

CHAPTER V.

AGRICULTURE, LIVESTOCK AND IRRIGATION.

Muzaffarpur district is an alluvial fertile tract divided into three natural divisions by the rivers Baghmata and the Burhi Gandak. The tract lying north of the river Burhi Gandak contains the most fertile land in the district. The other tracts are good paddy lands.

NATURAL CONFIGURATION.

The tracts lying south of the Burhi Gandak comprise of three different natural portions, namely,—

- (1) The area between the spill channel of the Gogra on the north and the Ganga on the south. Part of it is covered by low-lying lands fertilized yearly by the silt deposits of the Ganga.
- (2) The area between the Gogra and the Baya, a tract closely resembling that just mentioned. It contains some low-lying marshes.
- (3) The tract between the Burhi Gandak and the Baya, a vast stretch of upland broken by numerous shallow depressions and towards the north by a succession of horse shoe-shaped lakes left by the old beds of the Burhi Gandak.

The tract to the north of the Baghmata up to the frontier of Nepal can roughly be subdivided into the following four portions:—

- (1) The *doab* between the Lal Bakaya and the Baghmata, a stretch of low-lying land, subject to inundations, and yielding mainly paddy.
- (2) The area between the Baghmata and the Lakhandei except in the north-east where the land is very low and marshy. The greater portion of this part of the country consists of a slightly undulating low land subject to inundations from the Baghmata and its old channels, from the Kola and the Lakhandei. But as the surplus water is quickly drained off by these rivers, the soil is, as a rule, not water-logged.
- (3) The belt of country between the Adhwara and the Lakhandei. The northern portion of this tract is exceedingly damp and formed the most unhealthy portion of the district. The remainder is a stretch of undulating upland with marshy land here and there, especially towards the east, where there are some extensive *chauras*.
- (4) The rich plain bounded on the north and east by Nepal and on the south and west by the river Adhwara. The northern portion of this tract which is known as the Panch Mahalas from its containing the five *parganas* of

Nagra, Dilwarpur, Pariharpur, Laduari and Bahadurpur is perhaps the best paddy-producing tract in Tirhut. It is intersected by a series of mountain streams silt of which fertilizes the soil. The level plain is rich in crops, mango groves and clusters of bamboos.

SOIL.

The soil is alluvial and is grouped under four heads, namely,—*balsundari* (sandy loam), *matiyari* (clayey), *bangar* (a clay soil lighter than the latter containing an admixture of sand), and lastly, the patches of *usar* (containing the salt efflorescence called *reh*) which are found scattered all over the district. Paddy is grown chiefly on *matiyari* soil. Good *rabi* crops grow luxuriantly on *balsundari* soil. The autumn paddy crop also thrives on it. Indigo flourished in *balsundari* and also in *bangar*. *Balsundari* predominates in south of the Burhi Gandak, while in the north *bangar* and *matiyari* and in the west *usar* are distributed in patches.

RAINFALL.

In some of the northern and eastern tracts of the district people are wholly dependent upon rainfall for their rice crop. In the absence of irrigation in Sitamarhi subdivision, heavy rain in June is necessary for both the autumn and winter paddy. If a dry period comes too soon the autumn seedlings get burnt up by the sun and never recover. The August rainfall must be steady for the paddy crop. Good rain in June and July is also essential for preparing the nurseries. But a dry spell is wanted towards the end of August to ripen the grain. For sowing *rabi* rain is necessary either in the end of September or beginning of October along with the approaching cold. (For details see the Chapter on Climate and Rainfall and Statistical Appendix.)

AGRICULTURAL STATISTICS.

At the time the last District Gazetteer was compiled in 1907, out of a total area of 3,035 square miles 80 per cent of lands were cultivated in the district, and 605 square miles or 20 per cent were uncultivated. At present 84 per cent of the lands are cultivated and 16 per cent are uncultivated.

The total area cropped in all the three harvests in 1907 was 22,78,300 acres of which 72,300 acres were returned as *dofasli* or twice-cropped; and the net cropped area was 15,55,300 acres or 80 per cent of the total area as against 19,42,400 acres in 1911-12 of which the net area cropped more than once in 1911-12 was 10,18,500 acres. At present the total cropped area in all the three harvests is 23,19,600 acres of which 6,92,600 acres are returned as twice-cropped; and the net cropped area is 16,27,000 acres or 84 per cent of the total area of the district. The proportion sown with *bhadai* is 30 per cent, *aghani* 66 per cent and that sown with *rabi* 76 per cent of the net cropped area, the proportion of twice-cropped being 40 per cent.

The proportion of these crops sown, viz., *bhadai*, *aghani* and *rabi* has undergone some changes since 1907. At that time the proportion sown with *bhadai* was 38 per cent of the net cropped area, that sown with *aghani* 48 per cent and that sown with *rabi* 60 per cent.

PRINCIPAL CROPS.

In the south *bhadai* and *rabi* crops of a superior kind dominate whereas *aghani* and common *rabi* are grown in the north and thus nearly half of the total cultivated area of the district yields two crops a year. The thanas having the largest area under *aghani* also return *rabi* of which *khesari* is the main cash crop. The southern portion of the district is more suited for *bhadai* crops where *rabi* is also grown. Good *rabi* and good *bhadai* go hand in hand. Such area is in the south of the district which is more suited for the production of *bhadai* crops.

FOOD CROPS.

Altogether 88.5 per cent of the net cropped area is occupied by food crops. The northern thanas have 91 per cent of their area under these crops while the southern thanas have not more than 87.34 per cent and if the *diara* lands are also included, it is 81.15 per cent. Paddy is grown in about 6,45,700 acres as against 7,67,800 acres as mentioned in the last District Gazetteer and 7,55,300 acres in 1911-12. There appears to be a decrease in the area under paddy cultivation.

The area under other food crops is about 8,29,100 acres including pulses such as *khesari* which is largely grown in paddy lands when the rice crop is cut. The area under other food crops including pulses in 1911-12 was 4,67,900 acres. Paddy is the staple food crop grown in the northern thanas, varying from 63.35 per cent of the net cropped area in Katra to over 73 per cent in Belsand and Sitamarhi thanas. In the southern thanas its proportion is small varying from 35 per cent in Paru to 23 per cent in Hajipur. But even in this area it is more extensively grown than any other single crop.

Rice.

No less than 80 different kinds of paddy are grown in Muzaffarpur district. Of the total area under paddy about 5,92,600 acres are under winter paddy, about 53,000 acres under autumn and only about 100 acres under early paddy as against about 6,58,600 (*aghani*) and 1,09,200 (*bhadai*) acres respectively. O'Malley mentioned in the last District Gazetteer that only about 14.20 per cent of the total area was under early paddy.

The proportion of *bhadai* paddy is lowest in the southern thanas varying from 4 per cent in Muzaffarpur to 1 per cent in Paru and largest in the northern thanas even up to 21.29 per cent in Katra. Some improved varieties of paddy have been introduced.

Transplantation and Broadcasting.

Out of the two methods, viz., broadcast and transplantation, the latter is the commoner which is sown first broadcast on lands previously ploughed and made ready and then transplanted in rows in the puddles and flooded fields.

Broadcast cultivation is practised for the early paddy for which sowing takes place from February to June. For *bhadaï*, it is sown in June or July and is regarded as 60-day crop as it is reaped in August or September. The long stemmed *aghani* rice is grown broadcast only on very low land and occupies a small area. But this kind of paddy attains a height of 16 feet and grows with the rising water level.

OTHER FOODGRAINS.

The greater part of the area under other foodgrains is under *khesari*, which is a *rabi* crop sown in rice lands while the paddy straw is standing. Of the remainder, the pulses called *arhar* occupies the largest portion and is followed by the millets called *kcdo* and *china* (*Panicum millacum*), the pulses called *mung* (*Phaseolus mungo*) and *urid* and other crops such as *masoor*, *janera*, peas and oats. Some of these foodgrains are *bhadaï* and some *rabi* but both are sown mixed with other crops.

Barley.

This crop is now raised on 2,25,200 acres of land as against 19 per cent mentioned by O'Malley which comes to 2,95,507 acres. Though common to nearly all parts of the district, it is most extensively grown in the central portion. It is commonly sown as a second crop on fields which have already borne a *bhadaï* crop. New improved varieties of barley have been introduced by the State Agricultural Department.

Maize.

The cultivation of maize which comes next to barley was being done on 1,63,760 acres of land as mentioned in the last District Gazetteer which had increased to 1,94,400 acres in 1911-12. The present acreage of maize is 1,53,800. In none of the northern thanas it covers more than 5 per cent of the net cropped area, whereas in none of the southern thanas does it occupy less than 13 per cent. Pupri with 2 per cent returns the smallest and Hajipur with 21 per cent returns the largest area under this crop.

Marua.

O'Malley mentioned 82,450 acres under this crop whereas in 1911-12 it was 83,700 acres, the present acreage being 40,500. *Marua* is harvested in September. It is most common in Pupri where it accounts for 15 per cent of the net cropped area.

Wheat.

Its acreage mentioned by O'Malley was 69,700 while in 1911-12 it rose to 90,000 which has now grown to 1,30,500 and is an important *rabi* crop after barley. But the soil of the district is not suited to it. It is mostly grown on the *diara* lands.

Gram.

The acreage under gram as O'Malley has mentioned was 43,800. In 1911-12 it was cultivated with a very slight decrease on 43,500 acres. But the present acreage under this crop has gone up to 1,33,300. It is grown as a second crop to winter rice and is produced most extensively in the northern thanas. Some improved variety of gram has been introduced by the State Agriculture Department.

NON-FOOD CROPS.

Non-food crops were grown at the time of the compilation of the last District Gazetteer on 11.50 per cent of the net cropped area which comes to 1,78,299 acres. It decreased to 1,41,800 acres in 1911-12 and now the non-food crops including garden produce and orchards occupy 1,08,200 acres of land. The decrease in the non-food crops is due to the food shortage which has made its cultivation very limited.

Sugarcane.

Sugarcane is the most important cash crop of the district and its acreage is on the increase. It is planted during February or March. The ratoons are placed two feet apart and have to be well watered. It is ready for cutting in January or February. There is a Central Sugarcane Research Station at Pusa in Darbhanga district for sugarcane research and development. A number of improved varieties of sugarcane have been introduced by the State Agriculture Department.

The acreage under sugarcane in 1904-05 was nearly 10,000 which rose to 12,000 in 1911-12. The present acreage under this crop is 73,744. There are now three sugarcane mills in this district at Goroul, Riga and Motipur. Three sugar factories outside this district draw some sugarcanes from this district.

It may be mentioned here that the cultivation of sugarcane has received a great encouragement after the decline of indigo and oat cultivation which died out in the twenties of this century owing to economic reasons. The expansion of the acreage under the sugarcane crop in spite of the hard labour on the part of the cultivator and the exhaustion of the soil by its cultivation is a significant economic factor. This is so because of the ready money sugarcane brings. Expansion of this acreage is possible only at the cost of other food crops.

Oil-seeds.

Their area as mentioned in the last District Gazetteer was 55,000 acres of which 41,000 acres were under linseed. The total area under

these crops rose to 1,78,500 acres in 1911-12 of which 1,07,900 acres were under linseed alone. Oil-seeds now occupy 62,300 acres of which 29,200 acres are under linseed and the remainder under other oil-seeds. The other oil-seeds are sown singly but the linseed is usually mixed with barley, *khesari* and other *rabi* crops. Linseed is most commonly grown in the northern thanas of the district.

Tobacco.

In the last District Gazetteer the acreage under this commercial crop was mentioned as 17,400 acres. In 1911-12, the area under this crop was 17,500 acres and showed a very slight increase. Tobacco now occupies 52,700 acres. This substantial increase in acreage is due to its high price as a cash crop. Very good quality of tobacco is grown in Sakra police-station and in pargana Saraisa. There is a tobacco research station at Pusa which has considerably contributed to the improvement of this crop.

Other Crops.

The only other non-food crops requiring special mention are cotton and the thatching grass called *kharaul* which serves as fodder to the cattle and is used for thatching purposes. The area under non-food crop is going down due to the fact that under the Grow-More-Food Campaign larger impetus is being given to food crops. Chillies grow very well in parts of this district.

EXTENSION OF CULTIVATION.

In 1943, the extension of cultivation work was taken up under the Grow-More-Food Campaign. Various schemes for increased production of crops and reclamation of waste lands and intensive cultivation have been introduced which have met with some success and evoked co-operation of the farmers. The Agriculture Department has done much to maintain the fertility of lands by supply of manure to the lands which do not remain fallow even for one year.

IMPROVED METHODS OF CULTIVATION.

In the wake of Grow-More-Food Campaign improved methods for better cultivation have been introduced, i.e., by following cropping pattern, use of improved implement and green manures such as *sanai* for uplands and *dhaincha* for low lands. Crop rotation has been popularised. Rural compost making, started in the villages, has fed the under-nourished lands and kept the villages clean. The use of cow-dung for fuel has been replaced by the quick-growing trees due to the endeavour of the Agriculture Department. The low-lying lands in which only *khesari* could be broadcast have been drained and brought under the cultivation of wheat, peas and barley. In Hajipur area specially the cultivation has been much modernised and the cultivation of potatoes, bananas and cauliflowers has gone up in standard. The cultivators are advised by the Agriculture Department to practise

three or four years' rotation of crop which with green manuring is giving increased production and the fertility of the soil is preserved. Introduction of good grafts has helped the growers in growing better varieties of fruits. The cultivators are getting the advantages of the improved methods of cultivation. There is one District Agricultural Officer for the district and one Grow-More-Food Officer for each subdivision with Agricultural Inspectors, Engineering Supervisors, Overseers, etc., of the Agriculture Department to help and guide the farmers.

There are seven intensive cultivation blocks each of 10,000 acres or above in the charge of this Department which supervise the agricultural operations on systematic lines and help the farmers in their agricultural necessities. A number of demonstrations are given in these blocks to enlighten the agriculturists with scientific and improved methods. Mobile plant protection staff helps to fight out the pests.

LIVESTOCK : LIVESTOCK POPULATION.

The livestock position in 1951 as compared with the position in 1945 is as follows:—

			1945.	1951.	Variation.
Cattle	..	..	6,79,364	7,83,844	+1,04,480
Buffaloes	..	..	2,10,801	2,02,770	—8,031
Sheep	..	..	10,823	10,188	—635
Goats	..	..	2,78,537	4,23,634	+1,45,097
Poultry	..	..	1,09,021	1,45,182	+36,161
Horses	..	..	Not available	8,549	
Donkeys	..	..	Ditto	7,087	
Mules	..	..	Ditto	50	
Camels	..	..	Ditto	49	
Pigs	..	..	Ditto	12,405	

These statistics disclose a decrease in the population of buffaloes and sheep, which is mainly due to the area being heavily affected by liver-fluke and parasitic infestation in adult sheep. These diseases are common in water-logged areas. The increase in poultry may be due to the absence of contagious diseases such as *ranikhet*. Definitely more people are taking to poultry rearing as a subsidiary occupation. Poultry from Muzaffarpur has a ready market in Calcutta, Patna and other places. A large percentage of buffaloes is exported to deficit areas. The villagers are now keeping more goats to supplement their income.

FODDER.

No special fodder or grass is grown for feeding the cattle. Straw from the paddy and the leaves of maize and sugarcane supply fodder. Except for a few *chaurs* there is not much grazing ground. The work of growing fodder in the villages has also been taken up and for this purpose cuttings of elephant grass, barseem seeds and seeds of napier grass are supplied free.

Buffaloes requiring lesser attention for maintenance are the chief source of milk supply and dairy products. The soil is softer than that of South Bihar and he-buffaloes are not engaged in ploughing as substitute for bullocks.

CATTLE FAIRS.

The very heavy pressure on land leads to a potential market for goods which asserts itself by the holding of annual *melas* and fairs. Practically in all the *melas* and fairs some cattle are sold. But there are also a few purely cattle fairs. The more important cattle fairs are held at Sitamarhi, Susta, Bhairo Asthan, Kabin, Jaitpur and Hardi. There is a large turnover of cattle in these *melas* in spite of indifferent means of communication for some of them. Cattle shows are organized in these fairs and prizes in cash or kind are awarded with a view to encourage the local breeders.

GENERAL CONDITION AND INCIDENCE OF DISEASES.

The general condition of livestock is moderately fair. Black quarter, Haemorrhagic septicaemia and Foot and Mouth diseases are the common cattle contagious diseases prevalent. Liver fluke infestation in areas surrounding the *chaurs* is common.

In 1950-51 total number of outbreaks of various contagious diseases was 116 with 1,975 seizures and 267 deaths as compared to 39 outbreaks with 239 seizures and 100 deaths during 1951-52. The most regular means for obtaining information regarding outbreak of diseases is the village *chaudidar*. For this purpose the police, village co-operative societies and village *panchayats* are also important agencies. Criminal poisoning of cattle by arsenic, *dhatara*, *madar* and *kanail* is not frequent.

VETERINARY AID.

A veterinary hospital was established at Muzaffarpur in 1899. Four veterinary hospitals, namely, at Muzaffarpur, Maniari, Sitamarhi and Hajipur are now functioning together with eight veterinary dispensaries at other places. The hospitals give treatment to out-patients and in-patients whereas the dispensaries treat only the out-patients. During the year 1950-51, 455 in-patients and 9,538 out-patients were treated, while in the year 1951-52, 522 in-patients and 9,738 out-patients were treated in the veterinary hospitals. In the

dispensaries, the number of patients treated was 12,187 during the year 1950-51 and 15,580 during the year 1951-52.

Treatment, prevention and suppression of diseases of livestock are the main functions of such veterinary institutions. Serum inoculation in mass scale is the only method at present employed to minimise the death-roll in case of an outbreak and it has proved effective.

• BREEDING.

Regular breeding operations have not been attempted and only a few stud bulls are being maintained at the veterinary institutions for this purpose. The State Government have planned arrangements for artificial insemination.

GOSHALAS.

There are *goshalas* at Muzaffarpur, Sitamarhi, Bairagnia and Hajipur. Stud bulls have been supplied to these *goshalas*.

IRRIGATION.

There are three fundamental factors which are common to Tirhut Division and fully apply to the district of Muzaffarpur. They are : (1) increased density of population towards the west, (2) decrease in rainfall towards the west, and (3) the slope of the ground from north-west to south-east governing the flow of flood water. These factors have great influence on the agricultural economy of the district of Muzaffarpur. Any scheme for providing irrigation facilities for this district will have to be drawn up with reference to these factors.

The soils of the district of Muzaffarpur are capable of retaining moisture. There is sufficient rain during the rainy seasons ranging from 23.71 inches to 46.12 inches. It is, accordingly, one of the most fertile districts in Bihar. Formerly the cultivators did not find it necessary to obtain water for the fields from large irrigation works. As mentioned in the last District Gazetteer, only 30,000 acres or 2 per cent of the net cropped area was under irrigation. In the Census of 1911, the percentage of gross cultivated area which was under irrigation was 1.8. But on account of low production of food crops, deficit in food-grains and the increasing density of population, the necessity of having assured irrigation was badly felt.

The greater part of the irrigation is done by means of wells which cater for about 70 per cent of the irrigated area. Under the Grow-More-Food Campaign, 1,377 wells on a 50 per cent subsidy have been constructed. It has to be mentioned here that irrigation by wells is common only in the south. In the northern parts, the number of wells is limited as the land is low and subject to floods. In this area, rivers and tanks are the chief sources of water supply. The Adhwara, the Gandak, the Baya, the Purandhar, the Baghamati, the Lakhndei

and the Mahuara are the main rivers used for irrigation purpose. Pynes or irrigation channels leading from the banks of the rivers are also constructed. Many ponds and tanks have been completed and pumping sets have been given to the cultivators on a 50 per cent subsidy.

The necessity of irrigation by canals and other means was never felt acutely except during the famine years. The failure of crops in 1896 stressed the need for assured irrigation in the district of Muzaffarpur along with Saran and Champaran districts; and in 1897, the Champaran Canal Survey Division was formed for preparation of detailed plans and estimates for this project. As famine relief measure, earth work involving an expenditure of Rs. 5 to 6 crores was done in subsequent years. Later, the Tribeni Canal System was completed in 1911. This system does not help Muzaffarpur district.

The necessity of a more comprehensive irrigational system led to the creation of the Gandak Circle in 1948 with one Superintending Engineer and some Assistant Engineers in the initial stage for survey and investigation of the Gandak project.

The urgency of executing the Gandak project was felt after the Second World War when the general food situation deteriorated considerably aggravated by the partition of the country. Dr. Rajendra Prasad (then Minister In-charge of Food and Agriculture, Government of India) requested the Government of Bihar in 1947 to investigate the possibility of opening out canals. The canals will be both on eastern and western sides of the Gandak. Muzaffarpur district will be irrigated from the eastern canal.

The State Government of Bihar have opened power houses at Hajipur, Bairagnia and Sitamarhi. The North Bihar Tube-well Division has been set up for the construction of tube-wells to be operated by electricity that has now been made available. Tube-wells set up in this district are usually 300 to 400 feet deep. Each tube-well is designed to discharge about 33,000 gallons of water per hour.

The use of power for drawing water from ordinary wells has not been given a fair trial yet.

Further details about Irrigation will be found in the chapter under Natural Calamities.