERVENTIONS FOR AGRICULTURE IN DIMAPUR:

Sl. No	Crop	Problems	Intervention
1	Paddy	Use of traditional varieties	• Use of high yielding varieties of seed where there is assured irrigation. • Improved varieties may be obtained from local varieties through selection. • Exploration of HYV suitable for Jhum area and other rain-fed paddy area
		Inadequate plant nutrition	• Use of organic manures, bio-fertilizers, vermin compost. • Popularization of INM
		Pest and diseases	• Use of bio pesticides and bio control agents • Adoption of IPM
2	Maize	Use of local varieties	• Use of high yielding composite and hybrid varieties.
		Inadequate plant nutrition	• Use of organic manures, bio-fertilizers, vermicompost. • Popularization of INM
		Pests and diseases	• Adoption of IPM
		No post harvest management and value addition	• Maize sheller to be provided to the farmer for shelling of maize. • Establishment of poultry and cattle feed production units.

3	Pulses	Less area coverage under pulses	• Expansion of area under pulse
		Low yield	• Use of HYV. • Adoption of proper package of practices
		Lack of post harvest management and machinery for dal processing	• Awareness campaign on stored grain pest management. • Installation of pulse processor in pulse growing areas
4	Oilseeds	Less area coverage under oilseeds	• Expansion of area under oilseeds
		Low yield	• Adoption of proper package of practices
		Lack of post harvest management and machinery for oil expulsion	• Installation of oil expellers in oilseed growing areas



Farm Machinery distribution



TECHNOLOGICAL INTERVENTIONS FOR HORTICULTURE IN DIMAPUR

Sl. No	Crop	Problems	Intervention
1	Fruits	Non availability of quality planting materials	Creation of scion bank for production of quality planting materials. Arrangement for collecting planting materials from authentic sources. Establishment of Plant Tissue Culture laboratory
		Pests & Diseases	Use of resistant varieties. Bio-control measures. IPM
		Non availability of processing plants	Encourage establishment of Small scale processing units
		Marketing of Commodities	Construction of all weather rural roads for easy transportation of the farm produces. Establishment of market with all modern amenities so that farmers can get buyer for their produces.
2	Vegetables	Pest and diseases	Bio-pesticides. Bio-control agents. IPM
		Marketing and Storage	Cold Storage. Proper planning to avoid market glut through CIGs. Establishment of market with all modern amenities so that farmers can get buyer for their produces.
3	Spices	Processing and Marketing	Establishment of processing units. Export promotion in collaboration with APEDA and corporate sectors.



Mithun rearing at the National Research Centre for Mithun, Jarnapani



Sprinkler at Napier grass fodder field

STATUS OF ANIMAL HUSBANDRY AND DAIRY IN DIMAPUR.

Livestock and poultry contribute towards the livelihood earning of farmers. The Dimapur Milk Union Limited (DIMUL) at Dimapur, collects milk from different dairy producers and in turn, market processed milk, curd, ghee and other dairy products. Commercial piggery and poultry farms are located in the district besides backyard rearing of pigs, ducks and poultry in village households.

The district has the distinction of having the State Rabbit Breeding Farm at Jharnapani, set up to experiment and cross breed with different rabbit species such as Great White, Soviet Chinchilla and Angora to produce the best suitable breed for propagation and rearing in Nagaland. Under ICARs initiative the National Research Centre for Mithun (NRCM) and breeding of poultry, piggery and dairy have also been set up at Jharnapani.



Germplasm research at the Mithun Farm



Rabbit Rearing at Regional Rabbit Breeding Centre, Jarnapani



PRODUCTION AND PRODUCTIVITY OF LIVESTOCK AND DAIRY PRODUCTS IN
DIMAPUR

Produce	Total requirement (2008)	Production	Surplus/shortfall
Meat (MT)	13582.33	11500	Deficit 2082.33
Milk (KI)	23912.56	34716	Surplus 10803.44
Egg Nos in lakh	398.54	456.32	Surplus 57.78

Source: Department of Veterinary and Animal Husbandry, Kohima

MILK YIELD OF VARIOUS ANIMALS IN DIMAPUR

Type of animal	Milk yield (litres/day)
Cross bred cattle	3.78-5.40
Indigenous cattle	0.950-1.556
Buffalo	0.925-1.515
Goat	0.140-0.426

STATISTICS ON ANIMAL HUSBANDRY IN DIMAPUR

Cow / bull(Nos.)	Buffalo (Nos.)	Goat (Nos.)	Sheep (Nos.)	Pig (Nos.)	Fowl (Nos.)	Duck (Nos.)
208828	17861	67909	190	154590	557616	36080



Ducks and chicken at a Local market



SWOT ANALYSIS OF ANIMAL HUSBANDRY AND DAIRY SECTOR IN DIMAPUR

Strength • High demand in domestic market. • Less space required. • Enough space for grazing. • Use of family labour. • Locally available fodder and feed for open grazing livestock.	Weakness • Low investment in the sector. • Lack of improve breed. • Inadequate animal and poultry health care. • Secondary source of income. • Lack of scientific processing/ slaughter house and market facilities. • Lack of quality fodder and feed commercial livestock rearing
Opportunity • Scope for breed improvement of milch/ meat animal and poultry birds to meet export demand. • Scope for integrated/composite farming. • Scope for employment generation.	Threat • Animal and poultry diseases. • Decline in natural resources. • Youth shifting to other occupation.

Focus area for development of Animal husbandry and Dairy sector in Dimapur

- Improved breeds of livestock, pig and poultry should be readily available to farmers.
- Popularization of nutritious fodder cultivation and feed production for livestock
- Financial assistance should be made to the farmer for commercial farming.
- Animal health care facilities and trainings should be made available.
- Establishment of hygienic slaughter house and milk processing units
- Communication facilities should be built up.



Stall fed dairy farming



TECHNOLOGY INTERVENTION IN ANIMAL HUSBANDRY AND DAIRY SECTOR IN DIMAPUR

Sl. No.	Animals /birds	Problem	Intervention
1	Cattle	Diseases Low productivity Lack of commercial cattle farming Non availability of quality fodder & feed	Training on health care of cattle Vaccination Breed improvement Establishment of Commercial Dairy farms Cultivation of quality fodder
2	Pig	Diseases Low productivity Lack of commercial approach in pig rearing	Vaccination Introduction of high meat yielding breed Establishment of Commercial piggery
3	Poultry	Diseases Low productivity Non availability of quality feed	Vaccination Training on health management of poultry Improved layers and broiler birds Establishment of small scale maize based poultry feed units

STATUS OF FISHERY SECTOR IN DIMAPUR

Dimapur district has immense potential for fishery development in dams, rivers, ponds, small lakes and abundant marshy lands. These water bodies can be developed for fish farming to generate economic returns towards the upliftment of the rural farmers. Paddy cum fish culture is a promising enterprise which can boost the economy of the farming community.

FISHERIES STATISTICS OF DIMAPUR

Sl.No	Name of the District	Ponds/Tanks			Paddy-cum-Fish culture		
		Estimate potential total area	Utilized area up till	Unutilized area	Estimated potential total area	Utilized area up till	Unutilized area
		(ha)	2010-11 (ha)	(ha)	(ha)	2010-11 (ha)	(ha)
1	Dimapur	10040.0	1334.1	8705.9	33340.0	185.0	33155.0



PRODUCTION OF FISH

Particulars	Production
Production of Fish (Culture & Capture) (2010-11)	3762.00 (MT)

SWOT ANALYSIS OF FISHERY SECTOR IN DIMAPUR

Strength • Availability of low lying areas and water bodies. • Demand in the domestic market. • Comparatively low financial involvement	Weakness • Lack of awareness of integrated and composite farming. • Dependent on migrant labour. • Soil and water acidic in nature. • Less time period for fish growth.
Opportunity • Marshy land can be converted for fish production. • Scope for introduction of paddy cum fish culture. • Fish seed can be obtained from neighboring States.	Threat • Diseases of fish. • Uncertainty of labour availability.

Focus area for development of Fishery sector in Dimapur:

1. Training on integrated fish farming.
2. Introduction of paddy cum fish culture in low lying areas.
3. Large scale production of fish fingerlings to make it available to the farmer at the appropriate time.
4. Training on soil & water amendment measures to reduce water acidity and disease in fish.



Fishery pond



TECHNOLOGY INTERVENTION FOR FISHERY SECTOR IN DIMAPUR

Problem	Intervention
Low productivity	Quality fish seed
Non application of feed supplements	Feed & disease management
Lack of proper disease management	Paddy Cum Fish culture/ composite farming.
Lack of available area for expansion of fisheries	



Forest cover

Status of forest sector in Dimapur

The forest area under different categories are shown in the following table

Sl. No.	Types of forest	Area (in Sq. KM.)
1	Dense forest	140
2	Open forest	266
3	Scrub forest	6
4	Non forest	4
Total		416

Legal status of forest:

Sl. No.	Types of forest	Area (in Sq. KM.)
1	Reserved forest	62.26
2	Purchased land	8.12
3	Zoological parks	4.70
Total		75.08

Sources: DFO Dimapur.



SWOT ANALYSIS OF FORESTRY SECTOR IN DIMAPUR

Strength - Favourable Agro-climatic conditions for cultivation of forest species. - Slopes can be converted to Forest.	Weakness - Depletion of forest cover due to firewood collection. - New plantation in cultivable areas.
Opportunities - Quick growing species can be grown in Jhum cultivation areas to meet the need for fuel. - Aforestation can be done in soil erosion prone areas with proper technology.	Threats - Traditional method of farming (Jhum). - Degradation of soil.

Focus area for development in Forestry Sector in Dimapur

- Encouraging community participation to overcome the problem of encroachment in forest sector
- Planting of fast growing tree species in Jhum areas to reduce the pressure on forest for fuel as well as to help the famer to earn substantial amount.
- Extensive planting of fruit trees in slopes .

TECHNOLOGY INTERVENTION OF FORESTRY SECTOR.

Sector	Problem	Interventions
Forestry	Reduction of Jhum cycle to 5-9 years.	Integrated farming approach. Afforestation.
	Deforestation for fire wood.	Alternative fuel source. Plantation of fast growth species.



Agricultural land expansion



PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS IN DIMAPUR DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)			2015			2020			2025		
	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	22708	31791	1.4	24979	43713	1.75	27477	59624	2.17	30224	74050	2.45			
Requirement		69308			76503			86556			97930				
Surplus(+)		-37517			-32790			-26932			-23880				
Deficit (-)															

Action Plan to meet the requirement by 2025

1. Area expansion (10% ➡ 10% ➡ 10%)
2. Application of fertilizer in judicious dose.
3. Adoption of environment friendly PP measures
4. Replacement by HYV/hybrid (40% ➡ 60% ➡ 70%)
6. Adoption of INM.
7. Adoption of IPM.
8. Introduction of SRI.
9. Construction of storage facilities in rural area
- 10.Popularizing stored grain pest management practices

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN DIMAPUR DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Pulses			2015			2020			2025		
	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Pulses	1880	1880	1	2068	2482	1.2	2213	3098	1.4	2368	3788	1.6			
Requirement		4158			4590			5193			5876				
Surplus(+)		-2278			-2108			-2095			-2088				
Deficit (-)															

Action Plan to meet the requirement by 2025

1. Area expansion (10% ➡ 7% ➡ 7%)
2. Application of fertilizer in judicious dosage
3. Adoption of environment friendly PP measures
4. Replacement by HYV (5% ➡ 10% ➡ 15%)
5. Adoption of INM.
6. Adoption of IPM





ROJECTED REQUIREMENT AND PRODUCTION OF OILSEED CROPS IN DIMAPUR DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
				2015			2020		
	Area	Prod.	Productiv- tivity	Area	Prod.	Produc- tivity	Area	Productiv- ity	Prod.
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT/Ha.	MT
Oil seed	10185	8454	0.83	11204	13444	1.2	11988	14985	17316
Oil (35%)		2959			4705			5245	6061
Requirement		4158			4590			5193	5876
Surplus(+)		-1199			115			52	185
Deficit (-)									

Action Plan to meet the requirement by 2025

1. Area expansion (10% ➡ 7% ➡ 7% of the existing area)
2. Application of fertilizer in a balanced dose.
3. Adoption of organic PP measures
4. Replacement by HYV (20% ➡ 40% ➡ 60%)
5. Adoption of INM.
6. Adoption of IPM.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN DIMAPUR DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Vegetables					
				2015			2020		
	Area	Prod.	Productiv- tivity	Area	Prod.	Produc- tivity	Area	Productiv- tivity	Prod.
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT/Ha.	MT
Vegetables	2945	10308	3.5	3151	14180	4.5	3372	23602	29671
Requirement		20792			22951			25967	29379
Surplus(+)		-10485			-8771			-2365	292
Deficit (-)									

Action Plan to meet the requirement by 2025

1. Area expansion (7% ➡ 7% ➡ 10%)
2. Application of fertilizer in balanced dose.
3. Adoption of organic PP measures
4. Replacement by HYV (20% ➡ 40% ➡ 60%)
5. Introduction of hybrid varieties. (10% ➡ 20% ➡ 30%)
6. Adoption of INM.
7. Adoption of IPM.
8. Creation of cold storage facilities.





PROJECTED REQUIREMENT AND PRODUCTION OF FRUIT CROPS IN DIMAPUR.

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit					
				2015			2020		
	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Fruit	2800	9800	3.5	3080	13860	4.5	3388	18634	5.5
Requirement		20792			22951			25967	
Surplus(+)		-10992			-9091			-7333	
Deficit (-)								-1428	

Action Plan to meet the requirement by 2025

1. Area expansion (10% ➡ 10% ➡ 10% of the existing area)
2. Application of balanced fertilizer & micronutrients such as sulphur & borax
3. Adoption of eco friendly PP measures
4. Sprinkler irrigation at critical stage
5. Sowing at proper time
6. Replacement by HYV (40% ➡ 60% ➡ 80%)
7. Adoption of INM.
8. Adoption of IPM.
9. Application of bio fertilizers.

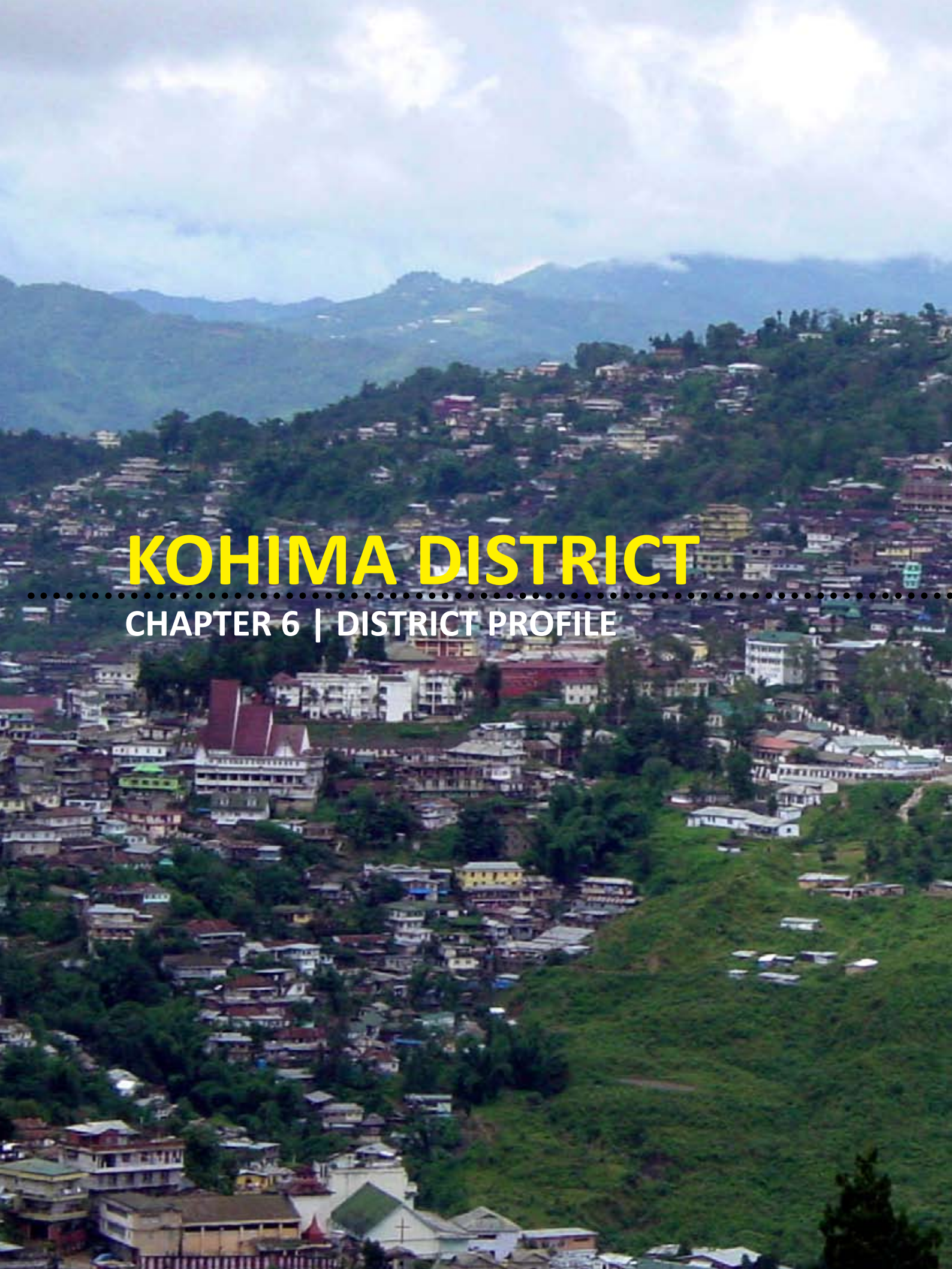
PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN DIMAPUR DISTRICT:

Base year /Year Proj.	2011	2015	2020	2025
Production'000 MT	18.76	26.26	36.77	51.48
Requirement '000 MT	15.94	17.6	19.91	22.52
Surplus/Deficit(+/-)	(+)2.82	(+)8.66	(+)16.86	(+)28.96

Action Plan to meet the requirement by 2025

- Proper animal health care
- Targeted increase of meat production @ 8% per annum.
- Introduction of high meat yielding breed of pig.
- Pig cum fish culture to be adopted in the feasible areas to increase both fish and pig productivity.
- Commercialization of pig, cattle, goat, duck and poultry rearing.
- Establishment of feed production units in the district.
- Introduction of exotic birds like ostrich, quail and turkey for meat and eggs.





KOHIMA DISTRICT

CHAPTER 6 | DISTRICT PROFILE

Kohima the State capital is one of the oldest districts of Nagaland. The total geographical area is 1595 sq kms. with an altitude ranging from 600m-3048 m MSL. Agriculture is the livelihood for the majority of the population which numbers 3,14,366. The main practice of agriculture is wet rice terrace cultivation and Jhum. The main crops of the district are rice, maize, potato, assorted vegetables, chilly, with fruits like papaya, passion fruit, guava and other temperate fruits. The cultivation practice is organic by default.

Agro-ecological Situation of the District:

Kohima district can be divided into two broad categories depending upon agro-ecological conditions.

AES-2 (Mid Hill) Altitude from 600 - 1500 m MSL.

AES-3 (High Hill) Altitude from 1500 m - 3048 m MSL.

Paddy, maize, ginger, chillies, tomato, colocasia, banana, vegetables, piggery and poultry are some common agricultural activities in Agro ecosystem-II.

In Agro ecosystem-III the major agricultural activities are paddy, maize, potato, temperate fruits, floriculture and forestry.

FARMING ORGANIZATION AT KOHIMA:

Nos. of farmers organization	Name	Activities	Resource obtained from
1	Angami Farmers Association	Welfare awareness and motivational activities.	Self and Govt. Department

FARM MACHINERIES AT KOHIMA:

Sl . No.	Farm machineries	Number
1	Power tiller	179
2	Water pump	23
3	Sprayer	800

Status of Agriculture and Horticulture in Kohima

People commonly practise and engage traditional methodologies or Jhum for cultivation of rice and other cereals. Modern technologies of agriculture such as improved seed, application of fertilizers, modern plant protection methods are of limited use or totally absent. There is minimum use of agro-chemical in crop production, which in turn gives the advantage of going for organic farming. Throughout the world organic products are appreciated and in great demand.

The agro climatic condition of the district is favourable for growing various types of fruits, vegetables and many sub- tropical to temperate crops such as strawberry, passion fruit, cabbage, squash and a wide range of flowers.

AGRICULTURE STATISTICS OF KOHIMA:

Sl. No	Name of crops	Area covered (Ha)	Production (in MT)	Productivity (qtls./ha)
1	Paddy (Jhum & TRC)	29311	52760	18
2	Maize	4020	6834	17
3	Mustard	1200	960	8
4	Other oilseeds	1472	1030	7

Production systems in Agricultural crops in Kohima:

1. Cereal production system-

Paddy –

Two types of production systems given below are followed by the farmers for paddy production.

- Jhum cultivation of traditional varieties in rain-fed condition on hill slopes.
- Terrace Rice culture (TRC) of traditional varieties and HYV in both rain-fed and irrigated conditions on hill slopes



Terrace Paddy cultivation

Maize - It is extensively cultivated as a mixed crop in Jhum cultivation under rain-fed condition and also as monocrop in settled cultivation on hill slopes.

Millet - Millets are cultivated as mixed crop in Jhum cultivation under rain-fed condition.

2. Pulse production system-

Kholar (rajmah), field beans (Naga dal), soybean are the predominant pulses in the district. The pulses are generally cultivated as a mixed crop in Jhum or in patches of settled cultivation.

3.Oilseed production system-

Sesamum, mustard, soybean are the oilseed crop grown in Jhum as well as settled cultivation under rain-fed condition.



Mustard



Rice grains



HORTICULTURE STATISTICS OF KOHIMA

Sl. No.	Name of crops	Area (ha)	Production (MT)	Productivity (Qtl. Per ha.)
Vegetables:				
1	Colocasia	90	855	95
2	Cabbage	105	263	25
3	Cauliflower	50	18	15
4	Brinjal	50	70	28
5	Chilly	400	300	7.5
6	Pea	110	121	11.17
7	Beans	300	180	6.8
8	Bhindi	50	100	20
9	Squash	425	1275	30
10	Others	925		
Spices :				
1	Ginger	400	6000	150
2	Cardamom	102	1825.5	0.5
3	Turmeric	80	3280	400
Fruits :				
1	Orange	510	700	23
2	Lemon	60	150	25
3	Pear	20	40	20
4	Plum	40	80	20
5	Apple	10	50	50
6	Banana	600	6000	200
7	Others	300	-	-
8	Passion fruit	150	40	0.27
9	Jack fruit	10	35	30
10	Pineapple	450	900	20



Squash harvest



Locally grown garlic



Production systems in Horticultural crops in Kohima:

1. **Fruits**- fruits like pineapple, citrus, banana, passion fruit and others are grown on the hill slopes.
2. **Vegetables**- vegetable like cole crops, leafy vegetables,tree tomato, sweet potatoes, cucurbitaceous vegetables, colocasia are grown in hill slopes and terraces.
3. **Commercial crops**- commercial crops like potato, king chilly and cabbage are extensively grown under rain-fed condition in terraces and hill slopes.



Potato cultivation in Kohima district

SWOT ANALYSIS OF AGRICULTURE SECTOR IN KOHIMA

Strength • Favorable agro climatic condition. • Knowledge of agricultural practices. • Fertile soil. • Less use of agro-chemicals. • Varied ecological zones. • Presence of KVK in the district.	Weakness • Fragmented land holding. • Lack of irrigation facilities. • Non availability of quality seed. • Reluctance to adopt modern technology by the farmers. • Large mono cropped area. • Financial constrains. • Steep hilly terrain. • Poor marketing infrastructure.
Opportunity • Easy transportation to the nearby districts. • High demand in the neighbouring States.	Threat • Tendency of farmers shifting to other occupation from agriculture. • Pest and diseases. • Soil erosion.



SWOT ANALYSIS OF HORTICULTURE SECTOR IN KOHIMA

Strength - Favorable agro climatic condition. - Land fertile and suitable for various horticultural crops. - Available land for cultivation. - Varied agro-climatic condition suitable for cultivation of different crops. - Scope for attracting educated youth towards cultivation.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Low capital investment. - Lack of irrigation facilities. - Lack of communication facilities with rest of the country.
Opportunity - Scope for development of communication infrastructure. - Organic vegetables and fruits cultivation can be undertaken. - Scope for establishment of processing industry.	Threat - Ecological imbalance due to shifting cultivation. - Unstable market price. - Tendency of farmers shifting to other occupations. - Soil fertility degradation.

Focus area for development of Agriculture and Horticulture sector in Kohima.

- Quality seed production of agricultural crops.
- Promote establishment of nurseries and tissue culture laboratory for horticultural crops.
- Increase the number of input dealers so that farmers get information at their doorsteps.
- Establishment of markets and agri-corridors to transport the produce from the sites of production.
- Development of water harvest structures to tap rain water and optimize its utilization.
- Soil conservation measures to prevent soil erosion and soil fertility degradations.
- Development of hill slopes for settled cultivation of horticultural crops in traditional Jhum area.



Plum harvest



Local Banana



TECHNOLOGICAL INTERVENTIONS FOR AGRICULTURE IN KOHIMA

Sl. No	Crop	Problems	intervention
1	Paddy	Use of traditional varieties	Use of high yielding varieties of seed where there is assured irrigation. Improved varieties may be obtained from local varieties through selection. Exploration of HYV suitable for Jhum area and other rain-fed paddy area
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermi compost. Popularization of INM
		Pest and diseases	Use of bio pesticides and bio control agents Adoption of IPM
2	Maize	Use of local varieties	Use of high yielding composite and hybrid varieties.
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermi compost. Popularization of INM
		Pests and diseases	Adoption of IPM
		No post harvest management and value addition	Maize sheller to be provided to the farmer for shelling of maize. Establishment of poultry and cattle feed production units.
3	Pulses	Less area coverage under pulses	Expansion of area under pulse
		Low yield	Use of HYV. Adoption of proper package of practices
		Lack of post harvest management and machinery for field beans (Naga dal), soya bean, sessamum processing	Awareness campaign on stored grain pest management. Installation of pulse processor in pulse growing areas



4	Oilseeds	Less area coverage under oilseeds	Expansion of area under oilseeds
		Low yield	Adoption of proper package of practices
		Lack of post harvest management and machinery for oil expulsion	Installation of oil expellers in oilseed growing areas

TECHNOLOGICAL INTERVENTIONS FOR HORTICULTURE SECTOR IN KOHIMA

Sl. No	Crop	Problems	Intervention
1	Fruits	Non availability of quality planting materials	Creation of scion bank for production of quality planting materials. Arrangement for collecting planting materials from authentic sources. Establishment of Plant Tissue Culture laboratory
		Pests & Diseases	Use of resistant varieties. Bio-control measures. IPM
		Non availability of processing plants	Encourage establishment of small scale processing units
		Marketing of Commodities	Construction of all weather rural roads for transportation of farm produce. Establishment of markets with all modern amenities so that farmers can get buyers for their produces.
2	Vegetables and Potato	Pest and diseases	Bio-pesticides. Bio-control agents. IPM
		Marketing and Storage	Cold storage. Proper planning to avoid market glut through CIGs. Establishment of markets with all modern amenities so that farmers can get buyers for their produces.
3	Spices	Processing and Marketing	Establishment of processing units. Export promotion in collaboration with APEDA and corporate sectors.

STATUS OF ANIMAL HUSBANDRY AND DAIRY IN KOHIMA

Livestock and poultry population of Kohima as per 2003 Census is as given below

Cattle	Buffolo	Mithun	Sheep	Goat	Rabbit	Pig	Duck	Fowl
34940	1492	5689	558	6766	3747	33844	11475	224123

Source: Directorate of Vety. & AH, Nagaland.

ANIMAL PRODUCTION SYSTEM OF KOHIMA:

Cattle and Goat Production System:

Free grazing of cattle and goat is mostly followed by the farmers except during paddy cultivation period. Stall fed system also followed by a few farmers.

Poultry Production System:

Mostly backyard poultry rearing is followed by the farmer. But some organized poultry rearing system is also found.

Pig production system:

In general, Pigs are reared in free grazing system. Stall fed system with kitchen waste and locally available feeds like colocasia, rice polish and wheat bran are also practiced. Veterinary department is providing animal health care by organising camps and training among the farmers.

SWOT Analysis of Animal Husbandry and Dairy Sector in Kohima

Strength	Weakness
• High demand in domestic market. • Less space required. • Enough space for grazing. • Farmers adapted to mixed farming practices. • Locally available fodder and feed. • Indigenous knowhow of animal and poultry rearing.	• Low investment in the sector. • Lack of improve breed. • Inadequate animal and poultry health care. • Secondary source of income. • Lack of scientific processing and market facilities. • High terrain and remoteness.



Opportunity	Threat
• Scope for breed improvement of milch, animal and poultry for high yielding meat • Scope for employment generation.	• Animal and poultry diseases. • Decline in natural resources.

Focus area for development of Animal husbandry and Dairy sector in Kohima

1. Improved breed of livestock and poultry to be made available to the farmer.
2. Promotion of nutritious fodder cultivation and feed production for livestock
3. Financial assistance made accessible to farmers for commercialization.
4. Animal health care facilities and trainings should be available.
5. Establishment of hygienic slaughter house and milk processing units
6. Communication facilities should be set up.

TECHNOLOGY INTERVENTION IN ANIMAL HUSBANDRY AND DAIRY SECTOR IN KOHIMA

Sl No.	Animals/ birds	Problem	Intervention
1	Cattle	Diseases Low productivity Lack of commercial cattle farming Non availability of quality fodder & feed	Training on health care of cattle Vaccination Breed improvement Establishment of commercial dairy farms Cultivation of quality fodder
2	Pig	Diseases Low productivity Lack of commercial approach in pig rearing	Vaccination Introduction of high meat yielding breed Establishment of commercial piggery
3	Poultry	Diseases Low productivity Non availability of quality feed	Vaccination Training on health management of poultry Improved layers and broiler birds Establishment of small scale maize based poultry feed units

STATUS OF FISHERY SECTOR IN KOHIMA

Fish production system:

Fisheries are a minor sector of economic development for the farmer of Kohima. The common fish cultures practised are in ponds, low lying areas, and paddy cum fish culture. Productivity of fish in higher altitude is 300 kg. per ha. whereas in the foot hills it is at 1805 kg. per ha. The average per capita fish consumption is 3.1 kg.

FISH PRODUCTION OF KOHIMA DISTRICT AND QUANTITY IMPORTED FROM OUTSIDE:

Particulars	Quantity
Fish production per annum	175 MT
Total fish imported per annum	600 MT
Total fish available	775 MT
Average per capita fish consumption *as per 2001 census.	3.1 kg.
Average per capita shortfall as per WHO standard.	7.9 kg.
Additional requirement	1975 MT

FISHERIES STATISTICS OF KOHIMA DISTRICT:

Sl.No	Name of the District	Ponds/Tanks			Paddy-cum-Fish culture		
		Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)	Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)
1	Kohima	2670.0	121.0	2549.0	8050.0	935.0	7115.0



Traditional Paddy cum Fish culture



SWOT ANALYSIS OF FISHERY SECTOR- KOHIMA

Strength • Demand in the domestic market. • Comparatively low financial involvement. • Area available for paddy cum fish culture • Local production of fish seed.	Weakness • Lack of awareness of integrated and composite farming. • Dependent on migrant labour. • Soil and water acidic in nature. • Lesser growth period for fish
Opportunity • Scope for introduction of paddy cum fish culture. • Demand in other districts.	Threat • Fish disease • Uncertainty of labour.

Focus area for development of Fishery sector in Kohima

1. Training on integrated fish farming.
2. Introduction of paddy cum fish culture in valley areas.
3. Large scale production of fish fingerlings made available to the farmer at the appropriate time.
4. Training on soil and water amendment measures to reduce water acidity and fish diseases.

TECHNOLOGY INTERVENTION FOR FISHERY SECTOR IN KOHIMA

Problem	Intervention
Low productivity Non application of feed supplements Lack of proper disease management Lesser available area for expansion of fisheries	Quality fish seed Feed & disease management Paddy cum fish culture/ composite farming.

Status of Forestry sector in Kohima:

Until 1990 the forest sector was the highest revenue earner. As a result of deforestation various conservation programmes are taken up to regenerate the forest cover. Today, Kohima has a good record of forest management helped by the community participation in conservation, afforestation programmes and cultivation of agro forestry. This is a positive sign for conservation of the biodiversity in the district.

FOREST AREA AT KOHIMA

Quick growing species Area (in ha)	Area under forestry (ha)		
	Very Dense forest	Moderate Dense forest	Open Forest
1550	285	921	1659

SWOT Analysis of Forest Sector

Strength • Favourable agro-climatic conditions for cultivation of forest species. • Slopes can be converted to forest	Weakness • Firewood collection depletes the forest. • New plantation in cultivable areas.
Opportunities • Fast growing species can be grown in Jhum cultivation areas to meet the requirement for fuel. • Afforestation on soil erosion prone areas and wastelands with proper technology.	Threats • Jhum cultivation • Degradation of soil



Forest cover



PROJECTED HUMAN POPULATION AND FOOD REQUIREMENT OF KOHIMA DISTRICT

Adoption of technology to meet food requirement in Kohima district

PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS:

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)									
			2015					2020				
	Area	Prod.	Prod- tivity	Area	Prod.	Prod- tivity	Area	Prod.	Prod- tivity	Area	Prod.	Prod- tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	30783	43096	1.4	31706	55486	1.75	32658	70867	2.17	33637	82412	2.45
Requirement		49286			54403			61552			69641	
Surplus(+)		-6190			1083			9315			12771	
Deficit (-)												

Action to be taken to meet the food requirement by 2025 :

- Increase the area of cereal crops (3% ➔ 3% ➔ 3%)
- Replacement by HYV / hybrid by (20% ➔ 40% ➔ 60%)
- Promotion of IPM for pest and disease management during cultivation.
- Increase irrigation potentiality to cultivate summer paddy.
- Utilization of modern technology in paddy cultivation such as SRI (5% ➔ 10% ➔ 15%.)
- Inputs like improved seed, fertilizer, agro-chemicals made accessible to the farmers.
- Reduction in post harvest losses by constructing rural warehouses
- Offering Minimum Support Price to the farmers.

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN KOHIMA DISTRICT

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of Pulses									
			2015					2020				
	Area	Prod.	Prod- tivity	Area	Prod.	Prod- tivity	Area	Prod.	Prod- tivity	Area	Prod.	Prod- tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Pulses	3039	3039	1	3343	4011	1.2	3577	4650	1.3	3827	5741	1.5
Requirement		2957			3264			3693			4178	
Surplus(+)		82			747			957			1563	
Deficit (-)												

Action to be taken to meet the requirement by 2025

- Introduction of rabi pulse after paddy, area expansion through intensification (10% ➔ 7% ➔ 7%)
- Use of bio-fertilizer
- Encourage pulse based food processing industries at cottage level.





PROJECTED REQUIREMENT AND PRODUCTION OF OILSEED CROPS IN KOHIMA DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
			Prod.	2015			2020		
	Area	Prod.		Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Oil seed	5220	4333	0.83	5742	7178	1.25	6316	8211	1.3
Oil (35%)		1516			2512			2874	
Requirement		2957			3264			3693	
Surplus(+)		-1441			-752			-819	
								9727	1.4
								3404	
								4178	
								-774	

Action to be taken to meet the requirement by 2025:

Area expansion by introduction of rabi oil seed after paddy (10% ➡ 10% ➡ 10%)

Cultivation under irrigation.

Application of bio- fertilizers

Encourage oil seed based processing industries at village level.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN KOHIMA DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Vegetables					
			Prod.	2015			2020		
	Area	Prod.		Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Vegetables	2545	8907.5	3.5	2723	12254	4.5	2914	16026	5.5
Require-ment		14786			16321			18466	
Surplus(+)		-5879			-4067			-2440	
Deficit (-)								932	
								21824	7
								20892	

Action to be taken to meet the requirement by 2025:

Area expansion of vegetables. (7% ➡ 7% ➡ 7%)

Introduction of hybrid vegetables.

Establish cold storage to minimize post-harvest loss.

Streamlining marketing through SHGs or CIGs.

Establish Agro-Export Zones for export of spices like Naga king chilli, ginger, turmeric, medicinal and aromatic crops.

Cultivation of summer potato.

Cultivation of summer and off season vegetable.

Major thrust given to large cardamom cultivation.

Distribution of refrigerated vehicles to minimize loss during transportation of perishable vegetables.





PROJECTED REQUIREMENT AND PRODUCTION OF FRUIT CROPS IN KOHIMA DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit								
				2015			2020			2025		
	Area	Prod.	Produc- tivity	Area	Prod.	Produc- tivity	Area	Prod.	Produc- tivity	Area	Prod.	Produc- tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Fruit	3430	12005	3.5	3670	16515	4.5	3927	21599	5.5	4123	26802	6.5
Requirement		14786			16321			18466			20892	
Surplus(+)		-2781			194			3133			5910	
Deficit (-)												

Action to be taken to meet the requirement by 2025 :

- Area expansion 7% ➡ 7% ➡ 5%
- Application of fertilizer.
- Adoption of PP measures
- Use of sprinkler and drip irrigation
- Rejuvenation of old orchards.
- Introduction of high value fruits.
- Establishment of processing industries.
- Distribution of refrigerated vehicle to minimize loss during transportation of perishable fruits.
- Establish export markets and linkage.
- Development of fruit processing industries.
- Construction of cold storage.

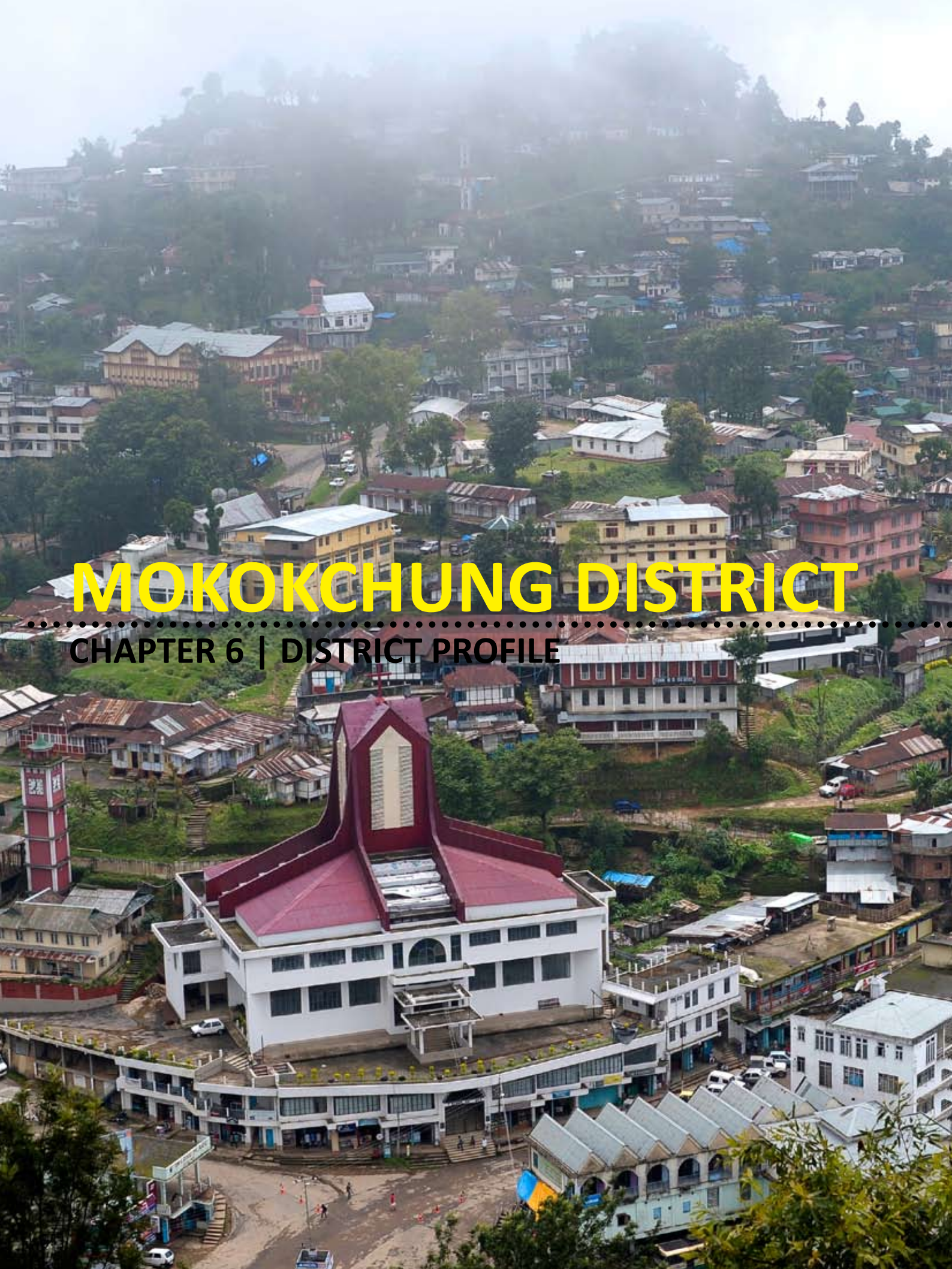
PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN KOHIMA DISTRICT

	2011	2015	2020	2025
Projected population	270063	298099	337272	381592
Production'000 MT	13.8	19.32	27.05	37.90
Requirement '000 MT	11.34	12.51	14.16	21.88
Surplus/Deficit(+/-)	(+)2.46	(+)6.81	(+)12.89	(+)16.02

Action to be taken to meet the requirement by 2025: V

- Improved breed of animals to be reared for getting optimum yield.
- Proper animal health care.
- Proper feed and fodder supply.





MOKOKCHUNG DISTRICT

CHAPTER 6 | DISTRICT PROFILE

Mokokchung district lies between 93° 53' and 94° 53' East longitude and 25° 56' and 27° 40' North latitude. The altitude ranges from 150 m - 1650 m MSL. It covers a geographical area of 1615 sq km. and shares boundaries with Assam in the north, Tuensang district in the east, Zunheboto district in the south and Wokha district and Assam in the west. The majority of the population consists of the Ao Naga tribe, who depend on agriculture for their livelihood and practice traditional methods of farming like Jhum.

Mokokchung district is endowed with varying natural conditions for farming of agricultural crops and rearing of livestock. The main crops are paddy, maize, tapioca, rice-bean. An increasing number of farmers are also engaging in fishery, dairy, poultry and tea production.

AGRO-ECOLOGICAL SITUATION

Three Agro-ecological situations prevailing in the district are as follows:

- AES 1- Plains below 400 m MSL
- AES 2- Mid-hill from 400 - 1200 m MSL
- AES 3- Above 1200 m MSL

AGRICULTURE MARKETING SYSTEM

Marketing of agricultural commodities are mainly done through the local weekly markets. Government has taken initiatives to market agricultural commodities in an organised way through the District APMC.

NUMBER AND NAMES OF FARMERS ORGANIZATION AT MOKOKCHUNG

Nos. of farmers organization	Name	Activities	Resource obtained from
1	Mkg. District Farmer Federation	Agricultural activities.	Self resources
2	Passion Fruit Association	Passion fruit cultivation	Self resources

FARM MACHINERIES AT MOKOKCHUNG

Sl. No.	Farm Machineries	Number
1	Power tiller	28
2	Water pump	56
3	Sprayer	637
4	Tractor	11
5	Sprinkler	10
6	Drip Irrigation	3

Agricultural and Horticultural system

Jhum and terrace cultivation are practiced in the district and rice is the staple food. Cultivation of mixed crop in Jhum is practiced. Modern technologies of agriculture such as improved seed, application of fertilizers, modern plant protection methods are in limited use. This minimum usage of agro-chemical in crop production has an advantage of acceding to organic farming.

The varied agro climatic condition of the district is favourable for growing various types of fruits, vegetables, flowers and many other sub- tropical to temperate crops.

AGRICULTURE STATISTICS OF MOKOKCHUNG

Sl. No	Name of crops	Area covered	Production (in MT)	Productivity in qtls.
1	Paddy (Jhum & TRC)	15320	27576	18
2	Maize	1057	1797	17
3	Mustard	2700	1647	6.1
4	Ground nut	210	252	12
7	Arahar	48	39	8.2
8	Moong	24	22	9.1
9	Pea	246	380	15.5
10	Lentil	574	69	1.2
11	Rice bean / Naga dal	202	268	13.3
12	Beans	30	66	22
13	Rajmah	95	179	18.9
14	Gram	40	28	7.1
15	Sugarcane	120	578	48.16
16	Tapioca	78	1040	133

HORTICULTURE STATISTICS OF MOKOKCHUNG

Sl.No.	Name of crops	Area (ha)	Production (MT)	Productivity (Qtl.Per ha.)
Vegetables:				
1	Colocasia	60	882	147.0
2	Sweet potato	43	460	107.0
3	Tomato	50	2350	470.0
4	Potato	68	1040	153.0
Spices :				
1	Ginger	80	500	62.5
2	Chilly	300	180	42.8
Fruits :				
1	Citrus	1330	4229	31.8
2	Litchi	80	21	2.6
3	Pear	16	409	255.9
4	Areca nut	44	70	16.0
5	Papaya	21	363	172.7
6	Banana	270	4563	169.0
7	Guava	9	37	41.6
8	Passion fruit	908	173	1.9
9	Mango	8	26	32.2
10	Pineapple	900	1026	11.4



Packaged oranges for sale



SWOT ANALYSIS OF AGRICULTURE SECTOR MOKOKCHUNG

Strength - Favorable agro climatic condition. - Knowledge of agricultural practices. - Availability of land for cultivation of diversified crops. - Limited use of agro-chemicals. - Presence of KVK.	Weakness - Hill terrain. - Lack of irrigation facilities. - Non availability of quality seed. - Reluctance to adopt modern technology by the farmers. - Lack of knowledge in modern plant protection techniques. - Financial constrains. - Poor marketing infrastructure.
Opportunity - Increase in area under double cropping. - Inter-state marketing.	Threat - Outbreak of wild fire during practice of Jhum cultivation. - Pest and diseases. - Soil erosion.



Tree tomato

SWOT ANALYSIS OF HORTICULTURE SECTOR: MOKOKCHUNG

Strength - Favorable agro climatic condition. - Fertile land suitable for various horticultural crops. - Available land for cultivation. - District has a wide range of indigenous food having a good market potential. - Availability of family labour. - Scope for attracting educated youth towards cultivation.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Poor transport and communication facilities.
Opportunity. - Scope for developing inter-state market. - Quality planting materials can be sourced from nearby states	Threat - Unstable market price. - Farmers shifting to other occupation. - Soil fertility degradation.

Focus area for development of Agriculture and Horticulture sector in Mokokchung

- Soil conservation measures to prevent soil erosions and soil fertility degradations.
- Establishment of nurseries and tissue culture laboratory for horticultural crops.
- Development of hill slopes for settled cultivation of horticultural crops in traditional Jhum area.
- Increasing the number of input dealers so that farmers get the access to information
- Establishment of market and agri-corridor to the market from the production site.
- Quality seed production of agricultural crops.
- Development of water harvest structures to tap rain water for optimum utilization of natural water resources.



Cucumber



Litchi

TECHNOLOGICAL INTERVENTIONS OF AGRICULTURE IN MOKOKCHUNG

Sl. No	Crop	Problems	Intervention
1	Paddy	Use of traditional varieties	Use of high yielding varieties of seed where there is assured irrigation. Improved varieties may be obtained from local varieties through selection. Exploration of HYV suitable for Jhum area and other rain-fed paddy area
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermi compost. Promotion of INM
		Pests and diseases	Use of bio pesticides and bio control agents Adoption of IPM
2	Maize	Use of local varieties	Use of high yielding composite and hybrid varieties.
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermi compost. Popularization of INM
		Pests and diseases	Adoption of IPM
		No post harvest management and value addition	Maize sheller to be provided to the farmer for shelling of maize. Establishment of poultry and cattle feed production units.
3	Pulses	Less area coverage under pulses	Expansion of area under pulse
		Low yield	Use of HYV. Adoption of proper package of practices
		Lack of post harvest management and machinery for dal processing	Awareness campaign on stored grain pest management. Installation of pulse processor in pulse growing areas
4	Oilseeds	Limited area coverage under oilseeds	Expansion of area under oilseeds
		Low yield	Adoption of proper package of practices
		Lack of post harvest management and machinery for oil expulsion	Installation of oil expellers in oilseed growing areas

TECHNOLOGICAL INTERVENTIONS FOR HORTICULTURE SECTOR IN MOKOKCHUNG

Sl. No	Crop	Problems	Intervention
1	Fruits	Non availability of quality planting materials	Creation of scion bank for production of quality planting materials. Arrangement for collecting planting materials from authentic sources. Establishment of Plant Tissue Culture laboratory
		Pests & Diseases	Use of resistant varieties. Bio-control measures. IPM
		Non availability of processing plants	Encourage establishment of small scale processing units
		Marketing of Commodities	Construction of all weather rural road for easy transportation of farm produce. Establishment of market with all modern amenities so that farmers can get buyer for their produces.
2	Vegetables and Potato	Pest and diseases	Bio-pesticides. Bio-control agents. IPM
		Marketing and Storage	Cold Storage. Proper planning to avoid market glut through CIGs. Establishment of market with all modern amenities so that farmers can get buyer for their produces.
3	Spices	Processing and Marketing	Establishment of processing units. Export promotion in collaboration with APEDA and Agro Corporate sectors.



ANIMAL PRODUCTION SYSTEM OF MOKOKCHUNG

Cattle and Goat Production System

Free grazing of cattle and goat is followed by the farmers except during the period of paddy cultivation. Goat rearing is restricted to a few villages in the district. Today, with many villages enacting laws banning open grazing there is a setback in large scale cattle and goat rearing in the district. Presently, a few farmers follow stall fed systems. On the whole, mutton is a less preferred meat by the people.

Poultry Production System

Backyard poultry rearing is practiced by the farmer but some organized poultry rearing systems are also prevalent.

Pig Production System

At one time pigs were reared as free grazing system but not anymore. Pigs are now reared in stall fed system with kitchen waste and locally available feeds like colocasia, rice polish and wheat bran. Veterinary Department is providing animal health care by organising camps and training among the farmers. Pork is a popular meat having a general preference over others in the state. Therefore, pig rearing should be encouraged.

LIVESTOCK AND POULTRY POPULATION OF MOKOKCHUNG AS PER 2003 CENSUS

Cattle	Buffalo	Goat	Rabit	Pig	Duck	Fowl
31155	1165	7626	1980	63074	8171	315887

Source : Directorate of Vety / AH, Nagaland.

TOTAL PRODUCTION OF MEAT, MILK AND EGGS IN MOKOKCHUNG DISTRICT

Meat in '000 tons	Milk in Kltrs	Egg 'lakh in nos
8.21	5.5	113.44

Source: Integrated sample survey, 2007-08, Directorate of Vety and AH, Nagalnd.

SWOT ANALYSIS OF ANIMAL HUSBANDRY AND DAIRY SECTOR : MOKOKCHUNG

Strength • High demand in domestic market. • Less space required. • Abundant space for grazing. • Use of family labour. • Locally available fodder and feed. • Disease resistant local breed.	Weakness • Low investment in the sector. • Lack of improved breed. • Inadequate animal and poultry health care. • Lack of feed processing plants. • Secondary source of income. • Lack of scientific processing and market facilities.
Opportunity • Scope for breed improvement of milch, animal and poultry for meat. • Scope for integrated farming. • Scope for employment generation.	Threat • Animal and poultry diseases. • Decline in natural resources.



Stall fed pig rearing

TECHNOLOGY INTERVENTION IN ANIMAL HUSBANDRY AND DAIRY SECTOR IN MOKOKCHUNG

Sl No.	Animals/ birds	Problem	Intervention
1	Cattle	Diseases Low productivity Lack of commercial cattle farming Non availability of quality fodder & feed	Training on health care of cattle Vaccination Breed improvement Establishment of commercial dairy farms Cultivation of quality fodder
2	Pig	Diseases Low productivity Lack of commercial approach in pig rearing	Vaccination Introduction of high meat yielding breed Establishment of commercial piggery
3	Poultry	Diseases Low productivity Non availability of quality feed	Vaccination Training on health management of poultry Improved layers and broiler birds Establishment of small scale maize based poultry feed units

Fish production system in Mokokchung

Fish is a major food item but its production in the district is at a nascent stage. Per capita availability of fish in the district is 3.2 kg. per head. The total fish production of the district is 389 MT.

FISHERIES STATISTICS OF MOKOKCHUNG DISTRICT

Name of the District	Ponds/Tanks			Paddy-cum-Fish culture		
	Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)	Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)
Mokokchung	2700.0	214.0	2486.0	6000.0	25.0	5975.0

Number of fish seed	Production (Kg)	Productivity (Kg/ha)
1283700	129000	5558.66

FORESTRY SECTOR IN MOKOKCHUNG:

In Mokokchung District, the forest cover found along the foot hills bordering Assam comes under Northern Tropical Semi Evergreen Forest. The rest of the district at a higher altitude is covered with Northern Sub-Tropical Broad Leaved Wet Hill Forest. Several pockets of social forestry has been undertaken by communities and individuals in the district.

STATUS OF FOREST AREA AT MOKOKCHUNG

Species of trees	Area covered (in ha)	Area under forestry (ha)		
		New	5 – 10 years old	More than 10 years
Fast growing species	2400	1350	740	310

SWOT ANALYSIS OF FORESTRY SECTOR: MOKOKCHUNG

Strength - Favorable agro climatic condition. - Rich in bio diversities. - Forest plant does not require much attention. - Vast waste land can be brought under forest plant.	Weakness - Deforestation to meet the requirement of fire wood. - Crop area brought under forest plantation. - Jhum cultivation.
Opportunities - High demand as fire wood and timber. - Scope for development of eco tourism. - Potentiality of diverse bamboo species. - Effective in reducing Jhum cycle.	Threats - Jhum cultivation. - Wild fire. - Unauthorized destruction of forest. - Landslides





PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)					
				2015			2020		
	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity
Cereals	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
	16377	22928	1.4	17196	30093	1.75	18056	39181	2.17
Requirement		35254			38914			44027	
Surplus(+)		-12326			-8821			-4846	
Deficit (-)								-3365	

Action to be taken to meet the food requirement by 2025

1. Expansion of area under cereal crops. (5% ➡ 5% ➡ 5%)
2. Replacement of traditional varieties by HYV / Hybrid / Composite (20% 30% 40% of existing area)
3. Promotion of INM
4. Promotion of IPM during cultivation.
5. Reduction in post harvest losses by constructing rural warehouses.
6. Minimum support price to the farmers.
7. Increased irrigation systems to cultivate summer paddy.
8. Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
9. Easy availability of improved seed, fertilizer, agro-chemicals to the farmer.



PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN MOKOKCHUNG DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Pulses					
				2015			2020		
	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity
Pulses	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
	1259	1259	1	1385	1662	1.2	1482	2075	1.4
Requirement		2115			2335			2642	
Surplus(+)		-856			-673			-567	
Deficit (-)								-452	

Action to be taken to meet the requirement by 2025

- Area expansion by introducing rabi pulse after paddy in plains. (10% ➡ 7% ➡ 7%)
- Seed replacement by HYV & selected variety (10% ➡ 20% ➡ 30%)
- Extensive use of Bio-fertilizer (Rhizobium).
- Encouraging pulse based food processing industries at cottage level.



PROJECTED REQUIREMENT AND PRODUCTION OF OILSEED CROPS IN MOKOKCHUNG DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Oil seed	4910	4075	0.83	5401	6481	1.2	5941	7426	1.25
Oil(35%)		1426			2268			2599	
Requirement		2115			2335			2642	
Surplus(+)		-689			-67			-43	
Deficit (-)								-15	

Action to be taken to meet the requirement by 2025

- Area expansion by (10% ➔ 10% ➔ 10%)
- Introduction of rabi oil seed after paddy.
- Use of bio-fertilizer.
- Cultivation of pulses in Jhum area after harvest.
- Encourage oil seed based processing industries at village level.



PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN MOKOKCHUNG DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of vegetables					
	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity	Area	Prod.	Produc-tivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Vegetables	1910	6685	3.5	2044	9196.7	4.5	2187	12027	5.5
Requirement		10576			11674			13208	
Surplus(+)		-3891			-2477			-1181	
Deficit (-)								265	

Action to be taken to meet the requirement by 2025

- Area expansion of vegetables (7% ➔ 7% ➔ 5%)
- Establish cold storage to minimize post harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-export Zones for export of spices like Naga King chilli, ginger, turmeric and medicinal and aromatic crops.
- Cultivation of summer potato.
- Cultivation of summer vegetable for export to other States.
- Major thrust to be given on large cardamom plantation

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1. Area expansion (7% $\rightarrow$ 7% $\rightarrow$ 7%)

9. Distribution of refrigerated vehicles to minimize loss during transportation of perishable fruits.

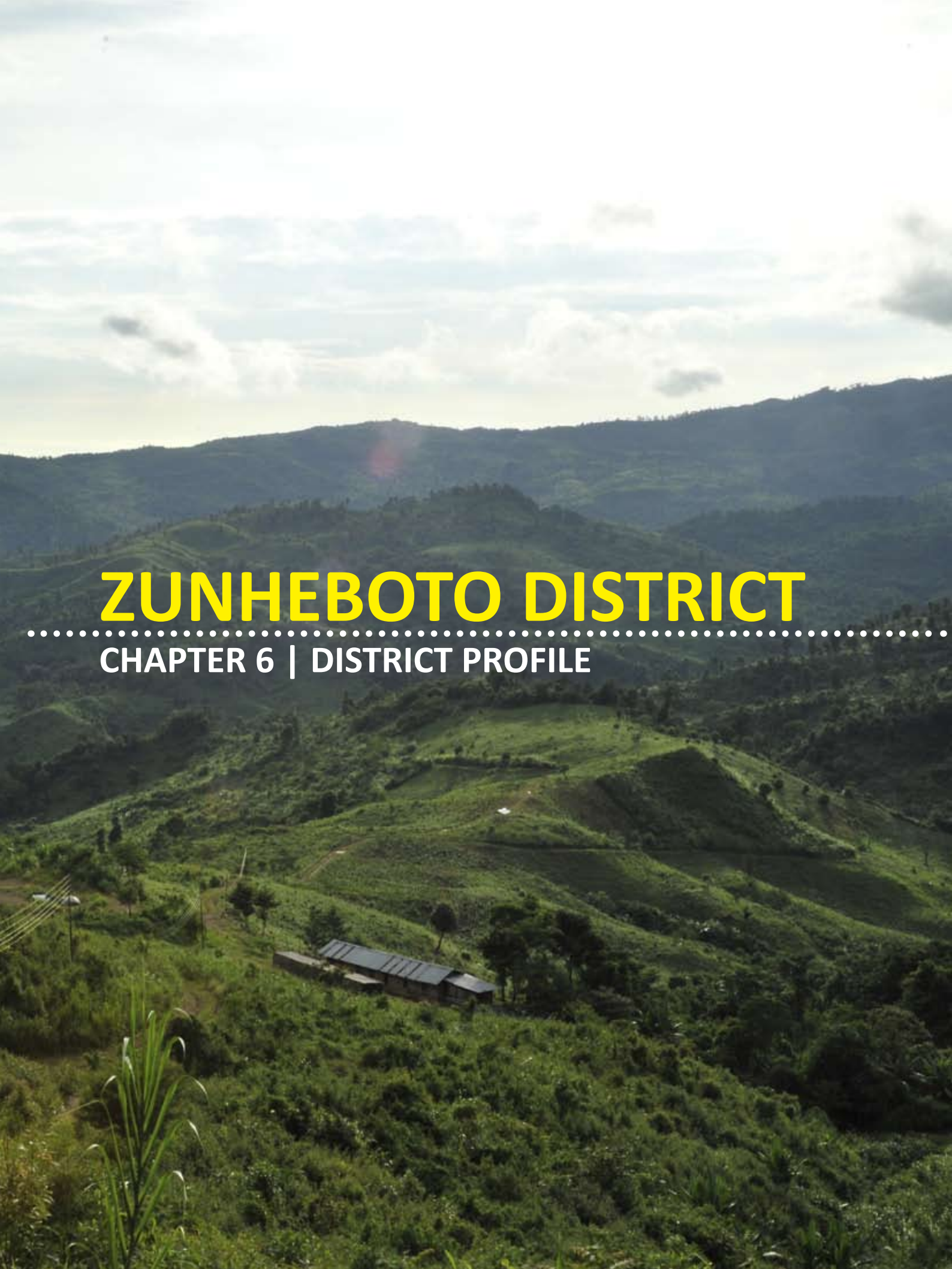
	2011	2015	2020	2025
Projected population	193171	213225	241244	272946
Production'000 MT	9.87	13.82	19.35	27.09
Requirement '000 MT	8.02	8.95	10.13	11.46
Surplus/Deficit (+/-)	(+)1.85	(+)4.87	(+)9.22	(+)15.63

Introduce programmes for improvement of livestock breed for optimum yield.

Awareness programme for proper animal health care.

Establishment of quality cattle feed production.

Extensive fodder cultivation



ZUNHEBOTO DISTRICT

CHAPTER 6 | DISTRICT PROFILE

Zunheboto district is home to the Sumi Naga and located between Latitude 26° 13'336"N and Longitude 94° 28'636"E. The District share boundaries with Mokokchung district in the north, Tuensang in the east, Phek in the south and Wokha in the west. It has a total population of 1,59,909 and literacy rate is 69%. The Nagaland University is located in the District at Lumami.

Agro Ecological Situation

There are two Agro Ecological Situations prevailing in the district.

AES-1 altitude ranging from 600-1500m MSL with sub tropical humid climate

AES-2 ranging from 1501m MSL and above with temperate climate.

Agricultural Marketing System

There are several developed markets in the District namely; Super Market and Daily Market at Zunheboto, Daily Market at Akuluto and Daily Market at Suruhuto. The marketing facilities in this district provide a good platform for the producers as well as consumers.

FARM MACHINERIES AT ZUNHEBOTO

Sl . No.	Farm machineries	Number
1	Tractor	3
2	Power triller	7
3	Power Pump	18
4	Drip irrigation	5
5	Sprayer	250

NUMBER OF FARMERS ORGANIZATIONS

Sl No	Name of farmers organization	Activities	Resource obtained from
1	Farmers Club	Agricultural and Allied activities	Department
2	Kiwi Growers Association	Agricultural and Allied activities	Department
3	Passion fruit Growers Association	Agricultural and Allied activities	Department
4	APMC, Zunheboto	Agricultural and Allied activities	Department
5	SHG of bee keeping (32)	Agricultural and Allied activities	Department
6	Multipurpose SHG (10)	Agricultural and Allied activities	Department

Agriculture System of Zunheboto

Agriculture is the main livelihood of the people. Jhum cultivation is the major system of cultivation in Zunheboto. Terrace rice cultivation (TRC) is also popular among the farmers.

Rice is the staple food of the people in the District. Modern technologies of agriculture such as improved seed, application of fertilizers and modern plant protection methods are in limited use. The utilization of farm machinery is restricted mainly due to the steep slopes and hilly terrain. Cultivation of mixed crop in Jhum is practiced. With less usage of agro-chemicals in crop production the advantage of going for organic farming is suitable and viable.

Besides rice, people grow maize, potato, tapioca, oilseed, soya bean, pulses, vegetables and commercial crops.

AGRICULTURAL STATISTICS OF ZUNHEBOTO 2009-10

Sl. No	Name of crops	Area covered (Ha)	Production (MT)	Productivity (Qt /ha)
1	Paddy (Jhum & TRC)	11424	21706	19
2	Maize	7690	13842	18
3	Soyabean	2910	2700	9.28
4	Rajmah	23	23	10
5	Beans	85	59	6.9

6	Pea	631	446	7.1
7	Ground nut	90	90	10
8	Sesemum	620	400	6.45
9	Linseed	900	580	7
10	Sugarcane	650	27300	420
11	Tea	80	160	20
12	Millet	3034	887	2.9
13	Arahar	747	783	10.5
14	Mung	69	45	6.5
15	Nagadal	216	149	6.9
16	Lentil	200	143	7.2
	Gram	100	72	7.2
17	Black gram	31	27	8.8
18	Other pulses	608	428	7
19	Mustard	1480	1040	7



Mixed cropping



HORTICULTURE STATISTICS OF ZUNHEBOTO

Sl. No.	Name of crops	Area (ha)	Production (MT)	Pdroductivity (Qtl.Per ha.)
Vegetables & Spices :				
1	Potato	174	882	50.7
2	Cabbage	30	39	13.1
3	Cauliflower	40	52	13.1
4	Knolkhol	13	30	23.2
5	Tomato	60	79	13.1
6	Brinjal	40	105	26.2
7	Squash	42	275	65.5
8	Chilli	63	42	6.6
9	Pea	23	15	6.6
10	Lady's Finger	14	14	10.0
11	Cucurbits	96	480	50.0
12	Ginger	220	2017	91.7
13	Turmeric	41	215	52.4
14	Cardamom	41	14	3.3
Fruits				
15	Citrus	600	1080	18
16	Banana	400	3040	76
17	Passion fruit	600	1140	19
18	Pineapple	400	2920	73
19	Guava	30	126	42
20	Jackfruit	60	2040	340
21	Kiwi fruit	30	87	29
22	Pear	170	459	27
23	Grapes	40	8	2



Packaged soyabeen



Local chilli



SWOT ANALYSIS OF AGRICULTURE SECTOR: ZUNHEBOTO

Strength • Favorable agro climatic condition. • Traditional knowledge of agricultural practices. • Availability of land for cultivation of diversified crops in different agro climatic zone as per elevation. • Limited use of agro-chemicals. • Availability of local quality germplasm.	Weakness • Low productivity. • Lack of irrigation facilities. • Non availability of quality seed. • Lack of knowledge in modern plant protection techniques. • Financial constrains. • Steep slopes. • Poor marketing infrastructure • Difficulty in mechanization due to hilly terrain
Opportunity • Increase in area under organic cultivation • Scope for crop diversification. • Scope for post harvest management. • Establishment of organic hub. • Scope for converting degraded hill slope under permanent terrace cultivation.	Threat • Pest and diseases. • Soil erosion • Land slides



Kiwi fruit



SWOT ANALYSIS OF HORTICULTURE SECTOR

Strength - Favorable and varied agro climatic conditions suitable for cultivation of wide range of horticultural crops. - Fertile land suitable for various horticultural crops. - Abundant land for cultivation. - Large area can be brought under specialized crops like passion fruit.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Poor transport and communication facilities.
Opportunity - Enhancing productivity through improved cultivation practices. - Scope for intensification and diversification. - Cultivation of organic fruits and vegetables can be undertaken. - Scope for introduction of high value crops. - Scope for establishment of processing industry.	Threat - Unstable market price. - Farmers shifting to other occupation. - Soil fertility degradation.

Focus area for Development of Agriculture and Horticulture Sector

- Quality seed selection of agricultural crops.
- Promotion for establishment of nurseries and tissue culture laboratory for horticultural crops.
- Increasing the numbers of input dealers and inputs made available to farmers at their doorstep.
- Establishment of markets and agri-corridor from the sites of production to the market.
- Development of water harvest structures to tap and ensure optimum utilization of rain water resources.
- Soil conservation measures to prevent soil erosions and soil fertility degradation.
- Development of hill slopes for settled cultivation of horticultural crops in traditional Jhum area.

TECHNOLOGICAL INTERVENTIONS FOR AGRICULTURE

Sl. No	Crop	Problems	Intervention
1	Paddy	Use of traditional varieties	Selection of high yield varieties from local varieties. Experiment of HYV for suitability of Jhum and other rain-fed paddy area
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Promotion of INM
		Pests and diseases	Use of bio pesticides and bio control agents Adoption of IPM
2	Maize	Use of local varieties	Use of composite and hybrid varieties.
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Popularization of INM
		Pests and diseases	Adoption of IPM
		No post harvest management and value addition	Maize sheller to be provided to the farmer for shelling of maize. Establishment of poultry and cattle feed production units.
3	Pulses	Less area coverage under pulses	Expansion of area under pulses
		Low yield	Use of HYV. Rhizobium application
		Lack of post harvest management and machinery for pulse processing	Awareness campaign on stored grain pest management. Installation of pulse processors in pulse growing area
4	Oilseeds	Less area coverage under oilseeds	Expansion of areas under oilseeds
		Low yield	Adoption of proper package of practices
		Lack of post harvest management and machinery for oil expulsion	Installation of oil expellers in oilseed growing areas



TECHNOLOGICAL INTERVENTIONS FOR HORTICULTURE SECTOR IN ZUNHEBOTO

Sl. No	Crop	Problems	Intervention
1	Fruits	Non availability of quality planting materials	Creation of scion bank for production of quality planting materials. Arrangement for collecting planting materials from authentic sources. Establishment of Plant Tissue Culture laboratory
		Pests & Diseases	Use of resistant varieties. Bio-control measures. IPM
		Non availability of processing plants	Encourage establishment of small scale processing units
		Marketing of Commodities	Construction of all weather rural roads for easy transportation of the farm produce. Establishment of markets with all modern amenities so that farmers can get buyers for their produces.
2	Vegetables and Potato	Pest and diseases	Bio-pesticides. Bio-control agents. IPM
		Marketing and Storage	Popularization of zero energy storage structures.. Proper planning to avoid market glut through CIGs. Establishment of market with all modern amenities
3	Spices	Processing and Marketing	Establishment of processing units. Export promotion in collaboration with APEDA and Agro Corporate sectors.

ANIMAL HUSBANDRY AND DAIRY SECTOR IN ZUNHEBOTO

The demand for meat is very high in the district. Though the accurate short fall is not ascertained, imported cattle and pig from other States indicate that the District is deficit in meat production.

LIVESTOCK PRODUCTS IN ZUNHEBOTO DISTRICT

Produce	Total requirement (2008)	Production (MT) (2005-06)	Surplus/Shortfall
Meat '000MT	61.82	54	7.82
Milk Kltrs	155.28	67	88.28
Egg No.in Lakh	169.85	N.A	N.A

Source Report on 2003 Livestock census Directorate of Veterinary & Animal Husbandry, Nagaland.



Stall fed pig rearing

LIVESTOCK AND POULTRY POPULATION OF ZUNHEBOTO :

Cattle	Buffolo	Mithun	Sheep	Pig	Goat	Rabbit	Poultry
50390	169	9028	2556	63014	18937	21	94434

Source: Report on integrated sample survey 2005-06, Directorate of Veterinary & Animal Husbandry, Nagaland.

MILK YIELD FROM ANIMALS

Type of animal	Milk yield (litres/day)
Cross bred cattle	5-7
Indigenous cattle	0.5-1.5
Buffalo	-
Goat	-



CATTLE PRODUCTION SYSTEM IN ZUNHEBOTO

The local non descriptive cattle are reared mainly for meat purpose in the District. Cattle are reared in free grazing system without any feed supplement. It is advantageous because cost of rearing cattle is very less and local breeds are resistant to many diseases. However, the local cattle give a low milk yield .

Pig production system in Zunheboto

Piggery plays an important role in fulfilling the demand for quality meat. Every household rear pigs to meet their requirement of meat. In some villages indigenous pigs are reared under free grazing system. While some farmers follow the backyard system of pig rearing in which feeds provided are kitchen wastes, local fodder, like rice bran.

SWOT ANALYSIS OF ANIMAL HUSBANDRY & DAIRY SECTOR ZUNHEBOTO

Strength • High demand in domestic market. • People favour a variety of meat. • Farmers have a livestock rearing tradition • Capable of rearing different livestock and poultry • Locally available fodder and feed. • Disease resistant local breed.	Weakness • Low capital investment in the sector • Reared in traditional practice with zero input system. • Inadequate animal and poultry health care. • Secondary source of income. • Lack of scientific processing and market facilities.
Opportunity • Scope for breed improvement of milch, animal and poultry for meat. • Development of pasture in fallow and waste land. • Scope for integrated farming. • Scope for employment generation.	Threat • Animal and poultry diseases. • Decline in natural resources. • Decline in fallow and wasteland.

Focus area for development of Animal Husbandry and Dairy sector in Zunheboto

- Improved breeds of livestock, pig and poultry should be readily available to the farmers.
- Promotion of nutritious fodder cultivation and feed production for livestock
- For commercial farming, financial assistance should be easily available to the farmer.
- Animal health care facilities and trainings should be accessible and available.
- Establishment of hygienic slaughter house and milk processing units
- Proper communication infrastructure should be set up.

TECHNOLOGY INTERVENTION IN ANIMAL HUSBANDRY AND DAIRY SECTOR IN ZUNHEBOTO

Sl .No.	Animals / birds	Problem	Intervention
1	Cattle	Diseases Low productivity Lack of commercial cattle farming Non availability of quality fodder & feed	Training on health care of cattle Vaccination Breed improvement Establishment of commercial dairy farms Cultivation of quality fodder
2	Pig	Diseases Low productivity Lack of commercial approach in pig rearing	Vaccination Introduction of high meat yielding breed Establishment of commercial piggery
3	Poultry	Diseases Low productivity Non availability of quality feed	Vaccination Training on health management of poultry Improved layers and broiler birds Establishment of small scale maize based poultry feed units

STATUS OF FISHERY SECTOR IN ZUNHEBOTO DISTRICT

Due to the topography of the District, fishery is not a popular enterprise in Zunheboto. However, adoption of paddy cum fish culture and utilization of all the available water bodies can be utilized for increasing fish production in the District. Adoption of improved technology of aquaculture will increase the productivity of edible aqua fauna.



FISHERIES STATISTICS OF ZUNHEBOTO

Name of the District	Ponds/Tanks			Paddy-cum-Fish culture		
	Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)	Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)
Zunheboto	1200.0	141.0	1059.0	2680.0	14.0	2666.0

SWOT ANALYSIS OF FISHERY SECTOR IN ZUNHEBOTO DISTRICT

Strength . • Demand in the domestic market. • Comparatively low financial involvement.	Weakness • Minimum availability of perennial water bodies • Lack of awareness of integrated and composite farming. • Lack of know-how of integrated fish production system. • Poor communication facilities. • Insufficient supply of quality fish seed.
Opportunity • Low laying land can be converted for fish production. • Scope for production of fish seed locally.	Threat • Diseases of fish. • Uncertainty of labour availability. • Unethical method of fishing like explosives and use of poison.

Focus area for development of Fishery sector in Zunheboto:

- Training on integrated fish farming.
- Introduction of paddy cum fish culture in valleys and flat lands.
- Large scale production of fish fingerlings made available to the farmer at the appropriate time.
- Awareness Trainings on soil & water amendment measures to reduce water acidity and management of diseases of fish.

TECHNOLOGY INTERVENTION FOR FISHERY SECTOR IN ZUNHEBOTO

Problem	Intervention
Lack of available area for expansion of fisheries	Paddy cum fish culture/ composite farming.
Low productivity	Quality fish seed
Non application of feed supplements	Awareness on feed management
Lack of proper disease management	Awareness campaign & trainings

FORESTRY SECTOR IN ZUNHEBOTO DISTRICT

District	Geo-graphical area (Ha)	Very Dense forest (Ha)	Mode-rate dense forest (Ha)	Open forest (Ha)	Total (Ha)	% of Geo-graphi-cal area	Change	Scrub
Zunheboto	1255	88	427	529	1044	83.19	-53	0
Nagaland	16579	1274	4897	7293	13464	81.21	-201	2
Total								

Source: Forest Survey of India, Published in 2009

SWOT ANALYSIS OF FORESTRY SECTOR ZUNHEBOTO DISTRICT

Strength • Favorable agro climatic condition. • Rich bio- diversity. • Forest plant does not require much attention. • Vast waste land can be brought under forest plant.	Weakness • Deforestation due to demand of fire wood. • Crop area brought under forest plantation. • Jhum cultivation.
Opportunities • High demand for fire wood and timber. • Scope for development of eco tourism. • Potentiality of diverse bamboo species. • Effective in reducing Jhum cycle.	Threats • Jhum cultivation. • Wild fire caused due to Jhum activity. • Unabated destruction of forest for fire wood, timber and fodder.



PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS IN ZUNHEBOTO DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)			2015			2020			2025		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	22148	31007	1.4	22812	39922	1.75	22812	49503	2.17	22812	55890	2.45			
Requirement		25735			28407			32140			36363				
Surplus(+)		5272			11515			17363			19527				
Deficit (-)															

Action to be taken to meet the food requirement by 2025 :

1. Increase the area of cereal crops (3%➡ 0% ➡0%)
2. Replacement of traditional varieties with HYV/Hybrid (0% ➡40%. ➡40%.)
3. Promotion and popularization of IPM for pest and disease management during cultivation.
4. Popularization of INM
5. Introduction of SRI in TRC.
6. Reduction in post harvest losses by constructing rural warehouses.
7. Offering of minimum support price to the farmers.
8. Increase irrigation potentiality to cultivate summer paddy.
6. Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
7. Making inputs like improved seed, fertilizer, agro-chemicals available at farmer’s door step.

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN ZUNHEBOTO DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Pulses			2015			2020			2025		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Pulses	2710	2710	1	2981	3577	1.2	3190	4147	1.3	3413	5119	1.5			
Requirement		1544			1704			1928			2182				
Surplus(+)		1166			1873			2219			2937				
Deficit (-)															

Action to be taken to meet the requirement by 2025:

1. Area expansion of Rabi pulses (10 %. ➡7% ➡7%)
2. Replacement by HYV (30%. ➡40% ➡40%)
3. Use of Bio-fertilizer.
4. Adoption of IPM.
5. Encourage pulse based food processing industries at cottage level.

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Oil seed	6000	4980	0.83	6600	7920	1.2	7260	9075	1.25
Oil(35%)		1743			2772			3176	
Requirement		1544			1704			1928	
Surplus(+)		199			1068			1248	

Action to be taken to meet the requirement by 2025 :

- Area expansion of oil seed through crop intensification (10% ➡ 10% ➡ 10%)
- Use of chemical fertilizers
- Use of Bio-fertilizer. Phosphate Solubilizing Bacteria (PSB)
- Cultivation of pulses in Jhum area after harvest of crop.
- Encourage oil seed based processing industries at village level.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN ZUNHEBOTO DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Vegetables					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Vegetables	1248	4368	3.5	1335	6009.1	4.5	1429	7859	5.5
Requirement		7721			8522			9642	
Surplus(+)		-3353			-2513			-1783	
Deficit (-)									

Action to be taken to meet the requirement by 2025 :

- Area expansion (7% ➡ 7% ➡ 5%)
- Replacement by HYV/Hybrid (10% ➡ 10% ➡ 10%)
- Relay cropping of seasonal vegetables with early, mid and late varieties
- Adoption of INM.
- Adoption of IPM.
- Construction of Zero Energy Cold Storage to minimize post harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-Export Zones for spices like Naga King chilli, ginger, turmeric, medicinal and aromatic crops.
- Cultivation of summer potato.
- Cultivation of summer vegetable to export to other areas.
- Special thrust on large cardamom cultivation.



PROJECTED REQUIREMENT AND PRODUCTION OF FRUIT CROPS IN ZUNHEBOTO DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Fruit	1930	6755	3.5	2065	9293	4.5	2210	13258	6
Requirement		7721			8522			9642	5.5
Surplus(+)		-966			771			3616	
Deficit (-)									

Action to be taken to meet the requirement by 2025

- Area expansion (7% ➡ 7% ➡ 3%)
- Rejuvenation of old orchards.
- Establishment of processing industries.
- Adoption of INM.
- Adoption of IPM.
- Distribution of refrigerated vehicles to minimize loss during transportation of perishable fruits.
- Introduction of exotic fruits like strawberry, kiwi fruit.
- Encourage the cultivation of fruits like, passion fruit and other local fruits having commercial viability.
- Construction of cold storage.
- Development of small scale and cottage level processing units for fruits in PPP mode

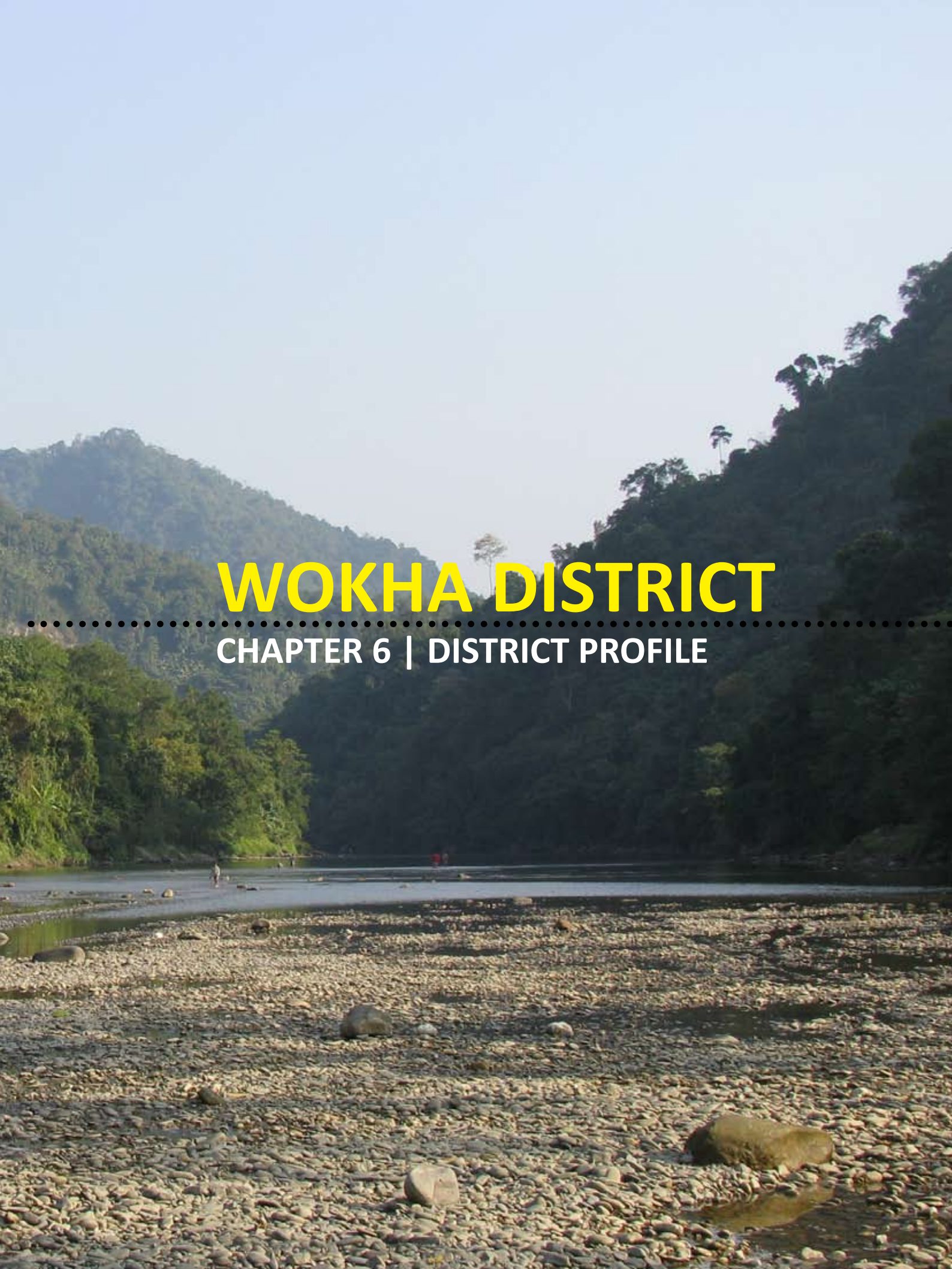
PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN ZUNHEBOTO DISTRICT

	2011	2015	2020	2025
Projected population	141014	155653	176107	199249
Production'000 MT	6.80	9.52	13.33	18.66
Requirement '000 MT	5.92	6.53	7.39	8.36
Surplus/Deficite(+/-)	(+)0.88	(+)2.99	(+)5.94	(+)10.30

Action to be taken to meet the requirement by 2025

- Extensive rearing of improved breeds of pigs, cattle and poultry birds.
- Awareness on proper animal health care.
- Awareness on nutritional feed supply
- Extensive cultivation of fodder crop
- Commercialization of livestock rearing.
- Establishment of hygienic slaughter house and dairy processing unit





WOKHA DISTRICT

CHAPTER 6 | DISTRICT PROFILE

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Wokha is the home district of the Lotha Naga. Wokha district shares its boundaries with Zunheboto in the east, Kohima in the south, Assam in the west and Mokokchung in the north. It spreads over a geographical area of 1628 sq km and 76.6% of the population inhabit 129 villages (2001 census). It has a population of 1, 61,098 (2001 census) and literacy percentage is above 81%.

The exploration of oil in the District since the last few decades has lead to major oil spillage, which has degraded vast tracts of prime agricultural lands in the lower foothills bordering Assam. These areas also face the threat of wild elephants that destroy agricultural lands and standing crops.

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Agro-ecological situations in Wokha

The three Agro Ecological Situations are:

AES-1 It ranges from 110-500m MSL and covers Bhandari, Wozhuro and Ralan block. The average rainfall is about 2000-2500mm per annum. The major crops cultivated are paddy, maize, brinjal, cabbage, cauliflower, tapioca, tea, mango, banana, litchi, coconut. Pisciculture and Animal Husbandry are also found in this situation.

AES-2 Ranging from 500-1000m MSL it covers Sanis block only. The major crops grown are paddy, maize, chilly, ginger, yam and a variety of vegetables. Horticultural crops like banana, pineapple, litchi and jack fruit grow abundantly. Farmers also rear animals, poultry and cultivate fish.

AES-3 The altitude ranges from 1000-1500m MSL and covers two blocks namely, Wokha and Chukitong. The average rainfall is 2000-2500mm. Major enterprises are agriculture, horticulture and animal husbandry.

Agriculture and Horticulture systems in Wokha

The major crops cultivated in Wokha district includes, paddy, yam, ginger, maize and a variety of vegetables. Horticultural crops such as orange, mossambi, pineapple, banana, passion fruit, guava, jack fruit and cucumber are abundant and commercially cultivated. Fishery, piggery, poultry and cattle rearing are practised by the farmers for meat and dairy. Wokha District is reputed for fruits and vegetables and processed bamboo shoot locally known as *Ruchu*, *Ruchak*, *Ruchon*.

Production systems in Agricultural crops in Wokha-

1. Cereal production system-

Paddy – The two types of production systems practiced by the farmers for paddy production are:

Jhum cultivation of traditional varieties in rain-fed conditions on the hill slopes.

Terrace Rice Culture (TRC) of traditional varieties and HYV in both rain-fed and irrigated conditions in plains and terraces

Maize - It is extensively cultivated as a mixed crop in Jhum areas under rain-fed conditions and also as monocrop in settled cultivation in some areas.

Millet - Millets is mainly cultivated as a mixed crop in Jhum cultivated areas under rain-fed condition.

2. Pulse production system-

Kholar (Rajmah) is cultivated in the District. Besides this, other pulses such as lentil, green gram and peas are also grown. Pulses are generally cultivated as a mixed crop in Jhum.

3. Oilseed production system-

Mustard, sesamum and soybean are the predominant oilseed crop grown in Jhum as well as in settled cultivation under rain-fed conditions. Besides this, linseed and niger are also grown in the District.

AGRICULTURAL MARKETING SYSTEM IN WOKHA

The general practice of the farmers in the District is to produce on a small scale with the surplus sold in local markets and along the State Highway. At present, the farming community has begun marketing of fruits and vegetables outside Wokha District, mainly in Kohima, Mokochung and Dimapur, where the demand for their agro produces is high. Passion fruit is sold and exported to the neighbouring State of Manipur for processing at the passion fruit extraction unit near Mao Gate together with other fruits.

NUMBER OF FARMERS ORGANIZATION

Nos. of farmers organization	Name	Activities	Resource obtained from
1	APMC, Wokha	Passion fruit, ginger marketing	Self resources
2	ATMA, Wokha	Passion fruit marketing	Self , and subsidy from govt.

AGRICULTURE STATISTICS OF WOKHA 2009-10

Sl. No	Name of crops	Area covered (Ha)	Manures & fertilizer used	Production (in MT)	Productivity (Qtl /ha)
1	Paddy (Jhum & TRC)	18335	-	36670	20
2	Maize	621	-	1118	18
4	Soybean	550	-	550	10
5	Rice bean	156	-	140	9
6	Mustard	830	-	664	8
7	Rajmah	30	-	30	10
8	Small Millet	17	-	6	3.5
9	Jobs tears	25	-	13	5.2
10	Wheat	44	-	47	10.6
11	Rice bean	156	-	140	9
12	Beans	200	-	280	14
13	Pea	55	-	60	11
14	Ground nut	115	-	104	9
15	Sessamum	558	-	335	6
16	Linseed	147	-	118	8
17	Sugarcane	146	-	8760	600
18	Jute	25	-	18	7
19	Tea	53	-	212	40

Source: District Agriculture Wokha.

HORTICULTURE PRODUCTION SYSTEM

Wokha district has gained prominence in Nagaland for its production of horticultural crops specially fruits like orange, mosambi,banana and passion fruits. In the lower foothill areas mosambi is cultivated abundantly. Passion fruit is marketed in processing units for juice production in Mao area.



HORTICULTURE STATISTICS OF WOKHA 2009-10

Sl.No.	Name of crops	Area (ha)	Production (MT)	Prroductivity (Qtl.Per ha.)
Vegetables and Spices				
1	Vegetables	1565	5321	34
2	Spices	900	6300	70
Fruits				
3	Citrus	1250	12500	100
4	Mango	33	165	50
5	Passion fruit	900	2700	30
6	Banana	700	7000	100
7	Plum	8	40	50
8	Pineapple	800	9600	120
9	Peach	8	40	50
10	Guava	6	30	50
11	Cashewnut	33	33	10
12	Coconut	33	148500 Nos.	4500 Nos.

SWOT ANALYSIS OF AGRICULTURE SECTOR WOKHA

Strength - Varied agro climatic condition. - Fertile soil. - Minimum use of agro-chemicals. - Large plain area and gentle hill slopes suitable for paddy cultivation. - Farmers avail the opportunities to market the produce.	Weakness - Fragmented land holding. - Lack of irrigation facilities. - Non availability of quality seed. - Reluctance to adopt modern technology by the farmers. - Large mono cropped area. - Financial constrains. - Share cropping in the district. - Poor marketing infrastructure.
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Opportunity

- Scope for intensification of cereals and pulses by means of double cropping.
- Ample scope for crop diversification.
- Increase in production through post harvest management.
- Organic cultivation can be promoted
- Scope for development of Agri –Market Hub.

Threat

- Farmers shifting to other occupation from agriculture.
- Pests and diseases.
- Soil erosion.
- Wild animals
- Oil spills



Passion fruit cultivation



Orange orchard



SWOT ANALYSIS OF HORTICULTURE SECTOR WOKHA

Strength - Varied agro climatic condition. - Fertile land suitable for various horticultural crops. - Available land for cultivation. - Farmers use less agro chemicals so organic cultivation is possible. - Availability of family labour. - Scope for attracting educated youth towards cultivation. - Availability of KVK in the district.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Low capital investment. - Lack of irrigation facilities.
Opportunity - Good communication facilities with other part of the country. - Scope for intensification and diversification. - Organic vegetable cultivation can be undertaken. - Scope for introduction of high value crops and floriculture. - Scope for establishment of fruit/food processing industry.	Threat - Unstable market price. - Farmers shifting to other occupations. - Soil fertility degradation. - Migration of rural population to urban areas - Wild animals

Focus area for development of Agriculture and Horticulture sector in Wokha.

- Soil conservation measures to prevent soil erosions and soil fertility degradation.
- Promotion of establishment of Nurseries and Tissue Culture Laboratory for horticultural crops.
- Development of hill slopes for settled cultivation of horticultural crops in traditional Jhum areas.
- Increasing the number of input dealers so that farmers information is accessible at their doorsteps.
- Establishment of markets and agri-corridors to transport the produce from the sites of production.
- Establishment of Bio- fertilizer and Bio-Pesticide production unit.
- Quality Seed production of agricultural crops.
- Development of rain water harvest structures to tap rain water for maximum utilization.

TECHNOLOGICAL INTERVENTIONS FOR AGRICULTURE IN WOKHA

Sl. No	Crop	Problems	Intervention
1	Paddy	Use of traditional varieties	Use of high yielding varieties of seed where there is assured irrigation. Improved varieties may be obtained from local varieties through selection. Exploration of HYV suitable for Jhum area and other rain-fed paddy area
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Popularization and promotion of INM
		Pests and diseases	Use of bio pesticides and bio control agents Adoption of IPM
2	Maize	Use of local varieties	Use of high yielding composite and hybrid varieties.
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Popularization and promotion of INM
		Pests and diseases	Adoption of IPM
		No post harvest management and value addition	Maize sheller to be provided to the farmer for shelling of maize. Establishment of poultry and cattle feed production units.
3	Pulses	Less area coverage under pulses	Expansion of area under pulse
		Low yield	Use of HYV. Adoption of proper package of practices
		Lack of post harvest management and machinery for pulses/lentils processing	Awareness campaign on stored grain pest management. Installation of pulse processor in pulse growing areas



4	Oilseeds	Less area coverage under oilseeds	Expansion of area under oilseeds
		Low yield	Adoption of proper package of practices
		Lack of post harvest management and machinery for oil expulsion	Installation of oil expellers in oilseed growing areas

TECHNOLOGICAL INTERVENTIONS FOR HORTICULTURE SECTOR IN WOKHA

Sl. No	Crop	Problems	Intervention
1	Fruits	Non availability of quality planting materials	Creation of scion bank for production of quality planting materials. Arrangement for collecting planting materials from authentic sources. Establishment of Plant Tissue Culture laboratory
		Pests & Diseases	Use of resistant varieties. Bio-control measures. IPM
		Non availability of processing plants	Encourage establishment of small scale processing units
		Marketing of Commodities	Construction of all weather rural roads for easy transportation of the farm produces. Establishment of market with all modern amenities so that farmers can get buyers for their produces.
2	Vegetables and Potato	Pest and diseases	Bio-pesticides. Bio-control agents. IPM
		Marketing and Storage	Cold Storage. Proper planning to avoid market glut through CIGs. Establishment of market with all modern amenities so that farmers can get buyer for their produces.
3	Spices	Processing and Marketing	Establishment of processing units. Export promotion in collaboration with APEDA and Agro corporate sectors.



STATUS OF ANIMAL HUSBANDRY AND DAIRY IN WOKHA

Animal Production System

Cattle Production System:

Free grazing of cattle is the general trend followed by the farmers except during paddy cultivation period. At present, many villages have enacted laws banning open grazing. So there is a setback in large scale cattle rearing in the District. Stall fed system is picking up and followed by a few farmers.

Poultry Production System:

Generally backyard poultry rearing is practiced by the farmer. Some organized poultry rearing system is also found in the District.

Pig production system:

In general pigs are reared in free grazing system, together with stall fed system practiced with kitchen waste and locally available feeds like colocasia, rice polish and wheat bran. Pork is a popular meat over others. Therefore, pig rearing on a commercial scale is to be encouraged for the District to be self-sufficient in the future.



Free grazing of cattle

PRODUCTION AND PRODUCTIVITY OF LIVESTOCK AND POULTRY PRODUCTS IN WOKHA DISTRICT

Produce	Total requirement (2008)	Production (MT) (2005-06)	Surplus/shortfall
Meat '000MT	2.32	0.52	1.8
Milk Kltrs	0.88	0.63	0.25
Egg Nos. in Lakh	53.16	40.7	12.46

Source: Report on 2003 Livestock census Dept. of Veterinary and Animal Husbandry, Nagaland.

The demand for meat is very high in the district. From the picture emerging on imported cattle, pigs and poultry in the District, it indicates that there is a deficit in meat production.



MILK YIELD OF ANIMALS

Type of animal	Milk yield (litres/day)
Cross bred cattle	7
Indigenous cattle	0.5-0.7

SWOT ANALYSIS OF ANIMAL HUSBANDRY AND DAIRY SECTOR WOKHA

Strength - High demand in domestic market. - Less space required for rearing. - Abundant grazing land - Employment of family labour. - Locally available fodder and feed. - Presence of KVK in the district.	Weakness - Low investment in the sector. - Lack of improved breed. - Inadequate animal and poultry health care. - Secondary source of income. - Lack of scientific processing and market facilities.
Opportunity - Scope for breed improvement of milch, animal and poultry for high yielding meat. - Communication to other districts. - Scope for employment generation.	Threat - Animal and poultry diseases. - Decline in natural resources.

Focus area for development of Animal husbandry and Dairy Sector in Wokha

- Improved breeds of livestock, pig and poultry should be readily available to the farmers.
- Promotion and popularization of nutritious fodder cultivation and feed production for livestock.
- Financial assistance for commercialization should be made available to the farmers.
- Animal health care facilities and trainings should be made available.
- Establishment of hygienic slaughter house and milk processing units
- Proper communication facilities should be built up.

TECHNOLOGY INTERVENTION IN ANIMAL HUSBANDRY AND DAIRY SECTOR IN WOKHA

Sl .No.	Animals / birds	Problem	Intervention
1	Cattle	Diseases Low productivity Lack of commercial cattle farming Non availability of quality fodder & feed	Training on health care of cattle Vaccination Breed improvement Establishment of commercial dairy farms Cultivation of quality fodder
2	Pig	Diseases Low productivity Lack of commercial approach in pig rearing	Vaccination Introduction of high meat yielding breed Establishment of commercial piggery
3	Poultry	Diseases Low productivity Non availability of quality feed	Vaccination Training on health management of poultry Improved breed of layer and broiler birds Establishment of small scale maize based poultry feed units

STATUS OF FISHERY SECTOR IN WOKHA

FISHERY STATISTICS

Ponds/Tanks			Paddy-cum-Fish culture		
Estimated potential total area (ha)	Utilized area 2010-11 (ha)	Unutilized area (ha)	Estimated potential total area (ha)	Utilized area 2010-11 (ha)	Unutilized area (ha)
2670.0	251.5	2418.5	6400.0	45.0	6355.0

No. of fishery ponds	97
Production (Kg)	547500





PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS IN WOKHA DISTRICT

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)			
			2015		2020	
	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	22148	31007	1.4	22812	39922	1.75
Requirement		30339			33488	
Surplus(+)		668			6434	
					13099	
						16426

Action to be taken to meet the food requirement by 2025

1. Increase the area of the cereal crops. (3% ➡ 3%)
2. Replacement by HYV & Hybrid (10% ➡ 20% ➡ 40%)
3. Pest and disease management during cultivation.
4. Reduction in post harvest losses by constructing rural warehouses.
5. Minimum support price to the farmers.
6. Increase irrigation potentiality to cultivate summer paddy.
7. Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
8. Making inputs like improved seed, fertilizer, agro-chemicals available at the farmer’s doorstep.

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN WOKHA DISTRICT

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of Pulses			
			2015		2020	
	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Pulses	1180	1180	1	1298	1558	1.2
Requirement		1820			2009	
Surplus(+)		-640			-451	
Deficit (-)					-329	
					2273	
					1944	
					1486	
					2378	
					2572	
					-194	

Action to be taken to meet the requirement by 2025

1. Area expansion of pulses through intensification (10% ➡ 7% ➡ 7%)
- 2 Replacement by HYV (10% ➡ 20% ➡ 20%)
3. Use of Bio-fertilizer.
4. Cultivation of pulses in Jhum area after harvest of crop.
5. Encourage pulse based food processing industries at cottage level.



PROJECTED REQUIREMENT AND PRODUCTION OF OILSEED CROPS IN WOKHA DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
				2015			2020		
	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Oil seed	1650	1370	0.83	1815	2178	1.2	2087	2922	1.4
Oil (35%)		479			762			1028	
Requirement		1820			2009			2273	
Surplus(+)		-1341			-1247			-1245	
Deficit (-)									

Action to be taken to meet the requirement by 2025

Area expansion of rabi oil seed by crop intensification (10% ➡ 10% ➡ 15%).
Increase productivity by use of Integrated Nutrient Management including Micronutrients.
Use of Bio-fertilizer.
Encourage oil-seed based processing industries at village level.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN WOKHA DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of vegetables					
				2015			2020		
	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Vegetables	2365	8277.5	3.5	2531	11387	4.5	2708	14892	5.5
Requirement		9102			10046			11367	
Surplus(+)		-825			1341			3525	
Deficit (-)									

Action to be taken to meet the requirement by 2025:

Area expansion for vegetables.(7% ➡ 7% ➡ 5%)
Seed Replacement by HYV & Hybrid (10% ➡ 20% ➡ 40%)
Establish cold storages to minimize post-harvest loss.
Streamlining marketing through SHGs or CIGs.
Establish Agro-Export Zones for export of spices such as, Naga King chilli, ginger, turmeric, medicinal and aromatic crops.
Cultivation of summer potato.
Cultivation of summer vegetables

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit					
				2015			2020		
	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Fruit	3850	13475	3.5	4120	18538	4.5	4408	25125	5.7
Requirement		9120			10046			11367	
Surplus(+)		4355			8492			13758	
Deficit (-)								17224	

Action to be taken to meet the requirement by 2025:

- Major thrust to be given to increase area and production of fruits (7% ➡ 7% ➡ 5%)
- Employment generation through cultivation, processing and marketing of fruits and other plantation crops like tea, coffee, rubber and cashewnut.
- Establishment of processing industries.
- Distribution of refrigerated vehicles to minimize loss during transportation of perishable fruits.
- Introduction of exotic fruits like strawberry, kiwi fruit etc.
- Encourage the cultivation of fruits like passion fruit, mossambi, and orange having commercial importance.
- Construction of cold storages.
- Marketing of semi finished product processed in collaboration with Agro Corporate houses.



PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN WOKHA

	2011	2015	2020	2025
Projected population	166239	183497	207610	234891
Production'000 MT	6.23	8.72	12.21	17.09
Requirement '000 MT	6.98	7.7	8.71	9.86
Surplus/Deficit(+/-)	-0.75	(+)1.02	(+)3.50	(+)7.23

Action to be taken to meet the requirement by 2025

- Improved breed of animals to be reared for optimum yield.
- Proper animal health care.
- Proper feed and fodder supply.
- Establishment of meat processing units
- Establishment of cold storages
- Establishment of slaughter house.



Fresh bamboo shoot



Orange harvest

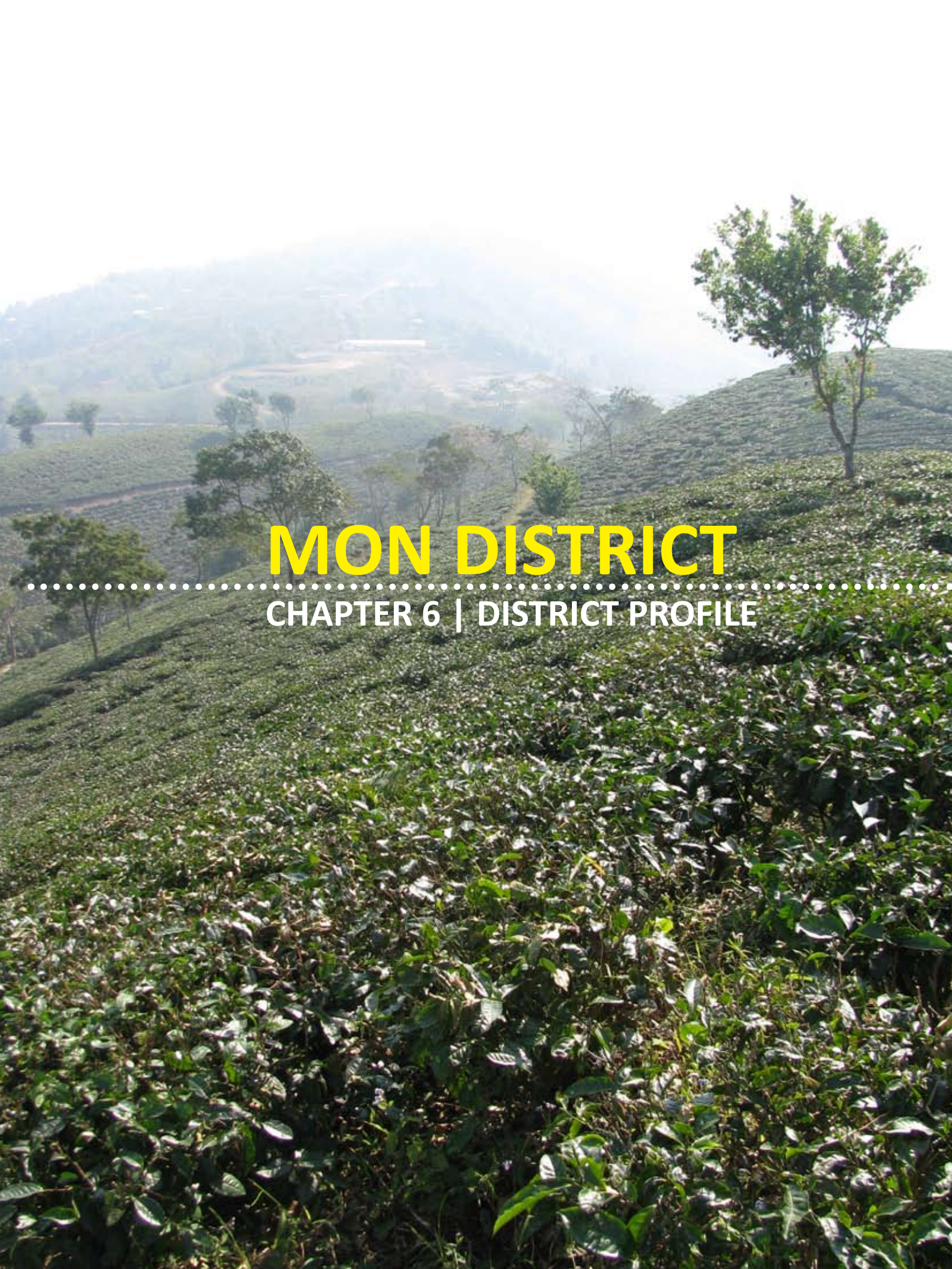


Cashewnut



Plum





MON DISTRICT

CHAPTER 6 | DISTRICT PROFILE

Mon district is the home of the Konyak Naga and is bordered by Arunachal Pradesh in the north, Myanmar in the east, Tuensang in the south and Longleng in the west. The topography of Mon district is mostly undulating with steep slopes having an altitude ranging from 180m MSL – 1625m MSL, interspersed with fertile valleys suitable for agricultural activities to achieve high productivity in food grain and other agricultural cash crops.

Mon District is situated on the North-eastern tip of the State of Nagaland having an area of 1786 sq km. Coal is mined in the District. This activity has led to the degradation of vast forest cover and agricultural lands being destroyed for coal extraction in the foothills bordering Assam.

Demography

Mon is the third populous district of Nagaland with a population of 2,74,438 (as per census 2001) comprising of 1,38,018 male and 1,36,420 female. The average density per sq km is 145 persons. The literacy rate as per census 2001 is 42.25%.

Agro Ecological system

The district can be divided into 3 AES's.

AES-1 ranges from 180m-600m MSL

AES-2 ranges from 601m t- 1200m MSL

AES-3 ranging from 1201m and above.

Agriculture Marketing

Marketing of the agriculture products is mainly done in the weekly/daily markets and along the roadside. The farmers get lower prices for their produces in these markets. Therefore, to promote marketing efforts Agricultural Produce Marketing Committee (APMC) has been set up in the District.

Status of Agriculture in Mon District

Although endowed with fertile land and favourable climatic conditions suitable for crop and livestock production, almost all the cultivated areas are under jhum cultivation. Only 2 percent of the cultivated areas account for wet rice cultivation, and 1 percent for horticultural crops.Traditional staple food of the District is yam, millet and maize. Rice is also another staple diet along with glutinous rice which has a large presence. The people of the District cultivate yam, maize, millet, jobs tears, glutinous rice on a large scale along with rice under Jhum cultivation. Wet terrace rice cultivation is also found in patches where good water source for irrigation is available.

Important cash crops of Mon District are cardamom and Naga King chilli. Kholar (rajmah) is a major pulse crop. An important oilseed crop is soybean with tea as a major commercial crop in the District.

BASIC DATA OF AGRICULTURE

Sl. No.	Crop	Area	Productivity	Production
1	Vegetables	1515	3.00	4545
2	Fruits	2200	3.50	7700

Livestock production

Livestock rearing provides additional income and employment to the farmers besides meeting their meat requirements.The major livestock reared are cattle, mithun, pig, buffalo and poultry

Production systems in Agricultural crops in Mon

1. Cereal production system

Paddy – Two types of production systems as given below are followed by the farmers of Mon for paddy production.
Jhum cultivation of traditional varieties in rain-fed condition in hill slopes.
Wet Rice Culture (WRC) of traditional varieties and HYV in both rain-fed and irrigated conditions in plains and terraces

Maize - It is extensively cultivated under rain-fed condition as a mono crop in settled cultivation in large areas and also as a mixed crop in Jhum.

Millet - Millet is mainly cultivated in Jhum practice under rain-fed conditions as a mono crop in settled cultivation and also as a mixed crop.

2. Pulse production system-

Kholar (Rajmah) is the predominant pulse. It is generally cultivated as a mixed crop in Jhum.

3. Oilseed production system-

Soybean and sessamum are the predominant oilseed crops grown in Jhum as well as in settled cultivation under rain-fed conditions.

Production systems in Horticultural crops

- 1. **Fruits**- fruits like pineapple, citrus, banana, litchi, passion fruit, jack fruit, papaya are grown along the hill slopes and terraces.
- 2. **Vegetables**- vegetable like cole crops, leafy vegetables, sweet potatoes, cucurbitaceous vegetables, yam, colocasia, pumpkins, gourd, squash and others are grown in hill slopes and kitchen gardens.
- 3. **Commercial crops**- commercial crops like orange, Naga King chilli, cardamom and tapioca are extensively grown under rain-fed conditions.



Yam harvest



SWOT ANALYSIS OF AGRICULTURE SECTOR IN MON

Strength - Favourable agro climatic condition. - Fertile soil - Knowledge of agricultural practices. - Minimum use of agro-chemicals. - Support from the Govt. Departments.. - Presence of KVK.	Weakness - Fragmented land holding. - Lack of irrigation facilities. - Non availability of quality seed. - Minimum number of Agro-input outlets - Non adoption of modern technology by the farmers. - Large mono cropped area. - Financial constrains. - Share cropping in the district. - Poor marketing infrastructure.
Opportunity - Scope for area expansion of high value cereals (glutinous rice) and export to the other parts of the State. - Scope for development of Agri –Market Hub. - Organic cultivation can be promoted.	Threat - Farmers shifting to other occupations from agriculture. - Pests and diseases. - Soil erosion. - Coal mining



Maize



SWOT ANALYSIS OF HORTICULTURE SECTOR IN MON

Strength - Favourable agro climatic condition. - Fertile and hill slope lands suitable for various horticultural crops. - Land available for cultivation. - Less agro chemicals usage by farmers giving advantage for organic cultivation. - Availability of family labour. - Scope for attracting educated youth towards cultivation.	Weakness - Non availability of quality planting materials. - Low maintenance of orchards - Low capital investment. - Less use of modern practices of nutrient management. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Lack of irrigation facilities.
Opportunity - Good communication facilities with other part of the country. - Scope for intensification and diversification. - Organic vegetables cultivation can be undertaken. - Scope for introduction of high value crops and floriculture. - Scope for establishment of processing industries.	Threat - Unstable market price. - Farmers shifting to other occupations. - Soil fertility degradation. - Dependency on migrant labour

Focus area for development of Agriculture and Horticulture Sector in Mon.

- Quality seed production of agricultural crops.
- Establishment of nurseries and tissue culture laboratory for horticultural crops.
- Increasing the number of input dealer so that farmers get information at their doorsteps.
- Establishment of markets and agri-corridors to facilitate the transportation of produce from the farms.
- Development of water harvest structures to tap rain water for optimum utilization.
- Soil conservation measures to prevent soil erosions and soil fertility degradations.
- Establishment of Bio- fertilizer and Bio-Pesticide production unit.
- Development of hill slopes for settled cultivation of horticultural crops in traditional Jhum area.



TECHNOLOGICAL INTERVENTION FOR AGRICULTURE IN MON

Sl. No	Crop	Problems	Intervention
1	Paddy	Use of traditional varieties	Use of high yielding varieties of seed where there is assured irrigation. Improved varieties may be obtained from local varieties through selection. Exploration of HYV suitable for Jhum area and other rain-fed paddy area
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Popularization of INM
		Pests and diseases	Use of bio-pesticides and bio-control agents Adoption of IPM
2	Maize	Use of local varieties	Use of high yielding composite and hybrid varieties.
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Popularization of INM
		Pests and diseases	Adoption of IPM
		No post harvest management and value addition	Maize sheller to be provided to the farmer for shelling of maize. Establishment of poultry and cattle feed production units.
3	Pulses	Less area coverage under pulses	Expansion of area under pulse cultivation
		Low yield	Use of HYV. Adoption of proper package of practices
		Lack of post harvest management and machinery for pulse processing	Awareness campaign on stored grain pest management. Installation of pulse processor in pulse growing areas
4	Oilseeds	Less area coverage under oilseeds	Expansion of area under oilseeds
		Low yield	Adoption of proper package of practices
		Lack of post harvest management and machinery for oil expulsion	Installation of oil expellers in oilseed growing areas



TECHNOLOGICAL INTERVENTIONS FOR HORTICULTURE IN MON

Sl. No	Crop	Problems	intervention
1	Fruits	Non availability of quality planting materials	Creation of scion bank for production of quality planting materials. Arrangement for collecting planting materials from authentic sources. Establishment of Plant Tissue Culture laboratory
		Pests & Diseases	Use of resistant varieties. Bio-control measures. IPM
		Non availability of processing plants	Encourage establishment of small scale processing units
		Marketing of Commodities	Construction of all weather rural roads for easy transportation of the farm produce. Establishment of market with all modern amenities so that farmers can get buyers for their produces.
2	Vegetables	Pests and diseases	Bio-pesticides. Bio-control agents. IPM
		Marketing and Storage	Cold Storage. Proper planning to avoid market glut through CIGs. Establishment of market with all modern amenities so that farmers can get buyers for their produces.
3	Spices	Processing and Marketing	Establishment of processing units. Export promotion in collaboration with APEDA and Agro corporate sectors.



Projected requirement and production of Cereals

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	22716	31802	1.4	23397	40946	1.75	24099	52296	2.17
Requirement		45747			50497			57132	
Surplus(+)		-13945			-9551			-4836	

Action to be taken to meet the food requirement by 2025:

- Area expansion of cereal crops (3% ➡ 3%. ➡ 6%)
- Pest and disease management during cultivation.
- Reduction in post harvest losses by constructing threshing devices and rural warehouses.
- Minimum support price to the farmers.
- Increase irrigation potentiality to cultivate summer paddy.
- Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
- Making inputs like improved seed, fertilizer, agro-chemicals available at the farmers’ door step.



PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN MON DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Pulses					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Pulses	1790	1790	1	1969	2363	1.2	2107	2950	1.4
Requirement		2745			3030			3428	
Surplus(+)		-955			-667			-478	
Deficit (-)								-271	

Action to be taken to meet the food requirement by 2025

- Area expansion of the Pulse crops. (10% ➡ 7% ➡ 7%)
- Pest and disease management during cultivation.
- Use of Bio-fertilizer (Rhizobium).





PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN MON DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of vegetables					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Vegetables	1515	5302.5	3.5	1667	7499	4.5	1833	10999	6
Requirement		13724			15149			17140	
Surplus(+)		-8422			-7650			-6141	
Deficit (-)								-5277	

Action to be taken to meet the requirement by 2025

- Area expansion of vegetables. (10% ➡ 10% ➡ 10%)
- Establish cold storages to minimize post-harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-Export Zones for export of spices like Naga King chilli, ginger, medicinal and aromatic crops.
- Cultivation of winter maize.
- Cultivation of off–season vegetable to export to the other States.
- Major thrust should be give on large cardamom.

PROJECTED REQUIREMENT AND PRODUCTION OF OILSEED CROPS IN MON DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of oil seed					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Oil seed	6860	5694	0.83	7340	8808	1.2	7854	10996	1.4
Oil(35%)		1993			3083			3848	
Requirement		2745			3030			3428	
Surplus(+)		-752			53			420	
Deficit (-)									

Action to be taken to meet the requirement by 2025

- Area expansion through crop intensification (7% ➡ 7% ➡ 7%)
- Use of Bio-fertilizer.
- Encouraging oil seed based processing industries at village level.
- Diversify to fodder processing units



Crop	20010-11 (Base year)				Expected increase in area, production and productivity of Fruit			
	Area		Productivity		2015		2020	
	(Ha.)	Prod. MT	MT/Ha.		(Ha.)	Prod. MT	(Ha.)	Prod. MT
Fruit	2400	8400	3.5		2568	11556	2748	15387
Requirement		13724				15149		17140
Surplus(+)				-5324		-3593		-1752
Deficit (-)								-639

Action to be taken to meet the requirement by 2025

- Major thrust to be given to increase area expansion of fruit crops. (7% ➡ 7% ➡ 7%)
- Establishment of fruit processing industries.
- Distribution of specialised transport vehicles to minimize loss during transportation of perishable fruits.
- Introduction of value added fruits such as strawberry.
- Encourage the cultivation of local fruits like like passion fruit having commercial value.

PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN MON DISTRICT

	2011	2015	2020	2025
Projected population	250671	276694	313054	354192
Production'000 MT	4.36	6.1	8.54	11.96
Requirement '000 MT	10.52	11.61	13.14	14.87
Surplus/Deficit(+/-)	-6.16	-5.51	-4.6	-2.91

Action to be taken to meet the requirement by 2025

- Improved breed of animals to be reared for getting optimum yield.
- Proper animal health care.
- Proper feed and fodder supply
- Incentives to farmers for taking up animal and poultry based units to meet the District requirement.



Kholar (rajmah)



Tea leaves



Jackfruit



Dried Naga king chilli



PHEK DISTRICT

CHAPTER 6 | DISTRICT PROFILE

Phek was carved out of Kohima district in 1973. It is inhabited by the major tribes Chakhesang and Pochury. It has a total population of 14826 (2001 census) and density of 73 persons/sq km. The literacy rate of the District is 71.35%. It lies in the south east of Nagaland between 94° 35'18" to 94° 38'09" E Longitude and 25° 37'37" to 25° 39'47" N Latitude. It is bounded by Kohima in the west, Zunheboto and Kiphire District in the north, Myanmar in the south east and Manipur state in the south. Its geographical area is almost 2026 sq km, with an altitude ranging from 520msl to 2900msl. The climate is temperate to sub-tropical.

Agri-Horticulture System of Phek district

The mainstay of the people is agriculture. Jhum is practiced here and it occupies 12160 ha in the district. The next prevailing system is TRC, practiced since time immemorial on hill slopes with terrace benches using rain fed irrigated water from streams and rivers. This farming system is settled cultivation which is more sustainable and productive and ecologically less detrimental than Jhum. The traditional practice of 'Zabou' is an indigenous methodology for using integrated watershed system practised only by the farmers of Phek and Kohima districts. Under this system, water when not available from streams the run-off from the upper catchments are harvested in ponds and used for growing paddy along with fish and snails during kharif season and vegetables during the rabi season. The major crop is paddy, cultivated mainly during the kharif season. Maize, beans,

pea, cowpea, arahar and Naga dal are the other common agronomical crops whereas cabbage, banana, orange, passion fruit, guava, garlic, ginger and cardamom are the major horticultural produces. In recent times kiwi has been introduced into the District as a value added fruit.

Of late, the district has the distinction of being a major supplier of winter vegetables to the State. There are 'vegetable villages' that have been identified and designated as potential crop zones by the Department of Agriculture. Tsupfume and Zhavame villages have optimized its favourable climate and soil conditions to grow potatoes and cabbage on a large commercial scale. Pfutsero for vegetables, passion fruit and cardamom; Chozuba for passion fruit, tea, kholar and cardamom; Phek for soybean, tea, kholar and cardamom and Meluri for ginger, maize

and orange. The total cropped area of the district is 27500 ha. (inclusive of fruit crop) however, the net sown area is 25521 ha.

Livestock provides additional income to the farmers besides meeting their daily protein requirement. The favoured livestock are pig, cattle, duck and poultry. On the other hand, there is scope for buffalo, rabbit, mithun, poultry, duck and pig on a commercial scale, as meat constitutes a major diet component and is high in demand, but the district is unable to meet it. In 2000, the Village Development Boards of Phek took the collective decision to ban all import of any meat or livestock for meat for consumption. To meet the demand each household had to rear pigs to produce 100kgs of pork per year. This ban compelled the people to improve their own livestock production. The Phek Model of self sufficiency has relevance to the entire State.

Agro Ecological Situation (AES)

AES have been identified based on soil,

rainfall, physiographic, altitude, irrigation pattern and temperature. The identified AESs are classified into the homogenous farming situations for the district. These are namely;

AES-I: It is spread over Phek and Kikruma Blocks of the district. The altitude ranges from 900m-1500m MSL. Average annual rainfall is above 1000mm. undulating topography with sandy loam to fine loamy humus soil. Major crops are paddy, potato, temperate fruits, kholar, soybean, floriculture, animal husbandry, paddy cum fish culture.

AES-2: It comprises of three blocks namely Pfutsero, Meluri and Sekrezu. The annual rainfall is 1500mm and the soil is sandy to clay loam. Altitude ranges from 1500m-3000m MSL. Major enterprises under this AES are agriculture and animal husbandry. Important crops grown are paddy, maize, ginger, banana, chilly, rice bean, passion fruit, tree tomato. Pig, cattle, mithun, goat, and poultry are the commonly raised livestock.

AGRO BASED INDUSTRY AT PHEK DISTRICT

Sl. No.	Name of unit	Deals in	Annual production & Return
1	95 Rice Mills	Rice de- husking	8mt.of rice.

AGRICULTURAL MARKETING IN PHEK DISTRICT

Agri-horticultural products are marketed in rural markets which are mostly weekly or bi-weekly in nature, roadsides and daily markets in the towns. Farmers are not getting remunerative prices for their produce, so Agriculture Marketing Board has taken the initiative and constructed two godowns. More initiatives are necessary for stream lining the marketing of agricultural produce so that farmers get the remunerative price.

The State based, Entrepreneurs Associates, a micro financing organization provides agriculture loans to farmers from the identified ‘vegetable villages’ and also assists in marketing of their produce.

EXISTING STORAGE FACILITY FOR AGRICULTURE PRODUCT

Sl.No.	Name	Capacity(MT)	Present Use
1	APMC, Phek	50	Agriculture commodities
2	APMC, Pfutsero	40	Agriculture commodities

NAMES OF FARMERS ORGANIZATION

Nos. of farmers organization	Name	Activities	Resource obtained from
1	Phek Farmer’s Union	Paddy, Potato and Ginger	Own resources And subsidy provided by Govt. for agricultural inputs.

FARM MACHINERIES AT PHEK DISTRICT

Sl . No.	Farm machineries	Number
1	Power tiller	76
2	Water pump	37
3	Sprayer	53

AGRI-HORTICULTURAL SITUATION OF PHEK DISTRICT

Agricultural sector in the district engages the highest proportion of the total working population and is the largest user of land resources. Agriculture is the main source of livelihood of the rural population which constitutes more than 91% of the district’s total population. Jhum under rain fed condition is the major practice in agricultural sector. Terrace Rice Cultivation is popular in areas with irrigation facilities utilizing traditional methods such as bamboo channels.

Horticultural crops are cultivated along the hill slopes and constitute 4% of the land use according to the Nagaland Village Profile 2001, Department of Agriculture.

Farmers show their preference to grow vegetables over fruits and plantation crops as it gives immediate returns and less financial investments. In urban areas, due to favourable climatic conditions floriculture and mushroom cultivation have gained ground. Citronella is another plant having a good market demand in the aromatic sector and use as mosquito repellent. Another area of scope is in bee keeping and tea.



BASIC DATA OF PHEK 2009-10

Sl. No	Name of crops	Area covered (ha)	Production (in MT)	Productivity (Qtl / ha)
1	Paddy (Jhum & TRC)	19940	35892	18
2	Maize	8000	13600	17
3	Mustard	270	10	5
4	Soybean	6397	1090	14
5	Rice bean	540	432	8
6	Groundnut	83	83	10
7	Rajmah	2700	2430	9
8	Bean	380	304	8
9	Arahar	40	28	7
10	Pea	480	432	9
11	Wheat	210	182	8.66
12	Perilla	2477	991	4
13	Sugarcane	190	5700	300
14	Millets	5920	4144	7

HORTICULTURE STATISTICS OF PHEK DISTRICT

Sl.No.	Name of crops	Area (ha)	Production (MT)	Productivity (Qtl.Per ha.)
Vegetables & Spices				
1	Potato	520	5200	94.5
2	Cabbage	20	40.00	20.
3	Cauliflower	110	165	15
4	Brinjal	10	15	15
5	Chilly	110	180	17.2
6	Pea	10	25	25
7	Beans	50	65	13
8	Chowchow	105	1040	99.8
9	Tomato	60	70	11.67
10	Ginger	260	600	23.1
11	Garlic	20	28	14
12	Tapioca	100	1000	100
13	Colocasia	180	1000	55.55
14	Tree Tomato	20	158	79
15	Turmeric	10	60	60

16	Leafy vegetables	300	200	6.67
17	Others	60	600	10
Fruits				
18	Citrus	6000	175	4.89
19	Passion fruit	50	10	2
20	Pear	30	10	3.33
21	Papaya	110	132	12
22	Banana	138	538	39
23	Guava	40	290	72.5
24	Mango	40	20	5
25	Plum	30	46	15.38
26	Apple	30	10	3.33
27	Pineapple	165	385	23.33
28	Kiwi fruit	60	5	0



Rice Bean (Naga dal)



Chilli produce



PRODUCTION AND PRODUCTIVITY OF LIVESTOCK AND POULTRY PRODUCTS IN PHEK DISTRICT

Produce	Total requirement (2008)	Production (MT)	Surplus/shortfall
Meat '000MT	9962.6	3440	-6522.6
Milk '000 K ltr	11495.31	3974	-7521.31
Egg Nos. in Lakh	191.59	131.34	-60.25

Source: Department of Veterinary and Animal Husbandry, Kohima

SWOT ANALYSIS OF AGRICULTURE SECTOR IN PHEK DISTRICT

Strength - Favorable agro climatic condition. - Knowledge of traditional agricultural practices. - Availability of land for cultivation of diversified crops in different agro climatic zone as per elevation. - Minimum use of agro-chemicals. - Presence of KVK.	Weakness - Steep and rugged terrain. - Lack of irrigation facilities. - Non availability of quality seed. - Reluctance to adopt modern technology by the farmers. - Lack of knowledge in modern plant protection techniques. - Financial constrains. - Poor marketing infrastructure.
Opportunity - Promotion of organic production and status. - Demand in the State and neighboring States.	Threat - Stray animals. - Pests and diseases. - Soil erosion.

SWOT ANALYSIS OF HORTICULTURE SECTOR IN PHEK DISTRICT

Strength - Favorable agro climatic condition. - Fertile land suitable for various horticultural crops. - Availability of land for cultivation. - Organic production system. - Availability of family labour.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Poor transport and communication facilities. - Irregular power supply
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Opportunity

- High demand in the State and other States
- Setting up small scale industries on fruit processing.

Threat

- Unstable market price.
- Farmers shift to other occupation.
- Soil fertility degradation.
- Irregular power supply

Focus area for development of Agriculture and Horticulture sector in Phek

- Quality seed production of agricultural crops.
- Establishment of nurseries and Tissue Culture Laboratory for horticultural crops.
- Increasing the number of input dealer so that farmers get input at their doorsteps.
- Establishment of market and agri-corridor to the market from the sites of production.
- Development of water harvest structures to tap rain water for optimum utilization.
- Soil conservation measures to prevent soil erosions and soil fertility degradations.
- Establishment of Bio- fertilizer and Bio-Pesticide production unit.
- Development of hill slopes for settled cultivation of horticultural crops.

MILK YIELD OF ANIMAL

Type of animal	Milk yield (litres/day)
Cross bred cattle	6-7
Indigenous cattle	0.5-0.7

LIVESTOCK AND POULTRY POPULATION OF PHEK AS PER 2003 CENSUS

Cattle	Buffalo	Sheep	Rabbit	Pig	Duck	Fowl
Cross breed	Indigenous					
4618	4959	3104	74	5942	616261	41318
						355713

Source: Report on Integrated Sample Survey 2007-08, Directorate of Veterinary & Animal Husbandry, Nagaland.

SWOT ANALYSIS OF ANIMAL HUSBANDRY & POULTRY SECTOR PHEK DISTRICT

Strength

- High demand in local market.
- Farmers aware of livestock rearing.
- Suitable for rearing different livestock and bird.
- Use of family labour.
- Locally available fodder and feed.
- Disease resistant local breed.

Weakness

- Low investment in the sector and reared in traditional way with zero input system.
- Lack of improve breed.
- Inadequate animal and poultry health care.
- Lack of feed processing plants.
- Secondary source of income.
- Lack of scientific processing and market facilities.
- Inadequate power supply.



Opportunity • Scope for breed improvement of milch, animal and poultry birds. • People adapted to various types of meat. • Scope for integrated farming. • Scope for employment generation.	Threat • Animal and poultry diseases. • Decline in natural resources.
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Focus area for development of Animal husbandry and Dairy sector in Phek

- Commercial farming by giving incentive to farmer.
- Popularization of nutritious fodder cultivation and feed production for livestock
- Improved breeds of livestock, pig and poultry made readily available to farmers
- Animal health care facilities and farmers trained on animal hygiene
- Establishment of hygienic slaughter house and milk processing units
- Development of communication facilities both for transportation and e-marketing

FISH PRODUCTION SYSTEM OF PHEK

Farmers are unaware of modern technologies of aqua culture and continue with rearing fish in the traditional way, such as in the indigenous system of ‘Zabou.’ However, in recent years with the intervention of Fishery Department, awareness has been inculcated among the farmers on the commercialization and economic benefits of composite fish culture and paddy cum fish culture.

FISHERY STATISTICS OF PHEK DISTRICT

Sl.No	Name of the District	Ponds/Tanks			Paddy-cum-Fish Culture		
		Estimated potential total area (ha)	Utilized area upto (2010-11) (ha)	Un-utilized area (ha)	Estimated potential total area (ha)	Utilized area upto (2010-11) (ha)	Un-utilized area (ha)
1	Phek	2660.0	168.2	2491.8	11920.0	1320.0	10600.0

ADOPTION OF TECHNOLOGY TO MEET FOOD REQUIREMENT IN PHEK DISTRICT

Projected requirement and production of Cereals

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)					
				2015			2020		
	Area	Prod.	Productivity	Area (Ha.)	Prod. MT	Productivity MT/Ha.	Area (Ha.)	Prod. MT	Productivity MT/Ha.
Cereals	22716	31802	1.4	23397	40946	1.75	24099	52296	2.17
Requirement		29801			32895			37218	
Surplus(+)		2001			8051			15078	

Action to be taken to meet the food requirement by 2025

- Area Expansion of cereal crops. (3% ➡ 3% ➡ 3%)
- Pest and disease management during cultivation.
- Increase irrigation potentiality to cultivate winter paddy.
- Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
- Making inputs like improved seed, fertilizer, agro-chemicals available at the door step of farmers.
- Minimum support price to the farmers.
- Create modern marketing facilities with outside marketing exposures and Agro corporate tie-ups.

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN PHEK DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Pulses					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
Pulses	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
	4140	4140	1	4430	5316	1.2	4651	6047	1.3
Requirement		1788			1974			2233	
Surplus(+)		2352			3342			3814	
Deficit (-)								4660	

ACTION TO BE TAKEN TO MEET THE REQUIREMENT BY 2025

- Area expansion of pulse through crop intensification at the rate of (7% ➡ 5% ➡ 3%)
- Use of Bio-fertilizer.
- Use of chemical fertilizer.
- Encourage multiple cultivation of pulses in Jhum area after harvest of crops.
- Encourage pulse based food processing industries at cottage level.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN PHEK DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of vegetables					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
Vegetables	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
	1835	6423	3.5	1963	9817.3	5	2101	11555	5.5
Requirement		8940			9868			11165	
Surplus(+)		-2518			-51			390	
Deficit (-)								1980	

Action to be taken to meet the requirement by 2025

- Area expansion of vegetables by crop intensification (7%. ➡ 7% ➡ 7%)
- Establish cold storage to minimize post-harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-Export Zones for export of spices like Naga King chilli, ginger, turmeric and medicinal and aromatic crops.
- Cultivation of summer potato.
- Cultivation of off season vegetable to export to the other States.
- Major thrust to be given on kiwi, mushroom, large cardamom, and other value added crops.



PROJECTED REQUIREMENT AND PRODUCTION OF FRUIT CROPS IN PHEK DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit					
	2015			2020			2025		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Fruit	2500	8750	3.5	2675	12038	4.5	3005	19535	6.5
Requirement		8940			9868			12632	
Surplus(+)		-190			2170			6903	
Deficit (-)									

Action to be taken to meet the requirement by 2025

- Major thrust to be given to increase area of fruit crops by (7% ➡ 7% ➡ 5%)
- Establishment of fruit based processing industries.
- Distribution of specialised transport vehicles to minimize loss during transportation of perishable fruits.
- Introduction of high value fruits like strawberry, kiwi fruit and apple.
- Construction of cold storages.
- Identify and establish specific market tie-ups.
- Development of agri-corridors to transport produce from the sites of production to the market.

PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN PHEK DISTRICT

	2011	2015	2020	2025
Projected population	163294	180246	203932	230730
Production’000 MT	5.97	8.36	11.7	16.38
Requirement ’000 MT	6.85	7.57	8.56	9.68
Surplus/Deficit(+/-)	-0.88	(+)0.79	(+)3.14	(+)6.70

Action to be taken to meet the requirement by 2025

- Improved breed of animals to be reared for getting optimum yield of meat, milk.
- Improved layer and broiler birds to meet the requirement of egg and meat.
- Introduction of other birds with value addition such as quail and turkey.
- Proper animal health care.
- Proper feed and fodder supply.



Lime



Orange

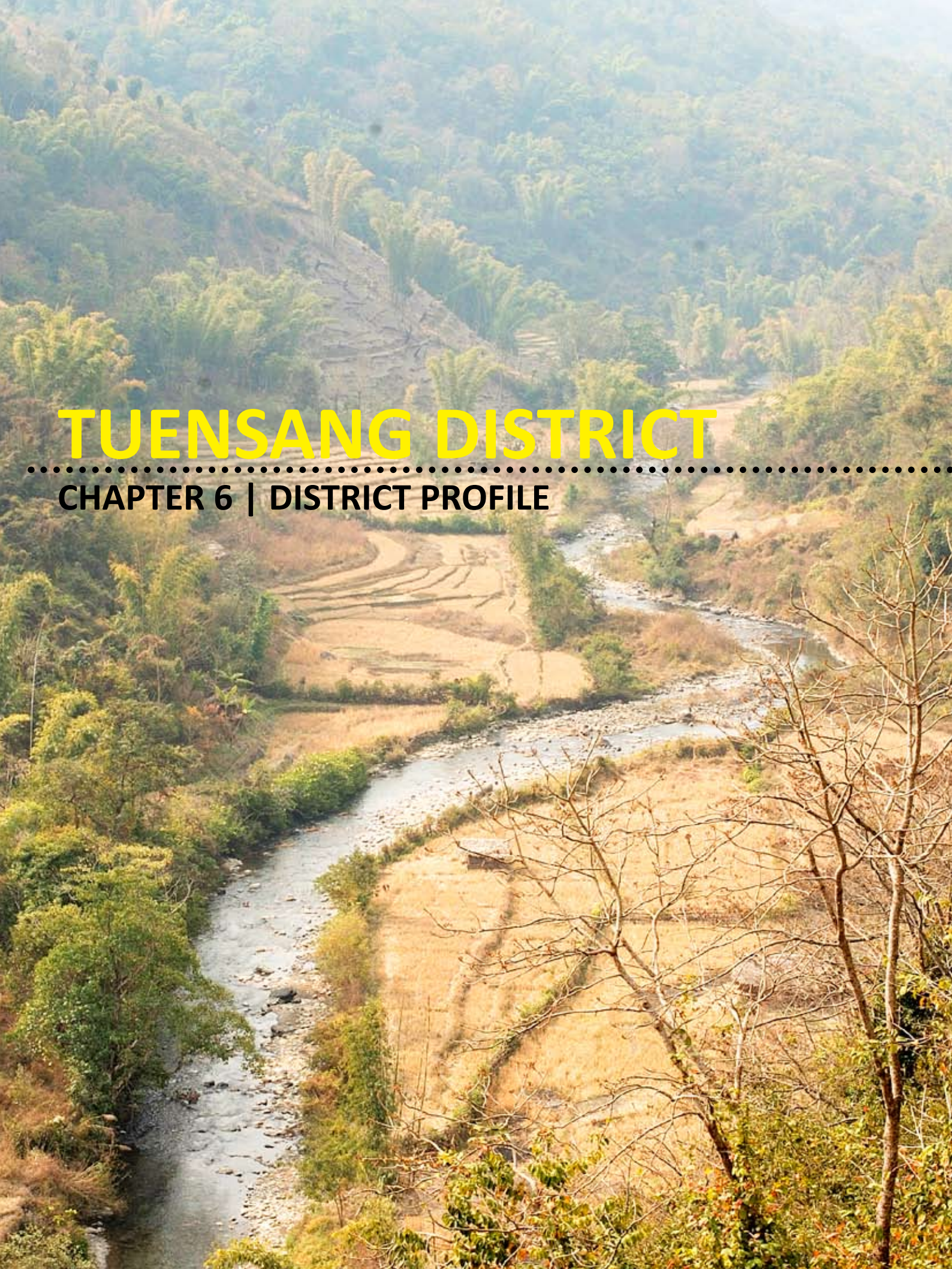


Maize



Banana





TUENSANG DISTRICT

CHAPTER 6 | DISTRICT PROFILE

Tuensang district of Nagaland lies on the eastern side sharing its borders with Myanmar, Mon and Longleng districts. It is situated between Latitudes 25° 6’ to 27° 4’N and Longitude of 93° 20’ to 95° 1’ E, with an altitude ranging from 800m to 3500m MSL and an area of 1,728 sq.km. The main inhabitants of the district are Chang, Sangtam, Yimchungru and Khiamniungan. These communities are spread over 104 villages in the district.

Tuensang district falls under Eastern Himalayan Agro climatic zone with sub-alpine to sub-tropical climate. Though the district is endowed with rich natural and mineral resources, the traditional system of cultivation, lack of technological intervention coupled with poor communication has set back the district. Due to these bottlenecks, the district lags behind in the pace of development with the other districts, especially in agriculture.

Agro Ecological System (AES)

Considering the altitude as the primary parameter, soil and rainfall as secondary, the district is categorized into two distinct AESs.

AES-1: It ranges from low to mid hills of 100m -1500m MSI having warm summer to mid winter cold and high rainfall sub-tropical hill climate. The climatic weather conditions are suitable for agriculture practices. Important major crops such as, paddy, maize, sugarcane, sessamum, ginger, colocasia, gourd, pumpkin, chowchow, mustard, chilli, potato, cabbage, banana, orange, pineapple, large cardamom, kiwi, and passion fruit are grown in the district.

AES-2: Its altitude is 1500m MSL and above, having cold to extreme cold climate, high rainfall with sub alpine temperature. Crops like paddy, maize, millets, jobs- tears bean, kholar, soybean, cabbage,tree tomato, potato, raddish ginger, garlic, pears, plum, large cardamom are grown.

NAMES OF FARMERS ORGANIZATION

Nos. of farmers organization	Name	Activities	Resource obtained from
1	Eastern Farming Society	Various agriculture crops	Self resource
2	Orange Growers Society	Orange	Self resource

FARM MACHINERIES AT TUENSANG

Sl . No.	Farm machineries	Number
1	Power tiller	2
2	Tractor	3
3	Sprayer	50

Agri-horticulture system of Tuensang

Traditional rain fed agri-horticulture crop production is the main farming system followed by the farmers of the district. Jhum cultivation is practiced as well as terrace rice cultivation on the hill slopes, where mixed cropping pattern is followed during kharif season. Rice is the staple food and the dominant crop along with kholar (rajmah) which is another important cash crop of the district.

BASIC DATA OF AGRICULTURE SECTOR OF TUENSANG

Sl. No	Name of crops	Area covered (ha)	Production (in MT)	Productivity (Qtl/ha)
1	Paddy (Jhum & TRC)	12930	23274	18
2	Maize	7560	12852	17
3	Soybean	1043	1252	12
4	Rice bean	1184	1421	12
5	Tapioca	110	1200	109
6	Rajmah	3114	3644	11.7

HORTICULTURE STATISTICS OF TUENSANG

Sl.No.	Name of crops	Area (ha)	Production (MT)	Pdproductivity (Qtl/ ha)
Vegetables & Spices				
1	Potato	936	8424	90
2	Cabbage	19	23.75	12.5
3	Cardamom (Large)	444	44	1
4	Ginger	38	171	45
5	Colocasia	321	2568	80
6	Turmeric	30	105	35
7	Other vegetables	74	318.2	43
Fruits				
1	Orange	355	-	-

2	Litchi	20	-	-
3	Passion fruit	122	183	15
4	Banana	130	1014	78
5	Plum	24	-	-
6	Pineapple	175	1837.5	105
7	Kiwi fruit	16	-	-



Kholar (rajmah) harvest



Passion fruit



SWOT ANALYSIS OF AGRICULTURE SECTOR TUENSANG

Strength - Favorable agro climatic condition. - Knowledge of agricultural practices. - Less risk traditional method of cultivation. - Minimum use of agro-chemicals. - Support from KVK.	Weakness - Low productivity. - Lack of irrigation facilities. - Non availability of quality seed. - Reluctance to adopt modern technology by the farmers. - Lack of knowledge in modern plant protection techniques. - Financial constrains. - Poor marketing infrastructure.
Opportunity - Increase in area under double cropping. - Scope for crop diversification. - Scope for increased productivity through nutrient and pest management. - Scope for post harvest management. - Promotion of organic cultivation. - Scope for converting degraded hill slope under permanent terrace cultivation.	Threat - Outbreak of wild fire during slash and burn. - Pests and diseases. - Soil erosion.

SWOT ANALYSIS OF HORTICULTURE SECTOR TUENSANG

Strength - Favorable agro climatic condition. - Fertile land suitable for various horticultural crops. - Availability of land for cultivation. - Availability of large number of indigenous fruits and vegetables having good market demand. - Availability of family labour. - Scope for attracting educated youth towards cultivation.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Poor transport and communication facilities. - Lack of marketing infrastructure and linkages. - Lack of cold storage facilities - Inadequate source of power
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Opportunity - Scope for intensification and diversification. - Organic fruit and vegetable cultivation can be undertaken. - Scope for introduction of high value crops. - Scope for establishment of fruit processing industry.	Threat - Unstable market price. - Farmers shifting to other occupations. - Soil fertility degradation.
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Focus area for development of Agriculture and Horticulture sector in Tuensang.

- Soil conservation measures to prevent soil erosions and soil fertility degradations.
- Development of hill slopes for settled cultivation of horticultural crops
- Quality seed production of agricultural crops.
- Promotion of establishment of nurseries and tissue culture laboratory for horticultural crops.
- Increasing the number of input dealer so that farmers get input at their doorsteps.
- Establishment of market linkages and agri-corridor from the sites of production to the market.
- Development of water harvest structures to tap rain water and utilization of the natural water resource.
- Establishment of Bio- fertilizer and Bio-Pesticide production unit.

ANIMAL HUSBANDRY SECTOR IN TUENSANG

Production and productivity of livestock and poultry products in Tuensang district

Produce	Total requirement (2008)	Production (MT) (2005-06)	Surplus/ shortfall
Meat '000MT	N.A	8.96	N.A
Milk Kltrs	N.A	6.05	N.A
Egg No.in Lakh	N.A	35.88	N.A

Source: Department of Veterinary and Animal Husbandry, Kohima



MILK YIELD BY TYPE OF ANIMAL.

Type of animal	Milk yield (liters/day)
Cross bred cattle	4.1
Indigenous cattle	0.95
Buffalo	1.12
Goat	0.26

LIVESTOCK AND POULTRY POPULATION OF TUENSANG AS PER 2003 CENSUS

Cattle		Buf-falo	Mit-hun	Rabbit		Pig		Goat	Dog	Duck		Fowl	
Cross breed	Indig-enous			Oth-ers	An-gora	Im-proved	Indig-enous			Im-proved	Indig-enous	Im-proved	Indig-enous
14656	11657	194	9693	638	543	27041	22505	9395	8973	3630	953	65512	84657

Source: Report on Integrated Sample Survey 2005-06, Directorate of Veterinary and Animal Husbandry, Nagaland.

SWOT ANALYSIS OF ANIMAL HUSBANDRY & POULTRY SECTOR TUENSANG

Strength - High demand in domestic market. - Farmers aware of livestock rearing. - Suitable for rearing different livestock and bird. - Use of family labour. - Locally available fodder and feed. - Disease resistant local breed.	Weakness - Low investment in the sector and reared in traditional way with zero input system. - Lack of improved breed. - Inadequate animal and poultry health care. - Lack of feed processing plants. - Secondary source of income. - Lack of scientific processing and market facilities.
Opportunity - Scope for breed improvement of milch, animal and poultry birds for high meat yield. - People adapted to various types of meat. - Scope for integrated farming. - Scope for employment generation.	Threat - Animal and poultry diseases. - Decline in natural resources.

Focus area for development of Animal husbandry and Dairy sector in Tuensang

- Commercial farming by giving incentive to farmer.
- Popularization of nutritious fodder cultivation and feed production for livestock
- Improved breeds of livestock, pig and poultry should be readily available to the farmers
- Animal health care facilities and trainings on animal hygiene
- Establishment of hygienic slaughter house and milk processing units

Fish production system of Tuensang

Farmers are practicing tradional method for rearing fish. However, in recent years with the initiative of the Fishery Department, awareness has been developed among the farmers about composite fish culture and paddy cum fish culture for commercialization and economic returns.

FISHERY STATISTICS OF TUENSANG

No. of fishery ponds	1645
Fingerlings supplied (2007)	-----
Production (Kg)	11647



Fishery pond



PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS IN TUENSANG DISTRICT

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of cereals (Productivity in terms of Rice)					
			2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT
Cereals	20490	28686	1.4	21105	36933	1.75	21738	47171
Requirement		35916			39645			44854
Surplus(+)		-7230			-2712			2317
Deficit (-)								4106

Action to be taken to meet the food requirement by 2025

- Increase the area of the cereal crops (3% ➡ 3% ➡ 3%)
- Pest and disease management during cultivation by encouraging IPM .
- Reduction in post harvest losses by constructing rural warehouses.
- Minimum support price to the farmers.
- Increase irrigation potentiality to cultivate summer and winter paddy.
- Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
- Making inputs like improved seed, fertilizer, agro-chemicals available at the farmer’s door step.

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN TUENSANG DISTRICT

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of Pulses					
			2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT
Pulses	4298	4298	1	4599	5519	1.2	4829	6277
Requirement		2155			2379			2691
Surplus(+)		2143			3140			3586
Deficit (-)								4416

Action to be taken to meet the requirement by 2025

- Area expansion of pulse through crop intensification (7%. ➡ 5%. ➡ 3%)
- Use of Bio-fertilizer.
- Encouraging pulse based food processing industries at cottage level.

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Oil seed	2043	1696	0.83	2247	2697	1.2	2472	3461	1.4
Oil(35%)		593			944			1211	
Requirement		2155			2379			2691	
Surplus(+)		-1562			-1435			-1480	
Deficit (-)									-1553

Action to be taken to meet the requirement

- Area expansion by (10% ➡ 10% ➡ 10%).
- Application of bio- fertilizer and micronutrient.
- Adoption of IPM
- Expanded and assured Irrigation
- Sowing at proper time



PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN TUENSANG DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of vegetables					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Vegetables	1935	6772.5	3.5	2070	9317	4.5	2215	12185	5.5
Requirement		10775			11893			13456	
Surplus(+)		-4003			-2576			-1271	
Deficit (-)								183	

Action to be taken to meet the requirement by 2025

- Area expansion of vegetables (7% ➡ 7% ➡ 7%)
- Use of organic fertilizer such as vermicompost.
- Establish cold storage and zero energy storage to minimize post harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-export Zones for export of spices like Naga chilli, ginger, turmeric, medicinal and aromatic crops.
- Cultivation of summer potato.
- Cultivation of off season and value added vegetable to export to the other states.





PROJECTED REQUIREMENT AND PRODUCTION OF FRUIT CROPS IN TUENSANG DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit		
	2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity
Fruit	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
	2470	8645	3.5	2643	11893	4.5
	2470	8645	3.5	2643	11893	4.5
Requirement		10775			13456	
Surplus(+)		-2130			683	
Deficit (-)						

Action to be taken to meet the requirement by 2025

- Area expansion of Fruit crops by (7% ➡ 7% ➡ 5%)
- Rejuvenation of old orchards.
- Establishment of fruit processing industries.
- Distribution of specialized transport vehicle to minimize loss during transportation of perishable fruits.
- Introduction of exotic fruits like strawberry and kiwi fruit.

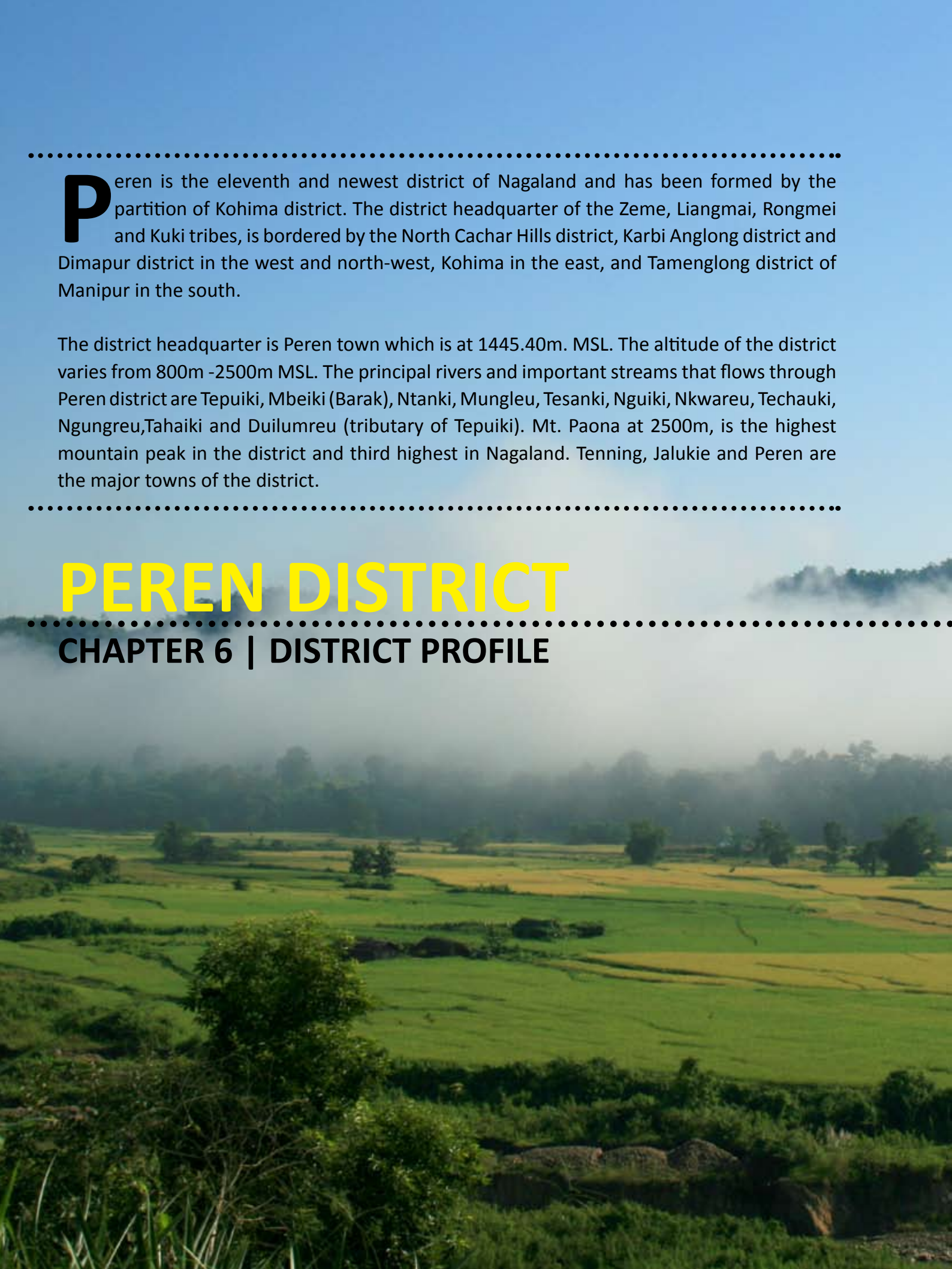


PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN TUENSANG DISTRICT

	2011	2015	2020	2025
Projected population	196801	217231	245777	278075
Production'000 MT	3.73	5.22	7.31	10.23
Requirement '000 MT	8.26	9.12	10.32	11.67
Surplus/Deficit(+/-)	-4.53	-3.90	-3.01	-1.44

Action to be taken to meet the requirement by 2025

- Improved breed of animal to be reared for getting optimum yield.
- Proper animal health care.
- Proper feed and fodder supply



Peren is the eleventh and newest district of Nagaland and has been formed by the partition of Kohima district. The district headquarter of the Zeme, Liangmai, Rongmei and Kuki tribes, is bordered by the North Cachar Hills district, Karbi Anglong district and Dimapur district in the west and north-west, Kohima in the east, and Tamenglong district of Manipur in the south.

The district headquarter is Peren town which is at 1445.40m. MSL. The altitude of the district varies from 800m -2500m MSL. The principal rivers and important streams that flows through Peren district are Tepuiki, Mbeiki (Barak), Ntanki, Mungleu, Tesanki, Nguiki, Nkwareu, Techauki, Ngungreu,Tahaiki and Duilumreu (tributary of Tepuiki). Mt. Paona at 2500m, is the highest mountain peak in the district and third highest in Nagaland. Tenning, Jalukie and Peren are the major towns of the district.

PEREN DISTRICT

CHAPTER 6 | DISTRICT PROFILE

BASIC INFORMATION

Total Geographical Area	16,68,00 Ha
Plain	67,520
Foot hill	8,440
High hill	75,960
Plateau	16,880
Total cultivable Area	45,846
Net cropped area	15,042
Seasonal	21802
Perennial	24662
Total	92565
Current fallow	21,802
Cultivable waste land	24,662
Forest land	92,565
Area under Tea	225

Area in Hectares.

Production systems in Agricultural crops in Peren

1. Cereal production system

Paddy – Two types of production systems are followed by the farmers of Peren for paddy production.

Jhum (shifting) cultivation of traditional varieties in rain-fed condition in hills and slopes. Terrace Rice Culture (TRC) of traditional varieties and HYV in both rain-fed and irrigated conditions in plains and terraces.

Maize - It is extensively cultivated as mixed crop in Jhum cultivation under rain-fed condition and also as mono crop in settled cultivation in some area.

Millet - Millets are mainly cultivated as a mixed crop in Jhum cultivation under rain-fed conditions.

2. Pulse production system

Pulses such as lentil, green gram, Naga dal and peas are cultivated as mixed crop in Jhum.

3. Oilseed production system

Mustard is the predominant oilseed crop grown in Jhum as well as in settled cultivation under rain-fed conditions. Other than this soybean, linseed, niger, sesamum and ground nut are also grown in the district.

AGRICULTURE PRODUCTION

Name of the crop	Area covered (In Ha)	Manures and Fertilizers used	Total Production (In MT)	Productivity (MT/Ha)
Rice	12100	Nil	24926	2.06
Maize	1000	Nil	1800	1.80
Small Millet	100	Nil	1200	12.00
Jobs Tears	550	Nil	440	0.80
Wheat	29	Nil	29	1.00
Other Cereals	1670	Nil	3730	2.23
Arahar	36	Nil	80	2.22
Naga dal	80	Nil	80	1.00
Bean	80	Nil	80	1.00
Pea	37	Nil	55	1.49
Black Gram	39	Nil	31	0.79
Total Pulse	272	Nil	1046	3.85
Total Food Grains	14042	Nil	29445	2.10
Oilseed				
Groundnut	15	Nil	15	1.00
Soybean	68	Nil	102	1.50
Perilla	250	Nil	15	0.06
Sesame	28	Nil	168	6.00
Mustard	119	Nil	119	1.00
Total Oilseed	480	Nil	419	0.87
Commercial Crops				
Sugarcane	28	Nil	182	6.50
Cassava	250	Nil	625	2.50
Turmeric	28	Nil	140	5.00
Potato	99	Nil	1287	13.00
Colocassia	165	Nil	1650	10.00
Ginger	175	Nil	1750	10.00

SWOT ANALYSIS OF AGRICULTURE SECTOR PEREN DISTRICT

Strength - Favorable agro climatic condition. - Knowledge of agricultural practices. - Fertile soil. - Less use of agro-chemicals. - Varied ecological zones.	Weakness - Fragmented land holding. - Lack of irrigation facilities. - Non availability of quality seed. - Reluctance to adopt modern technology by the farmers. - Large mono cropped area. - Financial constrains. - Steep hilly terrain. - Poor marketing infrastructure and linkages.
Opportunity - Scope for introduction of HYV. - Scope for intensification and diversification. - Increase in area under double cropping. - Scope for post harvest management. - Scope for development of Agri –Market Hub. - Organic cultivation can be promoted.	Threat - Farmers shift to other occupation from agriculture. - Pests and diseases. - Soil erosion. - Deforestation due to logging operations.



Pineapple plantation



Mustard



Naga King chilli



Orange harvest



TECHNOLOGY INTERVENTIONS FOR AGRICULTURE IN PEREN

Sl. No	Crop	Problems	Intervention
1	Paddy	Use of traditional varieties	Use of high yielding varieties of seed where there is assured irrigation. Improved varieties may be obtained from local varieties through selection. Exploration of HYV suitable for Jhum area and other rain-fed paddy area
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Popularization of INM
		Pest and diseases	Use of bio pesticides and bio control agents Adoption of IPM
2	Maize	Use of local varieties	Use of high yielding composite and hybrid varieties.
		Inadequate plant nutrition	Use of organic manures, bio-fertilizers, vermicompost. Popularization of INM
		Pests and diseases	Adoption of IPM
		No post harvest management and value addition	Maize sheller to be provided to the farmer for shelling of maize. Establishment of poultry and cattle feed production units.
3	Pulses	Less area coverage under pulses	Expansion of area under pulse
		Low yield	Use of HYV. Adoption of proper package of practices
		Lack of post harvest management and machinery for dal processing	Awareness campaign on stored grain pest management. Installation of pulse processor in pulse growing areas
4	Oilseeds	Less area coverage under oilseeds	Expansion of area under oilseeds
		Low yield	Adoption of proper package of practices
		Lack of post harvest management and machinery for oil expulsion	Installation of oil expellers in oilseed growing areas

PRODUCTION SYSTEMS IN HORTICULTURAL CROPS IN PEREN

- 1. Fruits-** fruits like pineapple, citrus, banana, litchi, papaya and passion fruit are grown along the hill slopes and terraces.
- 2. Vegetables-** vegetable like Cole crops, leafy vegetables, sweet potatoes, cucurbitaceous vegetables, colocasia, yam and tree tomato are grown in hill slopes and terraces.
- 3. Commercial crops-** commercial crops like potato, tapioca and papaya are extensively grown under rain-fed conditions

HORTICULTURE PRODUCTION

Name of the crop	Area Covered (In Ha)	Productivity (MT/Ha)	Production (In MT)
Pineapple	1,200	15	18,000
Orange	350	08	2,800
Banana	450	20	9,000
Vegetables	1,000	10	10,000
Spices	2,000	15	20,000

SWOT ANALYSIS OF HORTICULTURE SECTOR PEREN DISTRICT

Strength - Favorable agro climatic condition. - Fertile soil suitable for various horticultural crops. - Land available for cultivation. - Different agro-climatic condition suitable for cultivation of different crops. - Scope for attracting educated youth towards cultivation.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Low capital investment. - Lack of irrigation facilities. - Inadequate power source
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Opportunity • Scope for development of communication infrastructure. • Scope for intensification and diversification. • Organic vegetables and fruits cultivation can be undertaken. • Scope for introduction of high value crops and floriculture. • Scope for establishment of fruit processing industry.	Threat • Ecological imbalance due to shifting cultivation. • Unstable market price. • Tendency of farmers to shift to other occupations. • Soil fertility degradation. • Loss of forest cover due to logging and firewood collection.
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TECHNOLOGY INTERVENTIONS FOR HORTICULTURE SECTOR IN PEREN

Sl. No	Crop	Problems	Intervention
1	Fruits	Non availability of quality planting materials	Creation of scion bank for production of quality planting materials. Sourcing plant materials from authentic sources. Establishment of Plant Tissue Culture laboratory
		Pests & Diseases	Use of resistant varieties. Bio-control measures. IPM
		Non availability of processing plants	Encourage establishment of small scale processing units
		Marketing of Commodities	Construction of all weather rural road for easy transportation of the farm produce. Establishment of market with all modern amenities so that farmers can get buyer for their produces.



2	Vegetables and Potato	Pest and diseases	Bio-pesticides. Bio-control agents. IPM
		Marketing and Storage	Cold Storage. Proper planning to avoid market glut through CIGs. Establishment of market with all modern amenities so that farmers can get buyer for their produces.
3	Spices	Processing and Marketing	Establishment of processing units. Export promotion in collaboration with APEDA and Agro corporate tie-ups.

FISHERY STATISTICS OF PEREN DISTRICT

Sl.No	Name of the District	Ponds/Tanks			Paddy-cum-Fish culture		
		Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)	Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)
1	Peren	3020.0	164.4	2855.6	6780.0	205.0	6575.0

FOREST TREE SPECIES IN PEREN DISTRICT

Species of Trees	Current Total Area Covered (In Ha) (Govt + Pvt) (A)	Age-wise Break-up (In Ha)		
		New (B)	5-10 Yrs Old (C)	More than of 10 Yrs Old (Balance) A-(B+C)
1. Teak	6930	693	3465	2772
2. Neem	2772	1524	1109	139
3. Gamari	2079	104	728	1247
4. Hollock	1386	555	693	138
5. Tita Chap	693	209	346	138
6. Bamboo	11529	6917	3459	1153
7. Broom	1647	1318	329	-
6. Others	5940	2376	1782	1782



Crop	20010-11 (Base year)		Expected increase in area, production and productivity of cereals(Productivity in terms of Rice)			
			2015		2020	
	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	15449	21629	1.4	15912	27847	1.75
Requirement		17329			19128	
Surplus(+)		4300			8719	
Deficit (-)						

Action to be taken to meet the food requirement by 2025

- Increase the area of cereal crops. (3% ➡ 3% ➡ 3%)
- Pest and disease management.
- Reduction in post harvest losses by constructing rural warehouses.
- Minimum support price to the farmers.
- Increase irrigation potentiality to cultivate summer/winter paddy.
- Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
- Making inputs like improved seed, fertilizer and agro-chemicals available at the door step of farmers.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN PEREN DISTRICT

Crop	20010-11 (Base year)		Expected increase in area, production and productivity of Pulses			
			2015		2020	
	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Pulses	1245	1245	1	1332	1599	1.2
Requirement		1040			1148	
Surplus(+)		205			451	
Deficit (-)						

Action to be taken to meet the requirement by 2025

- Area expansion of vegetables. (7% ➡ 5% ➡ 3%)
- Establish cold storages to minimize post harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-Export Zones for export of spices like Naga King chilli, ginger, turmeric, lemon grass, medicinal and aromatic crops such as patchouli.
- Cultivation of summer potato.
- Cultivation of summer vegetable to export to the other states.

PROJECTED REQUIREMENT AND PRODUCTION OF FRUIT CROPS IN PEREN DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit		
	2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity
Fruit	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
	2940	10290	3.5	3146	14156	4.5
	Requirement	5199			5738	
Surplus(+)		5091			8418	
Deficit (-)						

Action to be taken to meet the requirement by 2025
Major thrust to be given on increasing area of fruit crops by (7% ➡ 7% ➡ 5%)
Establishment of fruit processing industries.
Distribution of refrigerated vehicles to minimize loss during transportation of perishable fruits.
Introduction and promotion of exotic fruits like strawberry, expansion of orange orchards and value added crops like mushroom.
Creating market linkages and agri-corridor from production sites to the market.

PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN PEREN DISTRICT

	2011	2015	2020	2025
Projected population	94954	104811	118585	134168
Production '000 MT	4.00	5.60	7.84	10.98
Requirement '000 MT	4.00	4.40	4.98	5.63
Surplus/Deficit (+/-)	0	(+)1.20	(+)2.86	(+)5.35

Action to be taken to meet the requirement by 2025
Improved breed of animal to be reared for optimum yield.
Proper animal health care.
Proper feed and fodder supply.
Construction of hygienic meat shop and slaughter house.
Establishing cold storages.
Ensure sustained power source.



KIPHIRE DISTRICT

CHAPTER 6 | DISTRICT PROFILE

Kiphire is the ninth district of Nagaland which was carved out of Tuensang on January 24th 2004, by upgrading the Sub-Division of Kiphire to a fully fledged district. It shares its borders with Tuensang in the north, Phek in the west and Myanmar to the east. It is headquartered at Kiphire town, which is at an altitude of 896m MSL. The other towns are Seyochung, Sitimi and Pungro. Kiphire has the distinction of having Nagaland's highest peak mount Saramati (3,841m MSL), Fakim Wildlife Sanctuary and the Likhimro Mini Hydro power station. Recently Kiphire has come to the forefront for its exquisite apple produce at Thanamir village. Another vital source of food is the traditional harvesting of honey from rock bees located in Mimi village. The predominant tribes of the district comprises of the Eastern Sangtam, Yimchungru and Sumi.

AGRICULTURE PRODUCTION

Name of the crop	Area covered (In Ha)	Manure & Fertilizers Used (Pl specify)	Productivity MT / Hectare	Total Production (In MT)
Paddy (Local)	357	-	1.8	643
Maize	256	-	1.8	461
Kholar (Rajmah)	279	-	1.1	306.9
Soy Bean	105	-	1.1	115.5
Total Foodgrain	-	-	-	1102.1
Potato	19	-	10.0	190.0

NAME OF FARMERS ORGANIZATION

Total Number of Farmer's Organization - 12 Nos.

Name of Farmer's Organization / SHG	Activities	Resources obtained from
Achingkehda SHG	Maize & Kholar Cultivation	-
Kiphre District Farmers' Association	Maize & Kholar Cultivation	-

AVAILABILITY OF FARM MACHINERIES/EQUIPMENTS

Name of the Machinery	No. Available		
	Private	Govt. Scheme	Other Source
Power Tiller	0	3	0
Sprayers	0	200	0



Kholar (rajmah) beans



Shelled kholar (rajmah) beans

SWOT ANALYSIS OF AGRICULTURE SECTOR KIPHIRE

Strength - Favorable agro climatic condition. - Knowledge of traditional agriculture model practices. - Less risk of traditional method of cultivation. - Less use of agro-chemicals. - Support from allied Govt. Departments.	Weakness - Low productivity. - Lack of irrigation facilities. - Non availability of quality seed. - Reluctance to adopt modern technology by the farmers. - Lack of knowledge in modern plant protection techniques. - Financial constrains. - Poor marketing infrastructure.
Opportunity - Scope for crop diversification. - Scope for post harvest management. - Promotion of organic cultivation.	Threat - Outbreak of wild fire during practice of Jhum cultivation. - Pests and diseases. - Soil erosion.

SWOT ANALYSIS OF HORTICULTURE SECTOR KIPHIRE

Strength - Favorable agro climatic condition. - Land is fertile and suitable for various horticultural crops. - Land available for cultivation. - Availability of large number of indigenous fruits and vegetables having good market demand. - Availability of family labour. - Support from allied Government Departments	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Poor transport and communication facilities.
Opportunity - Scope for intensification and diversification. - Organic fruits and vegetables cultivation can be undertaken. - Scope for export of local fruits to other states - Scope for establishment of processing industry for value addition.	Threat - Unstable market price. - Farmers shifting to other occupation. - Soil fertility degradation.

Focus area for development of Agriculture and Horticulture sector in Kiphire

- Soil conservation measures to prevent soil erosions and soil fertility degradations.
- Development of water harvest structures to tap the available rain water resource and its utilization.
- Development of hill slopes for settled cultivation of horticultural crops.
- Promotion of establishment of nurseries and Tissue Culture Laboratory for horticultural crops.
- Quality seed production of agricultural crops.
- Increasing the numbe of input dealer so that farmers get input at their doorsteps.
- Establishment of market and agri-corridor to the market from the sites of production.
- Establishment of Bio- fertilizer and Bio-Pesticide production unit.
- Promotion and intervention for Apple based small scale processing units.

LIVESTOCK POPULATION AND PRODUCTION IN KIPHIRE

Name of the Live Stock	Total Number of Farms (Only Govt)	No Of Livestock Population (Govt+Pvt)	Production Per Year (Govt+Pvt)		
			Meat (Qtl)	Milk (Ltrs)	Eggs (In Thou)
1. Cattle	30	11,524	5,000	3,00,000	-
2. Piggery	5	29,118	20,000	-	-
3. Goatery	10	9,738	1,500	-	-
4. Poultry	3	78,934	3,000	-	_*
5. Duckery	-	2,680	500	-	_*
Total			30,000	3,00,000	-

Mithun is reared only for meat.
Eggs are imported from Dimapur.

FISHERY STATISTICS OF KIPHIRE DISTRICT

Sl.No	Name of the District	Ponds/Tanks			Paddy-cum-Fish culture		
		Utilized area uptill 2010-11 (ha)			Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)
1	Kiphire	1000.0	108.0	892.0	210.0	12.0	198.0



PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS IN KIPHIRE DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of cereals(Productivity in terms of Rice)								
				2015			2020			2025		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	11200	15680	1.4	11536	20188	1.75	11882	25784	2.17	12239	29984	2.45
Requirement		13511			14914			16873			19091	
Surplus(+)		2169			5274			8911			10893	

Action to be taken to meet the food requirement by 2025

Increase the area of the cereal crops. (3% ➡ 3% ➡ 3%)

Pest and disease management during cultivation.

Increase irrigation potentiality to cultivate summer paddy.

Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.

Making inputs like improved seed, fertilizer and agro-chemicals available at the door step of farmers.

PROJECTED REQUIREMENT OF PULSES IN KIPHIRE DISTRICT

[illegible]

Action to be taken to meet the requirement by 2025 :

Area expansion by (7% $\rightarrow$ 5% $\rightarrow$ 3%)

Application of fertilizer

Adoption of PP measures

Replacement by HYV (10%)



PROJECTED REQUIREMENT OF OILSEED CROPS IN KIPHIRE DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Oil seed	1324	1099	0.83	1456	1748	1.2	1602	2243	1.4
Oil(35%)		385			612			785	
Requirement		1040			1148			1299	
Surplus(+)		-655			-536			-514	
Deficit (-)									

Action to be taken to meet the requirement by 2025 :

- Area expansion by (10% ➡ 10% ➡ 10%)
- Application of fertilizer
- Adoption of PP measures
- Assured Irrigation.
- Sowing at the appropriate season



PROJECTED REQUIREMENT OF VEGETABLES IN KIPHIRE DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of vegetables					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Vegetables	835	2922.5	3.5	893	4020.5	4.5	956	5258	5.5
Requirement		4053			4474			5062	
Surplus(+)		-1131			-453			196	
Deficit (-)									

Action to be taken to meet the requirement by 2025 :

- Area expansion of vegetables.(7% ➡ 7% ➡ 5%)
- Establish cold storage to minimize post harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-Export Zones for export of spices like Naga King chilli, ginger, turmeric, medicinal and aromatic crops.
- Cultivation of summer potato.
- Cultivation of summer vegetable to export to the other states



PROJECTED REQUIREMENT OF FRUIT CROPS IN KIPHIRE DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Fruit	1935	6773	3.5	2070	9317	4.5	2174	11957	5.5
Requirement		4053			4474			5062	
Surplus(+)		2720			4843			6895	
Deficit (-)								8828	

Action to be taken to meet the requirement by 2025

- Area expansion by (7% ➔ 5% ➔ 3%)
- Application of fertilizer
- Adoption of PP measures
- Drip irrigation.
- Rejuvenation of old orchards.
- Introduction of high value fruits.
- Promotion, education and establishment of Apple based and other fruit processing units.
- Distribution of refrigerated vehicles to minimize loss during transportation of perishable fruits
- Establishing cold storages.
- Develop market linkages and communication facilities.



Apples

PROJECTED REQUIREMENT OF MEAT IN KIPHIRE DISTRICT

	2011	2015	2020	2025
Projected population	74033	81719	92457	104607
Production’000 MT	1.97	2.76	3.86	5.4
Requirement ’000 MT	3.11	3.43	3.88	4.39
Surplus/Deficit (+/-)	-1.14	-0.67	-0.02	(+)1.01

Action to be taken to meet the requirement by 2025

- Proper animal health care.
- Improved breeds of pig, cattle, poultry for high meat yield.
- Feed supplements and fodder cultivation.
- Establish cold storages.
- Sustained supply of power source.



Maize





LONGLENG DISTRICT

CHAPTER 6 | DISTRICT PROFILE

An important district of Nagaland, Longleng was formed in 2004 by the division of Tuensang District. Longleng is bordered by the three districts of Mokokchung, Mon and Tuesang. The district covers an area of 885 sq. km. with a population of 1,58,300. Longleng Town is the district head-quarter located at an altitude of 1,066m. MSL. Longleng is inhabited by the Phom Naga tribe spread over 38 villages. The district has one major college and several schools to support the educational structure. On the medical health sector, there are Government run hospitals as well as private medical centres.

Since attaining the status of a district, there has been notable development in the introduction of Keno a variety of orange that has been successfully cultivated in the district by private entrepreneurs. The fertility of the soil and climatic conditions are found to be conducive to its cultivation. Mossambi another citrus fruit has also been introduced. Growing betel vine has been a traditional occupation with the produce being sold in neighbouring Assam. Farmers continue to accrue income in its cultivation. Sericulture has made inroads into the district in the last few years. Eri farmers harvest the pupa for food which is a nutritious protein diet supplement and provides additional income to the farmer.

NAME OF FARMER'S ORGANIZATION INFO FOR 2009-2010

Total Number of Farmer's Organization: 30

Name of Farmer's Organization / SHG	Activities	Resources obtained from
Phonli SHG	Cardamom & Betel Vine	Yongam
Vomshakla SHG	Ginger	Yongyeh
Mukhula SHG	Banana	Tangha
Chingla	Ginger	Yongshai
ShenInja	Orange	Nokshosang
Nyamla	Banana & Ginger	Yoyyah

HORTICULTURE PRODUCTION FIGURES FOR 2009-2010

Name of the crop	Area Covered (In Ha)	Productivity Per Ha (In MT/Ha)	Production (In MT)
Orange	427	7.02	3000
Banana	195	10	1950
Pineapple	205	9	1845
Betel vine	335	0.03	10.5
Cardamom	75	0.3	22.5

FARMERS’ ORGANIZATIONS

Total Number of Farmers Organization: 121 SHGS

Name of Farmer’s Organization	Activities	Resources obtained from
Centre Women Society	Fruit preservation	Longleng
Taklanh SHG	Mushroom	Yong Shei Vill
Nedyldm SHG	Floriculture	Oraspkng vill
Hongmeila SHG	Banana & Pine Apple	Yongyah vill
Bangtoi	Pineapple	Yongshei vill
Baungi Shg	Orange	Alayong vill
Chende	Orange	Alayong vill
Bongilyla SHG	Betel vine	Tanghe vill
Ahchong	Vegetable	Yangm Vill
Mongrai	Vegetable	Yangam Vill
Samtoney	Pineapple	Yadang vill
Chingla	Pineapple	Longleng Vill
Konchn	Pineapple	Longleng Vill

SWOT ANALYSIS OF HORTICULTURE SECTOR LONGLENG

Strength - Favorable agro climatic condition. - Land fertile and suitable for various horticultural crops. - Available land for cultivation. - Availability of large number of indigenous fruits and vegetables having good market demand. - Availability of family labour. - Scope for attracting educated youth towards cultivation.	Weakness - Non availability of quality planting materials. - Lack of marketing infrastructure. - Lack of post harvest management and processing facilities. - Poor transport and communication facilities.
Opportunity - Scope for intensification and diversification. - Organic fruits and vegetables cultivation can be undertaken. - Scope for introduction of high value crops. - Scope for establishment of fruit processing industry. - Scope for expansion of betel vine.	Threat - Unstable market price. - Farmers shifted to other occupation. - Soil fertility degradation.



Betel vine



Eri larvae

LIVESTOCK POPULATION OF LONGLENG

Name of the Live Stock	Total number of Farms	Livestock Population
1. Cattle	450	2737
2. Piggery	6500	9456
3. Goatery	18	941
4. Poultry	3000	41976
5. Duckery	75	2516
6. Mithun	20	512
7. Rabbit	10	300

FISHERIES STATISTICS OF LONGLENG DISTRICT

Sl. No	Name of the District	Ponds/Tanks			Paddy-cum-Fish culture		
		Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)	Estimated potential total area (ha)	Utilized area uptill 2010-11 (ha)	Unutilized area (ha)
1	Longleng	1010.0	51.0	959.0	840.0	20.0	820.0





PROJECTED REQUIREMENT AND PRODUCTION OF CEREAL CROPS IN LONGLENG DISTRICT:

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of cereals(Productivity in terms of Rice)					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Cereals	9800	13720	1.4	10094	17665	1.75	10397	22561	2.17
Requirement		9233			10192			11531	
Surplus(+)		4487			7473			11030	
Deficit (-)								13190	

Action to be taken to meet the food requirement by 2025

1. Increase the area of the cereal crops. (3% ➡ 3% ➡ 3%)
2. Pest and disease management during cultivation.
3. Increase irrigation potentiality to cultivate summer paddy.
4. Utilization of modern technology in paddy cultivation such as SRI, for efficient use of irrigation water.
5. Making inputs like improved seed, fertilizer, agro-chemicals available at the door step of farmers.

PROJECTED REQUIREMENT AND PRODUCTION OF PULSE CROPS IN LONGLENG DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Pulses					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Pulses	1006	1006	1	1076	1292	1.2	1130	1469	1.3
Requirement		554			612			692	
Surplus(+)		452			680			777	
Deficit (-)								963	

Action to be taken to meet the requirement by 2025

- Area expansion by (97% ➡ 5% ➡ 3%)
- Application of fertilizer
- Adoption of PP measures
- Replacement by HYV (10%)

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Oil seed					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Oil seed	1245	1033	0.83	1370	1643	1.2	1506	2109	1.4
Oil (35%)		362			575			738	
Requirement		811			895			1012	
Surplus(+)		-449			-320			-274	
Deficit (-)									

Action to be taken to meet the requirement by 2025

- Area expansion by (10% ➔ 10% ➔ 10%)
- Application of fertilizer
- Adoption of PP measures
- Assured Irrigation.
- Sowing at the appropriate time.
- Establishment of oil-extraction and oil cake units for livestock.

PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN LONGLENG DISTRICT

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of vegetables					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Vegetables	845	2958	3.5	887	3549	4	932	4658	5
Requirement		2770			3058			3459	
Surplus(+)		188			491			1199	
Deficit (-)									

Action to be taken to meet the requirement by 2025

- Area expansion of vegetables (5% ➔ 5% ➔ 3%)
- Establish cold storage to minimize post-harvest loss.
- Streamlining marketing through SHGs or CIGs.
- Establish Agro-export Zones for export of spices like Naga King chilli, ginger, cardamom, medicinal and aromatic crops..
- Cultivation of summer vegetable and value added crops for export to other states.
- Introduction of refrigerated vehicles to transport perishable produce to the market.
- Market linkages, farmer exposure trips and training.
- Creating Agri-corridor from production sites to markets.

Crop	20010-11 (Base year)			Expected increase in area, production and productivity of Fruit					
				2015			2020		
	Area	Prod.	Productivity	Area	Prod.	Productivity	Area	Prod.	Productivity
	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.	(Ha.)	MT	MT/Ha.
Fruit	1460	5110	3.5	1562	7030	4.5	1640	9022	5.5
Requirement		2770			3058			3459	
Surplus(+)		2340			3972			5562	
Deficit (-)								7068	

Action to be taken to meet the requirement by 2025

- Area expansion of fruit crops by (7% ➡ 5% ➡ 3%)
- Establishment of fruit processing small scale units.
- Distribution of specialised transport vehicles to minimize loss during transportation of perishable fruits.
- Establishment of cold storage facilities.
- Introduction and expansion of high yielding fruits such as Keno orange.



PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN LONGLENG DISTRICT UP TO 2025

	2011	2015	2020	2025
Projected population	50593	55845	63184	71487
Production'000 MT	0.93	1.30	1.82	2.55
Requirement '000 MT	2.12	2.34	2.65	3.00
Surplus/Deficit (+/-)	-1.19	-1.04	-0.83	-0.45

Action to be taken to meet the requirement by 2025

- Proper animal health care.
- Improved breeds of pig, cattle and poultry for high meat yield.
- Feed supplements and fodder cultivation.
- Establishment of fodder processing units.

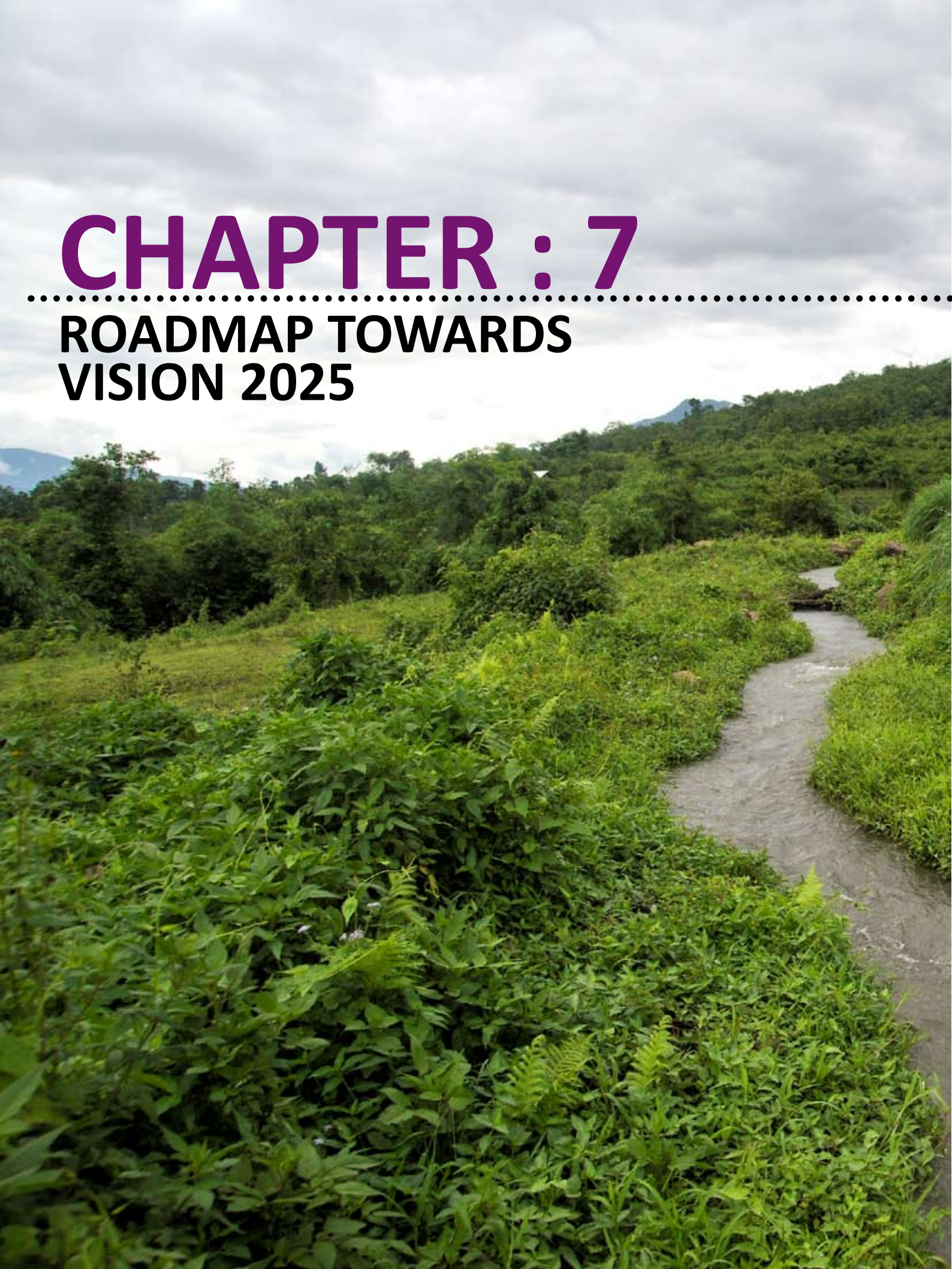


Orange harvest



Mithun open grazing



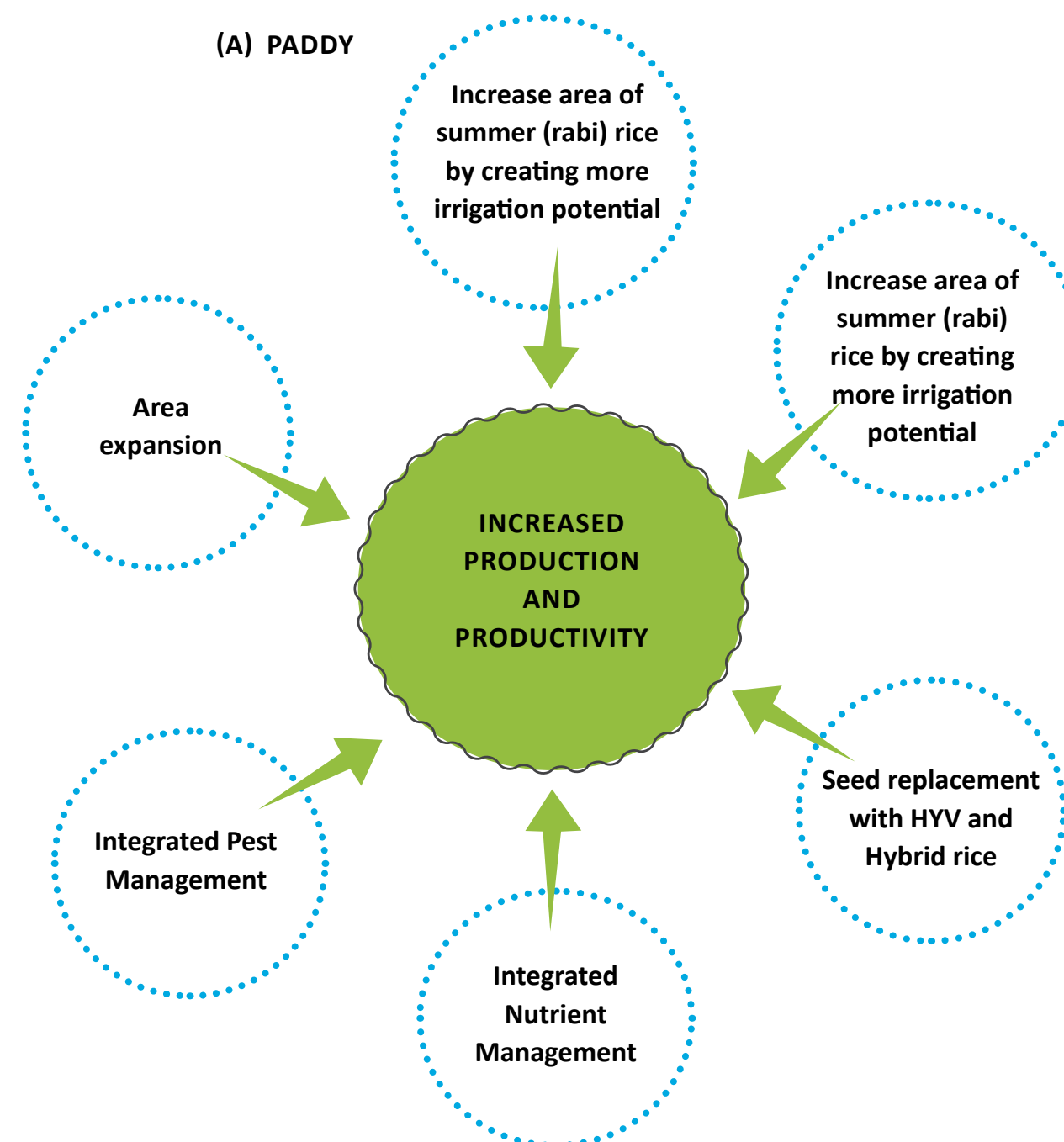


CHAPTER : 7

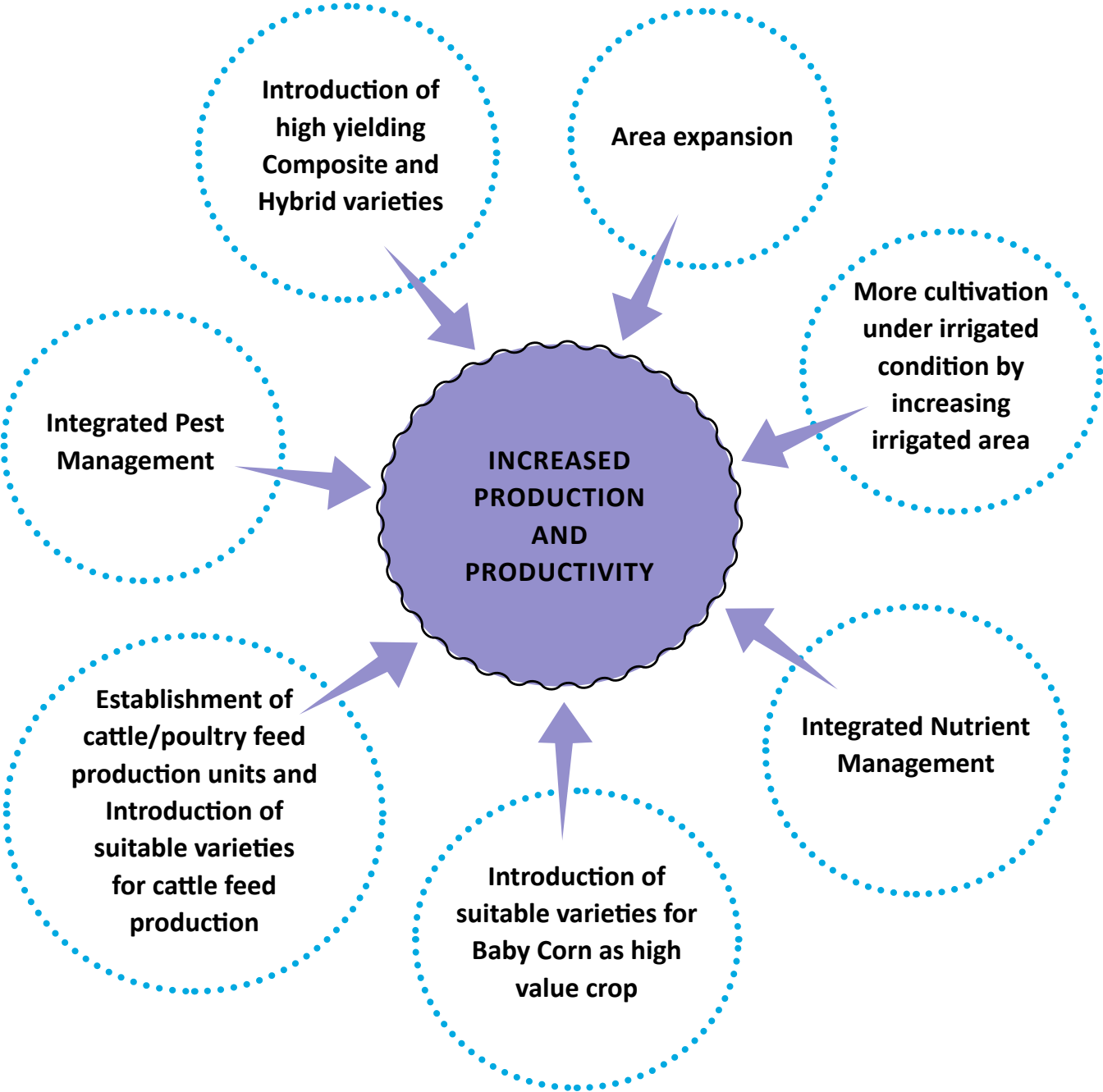
ROADMAP TOWARDS VISION 2025

The roadmap to arrive at the Vision is synergised with the technological inputs as projected in the district profiles on the Agri and Allied sectors in Nagaland. The roadmap is diagrammatically projected here.

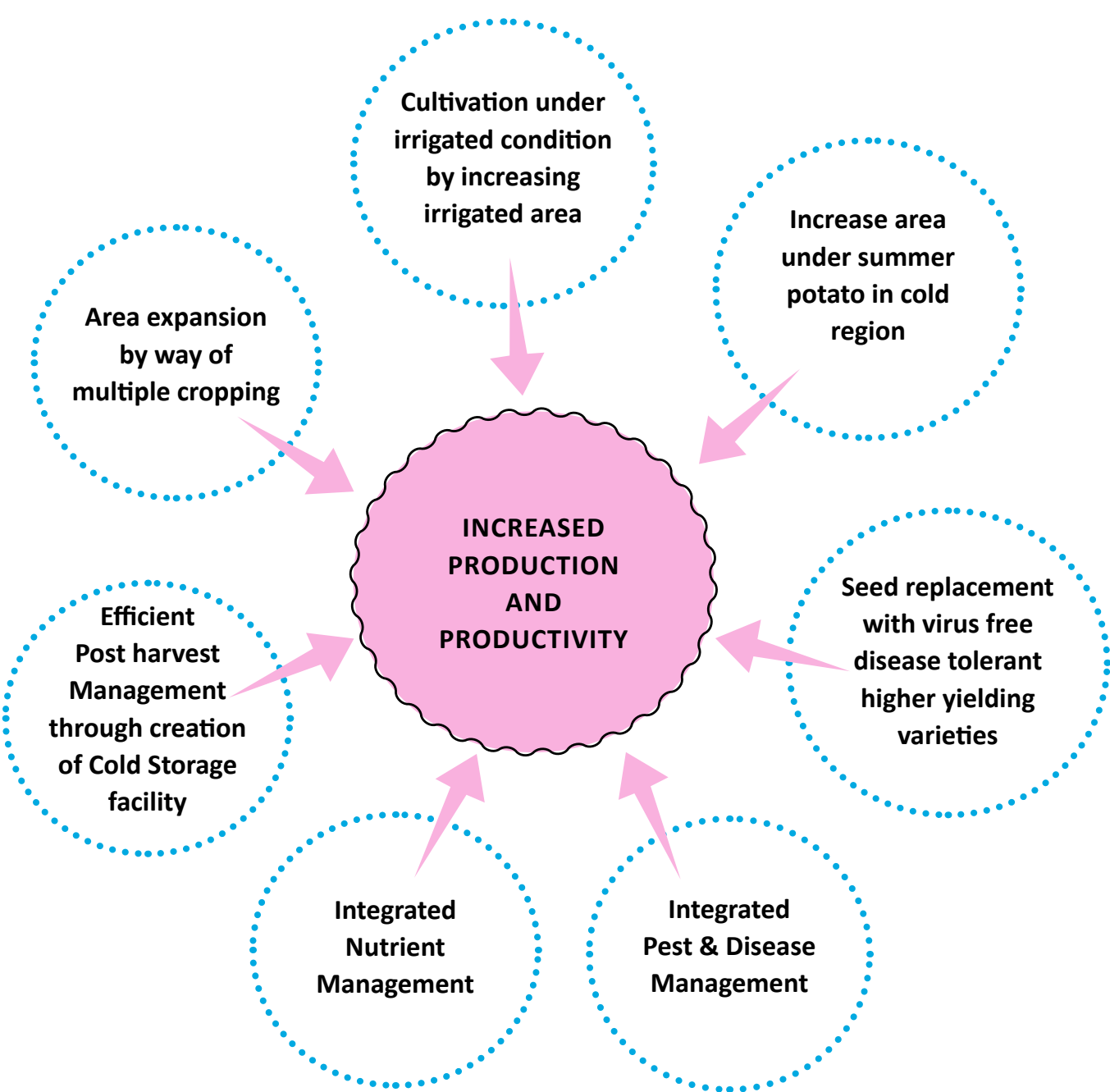
ROAD MAP TO ACHIEVE FOOD SECURITY BY 2025



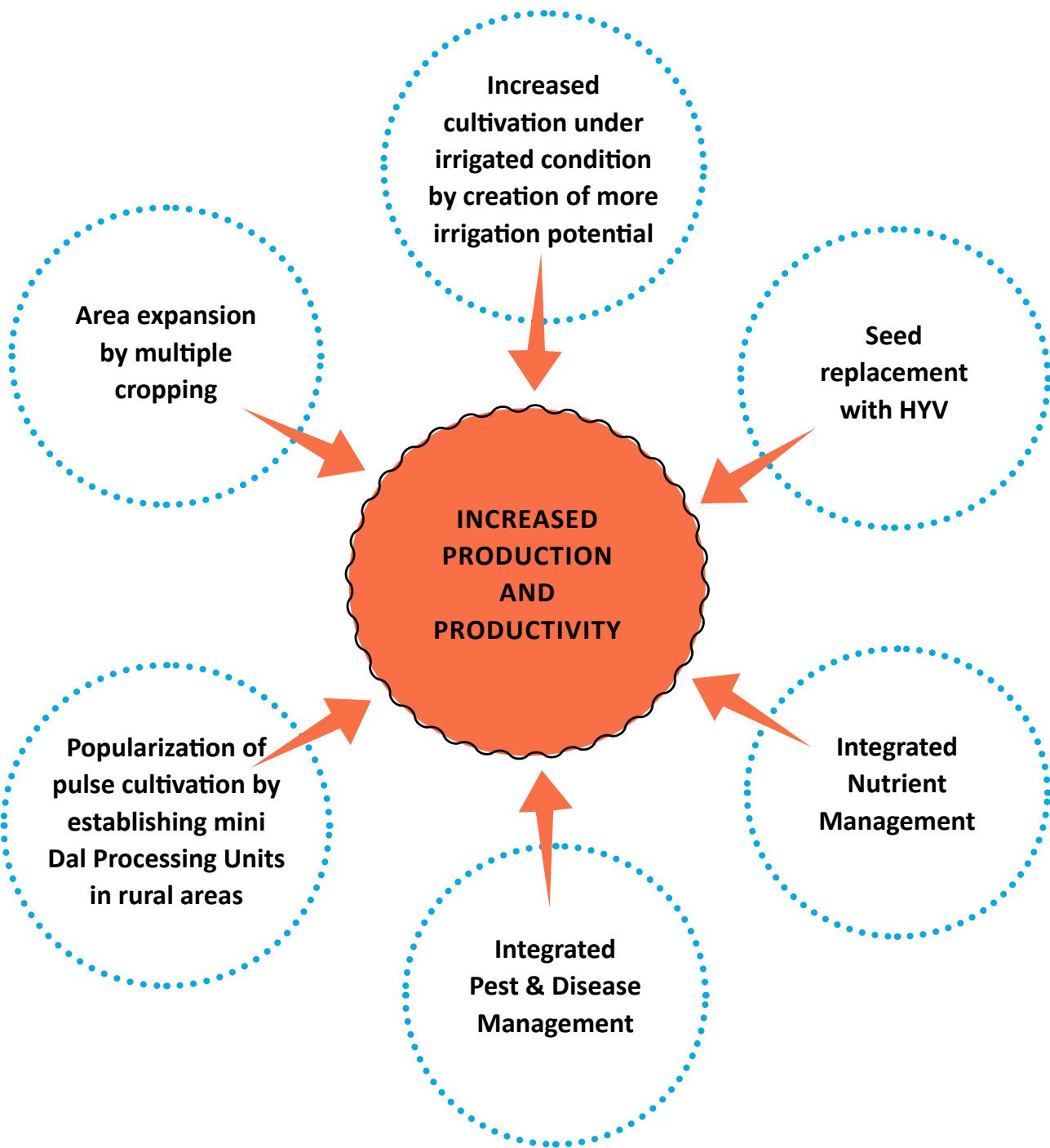
(B) MAIZE



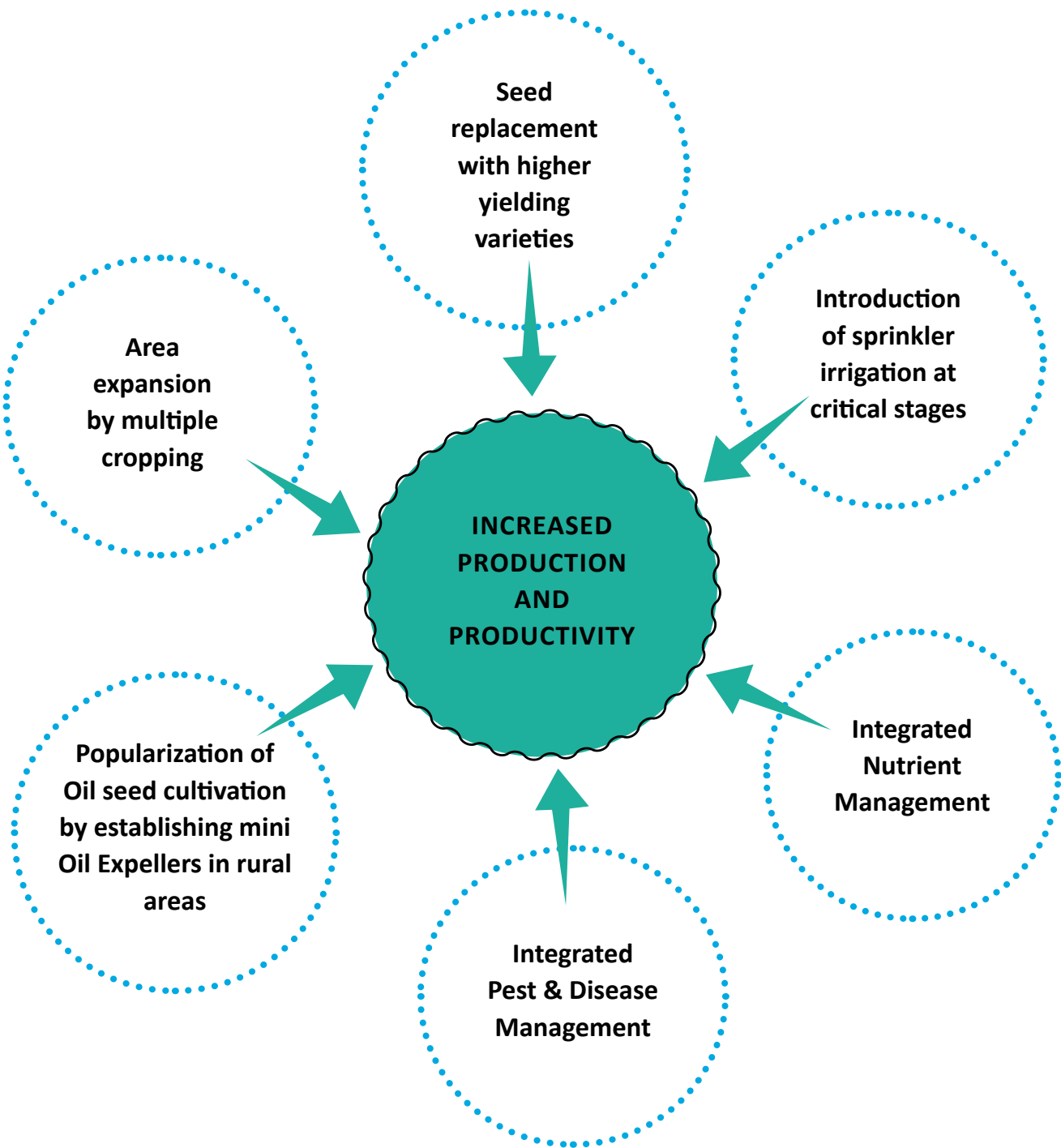
(C) POTATO



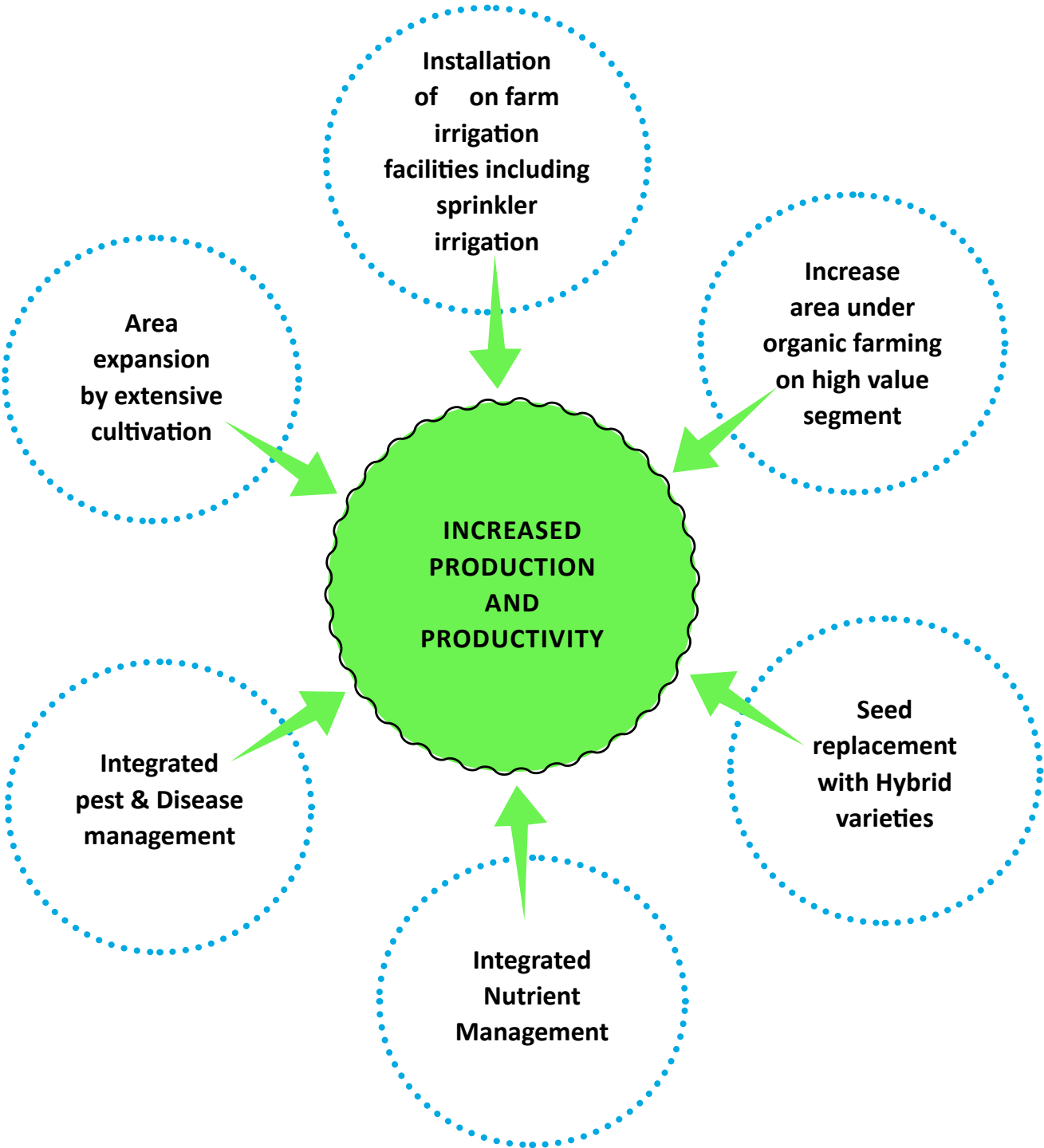
(C) PULSES



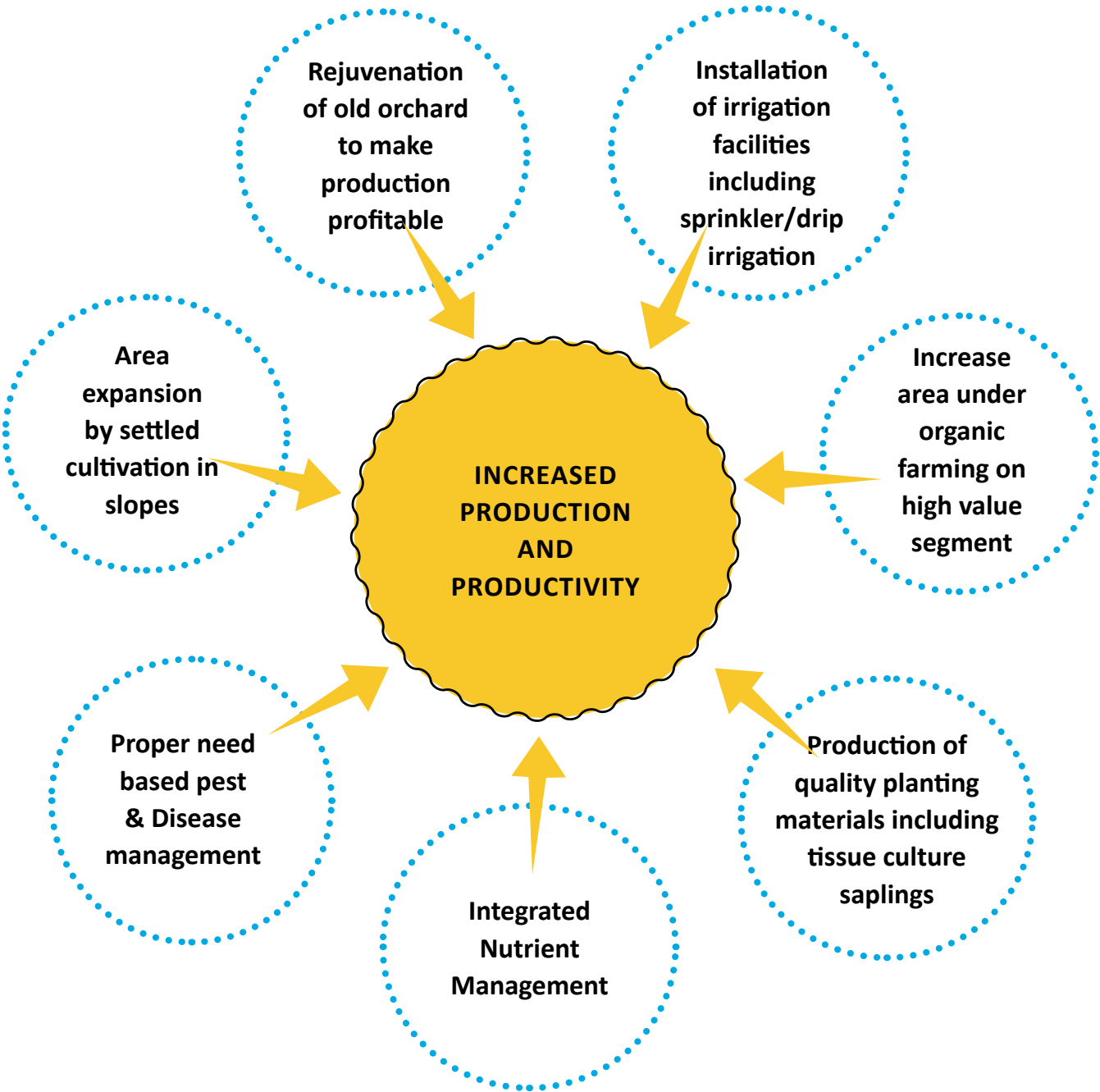
(D) OIL SEED



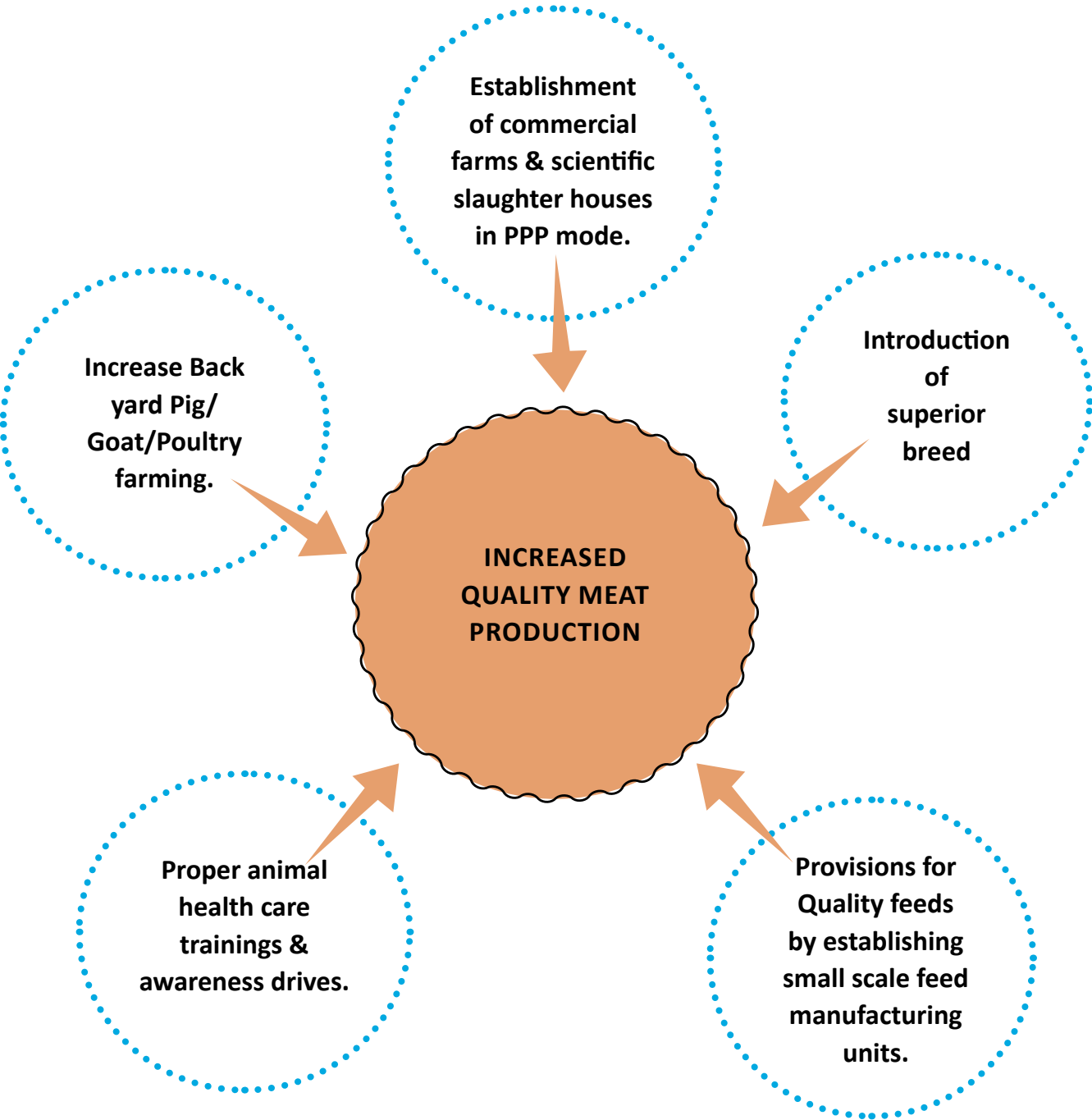
(E) VEGETABLES



(F) FRUIT



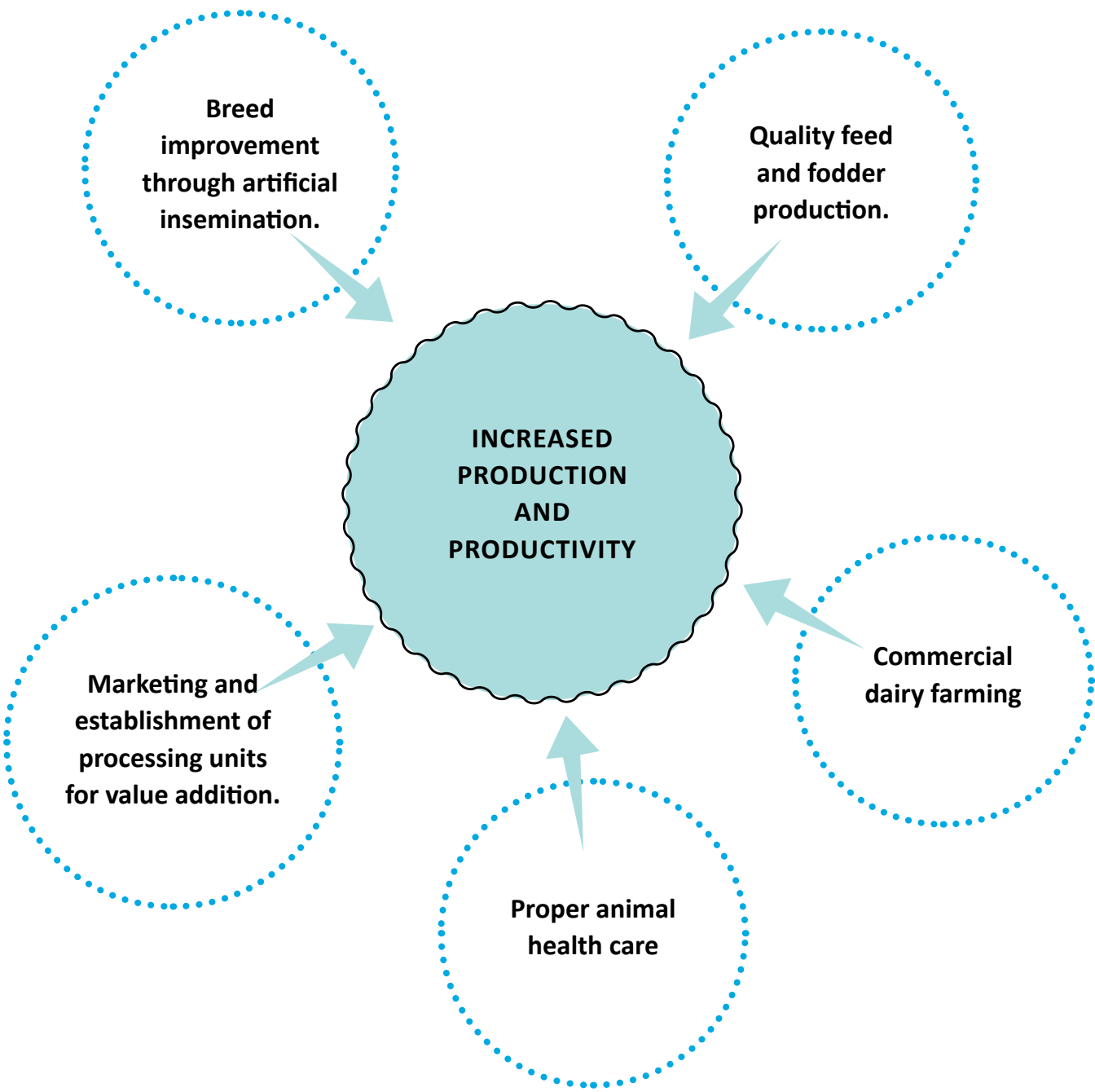
(G) MEAT



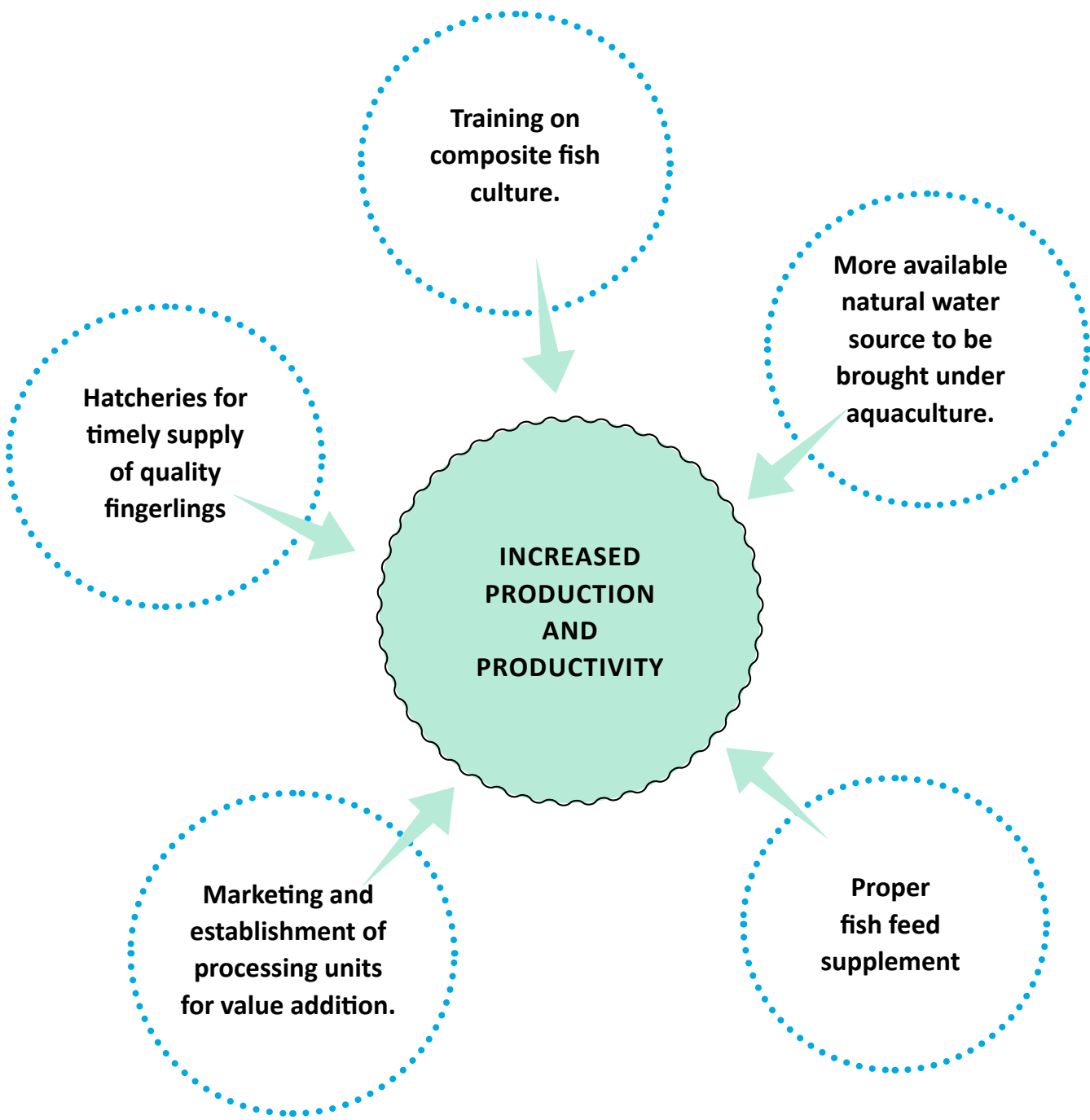
(H) EGG



(I) MILK

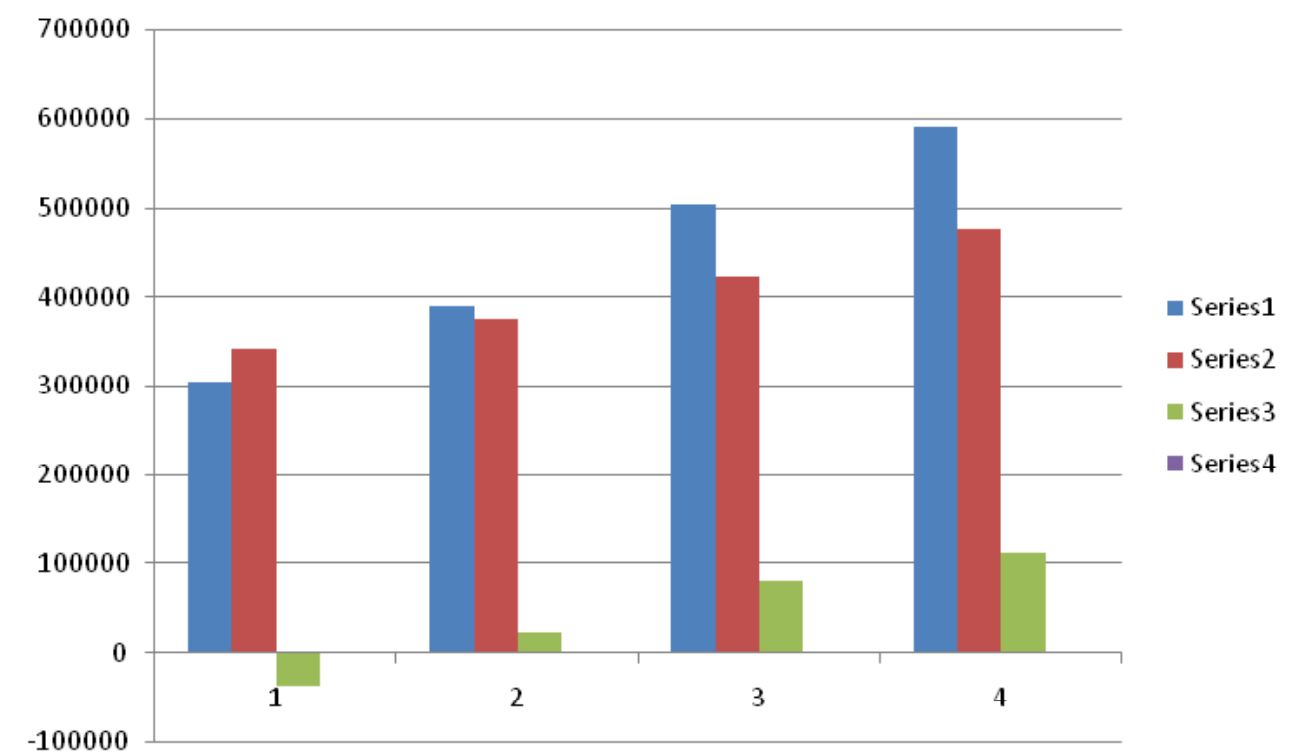


(J) FISH



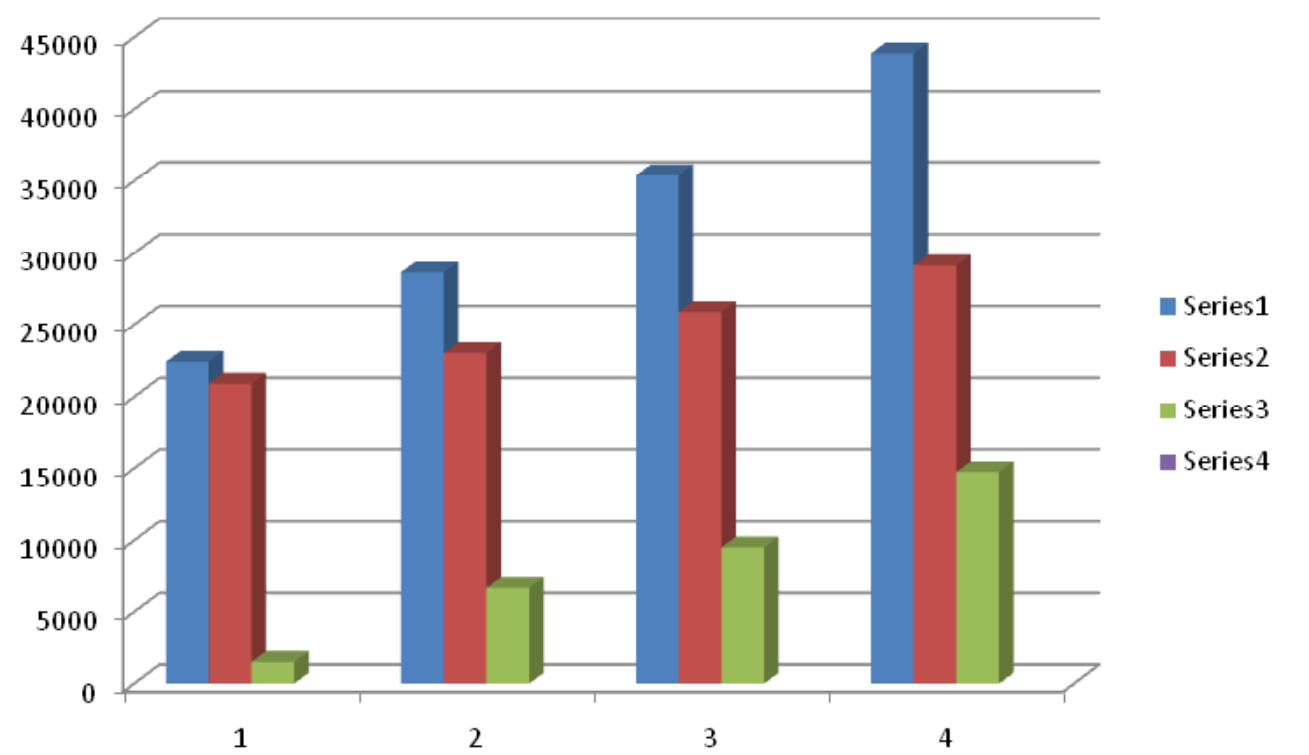
PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF CEREALS

	2011	2015	2020	2025
Production'000 MT	305419	389908	504783	591322
Requirement '000 MT	341699	376115	424072	478182
Surplus/Deficit (+/-)	-36280	23793	80711	113140



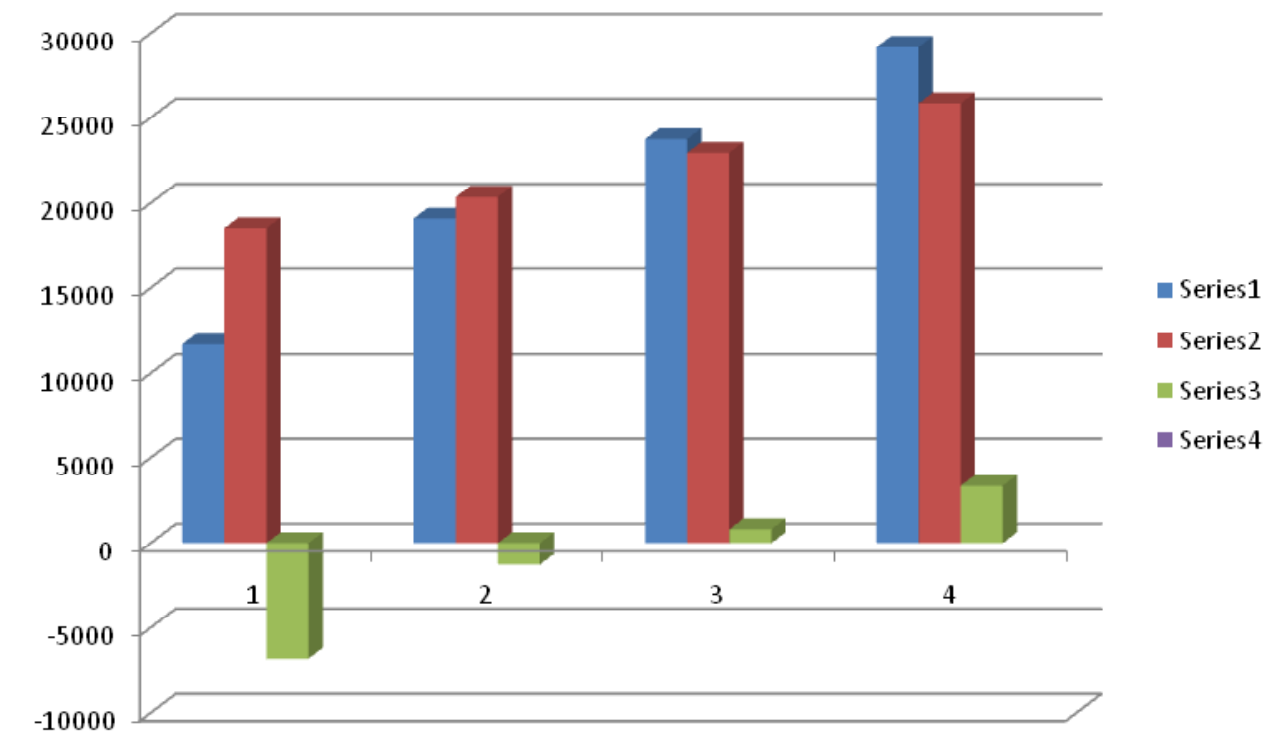
PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF PULSES

	2011	2015	2020	2025
Production'000 MT	22417	28663	35405	43894
Requirement '000 MT	20925	23003	25893	29151
Surplus/Deficit (+/-)	1492	6660	9512	14743



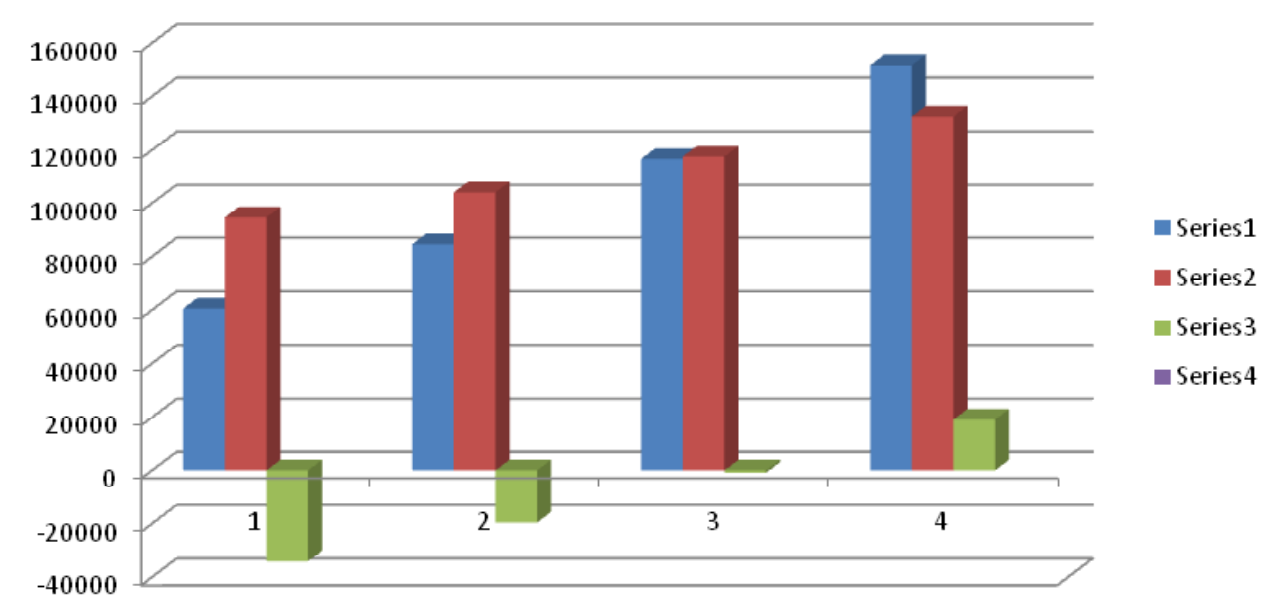
PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF OILSEEDS

	2011	2015	2020	2025
Production'000 MT	11706	19090	23741	29181
Requirement '000 MT	18514	20365	22942	25848
Surplus/Deficit (+/-)	-6809	-1276	803	3332



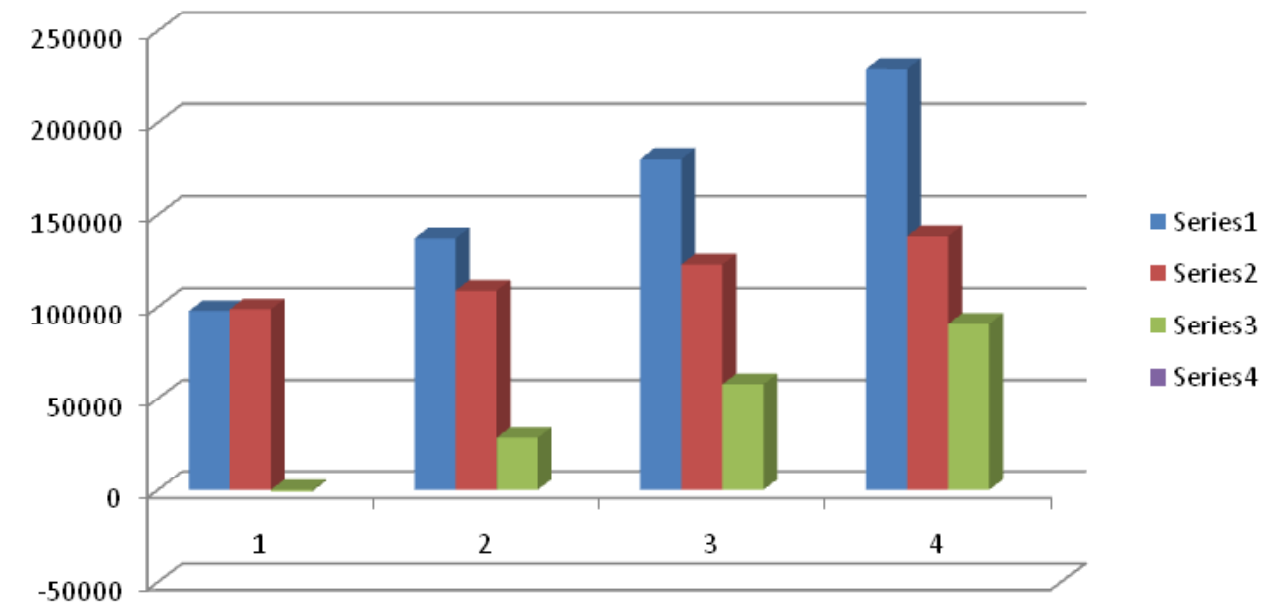
PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF VEGETABLES

	2011	2015	2020	2025
Production'000 MT	60547	84580	116645	151784
Requirement '000 MT	94576	104156	117517	132594
Surplus/Deficit (+/-)	-34033	-19575	-872	19188



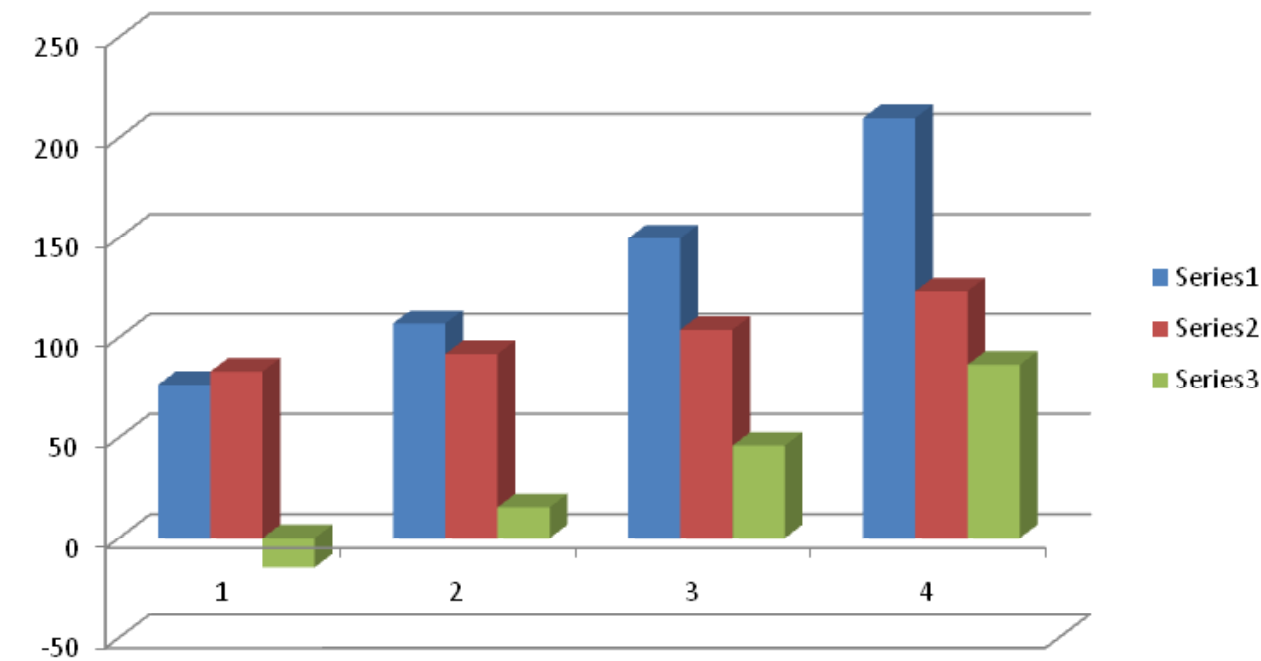
PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF FRUITS

	2011	2015	2020	2025
Production'000 MT	97791	137289	180540	229303
Requirement '000 MT	98753	108746	122711	138473
Surplus/Deficit (+/-)	-963	28543	57828	90831



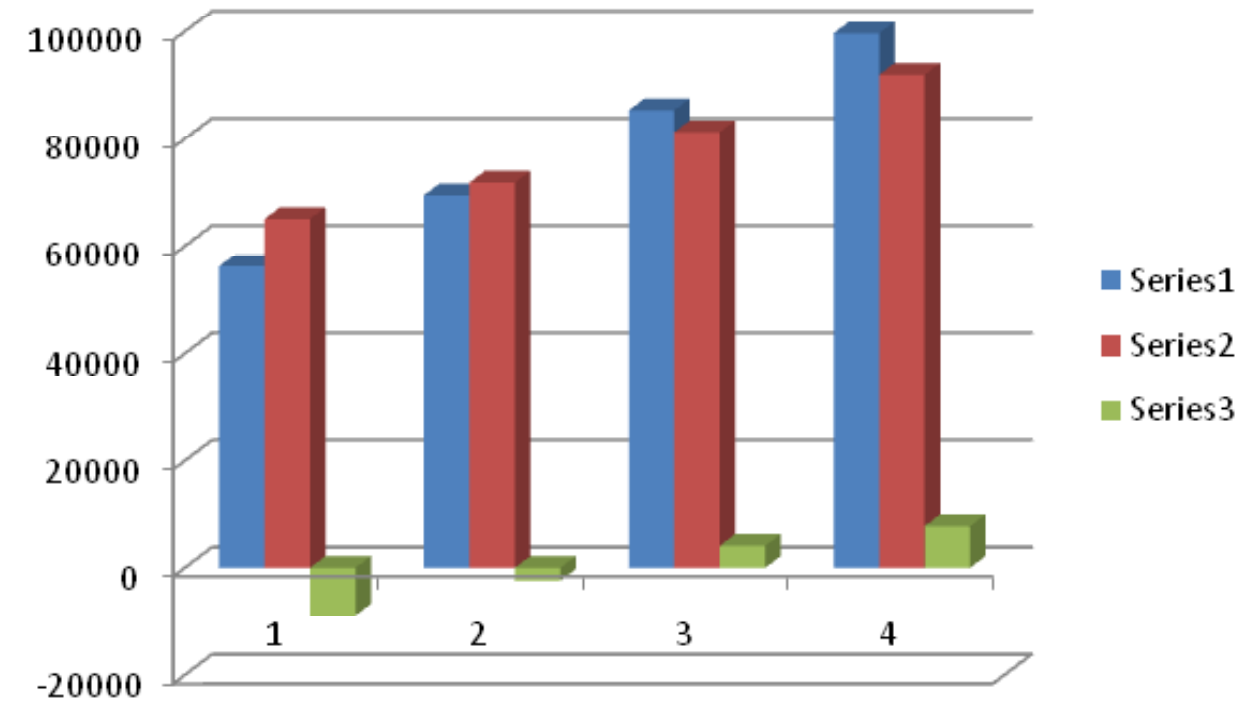
PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF MEAT

	2011	2015	2020	2025
Production'000 MT	76.42	106.98	149.78	209.72
Requirement '000 MT	83.06	91.77	103.82	123.32
Surplus/Deficit (+/-)	-14.65	15.21	45.96	86.4



PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF MILK

Sl. No.	Year	Internal production In KLt	Requirement In KLt	Surplus/ deficit
1	2010-11	56193	65063	-8870
2	2011-15	69432	71817	-2385
3	2015-20	85315	81254	+4061
4	2020-25	99645	91932	+7713



PROJECTED PRODUCTION AND CONSUMPTION PATTERN OF EGG

Sl. No.	Year	Internal production In Lakh No.	Per capita availability/year (Nos.)
1	2010-11	2483.7	125.40
2	2011-15	2980.3	136.32
3	2015-20	3874.4	156.64
4	2020-25	5036.7	179.98



YEAR-WISE PROJECTED FISH PRODUCTION AND PER CAPITA CONSUMPTION:

Sl. No.	Year-wise	Projected Target			
		Fish Production (Anticipated) (in MT)		Population (Anticipated)	Per Capita Consumption (Anticipated) (in Kg)
		State Production	Fish Import		
0	1	2	3	4	5
1	2010-11 (Base Year)	6585	4000	19,80,602	5.34
2	2011-15	8542	3500	22,00,000	5.47
3	2016-20	15377	1500	25,00,000	6.75
4	2021-25	22653	-	28,00,000	8.09

PROJECTED PRODUCTION AND REQUIREMENT OF AGRICULTURE AND HORTICULTURE CROPS IN NAGALAND

Crops	2010-2011		2011-2015		2015-2020		2020-2025		Remarks
	Require-ment in MT	Produc-tion in MT	Require-ment in MT	Produc-tion in MT	Require-ment in MT	Produc-tion in MT	Require-ment in MT	Produc-tion in MT	
Cereal (Grain)	361460	341691	398984	405164	451414	517476	510733	601774	By the end of 2025 Nagaland will be a surplus state in Agri-Horti products
Pulse	25302	23662	27929	30382	31599	34560	35751	41073	
Oilseed (Oil)	21688	14008	23939	21671	27085	27053	30644	31014	
Vegeta-bles	108438	68611	119695	115364	135424	145883	153220	168102	
Fruits	104100	81344	126535	121513	161494	167173	206112	208572	

(Facing page) Weekly market





PROJECTED REQUIREMENT AND PRODUCTION OF CEREALS IN NAGALAND.

2010-11 (BASE YEAR)					2015					2020					2025					
District	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status
Dimapur	22708	34062	1.5	49548	-15486	24980	49960	2.0	53632	-3672	29285	58570	2	59214	-644	29285	73213	2.5	65377	7836
Kohima	30783	43096	1.4	49286	-6190	31706	55486	1.75	54403	1083	32658	70867	2.17	61552	9315	33637	82412	2.45	69641	12771
Mokokchung	16377	22928	1.4	35254	-12326	17196	30093	1.75	38914	-8821	18056	39181	2.17	44027	-4846	18958	46448	2.45	49813	-3365
Zunheboto	22148	31007	1.4	25735	5272	22812	39922	1.75	28407	11515	22812	49503	2.17	32140	17363	22812	55890	2.45	36363	19527
Wokha	22148	31007	1.4	30339	668	22812	39922	1.75	33488	6434	23497	50988	2.17	37889	13099	24202	59294	2.45	42868	16426
Mon	22716	31802	1.4	45747	-13945	23397	40946	1.75	50497	-9551	24099	52296	2.17	57132	-4836	24822	60815	2.45	64640	-3825
Phek	22716	31802	1.4	29801	2001	23397	40946	1.75	32895	8051	24099	52296	2.17	37218	15078	24822	60815	2.45	42108	18707
Tuensang	20490	28686	1.4	35916	-7230	21105	36933	1.75	39645	-2712	21738	47171	2.17	44854	2317	22390	54855	2.45	50749	4106
Peren	15449	21629	1.4	17329	4300	15912	17847	1.75	19128	8719	16390	35566	2.17	21642	13924	16882	41360	2.45	24486	16874
Kiphire	11200	15680	1.4	13511	2169	11536	20188	1.75	14914	5274	11882	25784	2.17	16873	8911	12239	29984	2.45	19091	10893
Longleng	9800	13720	1.4	9233	4487	10094	17665	1.75	10192	7473	10397	22561	2.17	11531	11030	10709	26236	2.45	13046	13190
Total	216535	305419	1.41	341699	-36280	224947	389908	1.7	376115	23793	234913	504783	2.15	424072	80711	240758	591322	2.46	478182	113140

PROJECTED REQUIREMENT AND PRODUCTION OF PULSES IN NAGALAND.

	2010-11 (BASE YEAR)					2015					2020					2025				
District	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status
Dimapur	1880	1880	1.0	4436	-2556	2444	2933	1.2	4801	-1868	2811	4217	1.5	5301	-1084	3092	6184	2.0	5853	331
Kohima	3039	3039	1.0	2957	82	3343	4011	1.2	3264	747	3577	4650	1.3	3693	957	3827	5741	1.5	4178	1563
Mokokchung	1259	1259	1.0	2115	-856	1385	1662	1.2	2335	-673	1482	2075	1.4	2642	-567	1856	2537	1.6	2989	-452
Zunheboto	2710	2710	1.0	1544	1166	2981	3577	1.2	1704	1873	3190	4147	1.3	1928	2219	3413	5119	1.5	2182	2937
Wokha	1180	1180	1.0	1820	-640	1298	1558	1.2	2009	-451	1389	1944	1.4	2273	-329	1486	2378	1.6	2572	-194
Mon	1790	1790	1.0	2745	-955	1969	2363	1.2	3030	-667	2107	2950	1.4	3428	-478	2254	3607	1.6	3878	-271
Phek	4140	4140	1.0	1788	2352	4430	4316	1.2	1974	3342	4651	6047	1.3	2233	3814	4791	7186	1.5	2526	4660
Tuensang	4298	4298	1.0	2155	2143	4599	5519	1.2	2379	3140	4829	6277	1.3	2691	3586	4974	7461	1.5	3045	4416
Peren																				
Kiphire	1115	1115	1.0	811	304	1193	1432	1.2	895	537	1253	1629	1.3	1012	617	1290	1935	1.5	1145	790
Longleng	1006	1006	1.0	554	452	1076	1292	1.2	612	680	1130	1469	1.3	692	777	1164	1746	1.5	783	963





PROJECTED REQUIREMENT AND PRODUCTION OF VEGETABLES IN NAGALAND.

	2010-11 (Base year)					2015					2020					2025				
District	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status
Dimapur	1910	6685	3.5	11089	-4404	2483	9932	4	12003	-2071	3228	19368	6	13253	6115	3874	27118	7	14632	12486
	2545	8907.5	3.5	14786	-5879	2723	12254	4.5	16321	-4067	2914	16026	5.5	18466	-2440	3118	21824	7	20892	932
Mokokchung	1910	6685	3.5	10576	-3891	2044	9196	4.5	11674	-2477	2187	12027	5.5	13208	-1181	2340	15209	6.5	14944	265
	1248	4368	3.5	7721	-3353	1335	6009.1	4.5	8522	-2513	1429	7859	5.5	9642	-1783	1529	10702	7	10909	-207
Wokha	2365	8277.5	3.5	9102	-825	2531	11387	4.5	10046	1341	2708	14892	5.5	11367	3525	2897	18832	6.5	12860	5972
	1515	5302.5	3.5	13724	-8422	1667	7499	4.5	15149	-7650	1833	10999	6	17140	-6141	2016	14115	7	19392	-5277
Phek	1835	6423	3.5	8940	-2518	1963	9817.3	5	9868	-51	2101	11555	5.5	11165	390	2248	14612	6.5	12632	1980
	1935	6772.5	3.5	10775	-4003	2070	9317	4.5	11893	-2576	2215	12185	5.5	13456	-1271	2370	15408	6.5	15225	183
Tuensang	1245	1245	1	1040	205	1332	1599	1.2	1148	451	1399	1818	1.3	1299	519	1441	2161	1.5	1469	692
	835	2922.5	3.5	4053	-1131	893	4020.5	405	4474	-453	956	5258	5.5	5062	196	1004	6525	6.5	5725	798
Longleng	845	2958	3.5	2770	188	887	3549	4	3058	491	932	4658	5	3459	1199	960	5278	5.5	3914	1364
	Total	18188	60546.5	36	94576	-34033	19928	84579.9	446.2	104156	-19575	21902	116645	56.8	117517	-872	23797	151784	67.5	132594



PROJECTED REQUIREMENT AND PRODUCTION OF FRUITS IN NAGALAND.

		2010-11 (BASE YEAR)									2015					2020					2025				
District	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status	Area	Prod	Yield	Reqmnt	Status
Dimapur	1395	4883	3.5	11089	-6207	1895	9475	5.0	12003	-2528	2395	14370	6.0	13253	1117	2895	23160	8.0	14632						
	3430	12005	3.5	14786	-2781	3670	16515	4.5	16321	194	3927	21599	5.5	18466	3133	4123	26802	6.5	20892						
Mokokchung	3630	12705	3.5	10576	2129	3884	17478	4.5	11674	5804	4156	22858	5.5	13208	9650	4364	28365	6.5	14944						
Zunhebotos	1930	6755	3.5	7721	-966	2065	9293	4.5	8522	771	2210	13258	6.0	9642	3616	2276	14794	6.5	10909						
Wokha	3850	13475	3.5	9120	4355	4120	18538	4.5	10046	8492	4408	25125	5.7	11367	13758	4628	30084	6.5	12860						
Mon	2400	8400	3.5	13724	-5324	2568	11556	4.5	15149	-3593	2748	15387	5.6	17140	-1752	2885	18753	6.5	19392						
Phek	2500	8750	3.5	8940	-190	2675	12038	4.5	9868	2170	2862	14311	5.0	11165	3146	3005	19535	6.5	12632						
Tuensang	2470	8645	3.5	10775	-2130	2643	11893	4.5	11893	0	2828	14140	5.0	13456	683	2969	19300	6.5	15225						
Peren	2940	10290	3.5	5199	5091	3146	14156	4.5	5738	8418	3366	18513	5.5	6493	12020	3534	22973	6.5	7346						
Kiphire	1935	6773	3.5	4053	2720	2070	9317	4.5	4474	4843	2174	11957	5.5	5062	6895	2239	14555	6.5	5727						
Longleng	1460	5110	3.5	2770	2340	1562	7030	4.5	3058	3972	1640	9022	5.5	3459	5562	1690	10982	6.5	3914						
Total	27940	97791	3.5	98753	-963	30298	137289	4.5	108746	+28543	32714	180540	5.5	122711	+57828	34608	229303	6.6	138473						

PROJECTED REQUIREMENT AND PRODUCTION OF MEAT IN NAGALAND.

2011 BASE YEAR										2015					2020					2025				
District	Prod '000 MT	Reqmnt '000 MT	Status	Prod '000 MT	Reqmnt '000 MT	Status	Prod '000 MT	Reqmnt '000 MT	Status	Prod '000 MT	Reqmnt '000 MT	Status	Prod '000 MT	Reqmnt '000 MT	Status	Prod '000 MT	Reqmnt '000 MT	Status	Prod '000 MT	Reqmnt '000 MT	Status	Prod '000 MT	Reqmnt '000 MT	Status
Dimapur	18.76	15.94	(+2.82	26.26	17.6	(+8.66	36.77	19.91	(+16.86	51.48	22.52	(+28.96												
Kohima	13.8	11.34	(+2.46	19.32	12.51	(+6.81	27.05	14.16	(+12.89	37.9	21.88	(+16.02												
Mokokchung	9.87	8.02	(+1.85	13.82	8.95	(+4.87	19.35	10.13	(+9.22	27.09	11.46	(+15.63												
Zunheboto	6.8	5.92	(+0.88	9.52	6.53	(+2.99	13.33	7.39	(+5.94	18.66	8.36	(+10.30												
Wokha	6.23	6.98	-0.75	8.72	7.7	(+1.02	12.21	8.71	(+3.50	17.09	9.86	(+7.23												
Mon	4.36	10.52	-6.16	6.1	11.61	-5.51	8.54	13.14	-4.6	11.96	14.87	-2.91												
Phek	5.97	6.85	-0.88	8.36	7.57	(+0.79	11.7	8.56	(+3.14	16.38	9.68	(+6.70												
Tuensang	3.73	8.26	-4.53	5.22	9.12	-3.9	7.31	10.32	-3.01	10.23	11.67	-1.44												
Peren	4	4	0	5.6	4.4	(+1.2	7.84	4.98	(+2.86	10.98	5.63	(+5.35												
Kiphire	1.97	3.11	-1.14	2.76	3.43	-0.67	3.86	3.88	-0.02	5.4	4.39	(+1.01												
Longleng	0.93	2.12	-1.19	1.3	2.34	-1.04	1.82	2.65	-0.83	2.55	3	-0.45												
Total	76.42	83.06	-14.65	106.98	91.76	+15.21	149.78	103.83	+45.96	209.72	123.32	+86.40												

CHAPTER : 8

THE WAY FORWARD

The pre-requisites central to any development paradigm is the state of infrastructure development. The road map to agricultural development must bring within its ambit the two basic and crucial sectors of road connectivity and power. As activities expand, the main bottlenecks that will occur will be in the infrastructure sector. It is a comforting thought that 71 percent of the people in the State are engaged in agriculture. However, agriculture remains mostly subsistence in nature.

To envision and work towards an environment of food security by 2025, connectivity being of vital importance and crucial for development of inter-district connectivity, particularly between rural areas, linkages to all major urban areas will require serious attention. Establishment and sustaining road connectivity with proper surfaced roads crucial to delivery of services including, the transportation of agriculture and horticulture produces will be a major infrastructure challenge. The two lane highways presently constructed under the Special Accelerated Road Development Project (SARDP), a pan India initiative to connect district capitals with well surfaced roads by the National Highways Authority, will link Longleng, Mon, Tuensang, Zunheboto and Kiphire with neighbouring districts. This will bring the district capitals accelerated development and inter district connectivity.

The State even at its present level of economic activity is highly deficient in power generation. It is mostly dependent on the central sector power allocation. This aspect needs early attention. Exploring possibilities of other alternative power resources in production of non conventional forms of energy, encourage private sector for setting up power projects to meet the requirements of power, are issues to be addressed in development of the infrastructure segment in order to support agriculture, horticulture and animal husbandry interventions.

There is tremendous scope for growth in the agriculture sector. By building on the inherent strengths of agriculture, the way forward for Nagaland is the transformation of its agriculture to agronomics by way of shifting to commercial farming. The shift to commercial farming will entail development of sustainable

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agriculture, through specific interventions in existing practices by revitalizing the extension machinery through farmers capacity building, training, dissemination of modern production technology, research and use of improved and better seed, farm mechanization, setting up of tissue culture laboratories, establishment of food based cottage industries, creation of cold storage facilities, credit support, market linkages, exposure trips and participation in agro fairs. An important component is the development of post harvest management abilities of the human resources such as in the areas of storage and preservation technology, market linkages, specialized transportation and processing technology, as without this, any commercial agricultural activity would be futile. Clearly, the main focus is to move away from subsistence farming in cultivating with better mix of basic commercial cash crops, specialized value added vegetables and horticulture produce, floriculture, spices, medicinal and aromatic plants.

The existing practice of growing crops under organic conditions from the past to the present day has placed Nagaland in the position to take advantage of global trends for the demand of organic produce. This area needs to be explored for increased income generation in export opportunities. Crucial to market linkages is the involvement of private

sector or agro entrepreneurs in post harvest activities.

In the Animal Husbandry sector, the current production of livestock in the State is not sufficient to meet the growing consumption and demand for meat. However, there is scope of becoming self sufficient in livestock and poultry for meat constitutes a major diet component. The way forward is with improved breed of animal and poultry. Introduction of exotic birds with high meat yield such as, quail, turkey and emu is found compatible as a meat supplement with the people. It shows tremendous potential and has been successfully reared in the State. Some focused directions are the establishment of hygienic slaughter house and retail outlets, cold storage facilities and meat processing units to take forward looking initiatives in attaining self-sufficiency in meat.

Learning from the Phek Model is relevant for the other districts of the State to adopt as an example of people participation in meat self sufficiency. It puts into perspective opportunities for self-employment, increased income, improved livelihood and better utilization of resources.

Adapting and improving on time tested best traditional practices such as the paddy cum

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fish culture practiced in Phek and Kohima districts, is another lesson to be learnt in sensible resource management.

Development of Pisciculture in the State has undergone a sea change. Other than fish production, the introduction of prawn farming, disseminating of information and training in fish processing to women SHGs, has paved the way for diversification of fish by product and generation of income opportunities. Fish harvested from Doyang reservoir is widely available both fresh and smoked. The concentration of numerous water bodies and fisheries around Dimapur district has the potential to make the State self sufficient in fish. It will be vital to develop infrastructure for transportation in specialized

vehicles, establish cold storage facilities, and conform to hygienic parameters.

Participation of women in agriculture is crucial to the productivity of agriculture. Majority of rural women constitute more than half the total work force in agriculture and work longer hours as compared to men. Women attend to multiple tasks such as household chores in addition to farm duties. It has set them back from accessing delivery of support services and inputs, training, market information and credit. To understand the dynamics of women in agriculture it is important to sensitize and bring women within the ambit of any agricultural intervention, for their participation has a direct bearing on productivity.

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Clearly, the way forward for Nagaland is on the commercial development and improvement of its traditional best practices in the agricultural systems to act as a catalytic driver for economic prosperity through agriculture and attain food for all.

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REFERENCES

Mid Term Appraisal of 11th Five Year Plan, Planning Commission, Govt. of India.

Horticultural Boom in Nagaland, by K.G Karmakar and G.D Benarjee, NABARD.

Annual Administrative Report, Department of Animal Husbandry and Veterinary, Government of Nagaland.

Annual Administrative Report, Department of Agriculture Govt of Nagaland.

Climate Change in Nagaland. GIS report.

Forest Cover Change in Nagaland, GIS report.

Integrated Sample Survey 2005-06/ 2006-07/2007-08, Directorate of Veterinary and Animal Husbandry, Nagaland.

Administrative Report 2008, Department of Fishery, Government of Nagaland.

Directorate of Agriculture, Nagaland.

Report from DAO Kohima, Dimapur, Mokokchung, Wokha, Zunheboto, Phek, Mon, Peren, Longleng, Khipire, Tuensang.

SREP, ATMA Kohima, Mokokchung, Wokha, Phek, Mon, Zunheboto.

Report from District Horticulture Officers, Kohima, Dimapur, Tuensang, Mokokchung, Wokha, Zunheboto, Phek, Mon, Peren, Longleng, Khipire.

Statistical Hand Book of Nagaland, 2006-07/2007-08.

Nagaland Empowerment of People and Economic Development (NEPED) Project Report.

Nagaland Human Development Report 2004.

District Human Development Report 2009.

Vision 2020, Krishi Vigyan Kendras Nagaland.

ABBREVIATIONS

%	Percentage
@	At the rate of
AA	Assistant Agronomist
AAU	Assam Agricultural University
ACZ	Agro Climatic Zone
ADC	Additional Deputy Commissioner
AE	Assistant Entomologist
AES	Agro-Echological System
AFA	Agricultural Field Assistant
AI	Artificial Insemination
AICRIP	All India Coordinated Rice Research Project
Al	Aluminium
AMDP	Accelerated Maize Development Programme
AMO	Assistant Marketing Officer
AO	Agriculture Officer
APMC	Agriculture Produce Marketing Committee
APPO	Assistant Plant Protection Officer
ARV	Anti Rabies Vaccination
ASCAD	Assistance to states for control of animal diseases
ATMA	Agriculture Technology Managment Agency
Avg	Average
BGA	Blue Green Algae
BPL	Below Poverty Line
BQ	Black Quarter
BSI	Botanical Survey of India
CAU	Central Agriculture University
CDB	Coconut Development Board
CEC	Cation Exchange Capacity
CGI	Corrugated Galvanized Iron
CIFRI	Central Inland Fisheries Research Institute
CIG	Crop Interest Group
Cm	Centimetre

CPO	Chakesang Public Organisation
CRC	Chicks rearing centres
CSB	Central Silk Board
CSS	Centrally Sponsored Scheme
DAO	District Agriculture Officer
DAS	Days after Sowing
DC	Deputy Commissioner
DDG	Deputy Director General
DFL	Disease Free Layings
DOC	Day Old Chick
DVO	District Veterinary Officer
EAC	Extra Assistant Commissioner
EC	Electrical Conductivity
EM	Effective Micro-organism
ESDP	Eri Silk Development Project
Etc	Etcetera
FDA	Forest Development Agency
FFDA	Fish farmers development Agency
FIG	Farmers Interest Group
FLD	Front Line Demonstration
FM	Fallow Management
FMD	Foot and Mouth Disease
FO	Farmers Organisation
FS	Farmers School
FYM	Farm Yard Manure
G.B	Gaon Bura
GDP	Gross Domestic Product
Gms	Grams
Ha	Hectare
HPC	High Powered Committee
HQ	Head Quarter
HRD	Human Resource Development
HS	Haemorrhagic Septicemea
HTM	Horticulture Technology Mission
HU	Hatchery unit
HYV	High Yielding Variety
i.e	That is
IBO	Infectious Bursal Disease
ICAR	Indian Council of Agriculture Research



ABBREVIATIONS				ABBREVIATIONS			
ICIMOD	International Crop Research Institute for Semi Arid Tropics	MDFPGA	Mokokchung District Passion Fruits Growers Association		Network	SAU	State Agriculture University
ICT	Information and Communication Tools	me	milli equivalent	NPDP	National Pulse Development Programme	SBI	State Bank of India
IDM	Integrated disease management	MIC	Micri Irrigation Channel	NPK	Nitrogen Phosphorous Potassium	SDAO	Sub Divisional Agriculture Officer
IDRC	International Development Research Centre	Min	Minium	NPOP	National Programme for Organic Production	SDO(C)	Sub-Divisional Office (Civil)
IFPS	Integrated Forest Protection Scheme	MI	Mili litre	NPV	National Polyhedrasis Viruses	SF	Swine Fever
IFS	Integrated Farming Scheme	mm	Milimetre	NRCM	National Research Centre for Mithun	SHG	Self Help Group
IIFS	Intensive Integrated Farming System	MMAS	Metritis masitis agalacta syndrome		National Polyhedrasis Viruses	SJGSY	Swarn Jayanti Gram Swamjar Yajona
IMC	Indian Major Carp	mmos	millions	NRCs	National Research Centres	SMS	Subject Matter Specialist
IMO	Indigenous Micro Organism	MOET	Multiple Ovalution Embroy Transfer	NSCB	Nagaland State Cooperative Bank	Sq.cm	Square centimetre
INM	Integrated Nutrient Management	MOP	Muriate of Potash	NSKE	Neem Seed Kamal Extract	Sq.Km	Square Kilometre
IPM	Integrated Pest Management	MSL	Mean Sea Level	NWDPPRA	National watershed Development Programme in Rainfed Areas	SREP	Strategic Research and Extension Plan
IPR	Intellectual Property Right	MT	Metric Tonne	OC	Organic Carbon	SRI	System of Rice Intensification
ITK	Indigenous Technical Knowledge	MT/HA	Metric Tonne per hectare	OC	Degree centigrade	SWOT	Strength Weakness Opportunity Threats
IWM	Integrated Weed Management	N	Nitrogen	OFT	On Farm Testing	T	Tonne
JE	Junior Engineer	NA	Not Accounted	OPP	Oilseed Production Programme	SSP	Single Super Phosphate
JFMC	Joint Forest Management Committee	NABARD	National Bank for Agriculture and Rural Development	P	Phosphorus	ST	Schedule Tribe
JI	Jhum Intensification	NAEB	National A forestation and Eco-development Board	PA	Programme Assistant	SUBACS	Sugarcane Based Cropping System
JPB	Junior Plant Breeder	NAIP	National Agriculture Innovative Programme	PC	Programme Coordinator	TAR	Technology Assessment and Refinement
K	Potassium	NAP	National A forestation Programme	PD Maize	Project Director Maize	TFC	Twelfth Finance Commission
Kg	Kilogram	NARS	National Agriculture Research	pH	Hydrogen ion concentration	TO	Training Officer
KNCPs	Konoma Nature Conservation and Tragopan Sanctuary	System		PMRY	Prime Minister Rozgar Yojana	TPS	True Potato Seed
KNSK	Konyak Nyupuh Sheko Khong	NSAMB	National State Agriculture Marketing Board	PO	Project Officer	TRC	Terrace Rice Cultivation
KVK	Krishi Vigyan Kendra	NCDC	National Cooperative Development Corporation	PP	Plant Protection	UDA	Upper Division Assistant
LDA	Lower Divisional Assistant	NEC	North Eastern Council	PPP	Public Private Partnership	Viz	Namely
LMVs	Light Motor Vehicle	NEDFi	North East Development Financial Institute	PRA	Participatory Rural Appraisal	VDBs	Village Development Boards
LRD	Land Resource Development	NEFA	North East Frontier Agency	q/ha	Quintal per hectare	VMC	Village Marketing Committee
Lt	Litre	NEPED	Nagaland Empowerment of People through Economic Development	Qt	Quintal	VVK	Van Vigyan Kendra
M	Metre	NFDB	National Fishery Development Board	R.D. Block	Rural Development Block	WHO	World Health Organisation
MAP	Medicinal and Aromatic Plants	NGO	Non Governmental Organisation	RD	Ranikhet Disesae	WHP	Water Harvesting Pond
Max	Maximum	NH	National Highway	RH	Relative Humidity	WRC	Wet Rice Cultivation
MB	Mould Board	NHTA	Naga Hills Tuensang Area	RIDF	Rural Infrastructure Development Fund	ZSI	Zoological Survey of India
MDFF	Mokokchung District Farmers Federation	NICNET	National Informatics Centre	RO	Research Officer		
				RRA	Rapid Rural Appraisal		
				SARS	State Agriculture Research Station		



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