AGRICULTURE AND IRRIGATION.

INTRODUCTORY.

The total area of the district according to 1951 census is 4,896 square miles or 31,35,540 acres. The area occupied by forests and not available for cultivation is approximately 18,75,089 acres. The area under orchards is about 916 acres. The cultivable waste occupies about 2,28,766 acres. From 'these figures it will be seen that the area available for cultivation does not form the bulk of the area of the district. It has to be mentioned that these figures supplied by the Agriculture Department are approximate and somewhat different from the figures published by State Directorate of Economics and Statistics. But the differences are not very substantial and may be ignored. It is apparent from time to time the land distribution figures will differ.

The soil-type is more or less uniform throughout the district. Mostly the soil is loamy with very little variations. Stretches of reddish and black clay soil are also found. The area of Ranka and Bhandaria, police-stations has got red laterite soil while Panki and Lesliganj police-stations have light black clay soil. Geologically soil formation in the district is the outcome of the natural work of the rivers koil, Amanat and Son. There are two main zones of soil for agricultural purposes. The first consists of river valley basins of Amanat, Koil and son and contains stretches of fertile alluvial soil covered with varieties of rice and to a less extent of sugarcane, wheat, barley, gram, *kulthi* and *surgufa*. The second comprises the hilly tracts where the soil formed is of thin loose and gravelly type. This area is mostly covered with, jungles and cultivation is mainly carried on in the valleys lying among the hills and in the long stretched narrow basins formed on both sides of the hills, rivulets and rivers. Hilly tracts, viz., Ranka, Bhandaria, Garu, Mahuadanr, Latehar and Balumath are cultivated by hardy peasants belonging to Adibasi tribes like Orson, Kharwar, Korwa and Chere. The area under rice is comparatively less. Rice fields are, however, expanding under reclamation. There is not much interest, in *rabi* crops. The peasantry of this area mainly depends on *bhadai* crops, such as maize, *jowar, marua, kodo, bodi, urid,* and vegetables raised during rains.

As will be mentioned later there are two seasons for growing crops kown as *kharif* and *rabi*. There is also a third season called hot weather. *Kharif* season starts from the middle of June to the middle of October while the *rabi* season extends approximately from 15th of October to the middle of January. Hot weather season runs from the middle of January to the middle of June. Out of normal rainfall from 45 inches to 52 inches in different parts of the district about 95 per cent is received during the *kharif* and the rest is received in the *rabi* season. Hat weather season generally suffers from want of rain. The *hharif* season crops are maize, *marua, urid,* groundnut, *jowar, bajra,* paddy, *sanai* and *rahar. Sanai* is grown for green manuring. The main crops grown in *rabi* season are

wheat, barley, gram, peas, oat, sugarcane, *masuri, tisi, khesari* and mustard. During hot weather season *china,* maize and *bora* paddy are grown.

The district has been a chronic sufferer from famine, drought and scarcity conditions. Floods are not a problem as the rivers are mostly hilly excepting Son which is a perennial river and occasionally creates havoc in certain pockets. The flood of Son extends over three or four days or for a week at the most and the main crops damaged are maize and sometimes paddy. Cyclones of major intensity are not known

.

LAND UTILISATION.

Major G. Hunter Thompson, Superintendent, Revenue Survey, Chotanagpur Division, left some notes, geographical, statistical and general of Palamau Pergunnah written during 1862-66. Palamau was a part of Lohardagga or Chotanagpur district at the time. Major Thompson's report was printed at .Alipur Jail Press in 1866 and a copy is available in the Library of the Asiatic Society of Bengal. This report gives a useful account of the condition of agriculture in Palamau about a century before. Major Thompson mentioned that out of the approximate area of the Pergunnah 3,650 sq. miles, only about 456 sq. miles were cultivated. He pointed out that 2,399 sq. miles jungle was fit for cultivation while 608 square miles were natural hills and 187 sq. miles were unculturable waste. Palamau was at that time divided into 25 large estates locally termed Tuppeh "Tuppah". The flourishing area was Tuppeh "Tuppah" and 644 acres of this grew rice out of the one-third of the total area which was under cultivation. But the population of the Tuppeh was extremely meagre and was on the average 114 souls to the square mile. Some of the other Tuppehs had lesser population. Tuppeh "Munkheree" had only one-fifth of the total area. cultivated and had only 59 souls to the square mile. Tuppeh "Seemah" had only one-eleventh of the total area under cultivation and the population statistics 20 souls to the sq. mile. Netarhat was in this area.

Major G. H. Thompson could visualize better and more extensive cultivation in Palamau, for example, for Tuppeh "Sunnaya" he had observed that the area was well-watered from the Roil river and by many of its feeders coming from the hills to the south. Two main roads passed through the Tuppeh from Daltonganj to Checharee and to Sirgoojah and that the soil was rich, means of irrigation plentiful. Thompson thought that if the Tuppeh was better inhabited there would be fine crops. He has also good observations to make about 'Tuppeh "Turriya" which he found rich in coal as well. He mentioned about this Tuppeh "Skirts the right or north bank of the Koel river, along which for some distance inland, there is rich rice cultivation, which is well watered by numerous streams that flow from the hills on the northern parts of the tuppeh".

Major Thompson had also observed that" Amanat" valley, tuppehs Poondag, Imlee and *Kote* contained the richest cultivation in Palamau. Regarding the soil in Palamau his observation may be quoted :-"The soil in Pa.lamau where it has been opened up, and well tilled is generally very productive. The valleys, of course, contain the best soils for rice, and the cereal crops; but the soils of the higher lands, and hills, are rich in

decayed vegeta.ble mould, which is added to yearly by the fall of leaf from the jungle and forest, and are consequently best adapted for cotton. The iron and the lime are powerful stimulants to the soil, and with care, and proper attention to the seasons, almost any kind of crop can be successfully reared." Cotton seems to have been quite common at that time. He observes “The cotton lands are generally in the jungle, or on spurs of hills, and are frequently changed. Trees, although always cut down, are seldom or ever up-rooted on cotton lands; the practice being to clear the land of all low jungles, and spread this, with the branches of the trees, over the ground, and when all is dry, to set fire to the leaf, and branches thus spread out. Land thus prepared for cotton is called" *Daha"*. The charcoal and ash improve the soil, but the chief reason assigned by the native for this mode of preparing the cotton soil, is that it tends, better than any other system, to eradicate, by burning up, the roots of the grasses."

His report has an area statistical statement for Pergunnah Palamau in 1866. According to this statement the number of estates were 25 and the number of villages 2,749. The area in square mile under cultivation was 456, fit for cultivation 2,399, hills 608 and barren waste 187. This gives us a total of 3,650 square miles. The average size of villages in acres was 849. According to him the number of ploughs in the Pergunnah was 24,761, the number of bullocks 59,290, number of cows 38,895 and number of buffaloes 70,035. The population consisted of 1,56,876 souls-females 71,563 and males 85,313.

This picture drawn by Major Thompson could be compared with the present picture (1955-56) of land utilisation as disclosed in the following tabulated statistics published by Directorate of Economics and Statistics (1955).

Statement showing classification of areas (in thousand acres) during 1955-56.

Classification of land.	Area.
1. Forest ... … …	20,07
2. Not available for cultivation … …	2,64
3. Other uncultivated land excluding current fallow …	1,63
4. Current fallow … … …	2,77
5. Net area sown … … …	3,02
6. Total area of the district… … …	31,45
7. Bhadai crops … … …	1,81
8. Aghani crops … … …	2,03
9. Fruits … … …	…
10. Potatoes … … …	…
11. Vegetables including root crops … …	…
12. Total area sown … … …	5,87
13. Area sown more than once … …	2,83

HOLDINGS.

The distribution of the area of the holdings *is* not uniform. It appears that there had been progressive decline in the average size of a holding. This is only expected because of the Law of Inheritence, as on every death of the *kana* (family-head) of the family there will be a further partition of the holding. At the time of the settlement of D. H. E. Sunder (1894-95 to 1896-97) there were 12,952 holdings with 64,961.95 acres. From this it is apparent that the average size of a holding was 5 acres in the Palamau Government estate.

In the *District Censsus Hand and Book of Palamau*, 1951 there is the following chart on distribution of 1,000 agricultural holdings by size of holdings based on sample survey of size of holdings, 1952:-

Up to 0.5 acre	Exceeding 0.5 acre and up to 1 acre.	Exceeding 1 acre and up to 2 acres.	Exceeding 2 acre and up to 3 acres.	Exceeding 3 acres and up to 4 acres.	Exceeding 4 acres and up to 5 acres.	Exceeding 5 acres and up to 10 acres.	Exceeding 10 acres and up to 15 acres.	Exceeding 15 acres and up to 30 acres.	Exceeding 30 acres and up to 50 acres.	Exceeding 50 acres.
1	2	3	4	5	6	7	8	9	10	11
247	174	146	90	90	24	90	52	42	10	35

From the above-mentioned statistics it is clear that there had been decline in the average size of the holding. The number of small size holdings of 0.5 acre and one acre is greater than the big size holdings.

EXTENSION OF CULTIVATION.

Extension of cultivation in this district has been rather slow in comparison with the other districts. This is mainly due to the poor economic incidence of the common man. The first reclamation was obviously done by the Adibasis and the indigenous population who, however, were gradually reduced to the position of serfs, agricultural labourers or small cultivators by the zamindars. The incentive for extension of cultivation was thereby partially lost. With the abolition of the zamindari the problem has again been put in the crucible. With the advent of the Welfare State and a large number of

ameliorative measures taken in the First, Second and the Third Five-Year Plans extension of cultivation is expected to be more rapid. The district is, now divided into a number of blocks and each of the Block Development. Officer is expected to see to the extension of cultivation and better cultivation of the lands that are already under the block.

When we remember that there was a stage when the Adibasi, tribals practised the *beara* cultivation system for raising crops we have got to admit that there has been an advance although distributed over Several centuries. In *beara* cultivation they used to cut down the jungles and burn the trees. They used to drill holes in the earth and ash with the help of a pointed bamboo stick and put in seeds. The availability of supply of instructions for better agriculture, better seeds, manures and proper implements will no doubt help in extending cultivation. The Agriculture Department is charged with this duty.

The District Agricultural Officer is in overall charge for the agricultural development in the district. He has been given Sub divisional Agricultural Officers. Under each Sub divisional Agricultural. Officer there are two or three Agricultural Inspectors and under each Agricultural Inspector there are two or three *Kamdars* to assist him in the field work. The main items of work of this machinery are the, introduction and distribution of improved seeds, manures and implements, construction of minor *ahars, bandhs* and *pynes,* construction, of medium *bandhs,* multiplication of seeds and implementation of the. Agricultural policy of the State Government through the Community Development and the National Extension Service Blocks. There is one Government Experimental Farm engaged in research work on food, produce and citrus development. This farm is situated at Chianlci near Daltonganj. The area of the farm is 100 acres-30 acres for citrusre search farm, 30 acres for district agriculture farm and 40 acres, for agricultural school farm. It has already been mentioned elsewhere that this district can grow excellent oranges. There is no doubt why it cannot grow good mangoes, papayas, lemons, peaches and other fruits. It is in horticulture and extension of vegetable belts that the future cultivators will find a good deal of market in the near future as, the neighboring district of Ranchi is being rapidly industrialized and a new township will very soon grow up at Hatia near Ranchi because of industrialization. The vegetable belts round about Ranchi cannot possibly supply sufficient vegetables and fruits to the people of greater Ranchi. Palamau is excellently connected with Ranchi by roads and in the near future we will see truck loads of vegetables and fruits being rushed to Ranchi from the markets in Pala.mau district probably making it difficult for the Palamau population to get enough of them.

RAINFALL.

The district has a normal rainfall of 51.52", but the southern part of this district which is overgrown with thick forests and jungles gets more rainfall than the northern part which is almost a plain land bordering the districts of Gaya and Shahabad. The normal period when the monsoon breaks is the mid June and more than 50 per cent of the rains are

received during the months of July and August. In the latter part of the rainy season the rainfall is rather unevenly distributed and varies from year to year. There has been a conspicuous failure of *Hathia* rains in most of the parts of this district for the last three years. The southern portion, however, was slightly better.

The success of agriculture in this district is entirely dependent on rainfall. A good shower of *Hathia* rain when received in September ensures *rabi* and the prospect is further added by winter rains. In the other months there is very little rainfall. Details of rainfall have been given in a separate chapter.

Distribution of rain seems to have been more disturbed since the third decade of the twentieth century. One of the reasons may be the indiscriminate exploitation of forest. The frequency of drought years seems to have almost become a normal feature. Generally the peasants need a heavy shower of 3" as a premonition in Mayor early June to facilitate breaking up of the soil for the preliminary preparation for seed bed. The rain at the end of June and in July should be heavy to allow the seedlings to grow and the paddy fields to be preceded for transplanting. An interval of comparatively less rain follows showing inter-cultural weeding operations to be successfully done. In the end of September and the beginning of October, the *Hathia* rains come which must be very heavy. On the sufficiency of the *Hathia* rains depends the success of winter rice crop and the land preparation of *rabi* crops. Finally, the periodic showers from December to February inclusive are essential to a good ra*bi* harvest. These December to February showers help the growth, maturity and grain formation of ra*bi* crops.

TEMPERATURE.

Details of temperature have also been given in a separate chapter. There is a great variation in temperature of the district. There is a difference of about 30° between the normal maximum and normal minimum monthly temperature and it is not unusual for an equal wide variation to occur within the 24 hours.

There is also a great variation in the maximum temperature required for ripening of the various crops. *Kharif* crops generally ripen in the month of September to October and require maximum temperature from 700 to 800. In the case of *rabi* crops, the temperature required for ripening is much more varying from 100^0 to 105^0 F.

IRRIGATION.

The uncertainty of a. well-distributed monsoon has placed the importance of artificial method of irrigation in the forefront for successful crop raising. There are, it is true, a large number of rivers and streams in the district, but in most of them the supply of water diminishes rapidly or fails entirely soon after the end of the rams. The landscape being undulating and abnormally sloping, the *nallahs*, rivulets and rivers rising from the

hillocks and hills send out torrential currents during the rains which generally run to waste cutting deep ravimes and gorges in the basin tracts.

The system of artificial irrigation prevalent in the district consists of three main types, viz., Major Irrigation Schemes, Medium Irrigation Schemes and Minor Irrigation Schemes. The Major Irrigation Schemes, when executed supply a perennial supply of water both during *the kharif* and *rabi* seasons. The schemes constructed under Major, Irrigation Schemes are the Karabar, Harhgarhwa, Sadabah and Batre Batane channels. They irrigate in total 6,000 acres of land. Some of them do not supply perennial irrigation water though they are meant for the best insurance against the failure of *Hathia* rains in September-October and for raising *rabi* crops, if possible, even summer crops. However, they are very important from the view point that they have proved to raise the total yield of crops production in the area to an appreciable extent. Such schemes generally cost above rupees one lac and are capable of irrigating more than 1,000 acres.

The second type of scheme is the Medium Irrigation Scheme. They were sponsored during the Grow More Food Campaign launched during 1940-52. These schemes are intended to supply assured irrigation to paddy crop during the intervening drought periods in the *kharif* season. Less is expected from such type for irrigating *rabi* crops. Wherever the source of water supply is a living rivulet and a river or a hill percolation or a mountainous spring, irrigation to *rabi* and summer crops to some extent, is possible by such scheme. Such schemes are few and far between in the district. A Medium Scheme as sponsored by the Grow More Food Campaign costs above rupees five thousand and is normally capable of irrigating more than 100 acres of land., More or less this Medium Scheme is a rain-fed one and of a diversion type. It has generally a catchment area in the mountainous uptracts of various *nallahs,* rivulets, ravines and gorges. The run off from the catchment area is drained down to the main river or rivulet and is directed to the area to be benefited by a *bandh* or a pucca weir or dam across it. When water comes the surplus is let out through the flood escape and the remaining required water is stored in the bed of the scheme. The stored water is allowed to flow out through sluice gates fitted at the mouth of the *pyne* or irrigation channel when required, to puddle and irrigate paddy-cut field or to irrigate *rabi* crops, if there is a sufficient storage in the *bandh.*

So far, there are 16 Medium Schemes constructed in the district and they are capable of irrigating 17,000 acres of paddy and *rabi* crop land.

The third type of scheme sponsored by the Grow More Food Campaign is termed as Minor Irrigation Scheme. It includes minor *bandh, ahar, pyne, karaha* (small irrigation channels emanating from the main irrigation channel) and wells. The *bandh* is a diversion embankment constructed across a small *nallah* or depression along the contour level having a flood escape and an irrigation channel. As it runs along the contour level, it lengthens for miles together till it is broken by some river or great depression. As it proceeds on in length, the area of its catchment goes on increasing. At places it may require the other more *pucca* flood escapes to let out flood water. Such Food escapes are

called locally *Chahakas.* Here and there throughout the embankment and irrigational channel *Bdaos* (wooden or earthen or cement concrete pipes) are fitted to let out water for irrigating lands below. Such *bandhs* mainly depend upon rain water. Their irrigation channels do not function if the rains cease for a week or a fortnight.

The *ahar* is a temporary monsoon reservoir fed by irrigational channel or *pyne* emanating from the neighboring river or a diversion *bandh.* The water from the *ahar* is let out through *Bhawas* fitted at the bottom of the embankment. The *ahar,* is the oldest system of artificial irrigation scheme still proving very successful for paddy cultivation. After *Hathia* rains, water in the *ahar* is completely dried. It is then ploughed for *rabi* crop sowing. It grows very bumper *rabi* crops.

The *pyne* is the cut out channel across an upheaval stretch of land from the river bed down to the adjoining tract situated in lower level. It is a means for distributing river water into the fields.

The *karaha* is small irrigation channel which emanates from the main channel to effect more branching of the latter to facilitate distribution of irrigational water more widely and judiciously than otherwise.

The well is a perennial source for water-supply for irrigation. Its supply of water is limited. Generally a well of 10' diameter is sponsored by the Agricultural Department for the area costing about rupees two thousand for forty feet depth and is capable of irrigating one acre of land. Water is lifted from the well by means of *latha (a* wooden lever) and *kundi* (an iron bucket having V shape bottom). It is the oldest device of the area still proving very essential for *bari* land, upland, fruit and vegetable cultivation. It has proved very helpful even growing *rabi* crops, though with slightly high cost. Cultivators are encouraged by the Government to sink wells at 50 per cent subsidy basis. The increase of vegetable areas in the district depends more upon the increase of wells in number.

The *sair,* i.e., the swing basket is one of the oldest systems of artificial irrigation. It is neither effective nor econmnical. The cultivators take recourse to it during drought when they cannot get water for their crops by some other suitable means. It works in tanks, *bandhs,* and river.

The lift engine and pump scheme was sponsored *by* the State Government under Grow More Food Campaign in the year 1948-52. During these years State had no good *Hathia* rains. At places *Hathia* rains totally failed. The cultivators all over the State expressed their desire to have lift and pumps to combat drought. This district has more than one hundred sets operating all over the area. Side by side a squad of true mobile engine pumping sets has been set up in the district to combat the drought of areas having more than 500 acres of cultivated land in one block.

BORING OPEN WELLS.

On the whole, the Major Irrigation and Medium Irrigation Schemes have received full justification and appreciation from the peasantry of the district. The Minor Irrigation Scheme, except wells, is losing popularity. The Minor Irrigation Schemes are usually cheap in cost for construction and maintenance and are locally more, suitable to provide irrigation in tracts where other bigger schemes cannot work.

The following table will show the number of Grow More Food Schemes constructed in this district for supplying irrigational facilities:-

Year and Pumps.	Minor Irrigation Schemes.	Medium Irrigation Schemes.	Surface percolation wells.	Rahats.	Boring	Lift Engines
1	2	3	4	5	6	7
1942-43 ..	2	Nil	Nil	Nil	Nil	Nil.
1943-44 ..	72	Nil	Nil	Nil	Nil	Nil.
1944-45 ..	81	Nil	Nil	Nil	Nil	Nil.
1945-46 ..	77	Nil	Nil	Nil	Nil	Nil.
1946-47 ..	56	Nil	Nil	Nil	Nil	Nil.
1947-48 ..	79	Nil	9	Nil	Nil	Nil.
1948-49 ..	151	Nil	44	6	Nil	Nil.
1949-50 ..	176	Nil	77	12	Nil	5
1950-51 ..	Nil	Nil	122	40	15	23
1951-52 ..	26	2	90	10	35	63
1952-53 ..	30	1	30	3	22	Nil.

—						
	Total ..	750	3	372	71	72
91						

In addition to the above schemes completed in the district there are large number of minor *ahars* and *bandhs* spread over the entire district. These schemes depend primarily for their water-supply on rainfall and serve as small reservoirs and irrigate on an average 20 acres of land each. It is only in the beds of these *ahars* and also on the uplands where well and other surface irrigation exists and two crops are usually raised. The Waterways Department has taken up construction and repairs of several major schemes in the district so far. These schemes are providing irrigational facilities to about 5,000 acres of land each. The following table will show the areas irrigated by different sources :-

The total area under irrigation according to *Bihar Statistical Hand Book*, 1955 in 1955-56 is 1,10 thousand acres. Detailed figures are not very reliable due to incomplete survey of the district but are being quoted from 1953-54 to 1955-56 as they, nevertheless, show the trends :-

(Area irrigation in thousand acres)

—	Government Canals.	Private Canals.	Tanks.	Well.	Other Source.	Total
1	2	3	4	5	6	7
1953-54		16	33	7	60	1,15
1954-55		..	1	9	1,16	1,26
1955-56		..	..	11	99	1,10

Soil

There is a great heterogeneity in the nature of soil existing in the district. Right from hard clay to light loam is noticed changing from village to village as well as plot to plot. The following are the main types of soil found in this district : —

(i) Heavy clay— Locally known as *kewal* and is considered very rich. The soil becomes

very hard when dry and very sticky in wet condition due to high percentage of fine clay. The special feature of this soil is that it is capable of holding moisture for longer period, if proper care is taken. There is slight variation in this type of soil due to existence of nodular lime contents and this gives a whitish tinge to this type of soil at places. It does not grow good *rabi* crops.

(ii) Sandy soil. — This is commonly known as *balsundar* and contains a considerable admixture of coarse sand. With irrigation facility this soil is capable of producing good crops of pa.ddy, fruits and vegetables.

*(iii)L*oam. —This is commonly known as *dorasa* where a typical admixture of sand and clay exists. It is superior to sandy loam, but inferior to *kewal* soil. This soil grows *aman* paddy and sugarcane.

The above are the three main types of soil found in this district. There is, however, a great variation in their mixture due to existence of different soil constituents. The following are the admixture of soil obtaining in this district, over and above the three main classes mentioned above. Local names have been used: —

(i) *Gangti soil— This* is commonly known as *gangti* and has got a high percentage of
kankar and lime in the soil. It is also known as *garia* kewal.

(ii) *Ankrout— This* is an admixture of sandy and gravelly soil with clay.

(iii) *Pathri.-This* is a reddish soil full of gravels and pebbles and found on the slopes and at the bottom of the rivers.

(iv) *Lalmiti— It* is red ferruginous soil found in the south of this district near the
Chotanagpur plateau and in gneissic hillocks and ridges in the north-west.

(v) *Pawarv — This* soil has a large mixture of coarse sand and is very friable and poor in quality.

Area under each type of soil. — There is a great variation of area of the soil of each category and one type of soil is gradually converted into other by continued agricultural operations and by the application of organic and inorganic manures.

Crop raised in each type and their average yieds.

Sandy clay—	Paddy	…	12 to 15 mds. per acre.
	Wheat	…	4 to 6 mds. per acre.
	Gram	...	5 to 8 mds. per acre.
Clay—	Paddy	…	4 to 8 mds. per acre.
	Rabi	...	2 to 3 mds. per acre.

Millet	…	6 to 10 mds. per acre.
Oil seeds	…	3 to 4 mds. per acre.

Soil analysis conducted under the Chemical Section of Agriculture Department, Bihar, reveals that Palamau soil is mostly deficient in calcium and phosphorus.

Soil erosion or soil silting. — Broadly speaking, soil erosion is caused by rainfall as well as by wind. Though the agency of winds is working most inconspicuously, the result of wind erosion is not meagre and is very difficult to control where soil erosion is caused by rainfall or water, which is of two types :- (1) Gully erosion and Sheet erosion. Gully erosion is by far the worst and damages are very great, if not checked. So far in this district nothing conspicuous has been done to stop the ravages of soil erosion except some propaganda by Agricultural Department to cultivators to change their agricultural practices and follow improved method of crop growing. Soil erosions a big-problem in this district.

CLASSIFICATION OF LANDS.

The cultivated land in the district was classified in the record-of rights, as done in the other districts of. Chotanagpur into two main divisions, viz., rice land and upland. They have been again subdivided into three classes according to the merit of productivity.

Rice land (Don, Dhankhet) — First class rice land (locally termed *as gahera, bahiar or ghoghra)* grows a heavy crop of late ripening rice, harvested in *Aghan.* It remains moist for the greater parts of the year. If it is drained suitably *paira* crops of wheat and gram can be raised. The land of this class is usually irrigated by artificial means and is ordinarily situated in the bed of a *nallah* or immediate1y below *bandh* or an embankment.

Second class rice land (locally termed. as *sing ha, dohar, cham, kanki* or *ghugri)* grows varieties of paddy which ripen by the end of *Kartik* or the beginning of *Aghan.* It is less favorably situated than the first land, but derives some of its moisture from irrigation. Such land is usually found in long winding *nallahs* in the jungle or in narrow terraced land. Such land is generally irrigated by water diverted from the *nallah* or rivulets dammed across. If irrigation is assured, the yield of such rice crop can very well compete with that of the first class rice land.

Third class rice land (locally termed as *bad, tarkha, sathiar, tarkhet* or *badhian)* includes that large part of the rice land of the district where no water is brought by irrigational means but in which moisture is retained by terracing. This type of land is not very fertile and the paddy yield is much smaller.

Upland. — Upland has also several grades. The first class of upland commonly known as *bari* or *gharbari* is the usual homestead land by the side of dwelling houses. Such homestead land is usually fenced and well mannered and is capable of raising two

crops a year. It includes also such plots as are commonly used for the cultivation of sugarcane and growing vegetables, and the *dub* (inundated during the monsoon) land in the bed of reservoirs *(aharas)* which are let out after H*athia* rains or after serving the purpose of irrigation, and some of the rich land stretching on the bank of the Son and the Koil.

The second type of upland (locally termed as *bhita, maruabari, bapirbari* or *chira)* includes the unfenced lands, usually next to the first class upland, that are manured sometimes and like the first class upland bear two crops a year.

This class of upland is situated away from the villages. The most valuable crop is *aghani* which includes the best rice and sugarcane. The *bhadai* includes the early rice, *marua, kodo,* maize, *jowar,* millet and other less important grains. The r*abi* crop includes gram, barley, wheat, oats, lentils *(masoor),* linseed, *kulthi,* and other pulses. The area in which the autumn *(bhadai)* rice crop is raised is approximately identical with the third class rice land. This crop is of greatest importance in Palamau, much more than the winter rice crop. The proportion of upland to rice land is much higher in Palamau than in the adjoining districts of Chotanagpur as the following figures show:-

District		Rice land in acres.	Upland in acres
Palamau	..	2,65,000	7,64,000
Hazaribagh	..	6,78,000	8,44,000
Ranchi	…	11,92,000	14,34,000

Basti site.-It grows sometimes one crop a year and sometimes one crop every third year or few years. The extent to which this land is cultivated depends on the demand for land in the neighborhood. Generally this class of land grows maize, *rahar, jowar, bodi, urid, moong, til, marua,* and *kodo* after heavy manuring.

The uplands commonly known as *tam* are at the mercy of monsoon. With well irrigation some portion may turn into an orchard and vegetable garden. More of this type of land is coming under the plough.

Due to the undulating topography of the land of this district the cultivable land presents a diversity of the general appearance. Majority of the paddy lands in this district lie in valleys which are formed due to natural slope of the land and where conditions are most favorable to paddy cultivation. There are also other areas where paddy cultivation is done in fields after terracing and making proper *ails* in suitable pieces of plots with the minimum efforts. In these too, above types of land, main *aghani* paddy is grown and the type of land is known as first class paddy land. The nature of the soil of these fields due to continued cropping has become clayey or heavy soil. The second class land covers an extensive area of the district where paddy crop is grown and is entirely dependant on rainfall. The earlier crops which mature by the end of september or early October are raised on this land and the soil is light loam to loam in nature. Thirdly, there is a vast

expanse of cultivable lands where *bhadai* crops are grown depending upon the nature of the soil from plot to plot. Some of these lands which have, got irrigational facilities and which are close to the villages grow *rabi* crops in them.

About 25 per cent of the total cropped area is under two crops throughout the district. This area is mostly dependent on timely rainfall and is s1+bjectto variation from year to year with the construction of Medium and Major Irrigation Schemes in this district. This area is expecte.dto increase in next few years.

PRINCIPAL CROPS 1.

Paddy.

Paddy *(Oryza sativa)* is the most important crop in the district with an approximate area of 2,65,000 acres. The area, of course, will vary from year to year. The greater part of this crop is *bhadai* (2,10,000 acres) but the most valuable part is *aghani* (55,000 acres). The *aghani* paddy is in most part transplanted *(rapa dhan)* and is sown after the beginning of the rains in June or July on lands selected for seed-nurseries, which have previously been ploughed three or four times and heavily manured with cow-dung or compost. After four or six weeks, when the young plants are about a foot high, they are pulled out and transplanted in the permanent seed beds or plots which are prepared by puddling .the soil with plough and levelled with *hengas* (wooden planks or levellers). At the time of puddling plots are heavily manured with cow-dung's compost at the rate of 10 to 15 cart loads per acre to ensure good crop. The paddy plants are then left to mature with the aid of water till towards the end of September. The water is then drained off and the fields are allowed to dry up for 15 days and at the end of that time they a.re again flooded. It is this practice which makes the rainfall or failing that irrigation essential for a successful harvest. This practice is called *nigar.* After *nigar* the late rains *(Hathia)* are very important to bring the paddy crop to full maturity. *H athia* rains a.re essential to add and provide moisture to soil for *rabi* crop also. As *Hathia* rains are very precarious and mostly subject to failure, the practice of *nigar* is generally avoided by the cultivators. If *Hathia* rains fail, the paddy plant will wither and serve only the purpose of fodder, but if seasonable showers fall or the crops obtain sufficient supply from ahar, the paddy crop comes to inaturity in November and December and is then reaped.

A certain proportion of the paddy is sown broadcast in May or June in low-lying lands and is not transplanted, this system is known as *rasbuna* or *dhuriya bawag.* The system of broadcast of paddy in low-lying land is generally discouraged as it does not give high yield in comparison to transplantation.

The *bhadai* paddy (about 2,10,000 acres) is a.lso sown broadcast in Mayor June and is not transplanted. It is regarded as a 60 days crop and is generally harvested in September or October. One variety 1mown as *tenwa* is sown broadcast in February or March. It is a hot weather paddy and is reaped in Mayor June. The *tenwa* paddy is grown

on a small extent in the plots where the water of hill spring stagnates during the summer. Such types of land is available in southern part of the district. Other varieties are known as *karhaini* and *gora dhan.* The *karhaini* paddy is generally grown in the upland paddy fields which stagnate water during rainfall only for a week or two. The *gora* paddy *is* grown on the upland or *tam* land which does not at all accumulate water. It is sown mixed with *raha* and *bodi.* It thrives merely on water moisture.

---

1. The figures' of the area under different crops are supplied by the District Agricultural Officer and for 1958.59.

Maize.

Maize *(Zea mays)* forms another important crop. It occupies a gross area of about 73,000 acres. It is grown in *ban* land and upland *tanr* where rain water does not stagnate. It is the chief crop in the hilly parts, where the cultivation of autumn and winter paddy and *Tabi* crops cannot be profitably carried on. It is one of the staple food crops of the district. Its importance cannot be minimised and substituted by raising another similar crop as it supplies the bulk of foodstuff at inopportune moment when other staple foodstuffs run short. The poor cultivator and the agricultural labourers in the district generally fall back on this crop for their food during August and September when food shortage is generally very high.

It is sown in June or July after the first shower of the monsoon and harvested in August and September. The cobs begin to appear within a month after sowing and thence forward the fields have to be carefully watched to prevent the ravages of birds and beasts as well as loss by theft. The cultivators of the district attach so much importance to this crop as to put wholesale available cow-dung manure only to raise this crop. The other fields may complacently go without manure for raising other crops. The district of Palamau is one of the few best districts in Bihar for producing this crop.

Marua.

It *(Elensine coracana)* occupies a gross area of about 32,000 acres. It ranks next in importance to maize among the *bhadai* crops. It is sown in all parts of the district and is one of the main food crops in the hilly areas. It is both broadcast and transplanted. Seedlings for transplantation are raised on a small nursery where two or three inches layer of dried cow-dung is spread over and burnt.

It is a late crop and has to be harvested in October or November. *Marua* is very exhausting crop and requires heavy manuring for good harvest. Its preference over other similar *bhadai* crops, lies in the fact that it is a very hardy crop and once established can very well stand the drought of whatever intensity may be.

Gondli.

Gondli (Panicum miliare) is next to *mama* in importance as a drought resistant upland *bhadai* cereal crop. No other sown *bhadai* crops ripen as early as *gondli* does. It ripens in the last week of July. It is also a poor man's crop. The yield per acre is very low, i.e., three mounds per acre. The poorer section of the cultivators of sourthern tracts grow this crop with same care and interest as they take with other crop.

Jowar.

Jowar (sarghun vulgare) is another drought resistance cereal. It is best suited for upland and hill slope. It is sown just after the early shower of monsoon, i.e ., in June or July and harvested in November or December. This crop is sown mixed with rahar, gora paddy and other fibre plants (such as kudum).

In recent year the popularity o this crop is gaining ground as it is both a food and the fooder crop.

Gram.

Gram or boot (cicer arietinum is the most important rabi crop grown over a gross area of about 1,48,000 acres. It is grown both as a single and a mixed crop. It is grown mixed with wheat or barley. It is shown in October or November and harvested in March or April. A little shower in January or Febuary does well for the crop.

Barley.

Next to gram in acreage, barly (Hordeum vulgare) ranks high amongst the rabi crop. It has an area of about 72,000 acres and is grown in all parts of Palamau except in the hilly tracks inhabited by tribes of aboriginal descent who show little aptitude for the cultivation of food crop other than their favorite millets. It is essential the food for the poor classes who eat the grain, boiled or fried, make it into bread or consume it in the form of the sattu.

Wheat.

Wheat (Triticum sativum) occoupies a gross area of about 87,000 acres. It is grown more or less in all part of the Palamau except in the hilly tracts where the soil is too loose and gravelly. It is grown most extensively in the valleys of the Roil and the Amanat and the narrow strip of flat country fringing the district on the north. It thrives in *kewal* or strong clay soils and also does well in loamy soils and alluvial deposits, but the best outturn is obtained when it is grown in the beds of *ahars.* With irrigation facilities it thrives on every type of soil, however, poor it may be. The cultivators of Palamau specially of Hussainabad and Bhaunathpur have to dig *katcha* wells for growing wheat every year which collapse during the next monsoon.

Other cereals and pulses.

Amongst the less important cereals are millet or *bajra (Rennisetum ttyphordiul1.), sawn (Penicum jrumentacum), kodo (Paspalaum serobi culatum),* and *china (Penicum miliaceum).* These cereal crops occupy a small acreage of poor land.

Amongst the pulses the most common is *urid (Phaseolas roxburgi)* grown on about 20,000 acres, *barai (Phaseolas mungo)* on about 9,000 acres, *kulthi (Dolichus biflorous), rahar (Cajanus indicus)* on about 44,000 acres, *khesari (Lathyrus sativus)*on about 29,000 acres and
masoor (Ervam lens). Urid is grown on upland. Generally the cultivators spread dried leaves three inches thick over the plot during the summer and set it on fire. When fire goes out, leaf ash is ploughed in, which is conducive for the growth of *urid. Rahar* is cultivated both in the hills and in the plains, the aboriginal cultivators of the former exchanging the produce for rice and salt. The species raised by them is larger than that of the plains. They grow it by a system known as *beora* wherein the land is cleared by burning the jungle and the seeds planted in holes drilled about a cubit apart. *Khesari* is sown immediately after the rains among the standing paddy. It yields a coarse type of pulse which is eaten in the form of *sattu* or boiled and eaten as *dal. MaSoor* is another lentil which is eaten in the same way as *khesari.* It is sown broadcast like gram and wheat after ploughing the land for twice and thrice. It does well in clayey soil.

Oilseeds.

Amongst the oilseeds the most commonly grown is *til (Sasamum indicum).* It occupies a gross area of about 31,000 acres. It grows on the worst type of lands. *Sarguja (Guizelia abyssinica.)* and mustard are grown on upland occupying about 15,000 acres. Linseed *(Linum usetatissimum)* occupies the area of about 12,000 acres. Castor *(Ricinus communis)* grows well in the *bari* and the upland *tanr.* It occupies considerably a negligible area in the district. *China badam* or groundnut *(Archis hypogoes)* is grown in a very small scale. The soil is quite favourable for this crop. It is subject to the ravages of wild beasts and birds.

Sugarcane (Sacharum officinirum).

It is a cash crop of the district. It requires intense irrigation during the *rabi* and summer seasons. It is mostly grown in the valley in the north and in the central part of Palamau. It is not a popular crop in the south due to the absence of irrigational facilities. Irrigation to this crop is generally done through wells with the help of *latha* and *kundi* and through swing baskets which are operated to lift river water when it is grown on the

bank. The sugarcane sticks are pressed in iron roller mills so designed to extract out juice. The juice is converted into *gur*. The nearest sugar mill is at Guraru in Gays district and the Bihia mill in Shahabad.

Cotton.

Cotton *(Gossypium sp.)* used to be a favourite crop with the semi aboriginal tribes and the principal centres of cultivation were the jungly tracts. At present it is hardly cultivated at all but as the method of cultivation is primitive and interesting, it may be mentioned.

There are two methods of raising cotton *(kapas)* called respectively *kachhwa* and *daha*. The first system *kachhwa* needs the ploughing of fields for three or four times during the first rain preceding the break of monsoon. The fields are left to weathering process through the summer till early shower of the monsoon falls when cotton seed is sown broadcast. The method is generally unpopular owing to the amount of weeding required. The cultivator either cannot afford more intensive labour or is too indolent to do weeding operation. The second method called *daha* is by far the most common and involves a great waste. In this case the land selected is generally forest land which is cleared by cutting down the trees, the stumps alone being left standing. The whole field is then covered with a thick layer of brushwood which is set on fire during the hot weather. This firing has a two-fold object. Firstly it burns up the roots of all grasses and weeds lying near the surface, thus effecting a certain saving in weeding and secondly, the alkali contained in the ashes is an excellent manure. It is not often, however, that this latter advantage is secured for unless a shower happens to fall immediately after the land has been fired, the strong west winds carry away the ashes. As soon as the first showers have fallen, the cultivator ploughs up the land and sows the seed broadcast, when this has been done, he proceeds to fence the field round to keep off deer which are very fond of the crop; and this is the only expense he incurs till the time comes to gather the crop.

The *daha* system being the one most commonly practised, it is not surprising that the growth of cotton has decreased rapidly with the extension of cultivation, as the jungle is gradually burnt down or gives place to the plough, and also owing to the reservation and protection of forests in which such a method is strictly prohibited. In 1863 the Bihar Cotton Road was specially constructed to export cotton from Palamau and Surguja during the American Civil War. In 1872 the area under cotton was 9,600 acres; in the five year ending in 1905-06it averaged only 4,320 acres, in 1906-07it had fallen to 1,500 acres and at the last settlement the area recorded was only 1,200 acres. The period onwards 1930 recorded no area for the crop due to awful shrinkage in its acreage.

Fruit trees.

Mangoes are grown all over the district. Other fruits grown in the district are orange, plantain, custard apple, mulberry, guava, pomegranate, jackfruit, *bel,* and plum. *Mahua* is of the greatest economic importance and is the poor man's sustenance in times of scarcity.

Tea and coffee are not cultivated. Silk and tobacco are also not widely grown. Lac has an important place in the cultivation of tills district. It is cultivated on *palas, plum, kusum, pipal, bar, gulalr, pakar,* and other trees.

Vegetables and Fruits.

The vegetables of Palamau include potatoes, tomatoes, brinjal, *karaila* (Bitter gourd), *nenua* (Sponge gourd), *jhingi* (Ridge gourd), *kaddu* (Bottle gourd), *seem* (Beans), *konhra.* (pumpkin), *ramtorai* (Lady's finger), cucumber, *kundri, khekhsha* (wild gourd found in forests), mushrooms, etc. Tomatoes of Latehar area are very luscious and large.

With the fast industrialisation of the neighbouring town of Ranchi the vegetable belts in Palamau district are bound to have a fillip. With proper ca.re one can make a good profit out of a vegetable garden even now. A small plot .of about three *kathas* of land at Hariharganj in occupation of a Doctor has been a show-piece growing all kinds of winter vegetables with some care. The soil is drier than that of Ranchi and requires more water and manure for giving a good yield of vegetables.

Among the cultivated fruits, mangoes take a prominent place. They are grown all over the district and numerous large groves are found towards the north. Next to mangoes is oranges. The district has lime belts well suited for oranges. The quality and size could be improved upon. They grow very well particularly in Japla area. Other citrus fruits could also be well grown. Melons are cultivated extensively along the banks of streams. Other fruits are plantain, custard apple, mulberry, guava, pomegranate, pumelo, jack-fruit, *bel, mahua,* and blackberry. Custard apple, *bel,* blackberry and *mahua* grow in the district in wild state. Papayas do not grow as well as in Ranchi and will require more water for giving a good yield.

Of all fruit bearing trees the *mahua (Bassia latifolia)* has a great economic importance. It is found in great abundance all over the district, both in hills and in plains. For the poorer section of people, particularly aboriginal and semi-aboriginal tribes, it is the only supplementary article of food. This is largely consumed at the time of scarcity and famine. The part of the *mahua* which is eaten is the corolla of flowers, a fleshy blossom of pale yellow colour. When it is fresh, it has a disagreeable and pungent sweetish taste. The blossoms spring from the ends of the smaller branches of the tree, in bunches from 20 to 30 and as they approach ripeness, swell with juice and fall to the ground. Much depends on the weather while the flowers are developing; the crop requires sun and cloudy weather and thunderstorms are most destructive.

As soon as the buds appear, the ground under the trees is carefully cleared by burning all grasses and weeds. The first fall of the blossom is the signal for the women and children to be moving about. Those whose homes are near the trees, go out to work at dawn, returning two or three times during the day with what they have gathered. Where trees are at the distance the whole family member encamp close by and remain there till entire crop has been gathered. After being gathered it is spread out to dry upon the ground which has previously been smeared with a coating of cow-dung and mud. The ground under the mahua tree becomes the clearing house for village gossips for the time being.

The blossoms are rarely eaten while fresh, being considered unwholesome but are kept in the sun till they are dried, when they turn light brown and resemble raisins. There are several methods of preparing the blossoms for food, the most common being to boil it, but as this seems to take all flavour out of it, the seeds of the *sal* or some acid leaves or herbs are cooked with it in order to render it palatable. Another method is to fry it in *ghee* or butter, but it is too expensive a
luxury to be indulged in by the common man. Another important use to which the *mahua* blossoms are applied is in the distillation of spirit.

The fruit of the *mahua* commences to form immediately after the fall of the blossoms, and ripens in June. The fruit is never plucked in the tree nor is the tree shaken to induce it to fall, should this be done, the tree, it is said will not bear any fruit the following year; consequently it is allowed to drop itself. The fruit, when ripe is about the size of a peach and has three different skins, with a white nut or kernel inside. The whole of the fruit is utilised in the following ways.
The two outer skins are either eaten raw, or cooked as vegetable. The inner skin is dried and ground up into flour. Of the kernel oil is, extracted which is largely used for cooking purposes and for adulterating *ghee.*

Next in importance as an article of food is the *hair* plum *(Zizyphus jujuba).* It grows upon a small thorny thicket or bush. It is found all over the district. When half ripe, it has the pleasant acidic taste of an apple. It is gathered when fully ripe, dried and stored. In dried condition it is eaten either bailed or in an uncooked state. The thorny branches furnish materials for a cheap and impervious hedge. The *piar* is the small black fruit resembling sloe (small bluish black plum) in appearance. It grows plentiful in the jungly area. It is gathered and dried in the same way as *bair. T*he two small stones in the fruit, which are known as *chiraunji* are made into a delicate sweetmeat.

The forests contain numerous other edib1efruits and roots and for at least eight months in the year furnish the people of the jungly villages with a supply of food, which though perhaps not very substantial or digestible; is still sufficiently nutritious to prevent starvation. In this respect the inhabitants of jungles are better off in time of distress caused by famine than that of the highly cultivated parts. Some of the roots are highly nutritious and form a favourite article of food with the hilly tribes. These tribals are the only people who know where to find them. Neterhat plateau could well be utilised for horticulture provided a good water-supply is assured. An attempt has already been made and peaches, apples, avocado, pears are being grown. The taste has still to improve but

this will be a matter of time. There is no reason why cherries cannot be grown there. The pears are of cooking variety and could be well utilised in making jam.

Spices.

The district grows chillies, mustard, garlic, *dhania* and *shaunf* as crops for spices. Chillies are grown along with other garden crops, *Rai* and *dhania* grow as *rabi* crops. Garlic, *shaunf* are grown during *rabi* season under irrigation.

AGRICULTURAL IMPLEMENTS.

The time-worn agricultural implements are still largely used. The country ploughs made locally by the village carpenters still hold the market. Attempts are being made to introduce better implements through the Agriculture Department.

The Bihar Junior Plough is used for opening of furrows in lands. It ploughs at a greater depth than the *Deshi* plough. It has been recommended by the department. The price is about Rs. 18 only. It is a heavy plough and so it has not been popular in the district for the local light bullocks.

Bihar Cultivators and hoes are used only in the farms. The general cultivators do not keep them.

In addition to *deshi* plough which is nothing but a log of wood with or without an iron point, a wooden plank called *henga*, sufficiently heavy is also used which function mostly in breaking up the clods. After each ploughing it is used to cover up the seed and sown by broadcast method. Sometimes a plank two to three feet square is used for the same purpose. This also serves as a leveller in case of uneven ploughed lands. The cost of the plank varies from Rs. 2 to Rs. 8, depending upon the locality and type of wood used therein devised locally called *Malabasa* and is used for sowing of r*abi* crops in villages. This is used behind *Deshi* plough and generally made with the help of bamboo sticks with a hollow hole in it and the upper part has wooden mouth, funnel like in shape in which the seed is dropped. The lower end of the bamboo is connected with the *Deshi* plough through a hole.

The main difficulty in the use of the better implements such as Bihar Junior Plough, Bihar Senior Ridging Plough and the Sukhda Plough are the poor and small size of bullocks.

FACILITIES OF REPAIR AND REPLACEMENT.

Facilities of repair and replacement of the ordinary plough, Bihar Junior Plough and Bihar Cultivators are easily available. Hardly any special repairs and replacements are required for these implements and the cultivators are able to attend to them locally with the help of the village carpenters.

Tractors are still practically unknown in this district. The Agriculture Department has arranged for three tractors in the district which are run on hire system. No proper census of privately owned tractors has been taken but their number is not large. Disc plough and disc harrow and mouldboard plough are being used with tractor. The question of finding parts for the very few tractors in use has proved a difficult problem.

The topography of the country and the law of succession are impediments to any wide scale use of tractors. A tractor can only be used at an enormous cost if the country side is undulating and hilly. Small holdings are not suitable for tractor cultivation.

The statistics of agricultural machinery and implements in 1956 were as follows:-

Ploughs.			Sugarcane crushers.					Tractors.		Ghanis.	
Wooden.	Iron.	Carts.	Worked by power.	Worked by bullocks.	Oil Engines with pumps for irrigation purpose.	Electric pumps for irrigation purpose.	Government.	Private	Five seers and over.	Less than five seers.	
1	2	3	4	5	6	7	8	9	10	11	
1,18,634	268	3,265	44	995	79	2	3	5	158	1,554	

Seed Supply.

The sources of supply of seeds in the district are the Department of Agriculture, private local farms or the ordinary cultivators. Very usually the cultivator keeps back a quantify of his own crop for seed purposes. The Department of Agriculture runs seed supply stores or seeds are supplied through the Co-operative Department.

There is an attempt in upgrading the crops by the supply of improved varieties of seeds. A number of crop seeds are made available for early *aman* which is ready for harvest by the middle of November. The other varieties are for medium *aman* which gets ready for harvest by the end of November. Jaunpur maize and Kalimpong maize have been introduced in the district. Locally grown better type maize seeds are also supplied. The seed of the Jaunpur variety is smaller than the Kalimpong one. In a similar manner better type of seeds for wheat, gram and barley are also made available. But unfortunately the seed supply by the Government agencies are not sufficient to meet the local demands. That is why Government have introduced a Seed Multiplication Scheme by which cultivators are given improved varieties of seeds and are encouraged to grow them on

selected plot. When the crops are gathered the Agricultural Department takes back the seed and purchases more for distribution purposes.

In this connection it has to be mentioned that the storage facilities available to the average cultivator is meagre. Very few cultivators have any proper place for long time storage. Warehouse arrangements on behalf of the State Government have not yet reached the district of
Palamau.

Manures.

The ordinary manures are cow-dung, wood-ashes and the droppings of cattle. Manuring is done either by broadcasting or in lines. Previously manuring was done without knowing the deficiency of the soil. Now doses of manures other than cow-dung are given as per instructions issued by the Special Officer, Manurial Tables Schemes, though there are a large number of vil1ages where old methods are still followed. The cultivators themselves prepare farm-yard manure and compost. Town compost is seldom available from the local Municipality. Chemical fertilizers are available from the local Credit Agricole Department. Sulphate of Ammonia is being sold @ Rs. 13 per maund whereas Single Superphosphate and Bonemeal @ Rs. 9 per maund. There is a subsidy of 25 per cent on the phosphatic fertilizers inside the Intensive Cultivation Blocks. The cost of manuring depends upon the crops and soil of the locality. The source of distribution of manures is the Co-operative Credit Agricole Depot.

Trarwport.

Transport of the crops from the field to the granary or the threshing floor is still carried on either on head-load or pack bullocks or by bullock carts. The transport cost is usually not much the primary market is usually within a dozen of miles and the gathered grams are carried through by bullock-carts.

Rotation of Crops and Crop Combination Methods.

The average cultivator in the district does not follow any particular crop rotation or combination of crops. *He is* either too ignorant or too indolent to follow a rotation of crops or a combination of crops. There has been a traditional complacence about cultivation and the cultivator has to be taught that with the same plot of land he could probably raise two crops in the year in place of one. It is true, the want of irrigational facilities may be an obstacle. There are, however, small patches where minor irrigation facilities do exist and even at such places two crops are not normally grown.

The Agriculture Department is trying to introduce rotation of crops and crop combination methods. Previously also there used to be a mixed crop grown such as gram and barley and gram and wheat together and this fact is utilised for making a propaganda

for double cropping in the land which used to grow one crop. Irrigational facilities .are being extended and with propaganda and demonstration there is no reason as to why this district will not take to crop rotation and combination of crops. The following system of crop rotation is being popularised among the cultivators depending upon the type of lands in the different localities :-

Up land--Maize, wheat or gram, peas.
Medium land--Early paddy—barley and gram--early paddy--*masur*.
Low land--Paddy (late)-Paira khesari—paddy--fallow.

Pests and Diseases.

The followillg pests are found in the district :-

(a) Rice Gundhi Bugs (Leptocorisa Varicornis).-The bug infects at the milking stage of the paddy crop and for some years did a lot of damage recently. It is a serious type of pest for the paddy as it sucks the milk of the grain leaving only the husk.

These pests are controlled by dusting with Benzene Hexachloride.

(b) Rice Hispa.-At places, but in a very insignificant measure Rice Hispa is found damaging paddy. This is also controlled by dusting with Benzene Hexachloride.

(2) *Locust.-It* is an ordinary grass hopper which changes its living habits during certain periods when the climatic conditions become favourable. It is a migratory insect which moves in swarms and settles in compact block. They are controlled by baits.

(3) *Worms.-The* damage by worms is slight.

(4) *Rats.--The* damage caused by them both in the fields end godowns is very great. They are controlled by cynogassing.

(5)Wiid animals.-Among wild animals, blue-bulls *(nilgais)*, monkeys, jackals, bears, bores, porcupines cause great damage to the standing crops. They are controlled by fencing, by scaring away, by means of drums and scare-crows. In some cases crop is saved by means of guns. Wild elephants in certain areas create occasional havoc by destroying crops, particularly paddy. The wild elephant menace is definitely on the increase.

(6) Stray cattie.-Stray cattie also do harm to crops.

Animal Husbandry and Fisheries.

Area under fodder crops.

The forests of Palamau supply good pasturage during rainy and winter seasons. But in the dry season the supply of fodder is practically stopped for about four months. There had been practically no extension of modern fodder crops. By investigation it has

been ascertained that the fodder crops like *para* and berseem may extensively be grown. For the preservation of hay two hay-making centres one at Barwadih and other at Kumandih had been opened which preserve about 13,000 maunds grass. There is ample scope for spread of knowledge of fodder crops among the rural people. The Animal Husbandry Department has started tackling the problem but there has not been much headway yet.

Grazing facility is now controlled by the Forest Department. Professional graziers are commonly found in Garu, Barwadih, Ranka and Bhandaria thanas. They move about the jungles with their wives and children. Cattle are allowed to graze on payment which is popularly known as *kharchari.*

Dairy Farming.

There is only one small dairy at Netarhat. The produce is supplied to the Netarhat Public School, but is in a short supply. The cows are usually small in size and do not yield good quantity of milk. As has been mentioned elsewhere although efforts are being made to improve the variety but the size of the cow being small there has been difficulty in introducing the proper sized good breeding bull. The district has not got water pools and remains dried for several months. As such buffaloes cannot thrive. There is also dearth of fodder. A good percentage, of the milk is converted into *chhena* and *khou* for making sweets for which there is a good market in the urban areas. These are difficulties why there had not been a successful dairy although the milk supply in the urban areas cannot be described as inadequate. Daltonganj is one of the few towns where boiled milk as such is sold in some shops.

Sheep Breeding.

Sheep rearing is a subsidiary occupation, especially of the shepherd caste locally known as *Gareris.* A large number of sheep is exported from Palamau to the coalfields areas of Bihar and West Bengal. Some of the *hats* have a big turnover in sale and purchase of sheep and goats. Hariharganj and Daltonganj markets have large transaction in them. The animals are usually transported by trucks and no census has been taken. A class of Muslim known as Dabkars deals in them. The number of sheep in 1951 was 57,509 as against 56,165 in 1956. Hitherto no attempt has been made to improve the local sheep breed. The *Patania* variety is commonly found in the district. A few improved varieties of rams were distributed by the Animal Husbandry Department to improve the local breed but the upgrading is insignificant. The local wool is of inferior quality and so recently a Wool Development Scheme has been sponsored at Daltonganj by Government to improve the quality of the wool.

Poultry Farming.

Poultry is kept by quite a good number of people but there is, practically, no system of proper housing and feeding. Both in the urban as well as rural areas, poultry is kept in free range. Birds are shut up in a dark coup in the night and they are let loose in the morning to go about to collect food. Wild animals and particularly jackals are awful lifters of such birds. The Adibaj3is, the Muslims and some of the Scheduled Castes and Tribes men have a subsidiary income from poultry. The weekly market at Da1tonganj on Wednesday has a large turnover in poultry, mostly chickens. There is a great scope for upgrading the species. Local investigations at two remote areas Bhandaria and Mahuadanr indicated disappointing results although the Blocks of these two areas are reported to have worked for the improvement of poultry. With the rapid industrialization of the neighboring district of Ranchi there will develop an inexhaustible market of export of poultry from this district.

Fisheries.

Palamau district is not noted for fish. The rivers are mostly hilly and their currents are very sharp and so there is very little possibility for breeding. In the summer season almost all the rivers except Son become dry. Mahseer are found in the Son during the rains and they also pass up the Koil. During rainy season *Tohu* and *kajar* are found in the Roil. In other seasons fish becomes rare in Palamau. In order to develop fisheries three nurseries, viz., Latehar, Garhwa and Daltonganj have recently been started. Carp breeding scheme is also in operation in Daltonganj. Survey is going on and reservoirs are being examined for proper breeding places. There is a fish sanctuary in the Son nea Japla. The fishes are mostly found in tanks and their surface area, is about 120 acres. The varieties which are met frequently are *katala, rohu, naini, mirgal, magur, garai, bami* and *boari.* The district has very few big tanks where fish could be bred.

LIVESTOOK.

According to the livestock census in 1951 the district has 10,02,536 beads of livestock as against 10,44,332 in 1956. The population in the last two census years is given below :-

Livestock.		Population. 1951.		Population. 1956.
Cattie (males) over 3 years	…	2,77,319	…	2,65,368
Cattle (females) over 3 years	…	2,49,262	…	2,15,036
Cows ...	…	78,099	…	79,229
Youngstock (cattle}	…	1,34,443	…	1,68,298
He-buffaloes over 3 years	…	17,616	…	8,102
She-buffaloes over 3 years	…	74,300	…	68,685
She-buffaloes in milk	…	23,145	…	24,507

Youngstock (buffaloes)	...	32,929	…	39,565
Sheep …	...	57,509	...	56,165
Goats …	…	1,27,703	…	1,84,619
Other livestock	...	31,455	...	43,484
Total livestock	…	10,02,536	…	10,4.4,322
Poultry …	…	2,43,304	...	3,60,540

Further details of the livestock population for 1951 and 1956 as disclosed in live stock census are given in the Appendix.

CATTLE FAIRS.

Every weekly *hat* of Palamau has good turnover in cattie. Over and above there are a few important annual cattle fairs in the district, the details of which are as follows:-

Name of the fair.	Period.	Number of cattle.
1. Latehar … … …	Shivaratri (For three days)	6,000
2. Balumath … … …	Kartic purnima (For a weak)	29,000
3. Lesliganj … … …	January During Makar Sankranti (For a week)	2,000
4. Hariharganj … … …	Pus Purnima (For three Days)	30,000
5. Balubhang … … …	Ram Navami (For three days)	90,000
6. Shibla … … …	Basant Panchmi	6,000

Veterinary Aid.

The district is without any veterinary hospital. At present the district has got four dispensarie6 as detailed below :-

Name of institutions.	Jurisdiction.	Field veterinary dispensary centres.
1. Veterinary Dispensary, Daltonganj ..	Daltonganj. Lesliganj. Panki. Manatu. Patan.	.. Lesliganj. pol.

2.	Garhwa	..	..	..	Garwa Bhaunatpur. Untari. Ranka. Bhandaria.	.. Ramna. Obra.

	Name of institutions.	Jurisdiction.	Field veterinary dispensary centres.
3.	Hussainabad .. .. .. Mohammadganj Rehla.	Hessainabad. Hariharganj. Bishrampur.	 Chhattarpur.
4.	Latehar	All over the Subdivision	Chandwa Manika.

___

The district needs more institutions. It has been decided to open a dispensary at Lesliganj and it is also proposed to run a full-fledged hospital at the district headquarters. Cattle diseases of contagious nature like Rinderpost, Haemorrahagic, Septicaemia, Anthrax, Foot and Mouth disease, Sura, etc., are very common in this district.

CATTLE IMPROVEMENT.

The following schemes are functioning in the district :-

(1) Maintenance of bulls in key villages for stud purposes.
(2) Preparation of hay-a centre has been opened at Barwadih.
(3) Improvement of *goshalas* where cows are maintained properly. Pedigree bulls are distributed to the *goshalas.*
(4) Scheme for establishment of ccncentration camps for old and decrepit cattle. One such camp has been opened at Barwadih.

Bullocks playa great part in agriculture. At places Improved breeds like *Sahiwal* and *Tharparkars* are seen in the district that have been purchased from Govemment Farms. *Shahabadi* breed bullocks are gradually replacing the local breeds of poor and small-sizedbullocks.

Livestock Products.

Livestock products include milk, eggs, hides, hornbone and wool. The milk yield per cow is small but the number of milching cows being large the daily average milk yield in the district is quite large and more than what could be consumed as milk. A large quantity of the daily produce of milk is converted into *ghee* and *ghee* industry is thriving in this district. The good yield of milk has encouraged the preparation of palatable sweets like *sandesh, rasgollas,* and *chena- murki,* etc. The sweets prepared even in the interior are much better than what are produced in the neighboring district of Gaya. There is a good scope for the development of poultry in this district. The vast Adibasi population keep poultry as a rule. Trade in hornbone and wool product is not well organized and admits expansion.

LOANS FOR LAND INPROVEMENT.

The district has quite a large quantity of cultivable waste lands but the reclamation requires contour bunding, and other processes that require a lot of money. Tractor reclamation has not yet been tried and it is bound to be very expensive. In the meanwhile, loans are being given by the State to encourage reclamation of waste lands by manual labour. There is also a subsidy grant for reclamation of laterite soil. Land improvement loans and agriculturists' loans are also distributed annually for the improvement of the lands already cultivated or for purchasing tractors and other implements. The effect has not yet been phenomenal and it is not expected to be as such. * The following two statements show the amount of loans distributed under different heads for certain years:--

Statement showing amount advanced under the Land Improvement. Loans Act, 1888, Agriculturist's Loans Act, 1884 from 1951-52 to 1958-59.

Year.	Loan advanced.	
	Under Land Improvement Act (in rupees).	Under Agriculturist's Loans Act (in rupees).
1951-52	59,257	13,68,132

1952-53	..	..	..	72,829
	17,68,768			
1953-54	..	..	..	77,791
	18,00,934			
1954-55	..	..	..	8,825
4,50,000				
1955-56	..	..	..	4,720
9,99,800				
1956-57	..	..	..	1,450
4,10,000				
1957-58	..	..	..	1,450
8,75,000				
1958-59	..	..	..	0,780
	14,41,227			

—

Statement showing the amount of Land Improvement Loans and the Agriculturist' Loans distributed for reclamation of wa.ste land from 1951-52 to 1958-59.

Year.	Amount of the Land Improvement Loan distributed for purchase of implement dietributed (in rupees).	Area of waste lands reclaimed by manual labour (in acres) with assistance of agriculture loans and official initiative.	Amount of Agriculturist,s Loans distributed for tractors and other (in rupees).
1951-52	..	1,23,775	792	..
1962-63	..	37,450	544.00	..
1953-54	..	42,350	1,153.54	..
1954-55	..	70,170	2,713'55	2,75,000
1955-56	..	64,255	1,731'21	..
1956-57	..	59,805	..	..
1957-58	..	44,430	..	..
1958-59	..	22,390	..	..

*The figures are supplied from the Deputy Commissioner's office. (P. C. R. C.)

AGRIOULTURAL LABOURER.

The position of the agricultural labourer in the district of Palamau is calculated to be much more wretched economically than that of the agricultural labourers in the other districts of Chotanagpur. The other districts of Chotanagpur are pretty well industrialised and industrialization in some of them is so intense that thousands of labourers from outside are being engaged. In this district there are very few organised industries and the position of the agricultural labourer is rather isolated. He cannot dictate his own terms.

This is the district where the notorious *kamiya* system was in existence till only a few years back.

An agricultural labourer bas been described as "A person whose time not being occupied and not wholly occupied in cultivating land of his own is willing to work on land of another for some form of remuneration. The last five words marked the nature of the modem agricultural labour contact and should be remarked that the worker assumed to be landless or in occupation of only a small parcel of land."This definition has been adopted by the Ministry of Agriculture, Government of India.

In the chapter on 'People" there is a discussion on the possible break-ups in population under different occupations. Occupational statistics are known to be the least satisfactory of the census tables, mostly on account of changing, intermittent and non-specialized nature of employment. If census is taken in July, the number returned as agricultural laborers will be different than what will be returned if it is taken when tube crops are being cut. Besides an agricultural laborer may have another subsidiary occupation and in the censes he may brave been excluded from tube occupation which brings in a subsidiary income. It is, however, clear from the figures quoted elsewhere that the majority of the population in this district depends on agriculture and tube majority of tube population that depends on agriculture belongs to the class of agricultural laborers. This class bas two components of agricultural laborers with a small quantity of lend and completely the landless laborers. In this district there has not been any scientific census of agricultural laborers as such and it is clear from our investigation tab it is completely the landless laborers who supply the steel-frame of population of this sector. A completely landless labourer deserts the village in particular seasons and this is the district from where there used to be a large-scale recruitment of indentured labour for the tea districts.

The economic condition of the agricultural labourers, whether landed or landless is extremely poor. The difference is in degree of poverty. He has the instrument of his physical labour e.g., It spade an axe, a pick, a scythe and a hoe. He has very little money for diversion or for entertainment and at best he can indulge in a little quantity of *tari* and that also when *tari* is cheap. The trinkets his wife has are of very little value. His kitchen and dining equipments are principally made of earthen vessel.

In a typical case of agricultural labour the average monthly income comes to about Rs. 40 to Rs. 45 taking into consideration the gaps of unemployment. About Rs. 25 of the monthly income would be spent on food grains, about Rs. 3 on oil, spices or *gur*, and Re. 1 for *biri*, visiting any mela and buying some very cheap sweets for the family and so on. Any expenditure for additional food or non-food items like lighting, clothing, medicine, etc., are to be met out of the balance. If he owns a house it is nothing but a flimsy hut. The supplementary income of the family members is intermittent and slight.

If this be the position of the average agricultural labourer who owns a bit of land, one can understand the condition of the labourer who does not own any land.

The reasons for the very poor condition of the agricultural labourer in Palamau district are not far to seek. The district has been repeatedly affected by drought, scarcity and famine. The soil is not very rich and the bulk of the district is covered with jungles and hills. The economic backwardness is always intricately bound up with the large number of small zamindars in the past.

It will, however, be wrong to think that at any time the villages in this district were largely self-sufficient and self-perpetuating rural communities. There was a time when the labourer was a part and parcel of the *Malik's* (landowner's) family. He shared almost the same food and lived from generation to generation in the same family. But slowly the landlords had stiffened and the self-sufficient and self perpetuating rural communities started breaking out. The landlords or the land owning cultivators and the labourers were torn asunder and the traditional arrangement controlling the mutual exchange of labour and product snapped. The Permanent Settlement broke the back of the raiyats. By one stroke of pen Lord Cornwalis had reduced the present proprietors to an unenviable condition and the rent collectors were declared zamindars. The famines left very little scope open for the isolated, down-trodden, purely agricultural labourers with or without any land. The real serfs emerged as the *kamias* in this district. A *kamia* was one who had literally sold not only himself but his descendants unless the loan borrowed had been remitted or the small parcel of land given was bought. By bewildering arithmetic the labourers labour always went towards realisation of the interest and the principal sum remained intact. There has been a case here for a loan of Rs. 25 a father and a son had worked till the Magistrate intervened and set the *kamia* free.

The improvident ways of the Adibasis and backward sections in this district also helped to consolidate the *kamia* system. The small landlord was always ready to dole out a loan and the labourer was always in need of some money. The result was that the Adibasis started losing their best lands and the *mahajans* or speculators or outsiders started grabbing their best lands. The Chotanagpur Tenancy Act had to be altered but much of the mischiefs had already been done. The various ameliorative measures for the tenants, namely, rent reduction laws, etc., did not touch the class of agricultural labourers who were, as observed before, mostly landless. The few
who had lands had already parted with them. This is one of the reasons why a portion of the agricultural labourer was siphoned off in the forces of shappers and miners, the civil pioneer forces, etc., in years of war. The tea gardens also absorbed quite a number of them.

The system of bonded labour had existed in some other parts of Bihar also but this system kown as *kamia* in Palamau and Hazaribagh districts was rather notorious as the *kamias* were put to all kinds of ignominies. The Kisan Sabha did a lot in liquidating the system of bonded labour. Ultimately a statutory Act had to be passed in 1920 which curbed the system of bonded labour or *kamia* system.

NATURAL CALAMITIES.

The Indian Irrigation Commission described Palamau as the driest and probably the poorest district of the Province. The frequent droughts and famines or scarcity conditions that have visited this district within the last century support this observation. As mentioned elsewhere the main economy of the district is agricultural and out of the total population of 9,85,767 in 1951 census the agriculturists number 8,98,191, i.e., about 91 per cent of the population. The people, though agriculturists, are not adequately supported by the produce of their holdings but depend also on labour, *mahua* and jungle produce for eking out their existence. The district falls within the retreating range of the south-west monsoon and as such rainfall is wholly dependent upon local conditions and local winds which are seldom favourable to the district. Consequently the district suffers from regular droughts and famines. Within the period of last century there have been famines in 1859-60, 1873-74, 1896-97, 1899-1900 and 1918-19 and there have been several years of scarcity up to 1956 and the worst of all was perhaps that of the year 1955.

The rainfall in Palamau is not only scanty but very capricious in its distribution. Ideal conditions postulate some premonitory showers in Mayor June to enable the land to be prepared, abundant rain in the end of June and at intervals during July and August to allow transplantation and growth of seedlings and after an interval of comparatively fair weather during which weeding may be done, enough rain in September to allow grain to develop and mature fully. The weather then should shed off to fair in October to allow harvesting to be done. For the *rabi* crops periodical showers from December to February are essential. The agriculturists of the district are fairly conscious of changes in weather and they most accurately forecast their agricultural prospects. They rely mostly upon the saying of Ghagh, a well-known weather-reader of olden Bhojpur. Ghagh bases his forecast upon the conditions of the weather in different *nakshatras*

आवत आदर नही दिया, जात न दिन्हा हस्त ।
यही कारण दोनो गये, पाहुन और गृहस्त ।।

[If there is no rainfall in the beginning of *Adra* and at the end of *Hathia* (the debased form of *Hasta nakshatra) nakshatra* the agriculturist is done for and so is the case with the guest who is neither cordially receivedat the time of arrival nor heartily given a see off.]
In another verse Ghagh says—

सावन मास बहे पुरवैया, बैला बेच लेहू धेनु गैया ।

(If easterly wind blows in *Sawan* it is better to sell bullocks for cows.) The reasons are apparent. If the local wind blows easterly in *Sawan* it cannot bring clouds and rains which will follow drought and failure of crops. The third saying of Ghagh is also very important to understand his weather readings—

रात निवदर दिन के छाया, कहे घाष जे वर्षा गया ।

(If there are clouds in day and the sky is clear during night it will not rain.) These sayings contain some of the finest forecast of conditions of weather. But the weather itself is never favourable in this district. The chief crops in this district are *bhadai*, the *aghani* and the *rabi*. The north and centre of the district are chiefly under rice and *rabi* crops such as wheat, barley and gram while *bhadai* crops are only to a small extent. In the hilly tracts there is comparatively little rice cultivation and much less of rabi while *bhadai* crops such as maize, *marua, sawan* and *kodo* are extensively cultivated. These crops are much more evenly represented in this district than elsewhere in Chotanagpur. The people, therefore, seldom have all their eggs in one basket. But as they live always near the margin of subsistence, any shortage has the effect of reducing them from mere want to semistarvation. This is more specially the case because such a shortage not only reduces their own crops but makes it impossible for their employers to give them an adequate daily ration in return for each day'Singh labour. Such employmentas is available is almost exclusively agricultural and is itself affected by the unfavourable conditions.

SCARCITY AND DROUGHT.

From old records and reports it will appear that in 1868 there was a failure of *bkadai* crop and winter rice due to absence of rain and this caused a famine in 1869. The most affected areas were the north-east and north-west of the district and to a small extent the central areas. In 1873-74 there was again a failure of *mahua, bhadai, marua* and *aghani* and there was a general famine affecting Japla and Belaunja in the north, Deogan and Untari in the extreme north-east and north-west. In 1895 there was very little rain at the beginning and a heavy rain later when it was not necessary. In 1896 there was again an unfavourable distribution of rain which led to the famine of 1897. The pockets affected were the tracts running from east to west through the centre, i.e., revenue thanas of Garhwa, Daltonganj Balumath, Latehar and Patan covering an area of 2,563 square miles with a population of 3,83,400 souls. In 1898-99 the total rain was normal but in the next year there was an ill-balanced rainfall on account of which the crops partially failed and this led to the famine of 1900. The area of Mahuadanr thana was severely affected. The area affected was 502 Square miles. In 1918 there was an irregular distribution and early cessation of rainfall and a general scarcity. Practically the whole of the district was affected and Daltonganj area was worse hit. In 1932-33 the whole of the district suffered from drought. The drought was a severe one occasioned by a serious break in the monsoon. *Bhaaai* and winter rice crops were affected and *rabi* crop was considerably damaged by untimely rains accompanied by hail-storms. Prices of commodities became on the whole about half the average of the prices for the years 1920 to 1930 and the burden of cash rent consequently doubled. This was also the case in 1947-48, 1950-51, 1951-52 and 1952-53. There was almost the same irregular distribution of rain and failure of *Hathia* rains. From 1950 onwards practically near scarcity condition had affected the whole district. To be more detailed in 1950-51 the whole district was affected and Garu was worse hit. In 1951-52 the area affected included Bhaunathpur, Ranka, Bhandaria, Manatu, Bishrampur, Daltonganj, Garhwa, Panki, Barwadih (Garu), portions of Balumath, Latehar and Chandwa. In 1952-53 the areas affected included Ranka, Bhandaria, Garhwa, Bhaunathpur, Manatu, Chhattarpur, Daltonganj (south of the river

Koil), Panki (south and west portion), Patan (north portion), Barwadih, Garu, Mahuadanr and Balumath (north and west portion). The scarcity conditions were generally acute throughout the district in 1954-55 and 1955-56.

The district has had bad crops from 1937-38. In this year the *aghani* crop was damaged and *rabi* and spring oil-seeds could not be sown extensively as the fields were hard to be ploughed. The economic condition of the people grew worse on account or failure of crops and they were hard hit by the depression in the lac market. Prices of shellac touched the lowest level hitherto recorded causing considerable distress amongst growers and labourers.

During the post-war period and specially by the end or 1946-47 the position grew worse. The prices of foodgrains, cattle and other necessaries of life in general continued to remain high. The business community and more particularly the grain merchants, cloth merchants and mill owners were in as unusually prosperous condition and in spite of all efforts to check them, profiteering and black-marketing continued to the profits of these classes. The high prices mainly affected the landless labourers and the people with fixed income, the middle class and the lower classes. More hardship was caused by the shortage of cloth and other essential commodities. The quality of most of the foodstuffs like rice or *atta* was below standard.

Under this background of scarcity and economic depression, the years from 1947-48 to 1955-56 suffered from successive droughts partial in some years and complete in others. In 1950-51 there was heavy rainfall at the beginning of the year which damaged the *bhadai* crops and thereafter drought damaged the winter rice crops. *Hathia* rains failed completely. Prices of agricultural and other essential commodities rose very high. The Revenue Department launched a scheme of construction of minor irrigation works and a sum of Rs. 11,50,000 was spent over construction of *ahars, bandhs and* other petty schemes of irrigation. The Agriculture Department completed 121 irrigation wells; 40 *rahats* and pumps were fitted and 28 lift and pump engines were distributed at a total cost of Re. 81,500. Government took prompt action to meet the shortage of foodgrains and opened grain shops on a very wide scale to enable the people to purchase foodgrains at reasonable prices. Relief works were arranged to provide the poorer sections to obtain some wages. Minor Irrigation schemes were carried on an extensive scale and Taccavi and Land Improvement loans were given liberally. A sum of Rs. 1,30,565 was distributed as Agriculturist loans and another sum of Rs. 10,700 was distributed as Land Improvement loans.

Garn was the worst affected area. Though there was enormous communication difficulty owing to the river Koil and due to several other rivulets all unbridged, foodgrains were transported and relief had to be extended to that area. The year 1951-52 proved more difficult. The following areas were affected and declared scarcity pockets where relief measures were ordered to be undertaken :-

Sadar Subdivision.

(1) Bhaunathpur police-station.
(2) Ranka police-station.
(3) Bhandaria police-station.
(4) Manatu police-station.
(5) Bisrampur police-station-Union no. 1 and part of union no. 2.
(6) Daltonganj police-station-Ramgarh area, i.e., the south-west portion of the police- station bordering Ranks, and Bhandaria.
(7) Garhwa police-station-South-west portion.
(8) Panki police-station-North-west portion bordering Pratappura (Hazaribagh district).

Latehar Subdivision.

(1) Barwadih-Garu.
(2) Portion of Balumath police-station.
(3) Portion of Latehar police-station.
(4) Portion of Chandwa police-station.

Relief measures were started in last week of April, 1951. The landless labourers were employed in execution of Minor Irrigation Schemes, reclamation of waste land, repairs of old roads and construction of new ones. Fair price shops were opened in the interior of the district so that foodgrains may be reached in the interior at reasonable prices. In the beginning ration cards were distributed among the people paying chaukidari tax of six annas and later on it was brought to twelve annas level. In special cases the Circle Officers Incharge of relief work were authorised to exercise their discretion in giving this limitation of chaulidari payment so that no hardship may be caused to the really needy person. A sum of Rs. 45,309 was spent during the year 1951-52 over distribution of gratuitous relief to the needy persons as defined in Bihar and Orissa Famine Code. It was first distributed in shape of grains and later on it was distributed at the rate of six *chattaks* grain besides Rs. 2 as each doles for adults and at the scale of half to the minors. A sum of Rs, 8,576-6-6 was received as donation from the Prime Minister of India and others for distribution of food to the poor. Out of this amount Rs. 4,465-10-6 was spent during 1951-52. A sum of Rs. 49,085 was spent over construction and repairs of District Board roads in the scarcity area to give employment to the landless labourers. The Divisional Forest Officer, Palamau spent a sum of Rs. 1,30,070 over the construction and repair of 14 roads. A sum of Rs, 257 was spent for giving relief to spinners under the category of light manual labour. The Daltonganj Municipal tank was desilted at a cost of Rs. 8,761. Government had placed an allotment of Rs. 10,00,000 for the execution of M. I. schemes. The entire amount was spent in completing 632 schemes in the district. A sum of Rs. 10,73,043 was distributed as Agriculturist's loans and Rs. 1,35,595 as L. I. loans.

Children below the age of 14 and nursing and expectant mothers were given U. N. I. C. E. F. milk powder. There were 40 milk distributing centres in the district under the charge of the Medical Officers and Headmasters of schools. 280 fair price shops were opened and foodgrains had been stored in the different centres of the district. 2,70,299 maunds of grains were sold.

The year 1952-53 was also declared scarcity year and relief operations were ordered in the following places:-

Sadar Subdivwion.

(1) Ranka police-station-Entire.
(2) Bhandaria police-station-Entire.
(3) Garhwa police-station-Entire.
(4) Bhaunathpur police-station- Entire.
(5) Manatu police-station-Entire.
(6) Chhattarpur police-station-Entire.
(7) Daltonganj police-station-South of river Koil.
(8) Panki police-station-South-west portion.
(9) Patan police-station-Northem portion.

Latehar Subdivision.

(10) Barwadih police-station-Entire.
(11) Garu police-station-Entire.
(12) Mahuadanr police-station-Entire.
(13) Baluma.th police-station-North-west portion.

The following year 1953-54 was somewhat better than the previous one but some damages to the early paddy were done by Gundhi bugs in about 73 villages. The situation was brought under control by use of an insecticide. Leaflets were distributed to the agriculturists suggesting means to fight the menace. Some damages were also caused by floods in the river Son in Sonpura *Elaka* of Bhaunathpur police-station. Although the harvest was good this year the agriculturists could not be able to replenish their last resources and their conditions remained almost the same except for a little improvement in the economy of the large producers. Relife measures were continued. 31,702 maunds of foodgrains were sold at controlled rates through 51 fair price shops most of them being in the interior of the district. A sum of Rs. 3,00,000 as Taccavi loan and Rs. 42,325 as Waste Land Reclamation loan was distributed in the district. The Agriculture Department spent about Rs. 87,590 on construction of medium and minor irrigation schemes including wells and open borings. Besides 534 maunds of vegetables were also arranged and distributed in intensive block's areas. The Revenue Department completed 273 schemes out of 604 schemes of minor irrigation taken up during the year involving a cost of Rs. 3,50,000. These preparations could hardly prove a match to the nature which terribly fights with its deadly weapon of drought. The monsoon broke late in 1954 and the rainfall was recorded far below the normal. The *Hathia* rains failed completely and with this the agriculturists' hopes were gone.

Relief measures had to continue unabated. A number of schemes were taken up to give some relief.

Item of work.			Amount sprnt. Rs.
1 Hard Manual Projects	…	…	44,000
2. Minor and Medium Irrigation schemes by Revenue Department.		…	3,10,444
3. Medium and M. 1. Schemes by Agriculture Department.		…	1.79,780

Three hundred and eighty-one M. I. schemes and 3 medium schemes were under execution out of which 288 schemes were completed at a total cost of Rs. 3,10,444.

Forty-eight wells were dug and 379 were taken up for execution. These wells were primarily intended to supply drinking water to the rural population. The total amount of Rs. 1,50,058 was spent over these schemes.

The situation grew worse in 1955. It was a year of drought. The momsoon broke vrery late, and as a result of which sowing of seedlings was delayed, and the bulk of the paddy seedlings remained untransplanted. The *Bhadai* crop was damaged due to meagre rain. After this there was interrupted rain during the transplantation season. The *Hathia* rains failed completely and due to this *rabi* crops also could not be sown effectively. The statements as appendix to this chapter would show the average affected, the extent damage caused to *Bhadai*, *Aghani* and *rabi* crops in respect of each crop separately. There was also scarcity of drinking water. The agriculturists were hard hit as they had been facing successive droughts right from 1950-51 and the drought this year brought crisis in their economic condition. The effect of this drought badly prevailed during the months of April to June, 1956. There was shortage of fodder during the summer months of March to June and the cattle were badly affected. There was difficulty of drinking water in the forest area of Ranka. The average yield was reported to vary between 35 per cent to 50 per cent in different areas. The yield of crop was good in Mahuadam, portion of Hussainabad police-station and Leshganj police-station only. As a measure of relief, hard manual labour schemes in shape of construction of roads and desilting of tanks were taken up in different police-stations of the district, almost throughout the year except during the rainy season. The normal schemes of different departments were also pushed through vigorously. The Forest Department opened work in many of the coupes and as such large number of people in these areas had full employment. The Local Self-Government Department also granted separate sum for repair of District Board roads under the hard manual labour schemes. These coupled with the execution of minor Irrigation schemes, medium irrigation schemes, local works programme schemes, normal road schemes of District Board roads, building and road schemes of Public Works Department provided employment to a large number of persons.

The following table shows the items and expenditures over the relief measures:--

Amount

Rs.

(1) Hard Manual schemes … … 3,91,600
(2) M. 1. Schemes of the Revenue Department … 3,95,960
(3) Medium s,nd M. r. Schemes of. Agriculture Department. … 3,77,206

Three hundred and thirty-five M. L. schemes and 73 medium schemes were undertaken at the instance of the Revenue Department of which 155 schemes were completed. 326 wells were sunk under Local Works Programme and 493 more were under execution. The schemes were intended mainly to serve the purpose of supplying drinking water in rural areas. The total amount spent on well schemes was Rs. 1,83,593. Taccavi and other loans were distributed to relieve the distress.

FLOODS.

Palamau is not essentially riverain district and so is comparatively free from devastating floods. But there had been a devastating Son flood in 1923,the details of which in the last *District Gazetteer* of *Palamau,* 1926 are as follows:-

"In 1923 the district suffered from a dramatic but brief calamity in the shape of a flood of the Son, which rose to an unprecedented height and did much damage along the river bank on the northern fringe of the jurisdiction of Bhaunathpur police-station, from Khokha on the Mirzapur- border to Sunripura where the Son joins the Koil. The flood was caused by an exceptionally heavy and uninterrupted downpour of rain in the area drained by the river in the Central Provinces. It was first noticed in Palamau in the small hours of the morning of Saturday, August 18. During that morning the villagers went to the river bank to collect for use as fuel the trees and branches that were being swept down in the flood. The river continued to rise till 2 P.M. in the afternoon, and a number of the villagers who had gone to the river bank had to climb up into trees to save themselves. The flood remained at the unprecedented height which it had then reached till 10 A.M., on Sunday, August 19. The population of the village of Sonpura and the surrounding *bastis* had climbed up into trees or on to the roofs of their houses, and the trees and houses were now beginning to collapse in the swirling water. Seventy-nine lives were lost in this manner during these critical hours, including the whole of the inhabitants of the Dom *tola* who bad climbed up into a large tree as the flood rose. The water receded to some extent during Sunday afternoon, but some people remained cut off in the trees or on the roofs for three whole days, and three children were born in the branches of the trees. A boat had meanwhile arrived at Sonpura from Sunripura, which assisted in collecting the refugees and bringing them to the *garh* of Babu Bisambharnath Sahi of Sonpura. A

crowd of 800 persons had collected in his house by August 22. Two other boats that were in Sonpura were chiefly occupied at this stage in saving the belongings of some of the wealthier residents of the village.

"There is no bridged road and no "telegraph,to Sonpura, and not a word of
Information regarding the flood reached Daltonganj till August 21. The Sonpura estate was at that time still being administered under the Encumbered Estates Act, and the Manager, who was intimately acquainted with the neighbourhood, was dispatched that evening to the scene of the disaster with means of relief. He reached Sunrki, which is about four miles from Sonpura, on the 22nd. He found that the flood had receded, leaving behind it a sea of mud, and he also found that there was not a single boat at Sonpura. That afternoon he started distributing relief. In the early hours of the following morning he saw that the river was rising again. The first thing to be done was to collect boats, a matter of some difficulty, but the work of rescuing the people who bad again taken to the trees began that afternoon, continued till 10-30 P.M., that night, and was resumed on the following day, during which time 1,200 persons were brought to safety. Meanwhile the crowd had been penned up in the house at Sonpura for some days and steps had to be taken to prevent an outbreak of cholera there and in the neighbouring villages, hich also were crowded with refugees. Fortunately this danger was averted and, apart from some fever, no epidemic occurred.

In all 33 villages were affected and 1,381 houses were destroyed. More serious was
The damage caused to the fields of what was perhaps the most fertile tract of the district. The fertility of Baliari was proverbial 'Sau Untari, Naek Baliari'. But when the flood receded it had left a deposit of some six feet of sand over the best lands in the village. Other villages seriously affected in this way were Sonpura, Nawadih, Pindraha., Kishunpur, Gara Ealan, Gujaria, and Kadhwan. A sum of nearly Rs. 5,500 was collected in Daltonganj for immediate distribution to the afflicted population: to this sum the wealthy and the poor contributed after their means and a handsome subscription was received from a generous Indian gentleman of Bombay who desired to remain anonymous. A sum of Rs. 40,000 was distributed in loans, principally for the rebuilding of houses, and steps were taken to encourage the cultivators to apply for a reduction of rent on the ground of the deterioration of their holdings. The flood was also very serious in Bihar, but in no district was the loss of life in any way comparable to what occurred in Palamau. The reason for this was that elsewhere the water could spread itself out over vast areas a foot or two in depth but in Palamau the water rose to a much greater height, as it was held up between the Kaimur hills of Shahabad on the north and on the south by the low hills of Bhaunathpur which reach down to the point at Sunripura. Consequently, when the houses and trees began to collapse, there was little hope of saving the refugees who had ta.ken shelter in them and who were swept down with them into the flood."

After 1923 the district suffered lightly due to the minor floods in1953, 1956 and 1957. In September 1953 the river Son over-flooded Its banks and caused some damage in Bhaunathpur police-station. The water began to recede after two days. Relief measures were taken and Rs. 1,412 were distributed as agricultural loan among the flood-stricken

people. In August, 1956 there was flood in Majhiaon police-station due to the rise of the rivers Son and Koil. The flood remained for a week and caused damage to the standing crops and houses. Gratuitous relief in the shape worth Rs. 1,750 was distributed. In October, 1956 the river Roil again rose and caused some loss in village Chamartoli near Daltonganj. There was a flood in July, 1957 which was caused due to the rise of the river Harhi. It lightly affected Hussainabad. The rivers that do cause flood havoc occasionally are Son and Koil. The other rivers being hilly and small, the flood water passes off quickly.

Statement showing crop damage during *Bhadai* sasson 1955-56.

Serial no.	Name of crop.	Area affected (in acres).	Crop damaged (in maunds).	Percentage of damage.	Cause of damage.
1	2	3	4	5	6
1	Paddy	84,814.05	3,40,983.00	60	Drought.
2	Maize	90,351.40	3,00,677.39	50	Ditto.
3	Mama	46.736.75	4.58.198.36	45	Ditto.
4	Jowar	31.88	152.00	30	Ditto.
5	Bazra	0.09	0.05	30	Ditto.
6	Other cereals ..	45.616.61	1,31,524.01	40	Ditto.
7	Pulses	38,496.63	75,464.29	40	Ditto.
8	Oil-seeds	994.88	1,380.18	40	Ditto.
9	Supp. Lamp.. ..	29.42	30.21	20	Ditto.
10	Other fibres	0.32	2.10	20	Ditto.
11	Sugarcane	175.45	686.14	20	Ditto.
12	Other crops	5.19	29.12	20	Ditto.
13	Vegetable	20.69	56.16	30	Ditto

Statement showing crop damage during Rabi season 1955-56.

Serial no.	Name of crop.	Area affected (in acres).	Crop damaged (in maunds).	Percentage of damage.	Cause of damage.
1	2	3	4	5	6

1	Barley	6,219.89	25,932.21	50	Excessive drought.
2	Wheat	3,398.47	10,730.33	50	Ditto.
3	Gram	19,606.39	62,034.16	50	Ditto.
4	Arhar	9,951.73	31,576.25	50	Ditto.
5	Matar(peas)	109.41	190.21	50	Ditto.
6	Masur	4,899.72	18,241.07	50	Ditto.
7	Khesari	926.27	1,556.08	50	Ditto.
8	Mustard	2,441.67	6,074.02	50	Ditto.
9	Linseed	2,320.99	7,362.01	50	Ditto.
10	Gram and Barley ..	3,693.29	11,234.21	50	Ditto.
11	Wheat and Gram ..	560.85	2,798.09	50	Ditto.
12	Wheat and Barley ..	148.17	660.23	50	Ditto.
13	Potato	9.82	239.25	50	Ditto.

Statement showing crop damage during *Aghani* season 1955-56.

Serial no.	Name of crop.	Area affected (in acres).	Crop damaged (in maunds).	Percentage of damage.	Cause of damage.
1	2	3	4	5	6
		Ac. Dec.	Md. Sr.		
1	Paddy ..	17,970 64	1,48,529 35	60	Drought.
2	Kurthi (Dalhan)	2,775 64	13,639 0	43	Ditto.
3	Til ..	1,207 16	2,652 21	28	Ditto.
4	Other crops ..	2,173 10	6,884 9	41	Ditto.
5	Potato ..	4 07	65 30	40	Ditto.
6	Other vegetables ..	2 49	26 2	42	Ditto.
7	Sweet potato ..	1 72	28 16	52	Ditto.
8	Other Oil-seeds. ..	383 52	652 12	34	Ditto.
9	Reshadar ..	7 28	8 26	40	Ditto.