`CHAPTER – 3

AGRICULTURE SCENARIO OF ASSAM

3.1. PHYSICAL BACKGROUND:

The state of Assam is located in the north – eastern part of India. In terms of size, Assam represents 2.39 percent of the land area of India and has a total area of 78,438 square kilometers. The absolute location of Assam extends between 24°8′N to 28°2′ N latitude and 89°42′E to 96°E longitude. It is located in a tropical region and shares its boundaries with the Indian states of Meghalaya, Arunachal Pradesh, Nagaland, Manipur, Mizoram and Tripura and shares its international boundaries with Bangladesh and Bhutan. The state is nestled among the Arunachal Himalayas to the north, the Meghalaya plateau to the southwest, the Mizoram and Tripura hills to the south, the Patkai hills to the east and the West Bengal and Bangladesh plains to the west. The state along with six other north– eastern states is linked with mainland India through the narrow 'Chicken's Neck' strip of land in West Bengal, also known as the 'Siliguri Corridor'. Thus, Assam is bounded by plateaus and hills on three sides, except the west. Assam is thus considered to be the gateway to South East Asia for India because of its strategically important location.

3.2. SOIL

Soil formation in Assam is dominated by factors like parent material or the geology of the underlying rock strata, topography or slope of the land and climate. The soils of Assam are fertile and rich in humus content. The soils of the active floodplains are ideal for cultivation of paddy, vegetables and cash crops like jute while the soils of the upper Brahmaputra Valley are most suitable for tea plantation. The soils of Assam can be classified into

i) young alluvial soil

ii) old alluvial soil

iii) piedmont soil

iv) hill soil and

v) laterite soil

The young alluvium soils all along both north and south banks of the Brahmaputra and Barak rivers and their tributaries form the active flood plains of these river systems. These soils are eroded deposits brought by the rivers from their upper reaches which are deposited every year as residual transport material in the alluvial floodplains. They lack a well developed soil profile and have comparatively low humus content. These soils are poorly developed in chronic flood-affected low-lying areas which remain inundated for eight to ten months of the year as well as in and around the numerous wetlands and marshes which dot the entire Brahmaputra and Barak river valleys. They are light to moderately dark grey and more mostly composed of sandy to silty loam. These soils are slightly alkaline near the river course and become neutral to slightly acidic as one moves away from the river bank. The young alluvium tracts are highly fertile and extremely responsive to agriculture. Their fertility is recharged every year during

the annual monsoon-induced floods which inundate these tracts for one or two months leaving behind the rich fertile alluvium. These soils are zones of extensive fish-cum-paddy cultivation, jute and a number of vegetables.

The old alluvium soils occur in patches bound by the young alluvium tract and the piedmont soil tract. They are older alluvial deposits which were formed during extensive, high flooding. However, since these soils fall outside the active flood zone, they are, therefore, not rejuvenated by annual floods. These soils are dark brown to yellowish in colour and their texture ranges from coarse to fine loam. They are slightly more acidic than the younger alluvium soils. These soils have a well-developed soil profile. The tracts of the old alluvium soils are comparatively wider in and around Nagaon district. The old alluvium soil which occurs in extensive tracts in the upper and central Assam parts of the Brahmaputra Valley as well as in patches in the Barak Valley are ideal for tea cultivation since they are slightly more acidic in nature and well drained.

Piedmont soils are soils which occur all along the foothill regions of the Himalayan ranges. They comprise both Bhabar and Terai soils. The Bhabar soils occur immediately along the Himalayan foothills and are loose, unconsolidated deposits of rocks, boulders, pebbles and stones in addition to sand and silt deposits over them. These are formed due to deposition of the large-sized incumbent sediment load carried by the Himalayan rivers which are deposited all along the foothills when they enter the Assam plains. They are ill-drained and lack a well-developed profile. The Terai soils occur just south of the Bhabar belt. They comprise of sandy to silty loam deposits and are comparatively well-drained than the Bhabar soils. The Terai belt supports the growth of tall grasslands and this can be observed in the Manas National Park region in its most pristine form. An interesting phenomenon that can be observed in the Piedmont soil zone is that

rivers flowing from the Himalayas into the plains disappear under the Bhabar deposits due to the deep, coarse deposits to reappear in the Terai region.

The hill soils occur along the southern face of the hills of Assam. There are two distinct types of hill soils – the red sandy soils and the red loamy soils. The red sandy soils are of Archaean origin. They are moderately acidic and high in humus content. These soils are well drained, deep and comparatively well developed. The red sandy soils are found in the Assam-Meghalaya and the Karbi plateau and parts of the Barail ranges. The red loamy soils on the other hand have a comparatively well developed horizon and are less acidic than the red sandy soils. They occur mostly along the southern foothills of the hills in and around Assam such as the Assam-Meghalaya plateau, Arunachal and Nagaland Hills, the Karbi plateau and the Barail Range.

The Laterite soils are dark, have fine textured loam and occur extensively all over the Dima Hasao district, the Karbi plateau and in isolated pockets in the Barak Valley.

3.3. CLIMATE AND RAINFALL:

The climate of the state of Assam is of humid sub-tropical in nature with warm and humid summer and cool and dry winter. The state experiences heavy rainfall and high humidity. Winter lasts from late October to late February while the summer rains occur between end-May to end-October. The monsoons peak during the month of June. Thunderstorms locally known as Bordoisila occur frequently during the summer afternoons. The average minimum temperature is 6 degree Celsius while the maximum temperature is 36 degree Celsius. There is a high degree Celsius. There is a high degree of spatio-temporal variability in the

prevalent climate in the state owing to a high degree of local topographical variation.

Assam can be marked by four distinct seasons. They are

i) Pre-monsoon season

ii) Monsoon season

iii) Retreating Monsoon season and

iv) Dry winter season

The Pre-monsoon season extends from early March till end of May. This season is marked by clear skies. The temperature and rainfall gradually increases as the months pass. Mornings are pleasant while afternoons turn hot and humid with occasional thunderstorms in the afternoons. The beginning of this season favours Boro rice cultivation and during the end of the season, formers tend to cultivate jute and harvesting of the first and second flush of tea leaves is done.

The monsoon season starts from the end of May and runs up to end of September. During this season, the entire state receives heavy to extremely heavy rainfall. Moisture-laden monsoon winds cross the Bay of Bengal and causes orographic rainfall all over the Meghalaya plateau. At the same time, the monsoon wind system causes rainfall throughout the state. Regions like Lumding, Hojai and Doboka of Nagaon district, however, receives comparatively little rainfall during this period since they fall in the rain shadow zone of the Meghalaya plateau. It is not uncommon to experience rainfall continuously for a number of days at a stretch during the peak monsoon period. This is the time for the cultivation and harvesting of jute crop in the Brahmaputra plains. Monsoon rains, however, bring with it the perennial problem of floods in Assam. Rainfall activity in the hills and the mountain reaches also swells up the rivers which inundate the river valleys, causing huge loss to human and livestock life and property.

September is the month of retreating monsoons and the seasons sets it by the end September up to mid-November. This is the season where temperature starts to dip gradually and fog sets in with significant decrease in the number of rainy days.

The final season is the Dry Winter season which stretches from mid-November till the end of February. The onset of this season brings with it clear skies, dipping temperatures and more foggy mornings. There is little rainfall activity during this season. December and January are being the driest and the coldest of months.

3.4. DEMOGRAPHY:

The population of Assam stands at 3,12,05,576 of which 1,59,39,443 are males and 1,52,66,133 are females. Assam is the home of about 2.58 percent of India's population. According to available statistics, Assam ranks 14th in terms of population. Assam is extremely under-urbanized. According to 2011 census only 14 percent of the total population of the state lives in towns.

In 2011, Assam had 26,312 inhabited villages accounting for about 4 percent of the country's total number (5,08,781) of villages. The scheduled caste and scheduled tribes populations as per 2011 census are 22,31,321 and 38,84,371 respectively.

The Final Population Report of Census 2011 categorizes the total workforce of the state as cultivators (33.9 percent), agricultural laborers (15.4 percent), cottage industry workers (3.8 percent) and other workers (46.5 percent). According to the census report, employment in the agriculture sector (cultivators and agriculture laborers), which constitutes 49.3 percent of the total workers, has declined by 3 percent in the state.

3.5. AGRICULTURE:

Agriculture is the mainstay of the economy of the people of Assam. About 63 percent of the state's working force are engaged in agriculture and allied activities. Although agriculture is of prime importance to the region, it had remained largely under developed in the past. But now, agriculture in Assam, like in other parts of India, has been making significant headway. Primitive agricultural methods so long being used in the state are now being replaced by innovative methods thus helping in providing a much needed fillip to this vital sector of the economy.

The principal food crop of Assam is rice. Cash crops are jute, tea, cotton, oilseeds, sugar-cane, potato and various fruits, which are grown on a smaller scale. The state has a gross cropped area of about 34.41 lakh hectares (2011-12), more than 79 percent accounting for food-grain crops. Paddy alone covers about 25 lakh hectare. Production of food-grains during 2011-12 was estimated at 48.57 lakh tones.

Rice is the most important food crop of Assam. It is grown both in the plains and in the hills. It is often said that Assam, along with southern China and South-East Asia, is the original homeland of rice. That rice is in intimately connected with the life of the people of Assam is obvious from the fact that it not only forms of the staple food for them but also many of their ritual and festivals are associated with sowing and harvesting of the crops. Bihu, the biggest festival of Assam, is closely associated with rice cultivation and harvest. In Assam, as much as 25.46 lakh hectare of land is given to the cultivation of rice. All the districts of the Brahmaputra and Barak valleys grow rice abundantly. It is only in Dima Hasao and Karbi Anglong that rice is grown less because of the hilly terrain. It has been

notices that because of introduction of new high yielding varieties, rice production in the state has shown an upward trend of late. In the year 2011-12, the state produced 47.16 lakh tones of rice.

3.6. ASSAM STATE AGRICULTURE POLICY:

Keeping in mind the constraints of the Agriculture Sector in Assam and in inconsonance with the National Agriculture Policy, the Government of Assam wishes to lay down the following policy objectives, in the agriculture Sector:

1. The agriculture and allied sector grows at the rate of 4 percent per annum for the next decade to provide food security and to improve nutritional intake of the people of the state as well as significantly decrease the population below the poverty line.

2. To increase the Average Yield of all major crops, particularly that of rice, wheat, pulses and oilseeds.

3. To increase the cropping intensity in the sector through increase in irrigation facilities as well as giving a boost to mechanization in the state, to make it at par with the rest of the country.

4. To diversify into other crops, specifically wheat, oilseeds and partly pulses as well as improve our production of horticultural crops.

5. As the bulk of the population in the state lives in the rural area and most of the people are dependent on agriculture and allied sectors for their livelihood, the Government sees this sector as the engine for growth of the economy in the long run and wishes to treat the agriculture sector as an area of maximum employment generation in the state.

6. It should be recognized that increased cropping intensity and improvements in Average Yield and production for the market can only be sustained if the links of the farmers to the market are good, the market infrastructure well developed and the farmers gets a remunerative price for their produce. It will be the Endeavour of the state to develop marketing and processing infrastructure by focusing on development of rural roads, apni mandis, terminal markets and district level markets for agricultural produce as well as to focus on value addition of agricultural produce in the state essentially through facilitating private enterprise in the food processing sector. The development of a marketing infrastructure and value addition has tremendous potential for developing the economy of the state, considering the strategic location of the state and the potential markets, which exist for our produce in neighboring countries like Bangladesh and in parts South East Asia.

7. Since the resources at the disposal of the state are limited, the Endeavour will be to converge the resources available under various govt. schemes to ensure that funds are spent keeping in view the long term growth of the agriculture and allied sector in the state.

8. The state has a remarkable human resource in Field Management Committee, which have been functioning as an Extension Wing of the Agriculture Department. They shall be further strengthened and developed to function as a Self Help Groups to further strengthen the extension activities in agriculture. They shall also function as focal points for disbursal of agricultural credit and as entry points for extension activities of other allied sectors like livestock and fisheries. To ensure that the growth in agriculture is sustainable economically, environmentally and socially.

3.7. MAJOR AGRICULTURE SCHEMES UNDER IMPLEMENTATION IN ASSAM.

GOVERNMENT OF INDIA

SL.NO	Name of the scheme	Objective of the scheme
1.	Rastriya Krishi Vikash Yojana(RKVY)	For all round development of agriculture & allied sectors for food Security. Implemented from 2008-09.
2.	National Food Security Mission(NFSM)	Development of Rice cultivation. Implemented in 13 districts from 2007-08.
3.	National Horticulture Mission	Development of Horticulture in Assam. Implemented from 2001-02.
4.	Agricultural Technology Management Agency (ATMA)	Strengthening agricultural extension system through ATMA. Implemented in 12 districts from 2006-07. Another 11 districts covered under world bank assisted project (AACP).
5.	Macro Management Mode Of Agriculture (MMMA)	Implementation of various schemes identified to meet the state Requirement. Implemented from 2000-01.
6.	Seed Village Program	To produce quality seeds to make State self sufficient in seeds. Implemented from 2007-08 with direct involvement of farmers.

3.8. ASSAM STATE AGRICULTURAL MARKETING BOARD:

The Assam State Agricultural Marketing Board is committed towards smooth and orderly development of agricultural marketing in the state. The Assam State Agricultural Marketing Board (ASAMB), Guwahati was established in 1976, under section 3 of the Assam Agricultural Produce Market Act, 1972. The Regulated Market Scheme of agricultural produce – a mechanism to control the prices of agricultural produce so that the farmers can get a remunerative price in a market set up under the scheme with a provision for open auction and storage coupled with the facilities of grading, standardization and packaging, prevalent in other parts of the country since before independence was introduced in the state very late. As per the provision of the Assam Agricultural Produce Market Act, 1972, the Board shall perform the following functions and shall have power to do such things as may be necessary or expedient for carrying out these functions:

- To co-ordinate the functioning of the market committees including programs undertaken by such Market Committees for the development of markets and market areas.
- To undertake State level planning of the development of agricultural produce markets.
- To maintain and administer the Marketing Board Fund.
- To give advice to Market Committees in general or any Market Committee in particular with view to ensuring improvement in functioning thereof.
- To supervise and guide the Market Committees in preparation of plans and estimates of construction program undertaken by them.
- To make necessary arrangements for propaganda and publicity on matters relating to marketing of agricultural produce.

- To grant subventions or loans to Market Committees for the purposes of this act on such terms and conditions as it may determine.
- To arrange or organize seminars, workshops, exhibitions on subject relating to agricultural marketing.
- To do such other things as may be of general interest relating to marketing of agricultural produce.
- To carry out any other function specifically entrusted to it by this act.

To carry out such other functions of like nature as may be entrusted to it by the State Government.

3.9. AGRICULTURE DEPARTMENT OF ASSAM:

The Agriculture Department, Assam was created in April, 1982. The Department was then engaged in conducting crop cutting experiments on winter rice, mustard and sugarcane.

In 1942-43, the normal works of the Agriculture department had been changed. In accordance with new priorities many seed farms were started. In 1942 seed farms were started at Salchapra in Cachar, at Dalgaon in Darrang and Senchoa in Nagaon district. In 1948 more seed farms were started at Golokganj in Goalpara, at Kathiatoli in Nagaon and a Kahikuchi in Kamrup district. Kakilamukh Farm in Sibsagar district, which was started in 1936, was also used as a training farm for students. Assam lost Habiganj farm at Sylhat due to partition of India. To make up this loss, a deep-water paddy research farm was started at Raha in 1948 in Nagaon district.

With the large-scale expansion of the Agriculture Department, requirement of educated and trained manpower was urgently felt to look after research, extension and administration. To meet this requirement, the Department

established education and training infrastructure. A Gram Sevak training centre was started at Khanapara in Kamrup district and the Agricultural school was upgraded to Gram Sevak Training Centre at Jorhat in 1948. Another important landmark of the Department is the establishment of Assam Agricultural College on the 16th of August 1948 to produce agriculture graduates with Rev.B.M. Pugh as its first principal. The college was renamed as college of Agriculture after establishment of Assam Agriculture University in 1969.

With the independence of the country in 1947, there was great expansion of activities of the Department. The Agriculture Department contributed to increase in crop production through various schemes or minor irrigation, land reclamation, seed production and distribution, plant protection and farmers' training. During the First Five Year Planning period pump sets were introduced for Boro Paddy cultivation.

Besides research on rice, sugarcane and fruits, the Department widened the research activities to other crops also.

The age of high yielding varieties of crops started in Assam with the introduction of dwarf paddy variety in 1963-64 by agriculture Department. A special rice Development program called Intensive Agricultural District Programme was launched in Cachar district in 1963 and continued till 1968.

A world bank supported project, called Assam Rural Infrastructure and Agricultural Services Project (ARIASP) was started in 1995-96 for a project period of eight years with the Agriculture Department as a Nodal Department. The major contribution of this project towards the state is creation of micro irrigation through installation of Shallow Tube Wells (STWs). About 50,000 STWs have been installed. STWs have encouraged farmers to cultivate summer rice.

Another major STW program was undertaken by Agriculture Department in 1999-2000 with loan from the National Bank for Agriculture and Rural Development (NABARD). Under this program, another 99,000 STWs have already been installed. STWs installed under both ARIASPA and NABARD program have created assured irrigation potential in about three lakh hectare. Irrigation potential created thus has enabled the state to be self sufficient in rice production.

The launching of "Technology Mission for Integrated Development of Horticulture in the NE Region" in Assam in planned horticulture development in the State. This is a centrally sponsored scheme under the Union Ministry of Agriculture.

In order to enlist people's participation in implementation of schemes, an innovative approach was adopted in Assam. The Department first took step in the early sixties to organize among farmers Pathar Parichalana Samittee (PPS) or Field Management Committee (FMC). The FMC is a farmers body of 70-80 farmers cultivating a contiguous area of about 500 bighas (60 to 70 hectare). These are registered by District Agricultural Officers in districts. FMCs have been utilized now as a medium of extension.

Though there are quite large number of FMCs in Assam, level of performance of majority of these committees leaves much to be desired. In order to make the weak FMCs efficient, capacity building training was started taking consultancy of National Institute of Agricultural Extension Management (MANAGE), Hyderabad and Assam Agricultural University with financial support of ARIASP. The capacity building training will be continued as routine activity. Formation of several Self Help Groups (SHGs) in a FMC has been proposed now.