

CHAPTER XIII.

NATURAL CALAMITIES.

FLOODS.

The district of Muzaffarpur, as has been described before, is watered by three great rivers, the Gandak, the Burhi Gandak and the Baghmati, as well as by a number of streams running diagonally across it from north-west to south-east and connecting with its boundary rivers. On the west, separating Muzaffarpur from Saran and joining the Ganga at Hajipur, is the snow-fed Gandak, which issues from the mountains in Nepal. Next to the east is the Burhi Gandak, which rises from a *chaur* in Champaran district near Someshwar and receives on its left bank numerous streams of various sizes before it enters the district of Muzaffarpur. Further east, the Baghmati, rising near Kathmandu at an elevation of 4,750 feet, pierces the line of the Nepal hills, and after entering British territory near Dheng railway station flows between Muzaffarpur and Champaran, and then deflects abruptly to the south-east through the district. In this portion of their course the rivers assume a deltaic character, as their beds, raised by the silt they bring down, are elevated above the level of the surrounding country; and it will thus be understood that a sudden heavy fall of rain over the northern portion of Tirhut, the Nepal *tarai* and the range of hills to the north of it, some 150 miles in length, may easily cause these narrow drainage channels to overflow their banks. When this happens an inundation inevitably follows, and the lower down one goes, the more is the evil aggravated by the converging of the streams towards the same point, and by the net work of private *bandhs* or embankments that have been made year after year for the protection of the villages along their banks. Not only do they make matters worse for the villages lower down the stream, but in the end, when the floods have asserted themselves and spread over the country, they hedge them in and delay their subsidence. Owing to this combination of circumstances, the district has always been subject to severe and widespread inundations, which cause a great deal of temporary suffering, though on the other hand they do much good by fertilizing the soil and increasing its productive powers.

This district is subject to heavy floods and recorded history shows that there were floods in 1785, 1787, 1788 and 1793 in the 18th century. In the 19th century there were heavy floods in 1806, 1867, 1871, 1883, 1893, 1896 and 1898. The want of records for there being no floods from 1806 to 1867 should not be taken to mean that this period of more than half a century was comparatively free from flood. It will mean that records for any major floods are not available for that period. In the 20th century we have records for more or less heavy floods in 1902, 1906 and 1910. There were annual floods every year from 1916 to 1919. There was another high flood in 1928 followed by very heavy

floods in 1944, 1950, 1952 and 1953. The flood in 1953 was very severe in almost all the rivers in North Bihar. There was an investigation into the problem of the flood in 1953 which will be referred to later.

The physiography of the district is such that a heavy flood affects the bulk of the district. The pockets which are more or less severely affected are particularly Seohar in Sitamarhi subdivision and Mahua and Lalgunj thanas in Hajipur subdivision. The northern half of Sadar subdivision is more liable to floods.

Floods have caused great devastation to the district from time to time. In 1788 the flood damaged winter crop of practically the whole district and the effects of the calamities were felt for a number of years. In 1793 the town of Muzaffarpur together with a few *parganas* near-about were under water. The flood in 1867, it is recorded, had destroyed the crops of about 15,000 bighas and damaged 1,500 houses on the right bank of Burhi Gandak also called the Little Gandak. The flood in 1871 was peculiar in nature. There was a fall of 19" of rain in 36 hours which was followed by a flood in which the greater part of Muzaffarpur town was submerged. About 300 houses were entirely destroyed and a very large number of houses were damaged. The water did not subside for a number of days. The high flood in 1883 would have caused more devastation but for the reconstruction of an embankment in 1874. The area most affected was the country along both the banks of Baghmati and the Little Gandak. Muzaffarpur town again suffered severely. In 1893 the district was visited by not less than three distinct floods, one after another answering to the heavy fall of rains in July, August and September, causing immense damage to crops, houses and roads. A large area of about 800 to 900 square miles was submerged. Most of the *bhadai* and rice crops were lost and over 12,000 houses had collapsed. The flood of 1898 was also due to excessive rain and the Little Gandak overtopped the Turki embankment. Thousands of houses were swept down and the number of deaths from drowning reported by the people was 249.

The floods in the 20th century have been of a severe type. In 1902 a heavy flood caused great devastation of crops and properties including livestock. It was reported that altogether about 40,000 houses were damaged or swept away. The town of Sitamarhi had suffered very badly. In 1906 the height of the water registered at Muzaffarpur was a foot higher than in the flood in September, 1898. About half the area of the district was affected and the damage to crops and properties was very considerable.

The rainfall in 1910 was almost continuous and this led to high flood which damaged the *bhadai* crop. The almost annual floods from 1916 to 1919 were of same type and caused a good deal of damage to paddy.

FLOOD IN 1953.

The floods of Muzaffarpur district in 1953 were rather alarming and the Waterways Division had made a detailed study of the floods. A recital of the salient features will be useful. All the rivers of the district, namely, Baghmati, Purani Dhar, Lakhandeyi, Burhi Gandak, the Adhwara system of rivers consisting of the rivers Adhwara, Jamura, Sikao, Burhnad, the rivers Singhi Marha, Rato series besides the rivers Baya, Fardo, Kedane, Gangata, Ghaghara and the Gandak had risen in floods. Fortunately the level of the river Ganga did not rise exceptionally high and there was not much of inundation of the area which a high flood of the river Ganga could have effected.

Baghmati.

The heavy flood in Baghmati river affected the area comprising many of the villages of Seohar and Belsand police-stations. The cause of the flood was a heavy rainfall in Nepal territory and all over its catchment area. The catchment area from its origin up to the Dheng bridge in Sitamarhi subdivision is 1,430 square miles and has an approximate length of 91 miles and practically the whole of this area lies in the hilly parts of Nepal territory.

The river Baghmati has a net work of spill channels at various places. The high floods further developed these spill channels and caused inundation of hitherto unaffected parts. For example, the discharge through the spill channels called the Sugia Paradesia spill channels inundated a part of the Champaran district and joining the Bakua Nala, the bulk of the discharge passed on to the area lying in Minapore thana and caused a havoc. All the standing crops were washed away and a large number of houses collapsed in this area which forms almost a *doab* between the Baghmati and Burhi Gandak rivers. The inundation of this area was further aggravated by the Burhi Gandak flood spill from the south, joining that of the Baghmati from north and a large part of Minapore thana was almost converted into a vast sheet of water. This water found its way up to Muzaffarpur-Sitamarhi road on east and to Jhandaha in the 7th mile of Muzaffarpur-Sitamarhi road on the north causing damages to them.

Similar results took place at various other sections. Many of the channels could not cope with the abnormal discharge and water had spilled causing inundation of the areas lying on both its banks. The area lying on the west of Muzaffarpur-Sitamarhi road from the 19th to 21st miles was converted into a vast sheet of water. On the east of Muzaffarpur-Jhandaha road the Bharthua *chaur* area got expanded due to abnormal discharge coming into the *chaur* and had submerged areas extending up to Katra. The roads that had been affected by the spill of the river Baghmati are Seohar-Sisall road, Sisaula-Major-gunj road, Madhubani road and Seohar-Belsand road.

The area through which Baghmati flows is the most fertile part of the country and practically every acre of land is cultivated. The fertility

of this area is renewed by the visitation of floods depositing alluvial silt brought from the hills. Flood is almost a necessary evil and this part of the country cannot do without flood. As a matter of fact observation stretched over a number of years has shown that the area which is deprived of the Baghmatai spill begins losing the fertility of its soil. The area which remains in constant touch of the Baghmatai spill or a new area which is visited by flood retains fertility of the soil.

The enquiry after 1953 flood of Baghmatai suggested that the country through which the Baghmatai flows is still largely in its infancy so far as the land operations are concerned. On one side the main source of the troubles is the shifting nature of turbulent Baghmatai which has been oscillating its course causing devastations in the area, while on its creative side its land building operations are of immense value. The problem is not to prevent floods altogether but to give the excess water an easy run off supplemented by providing necessary irrigation facilities.

The investigations indicated that the permanent solution of the problems could only be effected by the training of the Baghmatai river which solution in its term suggests a Multipurpose Dam Project. This is, however, a very long term suggestion and certain interim schemes were approved. The schemes were—

- (a) the banking of the river together with suitable sluices provided in the embankments in the zone in which its flood mischiefs are heavy;
- (b) canalisation of the river through its various spill channels for irrigation in the areas requiring it by providing weirs above Dheng Railway bridge and construction of Baghmatai canal; and
- (c) controlling of a number of other spill channels by making easy drainage.

Puranidhar river.

This river also spilled its bank and caused damage due to the heavy rainfall in the catchment and flood in the Baghmatai river. Usually this river is in high flood simultaneously with Baghmatai river because of the Baghmatai above Dheng bridge passes through its *dhar*. The important means of communication affected were the Majorgunj road. Belsand road and Sisawla road.

Lakhandeyi river.

The river was in high spate in the month of July, 1953 and had spilled. There were also breaches in some of the *bandhs*. The spill of the river from Sitamarhi to Nepal border was caused by overtopping of the left bank of the river and the spill passing through low lands joining the flood of the Adhwara system of the river.

The cause of the flood was the heavy rainfall in the basin of Nepal territory and all over its catchment areas. The catchment area of the river from its origin up to the railway bridge at Sitamarhi is 246 square miles and the maximum length of the area is 49 miles.

This river is an excellent water course for drainage and irrigation purpose and passes through a very rich rice growing area. But due to the great Bihar Earthquake of 1934 its bed had upheaved and sections narrowed due to which the drainage of the country was badly impeded causing damage to crop. The water stagnated and brought in its chain Malaria epidemic to the area lying along its course. A scheme for the improvement of the river was evolved and has since been carried out due to which the drainage of the country has been improved and the incidence of Malaria has abated.

So far as the spill of the Baghmati river is concerned the matter requires closer investigation. It is appreciated that the training of river Baghmati will be required to avoid serious flood in the river. For the present a scheme for constructing a regulator across the Lakhandeyi river at Rajkhand has been prepared for irrigation purposes and if executed it is expected to irrigate 15,000 acres of land. It is also realised that there should be more regulators and parallel marginal embankments with a large number of sluices to ensure quick dispersal of flood water.

Burhi Gandak river.

The marginal embankments of this river on the right bank above Muzaffarpur are known as *Kanti bandh* along with several private *bandhs*, viz., *Bishunpur bandh*, *Motipur bandh*, *Kharika bandh* and *Kalua bandh*. The beds of the rivers Fardo and Kedane that carry the spill of Burhi Gandak upheaved and sections narrowed caused by the great Bihar Earthquake of 1934 and they could not drain out the spill discharge of Baghmati. As a result there was an appreciable spill over their banks and a large part of the area of Kurhani police-station was damaged and submerged.

The left bank spill of the Burhi Gandak above Atharghat and below Akharaghat had caused inundation of the area lying on the east of Muzaffarpur-Sitamarhi road up to the 14th mile. Several other *bandhs* had breached causing inundation.

The right bank spill of the Burhi Gandak below Akharaghat had caused severe inundation of the area. The Muzaffarpur-Pusa road was overtopped in the 4th, 7th and 14th miles. Other *bandhs* of this river, namely, *Mirapur bandh*, *Dholi bandh*, etc., had also breached.

The investigations that followed indicated that the rivers Fardo and Kedane which used to serve as drainage channels of the Burhi Gandak spill in a large part of Sadar, Paru, Mahua and Patapur police-stations, were rendered largely ineffective due to their beds being upheaved and sections narrowed during the great Bihar Earthquake of

1934 and hence quick drainage is impeded. Resectioning and desilting of these rivers are indicated to restore the lost drainage links. A scheme for this was taken up. Another remedial measure suggested was that there should be proper marginal embankments along the river Burhi Gandak but it was realised that the marginal embankments should be placed at the proper points and constructed properly.

Adhwara rivers.

The Adhwara system of rivers consisting of rivers Adhwara, Jamura, Sikao, Burhnad had been in high spate in 1953. The cause of the flood was heavy rainfall and the spill channels could not carry the full discharge of the Adhwara system of rivers. The floods of this group of rivers damaged the Sitamarhi-Pupri, Runisaidpur-Pupri and Pupri-Darbhanga roads.

It was held that the old course of the Adhwara river has to be desilted so that it may flow as she used to do before the Earthquake in 1934. At present due to change in the course of this river a great deal of flooding occurs in Jamura and Sikao near Bajpatti while the area along the old course remains dry for want of any flow and is in perpetual need of irrigation. The railway embankment from Bajpatti to Pupri also obstructs the flood water going to the south of the railway embankment. The water level on the north near Bajpatti rose up to rail level, overtopped at places causing suspension of trains for a few days. It was felt that there should be more openings in the railway embankment at suitable places to relieve flooding. This is almost a general popular demand throughout North Bihar that there should be more culverts.

The high floods in the rivers Baya, Fardo and Kedane were due to the beds of the river having been upheaved and sections narrowed due to the great Bihar Earthquake of 1934, and the extra water could not drain off easily. The beds have to be desilted and widened to ensure quick drainage of the country and some work to this effect has been done for river Baya. There have also to be regulators at suitable areas. It is expected that with the proper resectioning of these rivers a number of *chaurs* in the district that remain waterlogged and thrown out of cultivation would be rendered fit for cultivation. Separate schemes for the drainage of a few *chaurs* lying in this belt notably the Raksa tal. Maniari *chaur*, Rupnarainpur *chaur*, Paharpur *chaur* and Baraila *chaur* have been sanctioned and are in the course of execution.

The river Ganga.

The river Ganga did not rise exceptionally high in 1953, and there was not much of inundation. But several *bandhs* lying to the left bank of the river were hard pressed and had to be constantly watched to prevent breaches. An area comprising roughly of 21 square miles on the north of Mahnar road consisting of culturable lands had been saved from inundation by the construction of Bansidhar-ka-bandh and it is held that this *bandh* has to be extended to make the entire area

immune from flood. Mahnar road also obstructs the free play of the Ganga spill and additional waterways appear to be necessary.

A continuous embankment from Hajipur to Bajidpur embankment in Darbhanga district has also been suggested as necessary for controlling the flooding from the Ganga.

Gangata and Ghaghara rivers.

The flood in the rivers Gangata and Ghaghara was due to the same feature of the beds of the river having upheaved and sections narrowed due to great Bihar Earthquake of 1934. The excess water could not be drained off. These rivers have to be resectioned and regraded and further interlinked with suitable drainage channels from Malmala and Belwari series of *chaurs*. A scheme is being investigated by the Muzaffarpur Waterways Division.

River Gandak.

The embankment on the left bank of the river Gandak has a total length of 52 miles 400 feet and except for a gap of about 300 feet length in Deosar village in the 4th mile it is continuous throughout and motorable in all seasons. This gap is due to collapse of a sluice in 1918 but due to the country being high, flood water does not enter through the gap. There are 25 numbers of sluices in the embankment which are both used for drainage and irrigation. Apart from the main embankment, there are three numbers of retired lines—

- (1) Fatehabad retired line in the 19th mile.
- (2) Kukuria retired line in the 28th-29th mile.
- (3) Alahdadpur retired line in the 32nd-33rd mile.

In 1953 there was the erosion of the marginal land due to formation of a big *diara* in the river. The embankment was breached and a small *bandh* was constructed to resume communication along the old embankment.

It was realised that the old embankment should be protected by the construction of a few spurs and bank pilings, repair of an existing spur and bank pilings and construction of new retired lines and triangular spurs where necessary.

The floods of 1953 are an important land-mark in the district as they were investigated and remedial measures were suggested. The effects could be better appreciated in the light of the observations in the last District Gazetteer as follows :—

“ As a rule, though considerable distress and great loss of property are caused by such calamities, these evil effects are of a transitory nature. The chief loss which the cultivators sustain from a flood is the destruction of their cattle, and they are soon recompensed for the loss of their crops by a second crop of exceptional abundance grown on the land fertilized by the silt left by the receding water. These

floods are primarily due not to a heavy downpour of rain in the district itself, but to excessive rain in the catchment basins in Champaran and Nepal. The volume of the floods and their destructiveness are no doubt increased by the local rainfall, but as they come in August or September, when the paddy lands require water, and the uplands that stock of moisture on which the spring crops depend, their damage is restricted and their benefits are widespread. As paddy too is the only crop the loss of which causes famine, it follows that inundations, implying as they do a heavy downfall in the months when paddy crops require it, never accompany famine, though they often precede or succeed it at short intervals. Flood and famine have indeed been strangely associated with one another chronologically in Muzaffarpur. In 1785 there was a famine; in 1788 flood; in 1866 there was scarcity; in 1867 flood; in 1871 there was flood; in 1873 famine; in 1884 there was flood; in 1885 scarcity; in 1897 there was famine; and in 1898 flood."

O'Malley's remarks that the evil effects of the floods are of a transitory nature cannot be said to be very correct now. The northern part of the district comprising of the Sitamarhi subdivision and part of Sadar subdivision is liable to heavy flooding caused by the Burhi Gandak, which runs almost through the middle of the district, the Baghmati, which with its tributary the Lal Bakeya forms part of the western boundary of the district, the Lakhandeyi, the Sikao group, and the Rato group of rivers. These rivers except the Burhi Gandak as mentioned before run from north-west to south-east and traverse the area almost diagonally. There are large areas of swamps between these streams which represent areas which were not built up before the streams swung to another channel due to natural causes or obstruction by human agency.

All these rivers have sustained serious changes affecting their sections and grades caused by the earthquake of 1934. Steep banks of the rivers sank several feet below ground and crumbled towards the bed causing upheaval in certain lengths and thereby impeding the normal or natural flow. The beds of many of the *chaurs* or marshes in the district were upheaved by enormous quantity of sand coming from beneath the earth's crust through cracks and fissures while the dwellings in villages and towns cracked and settled below ground. During the flood season immediately after the earthquake the flooding of the homesteads was very acute due to the upheaval of the beds of the rivers and channels. These are some of the reasons why the effects of a large-scale flood now are not of a temporary character.

EMBANKMENTS.

The construction of protective embankments was considered essential as the rivers of the district had caused a great distress. O'Malley

had observed that the construction of protective embankment was one of the boons conferred on the district by British rule. There is a distinct school which does not believe in embankments as giving a proper protection. In any case the embankments have got to be kept in constant repairs and the sudden formation of channels or *dhars* is a peculiar behaviour of the rivers in North Bihar and has shown that the embankments are not always quite a boon.

Gandak embankment.

Attention appears to have been first drawn to the unprotected state of the southern portion of the district by the flood of the Gandak in 1801, when an embankment was constructed extending from the confluence of the river Baya to Harauli, six miles from Hajipur. This embankment does not appear to have been properly constructed and it used to be repeatedly breached leading to immense damage. The Tirhut and Gandak embankments now form a continuous line along the northern bank of the Gandak extending from the head of the Baya river near Karnaul to the confluence of the Gandak and the Ganga near Hajipur, 52 miles in length and protect an area of 1,250 square miles.

Turki embankment.

The Turki embankment along the Baghmatai was first constructed in 1810 by the Manager of the Kanti Indigo Factory to safeguard the indigo cultivation of that concern and for more than half a century the embankment was maintained by the Indigo Factory. In 1875 it was taken over by the Government. This embankment extends for 26 miles along the southern bank of the Baghmatai and gives protection to an area of $11\frac{1}{4}$ square miles in the *doab* between that river and the Little Gandak.

Daudpur embankment.

Another embankment is the Daudpur embankment near the Sikandarpur *maidan* at Muzaffarpur. This embankment was constructed in order to check the encroachment of the Little Gandak and to protect Muzaffarpur from flood. The railway embankment on one side, and the Sitamarhi road on the other, both aided by the private embankments, drive the full force of water down on to Muzaffarpur town. The embankment is thus required to protect it from inundation. It extends over 3,250 feet and the retired lines over 2,400 feet and the area protected is $2\frac{1}{2}$ square miles.

New embankments.

Some other embankments were taken up during the years 1954-55, 1955-56 and 1956-57. This work of constructing protective embankments had been taken up after 1947 and has been continued since.

The flood control schemes (construction of embankments and desilting of channels) in the district of Muzaffarpur have been described as follows by the Irrigation Department in 1957 :—

	Estimated cost in lakhs.	Area benefited in thousand of acres.
1. Akharaghat to Darbhanga district border right bank.	35.91	251.62
2. Akharaghat to Darbhanga district border left bank.	40.00	128.00
3. Akharaghat to Daudpur ...	1.24	0.64
4. Akharaghat to Pakari ...	9.60	4.48
5. Repairs and strengthening of Kanika <i>bandh</i> .	10.47	32.00
6. Retired line of Bansidhar-ka-bandh	0.49	13.44

Drainage Schemes.

	Estimated cost in lakhs.	Area benefited in thousand of acres.
1. Baraila <i>chaur</i> ...	5.27	9.90
2. Paharpur <i>chaur</i> ...	0.21	0.76
3. Rupnarainpur <i>chaur</i> ...	0.74	1.63
4. Gelhia <i>chaur</i> ...	1.75	2.68
5. Belwari and Malmala <i>chaurs</i> ...	14.31	17.66
6. Sondho and Pirapur <i>chaurs</i> ...	0.93	2.56
7. Narsan <i>chaur</i> ...	1.60	1.80
8. Pororia <i>chaur</i> ...	0.59	1.20
9. Lapaha <i>chaur</i> ...	1.10	1.20
10. Rotma Morsand <i>chaur</i> ...	1.15	3.62
11. Khangura <i>chaur</i> ...	0.10	3.20
12. Bhada <i>chaur</i> ...	0.89	1.60
13. Lebura <i>chaur</i> ...	0.55	0.64
14. Sahtha <i>chaur</i> ...	0.55	2.24
15. Kathaur <i>chaur</i> ...	0.32	0.91
16. Dahnal area experiment works	0.64	1.10
17. Raksa <i>tat</i> ...	1.50	2.56
18. Maniari <i>chaur</i> ...	0.69	2.24
19. Agrail <i>chaur</i> ...	0.64	1.10

RIVER TRAINING SCHEMES.

	Estimated cost in lakhs.	Area benefited in thousand of acres.
1. Protection of Sitamarhi town	3.60	
2. Lakhandeyi River (upper reach) ...	2.90	28.16
3. Improvement of Baya <i>nala</i> ...	15.08	87.04
4. Lakhandeyi River (middle reach) ...	3.38	70.40
5. Lakhandeyi River (lower reach) ...	7.42	49.92
6. Desilting of Siari <i>dhar</i> ...	4.68	30.72
7. Improvement of Ghaghara <i>nadi</i> ...	1.01	2.00
8. Adhwara Scheme (part desilting of Sikao).	0.69	10.00

It may incidentally be mentioned here that the Irrigation Department have concerned themselves with not only executing protection schemes but with combined irrigation programme as well. In their irrigation schemes they have utilised a number of sluices at various points of Tirhut embankment.

The river Gandak has a continuous embankment from Champaran district. The banks of the Gandak are appreciably higher than the surrounding country and in order to safeguard against inundation two series of embankments have been constructed—one on the Serai side and the other along Champaran-Muzaffarpur bank as far as Hajipur. The length of the embankment in Champaran district is 82 miles and that in Muzaffarpur district is 52 miles. There were gaps in highland in Champaran embankment through which flood water flowed during the year 1954 and this was recorded as the highest flood so far. In 1955 these gaps were closed at an estimated cost of Rs. 65 lakhs which afforded further protection to the district of Muzaffarpur. The lowest discharge of water into the Ganga towards the end of March is 10,391 cusecs and the highest recorded flood discharge is 6,42,000 cusecs in July, 1954.

FAMINE AND SCARCITY.

Flood and famine have indeed been strangely associated with one another chronologically in Muzaffarpur.

The earliest famine of which we possess any detailed records is that of 1769-70. A serious drought followed in 1783 when relief to cultivators was sought, though the scarcity did not culminate in actual famine. The years 1787 and 1788 were no more propitious as the country was inundated and the cattle died in large numbers and the crops failed. There was a serious drought in 1791 followed by another in 1792; and in 1809 there was considerable suffering owing to the failure of all the principal crops.

Famine of 1866.

The famine of 1866 was, however, the first great famine of the 19th century. This famine was severely felt in Muzaffarpur both as regards its intensity and the wide area over which it was spread. The prices of food crops rose to thrice the ordinary rate and cases of suicide for want of food and of deaths from starvation were reported. The usual grain supply from Nepal ceased; and as there was no demand for labour, the poorer classes suffered extremely and began to desert their homesteads and to migrate southwards in large numbers. The people, reduced by long privation, fell easy victims to Cholera, and 797 persons out of 1,070 died within an average period of 8 days after admission to the hospital. Relief measures were started in June, 1866 which continued till February, 1867. In September, 1866 the extreme pressure began to diminish, owing to the good *bhadai* crops and fortunately it never increased again. The total amount spent in relief was Rs. 39,448. The estimated number of deaths from starvation or disease engendered by want was 60,321.

Famine of 1874.

The next famine which visited the district was the famine of 1874. The rains of 1873 were insufficient all over Muzaffarpur and were not evenly distributed with the result that the outturn of the autumn harvest varied considerably in different parts. In Hajipore and in the Sadar Subdivision the yield was three-fourths of an average while the corn crop exceeded the average harvest. The yield of winter rice crop was about one-fourth of an average crop in Sitamarhi, about three-eighths in the headquarters subdivision while in Hajipore it was one-eighth of the average. The yield of the *rabi* crops was half in the headquarters subdivision, three-fourths in Sitamarhi subdivision and five-eighths in Hajipore subdivision. The failure of crops in Sitamarhi was the greatest, though not inconsiderable in Hajipore. The price of rice varied during the first six months of 1874 from 9 to 10 seers for the rupee or double the usual rate. Corn and millets, which form a large part of the food of the poor and which ordinarily were procurable at the rate of 30 seers for the rupee, rose to 13 to 15 seers during the same period.

Relief works were first opened in Sitamarhi in December, 1873 and in February, 1874, it was necessary to extend them to the headquarters subdivision, but it was as late as April that any relief operation had to be taken in Hajipore subdivision where it was not so necessary as in the north and centre of the district. Altogether 47,000 tons of grain were sold, distributed and advanced as loans or paid as wages. Rs. 2,21,000 were advanced in the shape of loans; Rs. 1,41,000 were extended in charitable relief, the number of persons in receipt of such charity rising from 6,550 in April, 1874 to 62,500 at the end of June which fell in October to 2,115. Rupees 11 lakhs were paid as wages, the number of labourers employed in relief works rising from 851 in

December to 3,27,248 or about 1/7th of the total population in May. The relief afforded by the Government was on a large scale.

Scarcity of 1876, 1889 and 1892.

Three periods of scarcity intervened between this famine and that of 1896-97. In 1876 there was some scarcity in Sitamarhi owing to the failure of the rice crop. In 1889 the failure of the winter rice caused scarcity in the tract of country running along Nepal frontier. Gratuitous relief had to be given to some 200 people as early as February which rose to 8,000 in August. This was gradually withdrawn in October of the same year.

Part of the district was again affected in 1892 owing to the deficiency of the rains in 1891 when the winter rice and *rabi* crops failed. The total area affected was 1,300 square miles, the tracts which suffered most being Lalganj thana in Hajipore and Sheohar thana in Sitamarhi. Relief works were opened in March and closed in early July. The total number relieved was however hardly more than one per cent of the total population of the affected area.

Famine of 1896-97.

Then came the famine of 1896-97 but on this occasion the people showed unexpected power of resistance, owing to better communication and their improved material condition. The rains of 1896 commenced in May; there was a heavy fall of over 13½ inches in July, which caused some floods and filled the swamps at an early date before a rice crop could be obtained from them; but up to the end of July the total fall was only 1/10th of an inch below the normal. The rain was followed by two long periods of drought, one in August and the other in September and after the middle of that month no rain fell. The whole district was severely affected excepting certain portions. The worst parts of the district were the Sitamarhi subdivision and the northern half of the headquarters subdivision. In the Hajipore subdivision the part severely affected was a tract along the northern boundary of the Mahua thana spreading into the south of the headquarters subdivision and a small tract between Lalganj and the railway.

The price of rice started rising high from October, 1896 when rice was sold at 8 seers to the rupee in the Muzaffarpur town; and in November test relief works were started at Sheohar, Belsand and Parhar in the western and northern parts of the Sitamarhi subdivision, which parts are usually affected badly. The number of persons in receipt of relief rose till the end of May, when 59,000 persons with 4,000 dependants were employed on relief works and 59,000 more were in receipt of gratuitous relief. The number of the latter increased to 72,000 in July. The famine was over by the end of September, 1897. The largest proportion of the population relieved in a single day either gratuitously or on relief works was 10 per cent and it was estimated that of those who attended relief works, at least 75 per cent were landless

labourers. The total expenditure on relief work was Rs. 5,64,000 and on gratuitous relief Rs. 4,91,000, in addition to which over two lakhs of rupees were advanced under the Agriculturists' Loans Act. The import of rice into the district during the famine amounted to nearly 33,000 tons, chiefly Burma rice from Calcutta. The affected area covered 1,851 square miles with a population of 16,60,000, the reported death indeed fell short of the average of the three preceding years by about 25,000.

Famines and scarcity of the 20th century.

In the beginning of the year 1909 agricultural operations ceased in the district and there was loss of crops consequent on the failure of rains in the preceding year but this gloomy picture was averted due to timely rain in the later part of the year.

In 1914 due to bad weather condition and on account of failure of *Hathiya* and *Chitra* rains causing the failure of all the three crops, much distress prevailed. The prices of foodgrains ruled very high affecting the middle and landless classes. In 1920 hailstorms damaged the *rabi* crops. In 1924 the harvest in the district was a total failure and 1932 faced a drought due to failure of rains. But the stock of grains relieved the acuteness of the situation.

In 1948 the food situation in the district worsened on account of two diverse factors. In Hajipore subdivision the floods completely damaged the *bhadai* and paddy crops whereas in the same period Sitamarhi subdivision was experiencing drought and crops specially paddy suffered on that account. Adequate relief measures both in the flood affected areas and the drought areas, were provided by the Government which mitigated the suffering of the people.

Due to the drought and consequent failure of crops in 1950 the district was adversely affected in 1951. There was a total failure of *bhadai* and *aghani* crops. The rise in prices of foodgrains and their non-availability in sufficient quantity created much hardship for the common man and even the well-to-do middle class people felt the pinch of the scarcity. The scarcity condition became very acute especially in Sitamarhi subdivision where there was a total failure of *Hathiya* rains in 1950 and the paddy crop of December, 1950, and January, 1951, was a miserable failure. Less than 25 per cent of its usual crop was harvested with the result that famine conditions began to manifest themselves by February, 1951. The price of rice rose from Rs. 25 per maund to Rs. 45 per maund. The subdivision of Sitamarhi was declared a distressed area and relief measures as detailed in Famine Code were taken up. As a result of the measures taken famine conditions began to decrease in Sitamarhi subdivision from September, after the harvest of autumn crop of *marua*, *bhadai*, paddy, maize, etc. But still the famine condition did not go away from other parts of the

district. Due to drought of 1950-51 the situation in Hajipore subdivision was almost verging on famine condition by the end of March, 1952. It took full one year to bring the situation under control in that subdivision through various relief measures.

Relief measures for the district were at once started. Inter-district embargo was imposed on most of the essential commodities as an emergency measure.

In Sitamarhi subdivision relief measures were started from April, 1951 which continued till October of that year. The principal heads of relief were (i) Hard manual, (ii) Light manual, (iii) Gratuitous relief, and (iv) Sale of Government grains through fair price shops on which more than 5 lakhs of rupees were spent. Moreover, a sum of 13 lakhs of rupees was granted as Taccavi loan to the cultivators which went a long way to avert starvation. Free grain was supplied to about 12 thousand destitutes. Light manual labour was arranged primarily to afford assistance to women. Fortunately no starvation deaths occurred. About one hundred thousand maunds of grain was sent to the Sitamarhi subdivision every month for sale through the fair price shops located throughout the subdivision.

In Hajipore also the Government tried to tide over the famine by giving relief to the people on the lines of Sitamarhi. There was grant of loan mainly in form of Taccavi to help the agriculturists in their agricultural operations amounting to Rs. 9,71,115. Fair price shops were opened throughout the subdivision. The entire urban and 75 per cent of the rural population was put on ration. These relief measures and better *bhadai* crops of 1952-53 ultimately improved the position.

In 1957 there was a general failure of *Hathiya* rains which caused widespread damage to the winter paddy crop. Peculiarly enough this failure of the *Hathiya* rains was common throughout the State. The prospects of the sowing of *rabi* were not also very hopeful. Fair price shops were opened and the consumption of imported wheat had been encouraged. All the possible water reservoirs were tapped for irrigating the fields. Even the fire engines of the Fire Service stationed at Muzaffarpur were utilised to draw water for irrigation purposes. The charges for tube-well water were slashed down. Pumping sets were distributed. *Bandhs* and other irrigation schemes were taken up to utilise water for the crops. Short term crops and consumption of imported wheat were encouraged. Schemes were taken up to give employment.

PROTECTIVE SCHEMES.

Any permanent protection* to the district like Muzaffarpur can only be given by protecting the country-side from inundation and by a provision for adequate irrigation. The problem of irrigation as a protective measure was taken up as long ago as 1876 when there was a scheme put forward for the construction of a high level irrigation canal leading from the Baghmati to the Lakhandeyi river calculated to irrigate 1,52,000 acres of *kharif* and 50,000 acres of *rabi* with a weir. This scheme was first rejected by the Government of India but was

revived on a smaller scale after the famine of 1896-97 and the work was proceeded with for famine relief. A large number of smaller schemes have been taken up from time to time to ameliorate the condition of *raiya*s by giving them water for the fields. Tube-well irrigation is easier but not yet popular owing to higher cost for water in comparison to canal water.

Gandak Project.

A big project for harnessing Gandak river for more food and power has been taken up. When this project is completed the precarious problem of the district of Muzaffarpur along with some other districts of North Bihar will be partially solved.

Although the Gandak project is still at the stage of a scheme it is meant not for Muzaffarpur only but also for the districts of Saran, Champaran and Darbhanga of Bihar and Gorakhpur and Deoria of Uttar Pradesh and Nepal. Some of the salient features of the scheme may be mentioned here.

The mountain basin of Gandak is known as Sapt Gandaki named after seven tributaries of Gandak traversing the region. Further down the river collects the discharge of a number of hilly streams before it debouches in the plains through a deep gorge at Tribeni situated in Nepal at the border of Champaran district of Bihar. Adjoining lower down is Bhaisalotan from where the existing Tribeni canal takes off. From here it flows in a south-easterly direction forming the natural boundary between the States of Bihar and Uttar Pradesh for a length of 28 miles. It flows by the side of this border in Bihar for another 44 miles from where it separates the districts of Champaran and Saran and winds its way in south-easterly direction to meet Ganga at Hajipore opposite Patna.

The region through which Gandak flows including Muzaffarpur district has a high incidence of density of population and the economy is purely agricultural. Perennial irrigation is very much needed and that is why the Gandak project was taken up in 1948 and the scheme has been revised in 1957 to the tune of Rs. 47.64 crores.

The scheme consists of a barrage construction and headworks across Gandak at Bhaisalotan about 1,000 feet below the take off of existing Tribeni canal to divert the river water for irrigation and power, construction of western canal system for providing annual irrigation in Nepal, Gorakhpur, and Deoria districts of Uttar Pradesh and Saran district of Bihar, construction of eastern canal system for providing annual irrigation in the districts of Champaran, Muzaffarpur and Darbhanga and construction of four hydro-electric power houses, two on the main western and two on the main eastern canals for generation of power.

The Gandak project can only be implemented if Nepal Government agrees. The matter has been taken up under a joint consultation of Nepal and the State Government of Bihar.

EARTHQUAKE OF 1934.

Earthquakes have occurred in the district of Muzaffarpur at the intervals of about 100 years or so. There was an earthquake in 1743 and again in 1833 which was repeated after 100 years in 1934. This part of Bihar being on the seismic belt according to Dr. Dunn, the chances of recurrence of earthquake is greater than anywhere else.

The greatest of the natural calamity to which the district was subjected to in the twentieth century was the Earthquake of 1934, which occurred at 2.16 P.M. on the 15th of January. The earthquake which lasted for only one minute and a few seconds created a terrible havoc throughout the district. Buildings were turned to debris and fissures and depressions occurred all round. Over one thousand square miles of land was filled by enormous jagged fissures and pitted with small volcanic craters from which sand or grey mud spread over the fields. Roads and railway bridges were damaged in all directions and all forms of communications by rail, road and telegraph were shattered. The upheaval in the rivers, *chaurs* and lakes was very marked and at places river beds got dry, the high lands became low lands and *vice versa*. At places unusual phenomenon in the fields like oozing out of black sands and water up to a height of 4 to 5 feet was seen for several minutes after the tremor stopped. Culturable fertile lands became barren and sanded up, for the reclamation of which the Government had to distribute sand removal loans to the cultivators. It was reported that 2,539 persons were killed in the district in this earthquake and many hundreds were injured. Many of the dead bodies were recovered weeks after the earthquake. There was a case of a man being brought out alive from the debris five days after the earthquake.

Muzaffarpur Town.

The worst sufferer from this calamity was Muzaffarpur itself. About 75 per cent of the buildings of the town were completely damaged as 90 per cent of the buildings before the earthquake had been erected with mud brick walls i.e., brick work built with mud-mortar instead of lime or cement mortar. The impact was more disastrous on double-storeyed buildings. Roads became impassable due to accumulation of debris of houses. Hundreds of persons were killed by the falling of houses on them or were buried under the debris. The narrow streets also made an escape from the falling masonry very difficult. The casualties in Muzaffarpur town accounted for 956 persons. The casualties were high in thickly populated parts of the town with narrow lanes like Mahajantoli, Purani Bazar, Chaturbhuji Asthan, Bhairi Asthan Road, Brahmantoli and Gudri Mohalla. The Chandwara Waterworks was badly damaged by the earthquake. The main pipe line of water supply was also badly damaged. The lighting of the town was hampered by the damages to electric connections. The Sikandar-pur Maidan at Muzaffarpur which was used as the landing ground for the aeroplane had been terribly cut by the earthquake which made it

unsafe for use. Mr. Fairweathers, a private pilot and engineer succeeded in marking out a strip of land suitable for landing and a plane from Calcutta requisitioned by Government landed at Sikandarpur on the 16th January at mid-day. A large part of the walls of the district jail had collapsed for which the troops had to relieve the police of the duty of guarding the jail at night. The sanitation of the town was completely upset.

Sitamarhi Town.

The town of Sitamarhi also was damaged very badly. The roads to Sitamarhi were damaged extensively and the town was completely cut off for sometime. Railway communication was dislocated and at places the railway lines were twisted and torn and lost the previous alignment. The level of the country changed and the town of Sitamarhi was so much damaged that at one time it was feared that it would have to be altogether abandoned as unsafe for re-building purposes on account of changes in the contour of the locality.

The Sugar Mills were all damaged and this at a time when there was a bumper sugarcane crop after a number of lean years due to insufficient rainfall. The prices of the commodities were very high and the economic condition of the people was miserable.

Relief Measures.

Relief measures were immediately taken into hand. To assure the people the Governor of the Province visited the town on 17th January 1934. Various shelter and relief works were started by the Government and some philanthropic institutions like Servants of India Society, Marwari Relief Committee, Menon Relief Committee, etc. Sri Rajendra Prasad, now President of the Republic of India organized relief work on behalf of the Indian National Congress. 12 Relief Centres and four Sanitation Centres were opened. There was complete co-ordination among all the Relief Committees. Government relief took up construction of shelter sheds, water supply and tube-well boring in Muzaffarpur town with Government grant and Viceroy's Relief Funds. Mr. Oliff Lee, Town Engineer took up construction of colony sheds and made them available to the sufferers and homeless. Relief was also given in the shape of clothing, foodgrains and housing materials. Drinking water in watering lorries was supplied by the municipality to the sufferers in colonies and shelter sheds.

The Indian Medical Association had also sent a batch of workers for giving first-aid and medical relief. Free kitchens were started by Gurmukh Langer Relief Committee which fed not less than a thousand of earthquake sufferers every day. The demolition of the dangerous houses affected by the earthquake was taken up by the Sappers and Miners who were posted here from Rurki. The Governor of Bihar arranged with General Mackmullen, General Officer Commanding, Eastern Command at Jhansi for a party of 70 men for Muzaffarpur for

the purpose of demolishing buildings and doing repairs to bridges. They were replenished by further detachments. Municipality was given grants to take up road-widening schemes. Help in the shape of money and materials poured into the district and all possible endeavour was done to minimise the miseries of the people. When things settled down the economic condition of the district got a little fillip in the shape of reconstruction activities. Cleaner areas and better modelled houses and roads grew up.

The district and particularly the urban areas could recover so quickly because there was an all-round keenness to tackle the misery and the State Government got unrestricted support from all sections of the public. The Bihar earthquake commanded interest and sympathy not only from all parts of India but also from some of the philanthropic bodies from different parts of the world.