PART III: SYNTHESIS
9.1 SUMMARY

In the foregoing chapters, an attempt has been made to analyse the natural, techno-economic and socio-cultural problems of agriculture found in the South Bank Region of the Kamrup District. In this chapter the main findings are summarised and conclusions are drawn on them.

Agriculture dominates the economy of the South Bank Region of the Kamrup District in spite of the various problems faced by the peasants of the region. It is observed that the problems of agricultural development are not similar everywhere within the study region. These vary from one ecological setting to the other inhabited by different communities, even though there are some common problems.

The physiographic framework shows that the region can be divided into three ecological settings, viz. (a) active floodplain and the char lands, (b) middle built-up plain and (c) the high plain foothill zone. The region
as a whole faces heavy rainfall causing floods during the summer months and drought condition prevails during the winter months. It is intersected by many tributaries of the river Brahmaputra, beals and swamps. The soils of the region categorised into three types, viz. (a) new alluvium, (b) old alluvium, and (c) lateritic soil form the basis for growing different types of crops in different soil zones. The forest area covers an area of 27 per cent of the total geographical area which is not adequate for the maintenance of ecological balance in a region.

It is actually the population with the various socio-cultural traits which is responsible for agricultural production and development. The region recorded alarmingly the high growth rate of population (50 per cent) during the decade 1961–71. The main cause of this high growth rate of population was the influx of large number of immigrants from Bangladesh (earlier East Bengal and East Pakistan) since the beginning of this century. In consequence of the high growth rate within the limited area expanse of the region, the density of population became very high (277 per km$^2$ in 1971). This density was more than that of the state as a whole (186 per km$^2$) and also that of the country (177 per km$^2$). Excluding the Guwahati City, the region is predominantly a rural one except a few small urban
centres. It is interesting to observe that the region is inhabited by three distinct social groups: namely, the indigenous tribal in the highland foothill zone, the indigenous non-tribal in the middle built-up plain, and the immigrant in the low-lying plain. The tribal population constitutes 15 per cent, the indigenous non-tribal 59 per cent and the immigrant 26 per cent of the total population of the region. It is not only the number, density and growth rate of population, but the quality of the people which determines agricultural production and development. The quality of the people is enhanced by literacy, proper education and purposive training and research. The literacy rate in the region was low (24.10 per cent) compared to that of the state as a whole (28.1 per cent in 1971). The percentage of educated persons is even lower than that of the literates. Of the educated persons, a very few take agriculture as their source of livelihood. Out of the total population, only 27 per cent are workers and as high as 73 per cent are non-workers. Thus one person in the region has to support more than three non-working persons. The large percentage of non-working persons is due not only to the children below the age of 14 years and the old persons above 60 years, but also due to a large number of dependent males and females in the active group. Such a condition is a clear indication that the region is economically backward. The
agricultural sector is still tradition-bound and subsistence-oriented. Because of lack of industrialisation and weak tertiary sector, as high as 75 per cent of the total workers have to be engaged in agriculture at a very low level of living leading to the problems of underemployment and disguised employment. Only a few small industries like saw mills, rice mills and brick works are there in the region, but most of them are located near Guwahati City or at the market places near the National Highway No. 37. Electricity is still not available in most of the villages.

The region is also very backward in respect of transport and communication. Even non-motorable roads are not there in many interior villages of the region. During the rainy season, boats are the only means of transport in the char areas.

The study of land use pattern in the region reveals that the total area available for cultivation was only 46.36 per cent of the total geographical area of the region. There was little scope for further horizontal expansion of cultivable land. Area sown more than once was only 8.93 per cent of the total area. The mouza-wise land use pattern reveals that the highest percentage (85.12 per cent) of net sown area was found in the Barabari Mouza and the lowest in the Lakshin Sarubensor Mouza (38.75 per cent).
The cropping pattern of the region shows that food-grain crops occupied 77.56 per cent of the total net sown area. Fibre crops occupied the second largest area of the total cropped area. Among the foodgrain crops, rice alone occupied 72 per cent of the total net sown area. Other principal foodgrain crops were wheat and pulses. Jute was concentrated mainly in the immigrant-dominated mouzas. The concentration strength of different crops is found to be highest in the Ramcharani Mouza of the Palbarhi circle and lowest in the Boko Mouza of the Boko Circle.

The analysis of crop-combination reveals that there are six crop-combination regions. The Chamaria, Garnimari, Fub-Chamaria and Sontali Mouzas form a 6-crop-combination region, the Nagarbera and Ramcharani Mouzas 5-crop-combination region, the Luki and Dakshin Garubansor Mouzas 4-crop-combination region, the Bekeli, Boko, Pangaon, Bholagaon, Chayani, Panbari, Dimoria and Sonapur Mouzas 2-crop-combination region and the Rampur and Dakshin Rani Mouzas a mono-crop-region.

The intensity of cropping in the region as a whole is very low which is found to be only 119.26 in 1984-85. However, there is mouza-wise variation in the intensity of cropping. The intensity of cropping is found to be comparatively high in the immigrant-dominated mouzas,
whereas it is low in the mouzas inhabited by the indigenous peasants. Among the factors responsible for increasing the intensity of cropping, only the immigrant population is positively correlated with intensity of cropping. 

Association of other factors with the intensity of cropping is found to be insignificant. By following proper crop-rotation and crop-calendar, the total production of crops could be increased even with the application of traditional inputs and methods.

The analysis of natural factors affecting agricultural production exhibits that flood, soil erosion, drought in winter, attack of animals, pests and diseases of crops, weak condition of draught cattle and general weakness of the peasants are found as the barriers of agricultural development in the region. Every year flood affects almost the entire char area which includes the Nagambera, Sontali, Chamaria, Garaimari, Pub-Chamaria and Dakshin Sarubansor Mouzas. Two to three waves of flood almost every year damage the kharif crops, mainly, sali, abu and jute in these areas. The middle plain region also suffers from occasional floods which affect the kharif crops in the fields.

Drought is another natural factor affecting winter rabi crops only. However, the kharif crops are not affected by drought as generally it does not occur in the summer season in the region. In the absence of irrigation, rabi
crops cannot be successfully grown in the region except in the char lands.

Soil erosion has been creating havoc since 1954 in the river banks of the mouzas of Pub-Chamaria, Dakshin Sarubansor, Sontali, Rampur and Chayani. Among these mouzas, Pub-Chamaria and Dakshin Sarubansor are badly affected. Several villages along with the agricultural fields have been eroded away by the Brahmaputra and still many villages are on the brink of submersion in the Brahmaputra.

Hispa, stemborer, swarming caterpillar, caseworm, rice-bird, gandhi-bird and aphids are the common pests which may either destroy or reduce the yield rates of crops. Besides these, the blight is a common disease of crops which may injure or damage the crops. Poor health and illness of the peasants, weak draught bullock pairs and epidemics of the cattle are some of the worst types of natural constraints against agricultural development in the region.

The problem of surplus farm labour is very much acute in agriculture of the region because of excessive pressure of rural population on cultivable land. The measurement of surplus labour with the help of relative index shows that a substantial proportion of the farm workers is redundant everywhere though there is mouzewise variation.
The average size of landholding in the region is only 1.44 hectares, which is lower than the national average of 2.30 hectares, but slightly higher than the state average of 1.37 ha. It varies from mouza to mouza. It is found to be highest (2.89 ha) in the Barduar Mouza and lowest (0.53 ha) in the Rampur Mouza.

Fragmentation and sub-division of agricultural plots in a landholding pose serious bottlenecks to agricultural development in the region. The average number of plots is found to be 4 per family. The existence of scattered plots of land of a family leads to the inefficiency of agricultural operation as there is loss of time and human energy on the part of the peasants.

The Lorenz Curve showing the relationship between the number of operational landholdings and the areas of operational landholdings does not indicate significant concentration of land in the hands of a few peasant families.

In order to increase agricultural production, the Government has taken some measures to provide irrigation in the agricultural fields of the region. As the study region suffers from heavy rainfall during the summer months, the requirements of irrigation is very limited. However, for growing rabi crops and spring rice, irrigation is highly essential. But the irrigation facilities provided so far
cover only 14.87 per cent of the total net sown area. The Sonapur Circle ranks first in respect of irrigation having an irrigated area of 29.8 per cent of the total net sown area. On the contrary, the Chhaygaon Circle having an irrigated area of only 1.54 per cent of the net sown area occupies the last position. Three types of irrigation are found in the region, viz. surface lift, surface flow and ground water lift irrigation. Among these, surface flow irrigation covering an area of 7310 ha. is somewhat important.

In order to augment the agricultural production, application of modern implements in the production process is of vital importance. But the majority of the peasants of the region use traditional implements. They prefer wooden plough rather than iron ones. Besides wooden plough, traditional implements like moi, kor, khonti, bindha, khabeni, dolimari, etc. are used by the peasants in agricultural production process. For harvesting, kachi, dao, and kor, and for transporting, hulabari, bullock cart and buffalo cart are used. Boats are also used by the peasants wherever river water is available. A few peasants have started the use of modern implements. Of the five circles in the region, the number of modern implements used by the peasants in the Sonapur Circle is highest and it is lowest in the Nagarbera Circle. Among the modern implements are mouldboard plough, weeder, garden rake, hoe and spade, khurpi,
handfork, powertiller, sprayer etc. However, it is found that the use of modern implements in the region has been increasing gradually.

Most of the peasants of the region use traditional varieties of seeds rather than the new HYV. From the field study it is known that the HYV of seeds are used in the low-lying areas. The HYV crops can be successfully cultivated only if fertilisers along with irrigation are provided. Cowdung and compost manure are used by the peasants to increase the soil fertility. However, consumption of chemical fertilisers was higher (20.43 kg per ha) in 1986-87, which was higher than that of the state. It is observed that the use of fertilizer is higher in the cases of rabi crops and vegetables.

With the introduction of HYV of crops there is a need to take plant protection measures as such crops have low resistant capacity against different pests and diseases. As the attack of pests and diseases on crops has been increasing, the use of pesticides, insecticides and germicides has also been increasing with the opening of sales centres at different places. It is found that the peasants of the Sonapur Circle are more conscious about the attack of pests and diseases on crops than those of other circles.
It is found that the traditional free market system of agricultural produces has been prevailing in the region. In this free market system, middlemen like beoparis and dalals manipulate the prices of agricultural commodities in such a way that they deprive the producers of remunerative prices and earn higher profits by raising the prices in spite of the fact that the government fixes the prices from time to time.

Spatial distribution of market centres in the rural areas is very important for the producers to get reasonable prices for their produces. But the study reveals that the market centres are not found at places easily accessible to the peasants from their homes. Only in the Sonapur Circle, the market centres have been distributed at reasonable distances apart.

Rural electrification is an important infrastructure for transforming the rural life through rural industries as well as irrigation. But its development is very much insignificant in the region. Of the total villages numbering 833, only 309 have been electrified so far. Out of the total consumption of electricity, only a small percentage is used in irrigation purpose. It may, therefore, be easily imagined how far agriculture is backward in the region.
A well developed, reliable, low-cost transport is of vital importance to the agricultural economy of the region. Particularly road transport plays an important role in transportation of agricultural commodities. But the motorable roads in the region cover a length of only 591 kms and the non-motorable roads cover 750 kms. Thus, there is a shortage of road lengths in the region. There is only about 52 kms of railway line in the region which does not play an important role in carrying the agricultural commodities. Water transport can play an important role as the cost of it is lower than the other modes of transport. Boat transport in Chamaria, Nagarbara and in the char areas has been playing a significant part in these areas. Although there is only one aerodrome, there is little impact of it on the development of agriculture. But some benefits accrue to the peasants of the neighbouring villages as a result of the sales of vegetables to the service holders residing in the campus of the airport.

The analysis of the socio-economic structure of the region reveals that there are three social groups of people – immigrants, indigenous non-tribal and indigenous tribal who have been inhabiting in the region. Of these three groups of people, the indigenous non-tribal is the largest group of people constituting about 59 per cent of the total population, whereas the other two groups – the immigrant and the tribal constitute 20 per cent and
15 per cent respectively. The immigrant villages can be identified easily as their mode of living is quite different from indigenous groups of people and as they have been settling mostly in the char areas. Although they use the colloquial Bengali in their day to day life, they speak broken Assamese with other groups of people. They educate their children in the Assamese medium schools and colleges but their literacy percentage is very low. Agriculture is their main livelihood. The char areas have been remaining isolated from the mainland of the region as there is almost absence of road link and road transport. Generally boat is the only means of transport in the rainy season. However, they are traditionally hard-working people and so they can grow a variety of rabi crops and jute in the most difficult terrain of the char areas which are perennially affected by flood and soil erosion. The indigenous non-tribal group of people have been settling in the middle plain areas. Generally, their agricultural fields are located at some distances apart from their homesteads. Home compounds are covered with varieties of trees - mostly bananas, betelnut, bamboo, coconut, etc. Moreover, spinning and weaving by the women is common in this society.

The indigenous tribal people have been generally settling in the highland plain near the foothills of the
Meghalaya and some of them in the midst of the indigenous non-tribal settlement in the middle plain. They are traditionally backward in all respects as they cannot do hard labour in agriculture because of their habit of drinking wine prepared by themselves at their homes. But the tribal females are more active than the males. The tribal females do a variety of works like planting, harvesting and carrying of paddy, gathering of wood fuels from the forests, catching of fish in the heals, ponds and swamps, spinning and weaving of eri and cotton cloths besides their daily household activities. In general, the economic condition of the tribal group of people is very much deplorable.

There are two religious groups of people in the region - the Hindu and the Muslim. The peasants of both the communities abstain from agricultural works for several days in a year. The Hindu peasants do not work in the agricultural fields during the days of Ambubachi, Bihu, Pujas, death anniversaries of religious leaders, Ekadashis, Amabasyas, Purnimas, Sradhas, etc. Similarly, the Muslim peasants also abstain from doing any kinds of agricultural works in the month of Roza and in the days of Ids and Moharram. Thus the religious beliefs of the peasants even in the days of modern science have been affecting the efficiency of agricultural operation in the study region.
The peasant society is stratified into the following groups: (1) the true cultivators who cultivate their own lands, (2) the landless agricultural labourers, (3) the tenants cultivators, (4) the cultivators who own small-sized landholdings and, therefore, take other's lands on lease for agricultural operation, (5) the petty traders, shopkeepers and artisans, and (6) those close of people who are in professions like doctors, teachers, officers, etc. Among the last group of people, some teachers are found to be interested in cultivation. They carry out agricultural operation with the help of hired labour and because of their good financial condition they can use modern inputs. The peasants belonging to other groups of people like the true cultivators, the landless agricultural labourers, the tenant cultivators, the cultivators who own lands and take other's land on lease or work as a part time hired workers are incapable of using modern technology in agriculture for development.

Besides the above stratification of the rural society in the region, the Hindu peasant society is stratified into different castes like Brahmin, Kalita, Kayastha, Keot, Koch, etc. Among the castes of the Hindu society, the Brahmin is regarded as the highest caste who carry on agricultural operation with the help of hired labourers or lease out their lands to the tenants on share-
cropping basis or sometimes they lease out their lands on the contract basis - chukani and adhi. But the population of the Brahmin caste is very few in numbers. The major caste in the Hindu society is Kalitas. Most of the peasant families belonging to this caste are owner-cultivators and only a few of them practice adhi and chukani in other's lands. There are a small number of Kayastha families in the region who do not plough the soil but carry on agricultural activities like the Brahmins with the help of hired labourers or lease out their lands to the share-croppers or tenants. The peasants belonging to Keot, Koch, and other backward castes are also owner-cultivators like the Kalitas, but most of their families possess small operational landholdings which are not feasible for supporting the families at a minimum level of standard of living. Besides, these castes of the Hindus, there are two groups of people recognised by the Constitution of India as scheduled castes and scheduled tribes. They are weaker sections of the society as most of them do not possess lands and, therefore, they have to hire out their labour for doing agricultural works in other's lands. Even if some families possess lands, the sizes of holdings are too small for increasing agricultural efficiency.

Consequently, the majority of the peasant families of these castes carry on agricultural activities in other's...
lands either as share-croppers or tenants. In short, the high caste families possess lands but do not cultivate the lands. So agricultural efficiency cannot be expected from the peasant families of high castes. On the other hand, the low caste families do not possess sizeable landholdings and, therefore, agricultural efficiency cannot increase at the hands of such peasants. As a result of such a stratification of the peasant society on the basis of castes is not conducive to agricultural development. However, such a division of the society according to caste is not there in the case of the Muslim peasants. So, their agricultural performance is better than that of the Hindu peasants. Out of the total workers in the region, the cultivator accounts for 64.26 per cent and agricultural labourers about 6.91 per cent. Though the cultivators are well-spread throughout the region, their concentration is found to be highest in the immigrant-dominated mouzas and tribal-dominated Luki Mouza of the Boko Circle. The agricultural labourers are found to be concentrated in the Bekeli and the Sonapur Mouza. Their concentration is not significant in other mouzas.

Most of the peasants are illiterate and, therefore, they are inefficient to introduce modern method of cultivation. The extension of general education in the rural areas has not become beneficial, because of the
reason that the general education creates a mentality in the minds of the children to give up agricultural activities and to search for some non-agricultural works. Resultantly, such a general education has led their children to other professions. Thus, this type of education in the rural areas is becoming a constraint against agricultural development. Instead of such a general education, agricultural education would have been helpful for attracting the youths of the peasant families towards agriculture. Besides agricultural education, the services of the village level workers (VLWs) and extension officers are very much essential for motivating and helping the ignorant peasants in the adoption of new methods of cultivation. In the study region, there are only 15 Extension Officers and 114 Village Level Workers. Such a small number of Extension Officers and VLWs cannot serve all the peasants in all the villages. Most of them are inefficient and rarely visit the villages for helping the peasants. There are a small number of farmers' training centres within the region to impart agricultural training to the peasants. Only a small number of peasants can be trained annually in these centres having limited number of seats. Emphasis should be laid on farmers' training by opening more training centres.

Besides the extension services, proper agricultural research is most essential for agricultural development.
But the region has been lagging far behind in this regard.

A micro level study of the problems of agriculture has been carried out by selecting six representative villages inhabited by three different communities in three different ecological settings of the region.

The Kalubari village inhabited by the indigenous non-tribal Hindu people under the Nagarbera Mouza is situated in the low-lying plain. In this village 50 per cent of the total workers are engaged in agriculture. Although it is a very interior village, the literacy level is very high (88.47 per cent). The Mohgarh is a village which is inhabited by the indigenous Muslims. It is located in the Pub-Chamaria Mouza in the low-lying plain. Here 68.63 per cent of the total workers are engaged in agriculture. The literacy level stands at 46.34 per cent. Dekachang is an immigrant village located in the Sontali Mouza of the low-lying plain where agriculture engages about 95 per cent of the total workers. The literacy rate of the village is very low i.e. only 7.26 per cent. Dakshin Bankakata is an indigenous tribal village situated in the Chhaya Gaon Pantan Mouza of the built-up middle plain where 72.22 per cent of the total workers are engaged in agriculture. The literacy level of the village stands at 66 per cent. The Ratakuchi village is located in the Chhaya Gaon Pantan Mouza of the built-up middle plain and it is inhabited by the indigenous
tribal and a small number of indigenous non-tribal. Here 62.5 per cent of the total workers are engaged in agriculture. The literacy level of the village is 47.7 per cent. The Maloibari village is located under the Dimoria Mouza of the built-up middle plain where 50 per cent of the total workers are engaged in cultivation. The literacy level of the village is 72 per cent.

The study of general land use in all these six villages reveals that the highest proportion of cultivable land is in the Mohgarh village. On the contrary, it is lowest in the Batakuchi village. The proportion of barri lands is found to be highest in the Kalubari village and smallest in the Maloibari village. The percentage of fallow land is highest in the Maloibari and there are no fallow land in the Kalubari and the Batakuchi villages. Waste land is found only in the Dekachang village.

The study of the landholding structure in the villages indicates that the average size of landholding is highest in the Dekachang village inhabited by the immigrant peasants whereas it is smallest in the Batakuchi village inhabited by the indigenous tribal people. Highest percentage (43.64) of big-sized landholdings is found in the Dekachang village. The average number of fragmented plots per holding is found to be 4 in all the villages. The only exception is the Maloibari village where the average
number of plot is 2. The average size of plots is found to be the biggest in the Maloibari and smallest in the Mohgarh and Batakuchi villages.

The study of the cropping pattern shows that both the summer and the winter rice are the dominant crop in all the villages. Sali rice is not grown in the Dekachang village. It occupies the highest percentage (57.95) of the total cropped area in the Batakuchi village. On the other hand, the percentage of ahu rice is highest in the Maloibari village while it is lowest in the Batakuchi village. Bao is grown only in the Dekachang and the Dakshin Bankakata village. Jute is grown more or less in all the villages. It occupies the highest position in the Dekachang village and lowest in the Dakshin Bankakata village. Besides, mustard, wheat, pulses, spices and vegetables are grown more or less in all the villages.

The yield rates of crops are found to vary from village to village. The productivity of ahu rice is found to be highest (4500 kg per ha) in the Maloibari village, whereas it is lowest in the Kalubari village. Its high productivity in Maloibari is due to the use of modern technology with irrigation facilities. The productivity of sali rice is also highest in the Maloibari village, but it
is lowest in the Mohgarh and the Kalubari villages. Rice is grown only in the two villages, viz. Dakshin Bankakata and Dekachang where the productivity per hectare is found to be 1800 kg.

The productivity of jute is same in all the villages except Dakshin Bankakata, while the productivity of wheat is highest (1800 kg per ha.) in the Dekachang village and lowest (600 kg per ha.) in the Kalubari village. The productivity of mustard is found to be highest (900 kg per ha.) in the Dekachang village.

Levels of agricultural development largely depend upon the infrastructural facilities provided for agriculture. Higher the use of modern inputs supported by infrastructural facilities in agriculture, higher is the productivity and vice versa.

The infrastructural facilities are rarely available in most of the villages. The Mohgarh village completely lacks irrigation facilities, while there is a single deep tube well for irrigation in each of the villages - Dakshin Bankakata and Batakuchi. The Dekachang village have a few private deep tube wells. There are only 5 deep tube wells in the Kalubari village. The Maloibari village has all types of irrigation like lift, deep tube well and canal irrigation.
Wooden plough is used for tilling the soil by each peasant family of all the villages. But iron plough is rarely used. Iron plough is found only in the Maloibari village.

Electricity is another important infrastructure which has not reached all the surveyed villages. Use of HYV is also very rare except in Maloibari. Among the popular HYV of rice are Ijong, Fankai, and Biplab. HYV of rice is not suitable for growing in the low-lying floodplain areas.

Use of chemical fertilizer is higher in the Maloibari and Dekachang villages, whereas its use is very much insignificant in the other villages. The peasants of the Maloibari village use fertilizer mostly in rice cultivation while the peasants of the Dekachang village use it in rabi crops cultivation.

It is interesting to observe that the peasants of the Maloibari village has accepted agriculture as a commercial venture, whereas the peasants of the other villages have been lagging behind in this respect and they are, therefore, not able to respond to the various facilities provided by the Government in recent years.

Besides such a negative psychological attitude of the peasants, there are also some genuine problems like
flood, attack of pest and diseases on crops, crop damages due to the stray cattle, low rate of literacy among the peasants, poverty, non-availability of modern technology; and insufficient extension services offered by the extension workers within which the peasants are entrapped. It is, therefore, imperative that such problems must be solved for agricultural development.

9.2 CONCLUSION

In the foregoing discussion, the findings of the preceding chapters have been summarised and here the thesis is concluded with some suggestions on the basis of the findings for the solution of the various problems faced with by the peasants of the region which may be categorised as natural, techno-economic and socio-cultural.

The three micro regions of the study region, viz. (a) the low-lying plain and the char land, (b) the built-up middle plain, and (c) the high plain inhabited predominantly by the immigrant Muslims, the indigenous non-tribal and the indigenous tribal in the respective order have been experiencing problems of agriculture of different nature, though some of them are common. As the low-lying plain and the char lands are chronically affected by flood, the kharif crops cannot be grown here and, therefore, emphasis should be laid on growing the early
variety of paddy during the pre-flood period. Pusa-221 which matures only after 3 months can be grown suitably during early spring and harvested before the onset of flood in June. During the post-flood period rabi crops can be grown very intensively. As the low-lying areas are very fertile due to the siltation during flood, wheat, mustard, pulses and a variety of vegetables can be grown during the winter months if the fields are provided with irrigation facilities. In these low-lying areas, shallow tube wells can be suitable and feasible. During the summer months, the crops like jute, early chh and deep water paddy such as kekoo-baor can be grown. Modern inputs necessary for agricultural development like supply of water, pesticides and insecticides, fertilisers and seeds of good quality should be made available to the peasants at appropriate time. The number of Agricultural Extension Officers should be increased to such an extent that each of them can deliver their services in demonstrating the modern methods of agricultural operation and advise the peasants in this respect most efficiently and effectively. Frequent interaction of the AEOs with the peasants is of great importance in successful agricultural operation. In the swampy areas and beels where water is available even in the dry season, spring rice like boro and Ijong, and HYV rice can be grown even if there is no provision of irrigation.
In the middle plain areas, sali rice is grown extensively with the help of rain water, but rabi crops cannot be grown without irrigation facilities. As only the mono-crop cultivation i.e. cultivation of sali rice has not been able to cater to the need of increasing number of people growing at a faster rate, rabi crops must be grown with the help of irrigation, the fallow lands and the cultivable waste lands whatever available should be brought under cultivation and emphasis should be laid on intensive cultivation by crop-rotation and multiple cropping with the help of irrigation, modern inputs and technology.

In the highland areas where there is no problem of flood, spring rice, winter rice and rabi crops can be grown intensively with the help of irrigation facilities. Efforts should be made in the fallow lands of the high plain areas for growing horticultural crops.

Because of the widespread coverage of the cultivated land throughout the region as a result of increasing population and settlement, there remains little scope for physical expansion of the net sown area. Therefore, all kinds of efforts should be made to increase the intensity of cropping. But to meet the food requirement of the increasing number of population, the net cultivated land has been increasingly used for growing foodgrains: mainly
Growing of other crops is either neglected or not possible in the absence of irrigation facilities. For the improvement of the economic condition of the peasants, cultivation of cash crops is necessary. There is good scope for growing cash crops in the region if capital inputs and marketing facilities are provided to the peasants.

The crop-combinational study shows that the number of crops grown is more in the immigrant-inhabited moulas of the low-lying areas, whereas it is comparatively less in the indigenous tribal and non-tribal-dominated moulas. The proper delineation of the crop-combination regions is very much essential for effective agricultural planning. For the low-lying areas, a scientific crop-calendar should be prescribed to the peasants so that they can follow a proper crop-rotation procedure and adopt multiple cropping without deteriorating the ecological condition. In the built-up middle plain and the highland, the programme of crop-rotation and multiple cropping could be implemented if irrigation is extensively provided. In the middle plain, ahu, sali paddy of short duration like fus-221, long and rabi crops like wheat, mustard or pulses can be grown in proper crop-rotation. In the low-lying areas jute - rabi crops or ahu - bao - wheat or rabi crops can be a proper crop rotation. In the high plain areas ahu - sali - rabi can be grown. In the low-lying floodplain areas, kekon-bao
which can exist with the rising level of water can be grown and after harvest of it rabi crops like pea, gram, Lentil or matikalai can be grown. Such a crop rotation is already followed by some peasants at present. The productivity of the rabi crops largely depends on the use of fertiliser, supply of water and improved seeds. Therefore, these inputs should be purveyed to the individual peasants at the proper time of growing crops.

Among the natural calamities, flood creates untold miseries in the South Bank Region of the Kamrup District. Except the construction of some earthen embankments along the banks of the Brahmaputra and the tributaries, effective scientific measures have not been taken so far. Therefore, a proper survey should be conducted to identify chronically, regularly and occasionally flood-affected areas so that flood control measures can be taken properly and the cropping pattern can be properly adjusted to avoid the damage by flood. In the chronically and regularly flood-affected areas, crops of short duration may be suggested to be grown so that such crops can be harvested before the onset of flood. For the post-flood period, rabi crops like mustard, wheat, rabi pulses and vegetables can be grown with the help of irrigation.

Soil erosion mainly by the Brahmaputra river has created a severe problem in the region since 1954. Already
a vast area of the region has been eroded. Therefore, appropriate steps should be taken to check the soil erosion.

Attack of pests and diseases on crops are also serious problems faced by the peasants for the last few years. Pesticides and insecticides should be distributed to the peasants and the Extension Officers should demonstrate to the peasants as to how these should be sprayed properly on the affected crops. Collective effort is necessary for effectively controlling the spread and attack of both pests and diseases.

As there is widespread use of draught bullocks in ploughing the soil and as there is no immediate prospect of using the machinery, every effort should be made to maintain the health and improve the breeds of the draught bullocks. Scientific measures for animal husbandry and veterinary should be taken by the Government for increasing the efficiency of the draught bullocks. Similarly, proper care should be taken to maintain and improve the health of the peasants so that they can increase their efficiency of labour.

The acute problem of surplus labour in the forms of under-employment and disguised unemployment can be solved only by diverting them from agriculture to other sectors.
of economy. Development of small scale industries particularly agro-based industries and handicrafts based on local raw materials and skills can provide a means of diverting the surplus labour from agriculture. Therefore, steps must be taken to develop such industries in order to make agricultural sector economically viable. Modernisation of agriculture can also create a condition where a large number of workers is required in the agricultural sector itself.

The landholding structure in the region is not suitable for proper agricultural development as there is excessive fragmentation and successive sub-division of cultivable plots of land belonging to the individual families generation after generation. Consolidation of fragmented plots of a landholding into single plots by mutual transfer of such plots of another landholding may be suggested as a solution to the problem of fragmentation. But it is not supported by most of the peasants of the region either because of their strong attachment with their plots whatever may be disadvantage or because of their practical idea that the cultivable plots are not equally fertile. Resultantly, consolidation of landholding in the region might not be successful. Therefore, efforts should be made to increase the productivity of the existing plots by intensive cultivation and effective legislation should be made to be strongly enforced in order to stop further
fragmentation. Moreover, the law of inheritance should be amended in such a way that the non-cultivating successors can be debarred from inheriting the lands of the parent in order to stop successive sub-division of small plots of landholdings. The cultivating sons, if there are more than one, should be encouraged to accept different plots of their fathers, instead of allowing them to subdivide all the plots equally on the plea of soil fertility. Since now-a-days infertile land also can be made fertile with the application of fertilisers and irrigated water. Alternately, organisation of co-operative farming by pulling together the different landholdings of different peasant families in a village may be the best way to remove the formidable constraints of fragmentation and sub-division of landholdings if the peasants can be convinced to agree to such a proposal for their overall benefits.

Transfer of agricultural land to other uses should be banned by legal measures. Only the beels and swampy areas where cultivation is impossible should be utilised for fishery development.

Surface lift and canal irrigation in the middle plain and high plain areas can be suggested for rabi crops and spring rice. Due to the heavy rainfall, irrigation is not required for summer rice and falli rice. There is an interrelationship between the use of HYV seeds and irrigation. The HYV of crops would be highly productive if
irrigation is provided. Successful production of HYV crops is not possible without irrigation and fertilizers respond well to increase the soil fertility only when there is irrigated water in the crop fields. Shallow tube wells can be feasible for irrigation in the low-lying areas. In order to combat with the winter drought, these types of irrigation would be sufficient in the region.

The traditional implements which are used extensively by the peasants of the region should be replaced by modern implements gradually wherever practicable. Sales and servicing centres at the public sector should be established in the rural areas and should be distributed at subsidised prices.

Credit money should be supplied to the peasants on easy terms so that the poor peasants can purchase the capital inputs. The proper handling and use of the modern implements should be demonstrated to them at the village or field level.

Agricultural marketing in the region carried on by both the free markets and state-controlled markets is not favourable to the interest of the small and marginal peasants. It is seen that the behaviour of the subsistence peasants in disposal of their crops is inversely related to the price movement in the market. So the prices prevailing
in the markets cannot influence the production of the small and marginal peasants. Only the big peasants who are few in number get the incentive of the rising prices of agricultural produces in the markets. The producer peasants are generally deceived by the middlemen who offer them low prices for their produce in the open free markets as the peasants are compelled to sell their produce just after the harvest at any price they receive to meet their dire needs of cash money and as they do not have storage capacity. Even the state-controlled market is not helpful to the peasants as the procurement is rarely carried out or in the case of procurement, the prices offered are lower compared to those in the free markets. For the removal of the defective marketing system prevailing at present, the organisation of producer's co-operative marketing may be suggested. The educated unemployed rural youths may take the lead in this respect.

The problem of transport and communication is interlinked with that of agricultural marketing. The marketing system cannot be efficient if there are no cheap and easy transport facilities. Special emphasis should, therefore, be given on the development of rural transport and communication for the cheap and easy movement of agricultural outputs of the peasants from th-
farms to the market centres.

The tenancy system like share-cropping and annual lease of land on contract basis locally known as *adhi* and *chukani* respectively prevailing in the villages of the region should be abolished as high productivity cannot be expected from such a system due to the frequent threat of eviction of the tenants from the landowners. Therefore, such a semi-peasant system should be abolished and instead, the lands cultivated by the tenants should be legally transferred from the absentee landowners to the landless tenants.

For the removal of conservative outlook and superstitions beliefs of the peasants and also for inculcating the scientific spirit for the adoption of modern technology in agriculture, there should be the universal spread of literacy and agricultural education among the peasants in the rural areas. Special emphasis should be given on farmers' training in scientific operation and management of agriculture.

Besides these recommendations, adequate number of Agricultural Extension Officers should be employed so that they can take care of each village of the region. They should be well trained not only in agricultural sciences, technology, operation and management, but also in social norms and values of the particular group or groups of peasant community. They should organise the
training camps of the peasants in the rural areas. Agricultural research would be useless if the findings of the research are not carried by the Extension Officers from the laboratory to the field.

Ultimately, for the effective solution of all sorts of problems of small scale agriculture in the region, intensive efforts are needed to be exerted by the Government with the cooperation from the peasants. This economically backward region should get top priority on agricultural development so that the potential agricultural resources of the region can be best utilised for overall development of the region.

Further, such an indepth research work carried out at both micro and macro level with a thorough geographical investigation may be a guideline for other research scholars to take up similar works in other regions of the state as well as elsewhere. The future research scholars may also take up certain specific problems affecting agricultural production and development in the same region for more precise and accurate analysis.