

Rani blocks have stony soils with *kankur*. The boulders are strewn all over and soil cover is very thin. In other parts of these blocks, the soil is sandy, sandy loam and loam. In other blocks, the soils are clay or clay loam. There is no problem of alkalinity or salinity in the district.

In general, the soils are deficient in nitrogen and organic matter, but the phosphorus and potash contents range from low to medium. Therefore, for obtaining good yields, the soils need heavy manuring with nitrogen and phosphate. It is further obvious that on account of lack of the organic matter, the soils should also be treated with organic matter like farm yard manure, compost and green manure.

Crops

The crops grown in the district are divided into two main categories, viz. kharif and rabi, locally called as *sawani* and *sadhi*. The former is the summer season harvest and the latter the winter season harvest. Any crop which does not strictly fall within these two harvests is known as a *zaid* crop and its harvest is called the *zaid kharif* or *zaid rabi*, according to the harvest with which it is assessed. *Toria* (an oilseed) is cultivated as *zaid kharif* and vegetables, melon and green fodder as *zaid rabi*.

The major kharif crops are sugarcane, groundnut, paddy and maize, while the minor ones or subsidiary crops are chillies, cotton, *bajra*, *jowar*, pulses (*arhar*, *moong*, *mash* and *moth*), vegetables, *til* and *sani*. The major rabi crops are wheat, gram, barley and oilseeds (*sarson* and *toria*) while the minor ones are *massar*, *berseem*, *methi*, potato, onion and other winter vegetables.

Sugarcane, cotton, chillies, potato, onion, vegetables and oilseeds are main cash crops of the district. Vegetables are generally cultivated near the towns where there is great demand for these. Some particulars about the crops grown in the district are given below:

Name of Crop	Local Name	Climate Suitable	Soil Required	Area of the District Where Grown
1	2	3	4	5
1. Paddy	<i>Ziri</i>	Hot-wet	Clay or clay loam	Throughout the district
2. Maize	<i>Makai</i>	-do-	Loam (well-drained)	-do-
3. <i>Bajra</i>	<i>Bajra</i>	Hot	Sandy or sandy loam (well-drained)	Ambala, Jagadhri and Narayangarh tahsils

1	2	3	4	5
4. Wheat	<i>Kanak</i>	Cold	Loam (well-drained)	Throughout the district
5. Gram	<i>Chhole</i>	Cold	(Well-drained) sandy loam, clay loam or all other poor soils	-do-
6. Barley	<i>Jaun</i>	Cold	Sandy loam and loam (well-drain- ed)	Ambala and Narayangarh tahsils
7. Groundnut	<i>Moong- phali</i>	Hot wet	Sandy (well- drained)	Narayangarh and Ambala tahsils
8. Sugarcane	<i>Ganna</i>	Hot wet	Loam and clay loam	Throughout the district

Hill Crops.—A few crops are grown in the Morni hills and other small hills section of Kalka and Jagadhri tahsils which are not found elsewhere in the district. The commonest are the cereal, *mandya* (*eleusine corocana*); the pulses, *kulthi* (*dolichos uniflours*) and ginger (*zingiber officinalis*).

Tables VIII to XI of Appendix give details about the sowing and harvesting of kharif and rabi crops ; the area under principal crops ; the yield per hectare and the production of principal crops from 1974-75 to 1977-78.

Foodgrain Crops

Paddy.—It is a major kharif crop. The area under paddy cultivation has increased considerably. In 1950-51, the area under this crop was only 26 thousand hectares. It rose to 52 thousand hectares in 1977-78. The district ranks third in the production of rice in the state. The main producing areas are Jagadhri block, Chhachhrauli block, Barara block, Ambala block and a part of Narayangarh block. The increase has been relatively more in the Jagadhri and Barara blocks due to increased irrigation facilities. The popular varieties grown are high yielding IR-8, IR-106, Pusa 2-21, Jaya and local improved Jhona-349 and Jhona-351, Basmati-217 and Basmati-370.

Maize.—It is the second major kharif foodgrain crop. The area under maize which was only 16.5 thousand hectares in 1950-51 rose to 44 thousand

hectares in 1977-78 thus registering 166.7 per cent increase over the period. The main varieties grown are hybrid, Ganga-5 and Ganga-1 and composite Vijay and Sona. But the local varieties of maize are still grown in many areas.

Bajra.—*Bajra* is mostly grown in *barani* areas of Raipur Rani, Bilaspur and Barara blocks. The area under this crop fluctuates every year depending on the intensity of rainfall. The area under *bajra* was 6.9 thousand hectares in 1950-51, 9.3 thousand hectares in 1955-56, 4.9 thousand hectares in 1960-61, 6 thousand hectares in 1965-66 and again 6 thousand hectares in 1974-75. It was 4 thousand hectares in 1977-78. The most common varieties grown in this district are Hybrid Bajra No. 1, Hybrid Bajra No. 4 and B.J.-104. Because of higher yield potential hybrid varieties are rapidly replacing the local varieties.

Wheat.—Wheat is the principal rabi foodgrain crop. It is grown in both *barani* (unirrigated) and irrigated areas. The area under this crop was 51 thousand hectares in 1950-51; rose to 54 thousand hectares in 1965-66 but sharply increased thereafter and was 97 thousand hectares in 1977-78. The increase in the acreage is largely due to increase in irrigated area and the introduction of new local and exotic high-yielding varieties.

The main high yielding varieties grown in the district are Kalyan, Sona (K-227), Sonalika (S-308), HD-2004, P.V.-18, H.D.M. 1553 and C-306.

Gram.—This is also an important rabi foodgrain crop. It forms a good diet both for human beings and cattle. It is mostly grown under *barani* conditions and therefore its acreage shows wide variation from year to year. The area under this crops was 48.4 thousand hectares in 1960-61 and though it dwindled to 39 thousand hectares in 1965-66 and further to 43 thousand hectares in 1971-72, it showed a decline during the subsequent years and was 39 thousand hectares in 1977-78. The important varieties grown in the district are PB-7, G-104, C-235 and S-26.

Barley.—Barley, though not an important crop of the district, was grown in 3 thousand hectares in 1977-78. The main varieties of this crop in the district are C-138 and C-164.

Commercial Crops

Sugarcane.—It is the most important cash crop of the district and is grown almost in all the tahsils, specially under irrigated conditions. There has been a great increase in the acreage under sugarcane since 1950-51. The area under sugarcane rose from 9.55 thousand hectares in 1950-51 to 36 thousand hectares in 1977-78. The main varieties of sugarcane grown in the district are Co. 1148, Co. 975, Co. 453 and Co. 212. Emphasis is being laid on covering different areas with early varieties like Co. 129, Co. J 58,

mid season variety like Co. 975 and late varieties like Co. 1148 and Co. J 39 so as to extend the sugar factory season.

Cotton.—Cotton which was earlier an important cash crop of the district is losing its importance due to heavy rainfall conditions during the growth period of the plants. This crop has two main varieties, Desi and American. The area under cotton has decreased over the years. The acreage under cotton (Desi and American) was 4.60 thousand hectares in 1955-56 and has decreased to 2 thousand hectares in 1977-78. The main varieties of cotton grown in the district are G2—7, H—14 and J—34.

Potato.—It is another important cash crop and is sown under irrigated and high fertility soil conditions both in winter and spring but the autumn crop covers more area. There has been a considerable increase in the area under potatoes. The area under this crop which was only 690 hectares in 1965-66 increased to 3,700 hectares in 1977-78. The increase in acreage has been more significant in the last few years. The main varieties grown in the district are Patna, Gola, Uptodate, Kufri Sanduri, Kufri Seetman and Chandermukhi.

Chillies.—Chillies are grown mostly in Ambala tahsil. The area under this crop was only 600 hectares in 1950-51, it rose to 870 hectares in 1960-61 and 2,501 hectares in 1977-78. Thus there has been a considerable increase in area under this crop over the period.

Among the minor crops, mention may be made of onion, tobacco and vegetables. The area under vegetables increased significantly from 1,065 hectares in 1962-63 to 4,162 hectares in 1977-78.

Oilseeds.—Groundnut and *til* are the oilseed crop of kharif and *toria* and *sarson* of rabi.

Groundnut is mainly grown in the sandy loam to sandy soils of Narayan-garh tahsil. It is grown under unirrigated conditions. The area under this crop which was 1,590 hectares in 1950-51 increased to 3,120 hectares in 1960-61 and to 7,676 hectares in 1977-78.

The area under *toria* and *sarson* and *til* during 1950-51, 1965-66, 1974-75 and 1977-78 was as follows :—

Crop	Area (Hectares)			
	1950-51	1965-66	1974-75	1977-78
<i>Toria</i> and <i>Sarson</i>	4,980	3,520	8,000	7,258
<i>Til</i>	260	190	950	596

Pulses.—*Arhar*, *mash* (*urd*) and *massar* are the three main pulses grown throughout the district. *Arhar* is generally grown as mixed crop with groundnut in unirrigated conditions during kharif. *Mash* is grown with *til*. *Massar* is grown as pulse during rabi, mostly in unirrigated conditions. These pulses are grown in all types of soils. *Moong* is also grown in few blocks of the district, but its acreage is very low.

The varieties of different pulses grown in the district are *arhar*; and Prabhat, *mash*; Mash 48, Mash 1-1, Mash T-9; *moong*; No. 54 Shining Moong No. 1 and *massar*; No. 9-12, No. TT. 3 T-35.

Hill Crops.—*Kulthi*, *mandva* and ginger are important hill crops of the district. All are kharif crops.

Kulthi is most important hill crop of the district. It is grown in hilly areas of Kalka and Narayangarh tahsils. The area under this crop in 1977-78 was 220 hectares.

Ginger is also grown in the hilly areas of Kalka and Narayangarh tahsils. The area under this crop in 1977-78 was 38 hectares.

Mandva is grown in Jagadhri and Narayangarh tahsil. The area under this crop in 1977-78 was 26 hectares.

Fodder Crops

About 12 per cent of the total cropped area of the district is under fodder crops. Apart from these crops, the stalks of *bajra*, *jowar* and maize and the chaff of wheat, gram and minor cereals are used as animal food. The forage crops are generally sown in the unirrigated area in the kharif season and irrigated condition in the rabi. The important among fodder crops are *chari*, green maize, *gwara*, *javee*, *berseem* and lucerne. Of these, *chari* is the leading crop in kharif and *berseem* in rabi. The following table gives the area under different fodder crops from 1971-72 to 1977-78 :—

		(Hectares)					
Fodder Crops	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
(a) Kharif Crops—							
<i>Jowar (Chari)</i>	22,485	25,472	20,028	23,300	24,472	27,954	26,183
<i>Gwara</i>	2,386	1,196	—	1,668	1,035	800	994
Other fodders	6,562	10,961	10,708	8,555	11,130	8,010	8,687
Total (a)	31,433	37,629	30,736	33,523	36,637	36,764	35,864
(b) Rabi Crops—							
<i>Berseem</i>	7,410	1,478	3,738	2,621	3,078	4,349	6,163
Oats	1,951	341	1,000	586	1,252	616	1,273
Other fodders	..	6,781	4,608	6,175	6,533	5,108	4,079
Total (b)	9,361	8,600	9,346	9,382	10,863	10,073	11,515
Grand Total (a)+(b)	40,794	46,229	40,082	42,905	47,500	46,837	47,379

An area of about 6,000 hectares was under permanent pastures and grazing land during 1969-70, which decreased to 3,300 hectares in 1977-78. There has been decrease in the area under permanent pastures and grazing land over the period because some pasture lands have been brought under cultivation.

Agricultural Production and High Yielding Varieties

As the maximum land has been brought under cultivation, a substantial increase in the agricultural production has occurred as a result of use of high yielding varieties of seeds, balanced dose of fertilizers, optimum irrigation and plant protection measures. The high yielding varieties programme was begun in the district in 1966-67, when Maxican varieties of wheat, high yielding varieties of paddy, hybrid maize and *hajra* were propagated and maximum area was brought under these varieties. The year-wise area under high yielding varieties since 1970-71 is given below :

(Hectares)

Year	High Yielding Variety of Wheat	Hybrid Maize	High Yielding Variety of Paddy	Hybrid <i>Bajra</i>	Total
1970-71	62,650	5,100	4,500	3,000	72,350
1971-72	70,000	5,000	12,000	500	87,500
1972-73	85,500	5,000	21,000	2,000	1,13,500
1973-74	98,008	5,000	21,050	987	1,25,045
1974-75	95,000	5,000	18,000	1,000	1,10,000
1975-76	98,000	4,200	25,000	700	1,27,900
1976-77	95,822	7,178	35,044	885	1,32,929
1977-78	95,954	542	23,775	64	1,20,137

The average yield has also increased substantially and ultimately the total production has increased in the district. Table X of the Appendix indicates the average yield of important crops during the years 1974-75 to 1977-78.

Fruit Crops and Gardens

Agro-climatic conditions are quite favourable for fruit cultivation in the Ambala district. The district enjoys special advantage for the plantation of mangoes in the south-western region. Apart from mango in the south-western region, guava, litchi, *chiku* and *loquat* are grown on commercial scale in the northern part of the district, particularly in Kalka tahsil. Pedigreed fruit plants are

supplied from the nursery of the Yadvindra Garden, Pinjore and other registered nurseries. The area under fruit trees has decreased considerably since 1967-68. It decreased from 3,102 hectares in 1967-68 to 1,400 hectares in 1977-78. A number of schemes have been taken up for the promotion of fruit cultivation in the district. Horticulture inspectors are posted at each block, to impart technical guidance to cultivators interested in fruit cultivation. Long-term loans are advanced to the growers under the 'Development of Horticulture' scheme.

Agricultural Implements

Improved agricultural implements and machines play a vital role in increasing the agricultural production. The farmers are gradually mechanising agriculture and adopting improved implements in accordance with their utility and scope for use. The brief description of agricultural implements used by farmers in the district is given below :

Plough.—It is made of wood or iron, the wooden one is generally of *kikar* wood, made by a carpenter. It scratches the soil up to 4 or 5 inches. In small land-holdings, fragmented and non-contiguous plots, this plough is very much suited and it does not disturb the level of the land. Of late, the use of the iron plough has become more popular as the figures indicate. In 1961 there were 46,060 wooden and 13,211 iron ploughs in the district. The number of wooden ploughs decreased to 43,372 and that of iron ploughs increased to 34,075 in 1966. The number of wooden ploughs further decreased to 24,226 and that of iron ploughs increased to 43,154 in 1972. In 1977 there were 15,162 wooden ploughs and 45,833 iron ploughs.

Tractors.—The use of a tractor, though limited to a few big farmers, is becoming increasingly popular. The district had only 388 tractors in 1960-61. The number increased to 531 in 1966-67 and 3,238 in 1977-78. Almost all types of tractors manufactured in the country are operating in the district.

Bullock cart.—This is the traditional load carrying device of the farmer. It is commonly used for carrying the farm produce to the threshing ground, grains to the homestead and surplus to the market, and even for a means of transport. The wooden wheel carts are being gradually replaced by pneumatic tyre carts. There were 23,080 carts in the district in 1961, 25,098 in 1966, 23,832 in 1972 and 24,886 in 1977.

Cane-Crusher.—It is another important agricultural implement used for crushing the cane. Wooden crushers, in vogue before Independence, have been replaced by steel crushers although their number has remained more or less the same. Much of the sugarcane produced in factory area is supplied to sugar mill at Yamunanagar and the rest is crushed locally for making *gur* or

khandsari. There were 760 cane-crushers in the district in 1961, 776 in 1966, 631 in 1972 and 810 in 1977.

Other implements.—A number of other tools and implements such as spade, *kasola*, *pora*, *kulhari* (axe), *dranti* (sickle) and seed drills are used. Although the scope of mechanised farming is limited because of the small land holdings, the modern implements are being gradually adopted by the farmers. The traditional system of threshing wheat under the feet of bullocks has almost been discarded in many parts of the district, in favour of the mechanised method through power threshers operated by the tractors or small motors. The farmers have adopted the improved implements, such as disc harrows, power thresher and seed-cum-fertilizer drills. The district produces agricultural implements sufficient to meet its own requirements.

Seeds

The Agriculture Department plays an important role in publicising the use of improved seeds. It also concentrates on multiplying and distributing improved seeds to the farmers. The better yielding varieties of some seeds are as under :

Wheat	..	Local improved variety	..	C-281, C-273 and C-306
		High yielding variety	..	Kalyan, Sona, Sonalika and PV 18
Paddy	..	Local improved variety	..	Jhona 349, Jhona 351, Basmati 217 and Basmati 370
		High yielding variety	..	TN I, IR 8 and IR-8-68, Jaya
Gram	..	PB. 7 and S 26		
Maize	..	Hybrid, Ganga 5 and Composite Vijay and Sona.		
Barley	..	C 138 and C 164		
Sugarcane	..	Co. 453, Co. L 29, Co. L 9 and Co. L 975, Co. S 46 and Co. 1148		
<i>Bajra</i>	..	Local improved variety		T 55, A 1/3 and S. 530
		High yielding variety		Hybrid Bajra No. 1 and 4
<i>Jowar</i>	..	J.S. 263, J.S. 20 and J.S. 21		

The seed is procured from National Seeds Corporation, Haryana Seeds Development Corporation, agricultural universities and the farms set up by the government.

The quantities of improved seeds distributed by the Agriculture Department in the district during 1967-68 to 1977-78 are given in the table below :

Year	Seeds Distributed by Agriculture Department
	(Quintals)
1967-68	1,938
1968-69	2,649
1969-70	1,852
1970-71	2,225
1971-72	1,500
1972-73	1,648
1973-74	984
1974-75	1,394
1975-76	1,703
1976-77	3,295
1977-78	4,421

Manures and Chemical Fertilisers

The use of manures and fertilizers has increased considerably in the past few years. The farmers use compost, farm-yard manure and chemical fertilizers to increase agricultural production. Night-soil and other urban wastes were neglected earlier, as the people did not like to use them due to social prejudices. Now these are being used in considerable quantities. Green manuring with leguminous crops add to fertility of the soil. Among all kinds of manuring practices, green-manuring has been found to be the cheapest. Chemical fertilizers are very useful for foodgrain crops.

The following figures regarding the distribution of chemical fertilizers show that the use of chemical fertilizers is steadily becoming more and more

popular among the cultivators of the district and it has increased manifold during 1967-68 to 1977-78 :—

Year	Chemical Fertilizers Distributed (Metric tonnes)			
	Nitrogenous	Phosphatic	Potash	Total
1967-68	20,720	2,559	166	23,445
1968-69	29,234	6,246	292	35,772
1969-70	34,151	3,504	500	38,155
1970-71	39,227	7,335	765	47,327
1971-72	49,421	8,264	852	58,537
1972-73	56,408	10,003	918	67,329
1973-74	55,692	15,882	1,351	72,895
1974-75	41,910	6,728	717	49,355
1975-76	52,460	5,934	768	59,162
1976-77	69,020	13,584	1,738	84,342
1977-78	87,450	21,192	2,484	1,11,126

Compost Manure

Urban Compost.—Urban waste are a potential source of plant-food ingredients. Efforts have been made in the past few years to conserve these wastes for manurial purpose. The municipalities of Ambala City, Kalka, Yamunanagar, Jagadhri, Notified Area Committee, Chhachhrauli and Cantonment Board, Ambala Cantonment are producing urban compost. Compost produced at these places is sold to the farmers. The government advances subsidies to the local bodies for the initiation and intensification of compost work.

Rural Compost.—The preparation of compost manure in the rural areas is also promoted. The extension workers for manure advise the farmers in villages for the preparation of compost and train them in the technique of scientific composting.

The progress in respect of compost production (urban and rural) from 1969-70 to 1977-78 shown by the figures below does not appear to be satisfactory:

Year	Compost Prepared (Metric tonnes)	Compost Utilized (Metric tonnes)
1969-70	5,64,000	4,23,000
1970-71	7,78,000	5,78,000
1971-72	5,99,000	4,55,000
1972-73	3,72,000	2,71,000
1973-74	4,93,261	4,35,942
1974-75	5,42,990	4,83,096
1975-76	3,61,800	3,53,500
1976-77	2,98,480	2,90,850
1977-78	3,16,482	3,03,320

Green-Manuring.—Green manuring is very important for soil fertility as it directly adds nitrogen to the soil. It also improves soil texture by addition of humus or organic matter. The addition of organic matter improves both heavy and sandy soils, for it has a binding effect on loose particles of sandy soil and makes tough and heavy soil friable. The water holding capacity of the soil also increases. Further, it creates better conditions for the increase of useful bacteria in the soil. The practice of green-manuring with sunn-hemp, *gwara* and *dhaincha* is being steadily popularised.

The area under green-manuring in the district is increasing year by year as is evident from the following figures :—

Year	Area under Green- Manuring (Hectares)
1970-71	522
1971-72	584
1972-73	415
1973-74	595
1974-75	715
1975-76	810
1976-77	1,120
1977-78	1,370

Crop Rotation

Two crops in a year is the common practice in areas of assured water supply. In swampy lands where nothing but rice can be grown, the fields were left fallow during rabi. With the adoption of intensive cultivation, the majority of such areas are now put under rabi crops also. In *barani* areas single cropping is still in vogue where either kharif or rabi is sown. However, when rains in September-October are adequate, gram, wheat and gram mixture, *sarson* or *toria* are sown. Mixed crops are commonly grown in *barani* tracts. Gram and wheat or gram and barley with rows of *sarson* or *toria* are sown mixed to provide safeguards against uncertainty of weather. Rows of *sarson* are drawn in wheat fields. *Sarson*, thus, sown is removed early for fodder and wheat is allowed to grow. It is a common practice to grow pulses which are short growing crops along with kharif cereals. i.e., *mash* is grown with maize and *moong* with *jowar-bajra*.

The rotation varies from soil to soil and it differs under irrigated and *barani* conditions. The general rotation of crops followed by the farmers is given below :

- (1) Wheat-fallow-*toria*-cotton
- (2) Rice-*berseem*-rice-wheat
- (3) Rice-wheat-gram-rice-wheat
- (4) Maize-*berseem*-maize-wheat
- (5) Wheat-*chari*-gram-maize
- (6) Wheat-cotton-fallow-*toria*-sugarcane
- (7) Cotton-*berseem*-maize-wheat
- (8) Wheat-*toria*-sugarcane
- (9) Maize-wheat-maize-wheat
- (10) Wheat-*bajra-chari*-fallow-wheat
- (11) Wheat-*bajra-chari*-gram
- (12) Maize-potato-onion
- (13) Maize-potato-potato

Pests and Disesses and Plant Protection

The crops are occasionally exposed to damages from the following diseases and pests :—

- (1) Crop Pests and Diseases
 - (a) Sugarcane top-borer
 - (b) Sugarcane stem-borer

These pests and diseases attack the standing crops and stored grains with varying intensity. The Agriculture Department is educating the farmers through intensive propaganda, the different measures to control or reduce the damage caused by these weeds. Legal action under the East Punjab Agricultural Pests, Diseases and Noxious Weeds Act, 1949, can be taken against the cultivators who do not eradicate weeds, pests and diseases before the maturing of seeds.

The plant protection work has become very important in the modern agricultural technology as pests and diseases attack the crops from the time of sowing to the time of harvesting. Farmers have become conscious to protect their crops against the pests and diseases. High yielding variety crops are more prone to various pests and diseases. The Assistant Plant Protection Officer, Ambala looks after the plant protection work in the district. He is assisted by three Plant Protection Inspectors stationed at Ambala, Narayangarh and Yamunanagar. Sufficient stocks of pesticides/fungicides are available with Plant Protection Inspectors. Plant protection equipments provided to the Inspectors are loaned to the farmers against nominal charges. Aerial spraying campaigns are arranged to control the pyrilla. The work of pyrilla control is done in Yamunanagar area in collaboration with sugar mill authorities. In 1968-69, there was a heavy attack of pyrilla and the government protected the sugarcane crop by aerial spraying operations in 65,248 acres. In 1975, the aerial crop spraying base was located at Kalka aerodrome.

The plant protection work has caught rapid momentum after the creation of Haryana as is evident from the table given below :

Items	1967-68	1968-69	1969-70	1970-71
1	2	3	4	5
Use of Pesticides (Liquid) Litres ..	2,200	2,750	2,900	3,500
Use of Pesticides (Solid) Kgs ..	14,000	15,500	17,000	20,000
Area Controlled (Acres) ..	15,222	50,432	1,05,537	1,10,000

1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
6	7	8	9	10	11	12
42,600	5,78,300	7,032	3,748	4,630	7,179	4,896
53,552	26,200	12,900	14,867	27,153	36,035	34,706
2,35,410	1,58,151	2,17,059	1,17,504	1,45,523	1,70,418	1,91,030

Before the introduction of high yielding varieties of various crops, plant protection work was restricted to a limited area. In the beginning, to popularise the use of pesticides and fungicides, a subsidy was also given, but during the Fourth Five-Year Plan the subsidy was stopped. However, for the aerial spraying, a subsidy of 50 per cent is still available.

As is evident from the figures given below, the district has made considerable progress in weed control and rodent control :—

Year	Weed Control (Hectares)	Rat Control (Hectares)
1953-54	49,800	44,270
1965-66	1,38,210	1,41,215
1966-67	80,530	1,50,000
1967-68	82,640	1,71,315
1968-69	85,330	2,21,114
1969-70	87,510	2,35,758
1970-71	90,500	2,40,000
1971-72	1,00,000	2,41,000
1972-73	33,098	1,20,161
1973-74	43,760	42,870
1974-75	11,150	1,62,086
1975-76	9,260	1,18,250
1976-77	14,565	2,00,000
1977-78	16,785	11,25,600

Agricultural Co-operatives

It is through co-operative farming that the scanty resources of the agriculturists can be pooled thus bringing to them the gains of large scale intensive farming. It is with this aim that co-operative societies are formed. In 1978, the total number of co-operative societies of all types excluding industrial co-operative societies were 829 with a membership of 3.29 lakh. Their owned funds and working capital amounted to 7.01 crore and 35.98 crore,

respectively. All the inhabited villages of the district were covered with one or the other type of the co-operative society. For meeting the credit, fertilizers and consumer goods requirements, there were 289 agriculture credit and service societies with the total membership of 1.09 lakh in June, 1978. These societies advanced short and medium term loans to the extent of Rs. 9.61 crore during 1977-78. Besides, in 1977-78, these societies distributed 939 tonnes of fertilizers through a net work of 84 regular sub-depots in the district. The consumer goods worth Rs 89.27 lakh were also supplied by the agricultural credit and service co-operative societies. Their owned funds and working capital were Rs. 2.51 crore and Rs 12.76 crore, respectively in June, 1978. These societies had also constructed 41 rural godowns by 1978. The Ambala Central Co-operative Bank Ltd., Ambala¹ with its 17 branches lends funds to member societies.

Joint farming and collective farming societies have also been organised. The government provides loans and assistance to these societies. Most of these societies organised in the district are of landless labourers some of whom have been given waste land. The total number of farming societies in the district as in June 1978 was 38 with membership of 436.

The other agricultural co-operatives in the field are co-operative marketing societies, garden colonies societies, irrigation societies, poultry societies, dairy and milk supply societies and cattle breeding societies. The number, membership, owned funds and working capital of these societies in the year 1978 as given below, indicate that sugarcane and dairy milk societies are doing well:

Type of Societies	Number	Membership	Owned Funds (Rs. in lakhs)	Working Capital (Rs. in lakhs)
Marketing ..	7	4,001	55.11	144.27
Garden Colonies ..	1	61	0.21	0.18
Irrigation ..	3	35	0.16	0.14
Poultry ..	26	438	0.29	0.69
Dairy and Milk Supply ..	177	13,495	11.61	34.95
Other Agricultural Non-credit ..	68	2,114	1.54	5.10
Sugarcane ..	7	21,800	18.53	21.80
Other Processing ..	1	18	0.01	0.01
Milk Unions ..	1	97	2.77	2.67
Total ..	291	42,059	90.23	209.81

1. For more details regarding the functioning of the Co-operative Bank, see Chapter on 'Banking, Trade and Commerce.'

STATE ASSISTANCE TO AGRICULTURE

It comprises subsidies, *taccavi* loans and other loans advanced to the agriculturists. The loans thus advanced during the period 1967-68 to 1977-78 are detailed in Table XII of Appendix.

DEVELOPMENT OF SMALL FARMERS, MARGINAL FARMERS AND AGRICULTURAL LABOURERS

The small landholders were not able to participate in the agricultural production programmes on account of various factors like the lack of credit worthiness, lack of security for obtaining long-term land improvement loans and lack of contact with the extension agencies and their backwardness. Realising this situation, the Government of India started a pilot project for providing credit security and subsidies on high cost capital based programmes to small farmers, marginal farmers and agricultural labourers and established two agencies, viz. Small Farmers Development Agency, and Marginal Farmers and Agricultural Labourers Agency in Ambala district. The main emphasis in the scheme was to provide assistance to these classes of farmers and labourers for creation of infrastructural support. This consisted of sinking of deep tubewells on community basis, creation of marketing and processing complexes, providing employment to landless labourers, assistance to artisans and subsidy to really deserving small and marginal farmers and agricultural labourers for land development and reclamation, agricultural implements, fruit seedlings, dairying, sheep breeding, poultry farming, piggery farming, etc.

The Small Farmers Development Agency (SFDA), Ambala which was established in September, 1970 with its headquarters at Ambala is looked after by a Chief Executive Officer assisted by three Project Officers, one each for development, animal husbandry and agriculture. The Marginal Farmers and Agricultural Labourers Agency (MFAL) was established in Ambala in 1971. This agency covered the development blocks of Ambala and Pinjore initially but later in 1973 extended its activities to Barara block also. Marginal Farmers and Agricultural Labourers Agency (MFAL) functioned up to March, 1976 and in April, 1976, it was merged with Small Farmers Development Agency (SFDA). Thereafter, the Small Farmers Development Agency (SFDA) covered small farmers, marginal farmers and landless agricultural labourers in all the blocks of Ambala district. The progress and achievement of the SFDA during 1976-77 and 1977-78 is given in Table XIII of Appendix.

The Agency has done good work and has shown that if special attention is paid to the interest of the small farmers, marginal farmers and agricultural labourers, they can not only be effectively involved in the agronomic revolution to increase production, but their economic condition can also be improved.

ANIMAL HUSBANDRY

Animal husbandry in the district is looked after by the Deputy Director, Intensive Cattle Development Project, Ambala. He is assisted by two Assistant

Directors (Special Livestock Programme) three Sub-Divisional Officers (Animal Husbandry), Semen Bank Officer, Assistant Poultry Development Officer, Piggery Development Officer, a team of Veterinary Surgeons, Stock Assistants, Veterinary Compounders and Field Assistants. His main activities relate to cattle breeding artificial insemination work, control of contagious diseases among livestock, improvement of livestock and provision of veterinary aid.

The district possesses a fairly large number of livestock including cattle, buffaloes horses and ponies, sheep, goats, donkeys, mules, camels, and pigs and ranks fifth among all the districts of the state. The climate of the district is suitable for livestock breeding. The livestock population of the district as per 1966 and 1977 censuses was 5.28 lakh and 6.22 lakh, respectively. It recorded an increase of over 17 per cent during the period 1966-77. The tahsil-wise figures of livestock as per Livestock Census of 1977 are given in Table XIV of Appendix.

Cattle and Buffaloes.—Animals, especially cattle and buffaloes, play an important role in the economy of the district, and animal husbandry forms an integral part of agriculture. Most of the farmers in the district have a pair of oxen to do the ploughing and to draw the cart. Although bullocks are being replaced by motor and electric power in some areas, yet the importance of cattle in the agricultural economy of the district remains unchanged.

The cattle and buffalo population which numbered 5.32 lakh in 1977 accounted for 85.5 per cent of the total livestock. Out of 2.69 lakh cattle and 2.63 lakh buffaloes, the breedable (i.e. female) population of cows and buffaloes was 0.79 lakh and 1.42 lakh, respectively. Their relative figures vis-a-vis those of their male counterparts are shown below:

(In thousands)

	Female Above Three Years				Male Above Three Years		Total
	In Milk	Dry	Not Calved	Others	Breeding Bulls	Others	
Cows	41	33	5	1	Less than one thousand	107	269
Buffaloes	93	41	8	1	Less than one thousand	10	63

The district has been populated predominantly with non-descript cattle of mixed breeds. Before the formation of Haryana in 1966, limited efforts were made to improve the quality of non-descript stock by establishing a key village block at Jagadhri with one artificial insemination centre and six key

village units. The scheme envisaged artificial insemination and controlled breeding through castration of scrub bulls. In 1967-68, it was felt that stock could be improved more beneficially by cross-breeding the cows. To promote crossbred cows, exotic bulls known for their high milk yield were more useful. Accordingly, in October, 1967, a Jersey cross-breeding station was established at Jagadhri, initially with import of two Jersey bulls of high pedigree from Jersey Farm, Katola (H.P.). This number was further increased by the import of four more Jersey bulls from Australia in 1969. Cross-breeding, artificial insemination services were extended through six new Jersey artificial insemination centres, 24 Jersey sub-centres, one artificial insemination centre and six key village units and one urban artificial insemination centre under key village scheme over a phased programme from 1967-68 to 1970-71. The programme was successful but coverage was limited. Hence an intensive cattle development project for improved scientific breeding was launched in February, 1973. The scheme envisaged systematic planned method for best utilisation of superior germs plasma through proper distribution by adopting artificial insemination technique, disease control and fodder management. To provide breeding facilities promptly and effectively and to penetrate the benefits of the latest policy of breeding to interior rural areas of the district, 12 centres and 78 sub-centres for artificial insemination were working in 1977-78. For list see Table XV of Appendix.

The results of artificial insemination done during 1974-75 to 1977-78 are given below:

Year	Artificial Insemination Done		Calves Born Through Artificial Insemination	
	Cows	Buffaloes	Cows	Buffaloes
1974-75	22,547	11,051	4,249	2,529
1975-76	27,882	9,649	5,368	2,364
1976-77	26,836	8,784	6,129	2,729
1977-78	24,000	6,840	5,530	2,488

To upgrade the buffalo stock, 5 Murrah buffalo bulls of improved quality have been kept for artificial insemination.

Gaushalas and Gosadan

The ban on cow-slaughter posed a problem of old, inferior and unproductive cattle. To house these useless, unclaimed and unproductive cattle, the

government opened a *gosadan* at Mandewala. The cattle are kept here till their natural death so that these animals are saved from starvation and also to exclude the possibility of their being a hindrance in the breeding programme.

Besides, there are 3 *gaushalas* in the district at Ambala City, Ambala Cantonment and Jagadhri. These *gaushalas* were opened out of religious sentiments to house the unproductive and useless cattle. These were run on charity alone but under the *Gaushala* Development Programme, *gaushalas* at Ambala Cantonment and Jagadhri were converted into cattle breeding-cum-milk producing centres. These two *gaushalas* have become self sufficient with the income from the sale of milk. The government is also providing technical guidance and financial assistance to these *gaushalas*.

Sheep-Breeding.—The district with a sheep population of 23 thousand does not have much scope for the development of sheep and consequently of wool industry. However, Morni hill area has the possibility for sheep development.

Poultry Farming

According to the Livestock Census of 1977, there were 3.2 lakh poultry birds in the district.

The poultry extension programme is carried through a Poultry Farm, Ambala and three poultry extension centres at Jagadhri, Pinjore and Narayanagarh. The poultry Farm, Ambala provides the facilities of determining the sex of the new born chickens, hatching of eggs on nominal charges and poultry training to interested persons in raising poultry on scientific lines. These facilities have promoted poultry farming in the district and many new farms have been opened. The farm is also engaged in an expansion programme of improving breed. A duck breeding unit and a small partridge unit is also functioning at the poultry Farm, Ambala.

Piggery

The district had 16 thousand pigs according to 1977 Census. Earlier, no improvement in the breed could be brought about since only Harijans with meagre resources and indigenous stock were engaged in pig breeding. As a part of the piggery development programme, the government opened a Pig Breeding Farm at Ambala in 1967-68 where exotic breed of white large Yorkshire pigs are kept for multiplication and issue of improved strain for upgrading the country pig cross-bred stock. The breeders are issued pigs of exotic strain on subsidized rates. A feed subsidy is also given to the breeders for raising pure improved stock.

To enlighten the breeders with the latest scientific method of pig raising and cross-breeding, training facilities have been made available at Pig Breeding

Farm, Ambala and two piggery expansion units at Devinagar and Yamunanagar. About 200 persons are imparted training in pig raising every year.

A pilot pork processing plant was set up at Pig Breeding Farm, Ambala during 1971-72 for manufacturing various pork products. The plant was closed in 1974-75.

Animal Diseases and Veterinary Hospitals

The common animal diseases prevalent in the district are haemorrhagic septicaemia, rinderpest, foot and mouth disease, surra, black quarter and fowlpox. These diseases are controlled with prophylactic vaccinations and curative measures. Regular campaigns of inoculation and vaccination against these diseases are conducted. The following figures show the progress of the work done for the disease control in the district during 1972-73 to 1977-78 :—

Particulars	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Animals brought to hospitals and treated..	94,917	93,259	7,16,602	81,125	78,061	90,118
Animals not brought to hospitals but supplied with medicine ..	9,782	12,123	21,208	200	121	—
Contagious disease cases treated ..	122	8,675	4	29	40	5,350
Castration performed	5,316	3,685	4,216	2,216	1,042	1,553

Veterinary hospitals.—In 1923-24, each tahsil headquarters in the district had a veterinary dispensary.¹ A number of veterinary hospitals and dispensaries were opened in the subsequent years. In March, 1978, there was a net work of 15 veterinary hospitals, 12 veterinary dispensaries, two semen banks shown in table XVI of Appendix to provide veterinary aid to the livestock in the district. A veterinary hospital functions under the charge of a Veterinary Surgeon who is assisted by a Compounder or Stock Assistant, while a veterinary dispensary functions under a Veterinary Compounder and a sub-centre under a Stock Assistant.

Slaughter-Houses

To ensure the availability of hygienic and disease free meat in the market for human consumption, the district has 10 recognised slaughter-houses in Ambala City, Barara, Kalka, Ambala Cantonment, Bilaspur, Jagadhri, Chhachhrauli, Yamunanagar, Sadhaura and Shahazadpur. Ante-mortem and post-mortem of all animals is carried out by the Veterinary

1. *Ambala District Gazetteer*, 1923-24, p. 93.

Surgeon. The number of animals slaughtered in the Ambala district during 1975-76 to 1977-78 is given below :

Year	Number of Animals Slaughtered
1975-76	.. 38,382
1976-77	.. 46,454
1977-78	.. 40,960

Dairy Farming

Milk is derived mostly from cows and buffaloes. According to 1977 Livestock Census the breedable population of cows and buffaloes was 72,700 and 1,11,500, respectively. The total quantity of milk produced daily in the district was estimated at 5,057.22 quintals in 1977 as compared to 2,733.17 quintals in 1966.

Though Haryana has been known for its cattle and dairy produce but the production of milk has been in small quantities by individual cultivators. These cultivators adopted cattle breeding as subsidiary to farming. As in other parts of the state, the milk trade remained disorganised in the Ambala district and prices of milk and milk products ruled high during the summer months. The dairying on modern lines was entirely absent. To develop the dairy industry on commercial lines, the Dairy Development Corporation was set up in 1970. The Corporation established a milk plant at Ambala in 1973-74 with a daily capacity of 20,000 litres of fluid milk. The plant manufactures standard bottled milk, toned bottled milk, sweetened flavoured milk, ice-cream, *paneer*, butter and ghi. A chilling centre has been established at Narayangarh from where the milk is supplied to the plant at Ambala. The milk plant has provided assured and standard milk to the consumers and a ready market for the milk produce of farmers.

The government have initiated schemes for promotion of milk production through incentives like loans at subsidised rates, subsidies to milk co-operative societies and establishment of milk collection centres within comfortable reach of producers. In 1977, there were 176 milk supply co-operatives with a total membership of 13,667 in the Ambala district. A District Producers Co-operative Union also functions at Ambala and supervises, coordinates and streamlines the activities of milk supply co-operatives, apart from supplying them balanced cattle feed at reasonable rates.

FISHERIES

The Fisheries Department in the district is represented by the Fisheries Development Officer. He is assisted by two Fisheries Officers, and other technical staff.

The natural sources of fish in the district include the Yamuna and its tributaries ; the Saraswati, the Chautang and the Rakshi ; the Markanda and its tributaries ; the Dangri (Tangri) and its tributaries ; and the Ghagghar river. Of these, the Yamuna is the most productive. Fishing rights in these rivers and streams are controlled by the state government. Tajewala and Dadupur are famous for Mahaseer fish. Besides these natural sources, fish are also available in canals, ponds and reservoirs formed by flood embankments.

Fishing rights of village ponds vests with their owners and those of panchayat ponds with the panchayats. A large number of the ponds get connected with flood channels from where fish enters into them. Fishing rights of these ponds are sold by the owners to petty fish contractors. In 1977, there were 114 ponds with a total area of 147 hectares in the district. Most of them dry up in summer due to non-supply of water. The Fisheries Department has improved a number of ponds and supplied fish seed at concessional rates. The government have also established a fish farm at Bishangarh on an area of 2 acres where fish seed is produced. Besides, a natural lake in Morni Hills known as Morni Tal covering an area of 40 hectares has been put under fish culture.

The important varieties of food fish available in the district are as follows :—

<u>Group</u>	<u>Scientific Name</u>	<u>Local Name</u>
Carp	<i>Tor putitora</i>	Mahaseer
	<i>Catla catla</i>	Katla Thaila
	<i>Labeo bata</i>	Bata
	<i>Labeo rohita</i>	Rohu
	<i>Labeo calbasu</i>	Kalbans
	<i>Labeo dyochilus</i>	Butal, Kali Machi
<i>Cirrhinus reba</i>	<i>Cirrhinus mrigala</i>	Mirgee, Naraini, Reba
	<i>Labeo dero</i>	Gidd
Cat Fishes	<i>Wallago attu</i>	Mullec
	<i>Mystus Singhala</i>	Singhara
	<i>Mystus aor</i>	Singhara
	<i>Mystus vittatus</i>	Kander

	<i>Heteropneustes fossilis</i>	Singhi
	<i>Bagarius bagarius</i>	Gonch
	<i>Rita rita</i>	Khagga
Murrels	<i>Channa marulius</i>	Soul
	<i>Channa stratus</i>	Soul
	<i>Channa gachna</i>	Douli
	<i>Channa punctatus</i>	Douli, Karrar
Feather-backs	<i>Notopterus chitala</i>	Pari, Moh
	<i>Notopterus</i>	Moh
	<i>Notopterus</i>	Pari

The average annual fish production in the district is 1,200 quintals. It is exported to U.P., Delhi and West Bengal. In 1977, the fisheries provided whole time employment to 300 persons. Besides 450 persons had fisheries as their subsidiary occupation.

FORESTRY

Ambala district has two forest divisions, Ambala Forest Division with headquarters at Ambala and Morni-Pinjore Forest Division with headquarters at Pinjore. This district falls in the North Haryana Forest Circle with headquarters at Chandigarh.

The nine forest ranges covering the district are Ambala, Kalesar, Kalsia and Jagadhri under Ambala Forest Division and Pinjore, Panchkula, Narayanagarh, Raipur Rani and Morni under Morni-Pinjore Forest Division. These ranges are further sub-divided in blocks and beats. The technical and executive staff looks after the existing forest areas, government as well as private, which are notified under section 38 of the Indian Forest Act, 1927 and sections 4 and 5 of the Land Preservation Act, 1900. Nurseries of different species listed in Table-XVII of Appendix are raised for afforestation and re-afforestation. The staff also attends to the soil conservation work and anti-erosion measures.

The forest areas of this district are largely situated in the Shiwalik hills. The following area was under forest during 1977-78 :—

<u>Classification of Forests</u>	<u>Area</u> (Hectares)
(A) Government Forests	
(i) Reserved ..	13,739
(ii) Protected ..	20,219
(iii) Unclassed ..	2,514
Strips (added in the protected forests)	
(a) Rail ..	396
(b) Roads ..	1,496
(c) Canals ..	673
(B) Private Forests	
(i) Forest area closed under sections 4 and 5 of Land Preservation Act, 1900 ..	24,412
(ii) Forest area closed under section 38 of Indian Forests Act, 1927 ..	261

Forests and their produce have a recognised place in the rural and urban economy. Forests are the source of much needed fuel for the public and timber for public utility purposes, forest based industries and for making agricultural implements. Forests provide raw material for paper industries and saw milling and packing industries.

The government have also developed forests strip along railway lines, roads and canals. Further efforts are afoot to increase the areas under forests by raising more and more plantations in the district. The acute shortage of fuel wood and timber has made the farmers conscious of the role of raising trees on farm lands as a part of farm forestry programme. The eucalyptus tree has attracted their attention because it grows fast and its interference with the crops is negligible.

Forest Produce.—The produce from the forests consists of timber, firewood, resin, *katha*, grasses and other minor forest produce. The income

derived from the sale of major and minor forest produce for the years 1967-68 to 1977-78 is shown below :

Year	Income from Forest Produce
	(Rs.)
1967-68	10,56,791
1968-69	9,96,067
1969-70	18,41,071
1970-71	21,02,605
1971-72	31,44,057
1972-73	18,03,786
1973-74	14,57,280
1974-75	20,87,327
1975-76	19,69,183
1976-77	24,50,825
1977-78	41,85,097

NATURAL CALAMITIES

Floods

The general character of the streams in the district, is that of broad sandy courses, scarcely below the surface of the country and varying in width from a hundred metres to upward of a kilometre. These are dry during the greater part of the year but pour down a formidable body of water in the rainy season. This character, they maintain for a distance, in the average of 30 kilometres below the hills. They then gradually tame down into sluggish docile streams with well defined clay banks. Eventually, almost all the streams except the Yamuna and its tributaries, unite in the Ghagghar.

The district is worst affected from overflowing of the Ghagghar, the Dangri (Tangri) and its tributaries, the Markanda and its tributaries, the Rakshi, the Chautang and the Yamuna. Due to the steep slopes, the water flows with high velocity and erodes the adjoining lands and spills over the agricultural land and village *uhadis*. The flood water causes damage to roads, rail tracks and canals. Flood embankments and marginal bunds and stone studs have been constructed at vulnerable points as a protection against flooding.

The flood protection work in Ambala district is looked after by Tangri Drainage Sub-Division, Ambala, Narayangarh Drainage Sub-Division, Narayangarh and Jagadhri Drainage Sub-Division, Yamunanagar under the administrative control of Ambala Drainage Division, Ambala.

The main flood embankments and marginal bunds in the district are given below:

Bunds along the Ghagghar

The Ghagghar traverses the district for some distance in the north-west where there is no problem of floods. The Ghagghar again traverses the district near Ambala city for about 7 kilometres where a flood embankment of 5 kilometres long has been constructed to protect Ambala City and the adjoining villages.

Bunds along the Dangri (Tangri) and its tributaries

(i) **Old Gazipur Bund.**—It is 4,971.5 metre long bund on the right bank of the Dangri (Tangri). It saves the *abadis* of Khera Gani, Gazipur, Tesrauli, Raiwali and Baldev Nagar Camp, Ambala City.

(ii) **New Gazipur Bund.**—It is an extension of the old Gazipur Bund and is 3,202.5 metre long. It saves *abadis* of Bunda Khera, Handesra (Punjab), Kalredi (Punjab) and Ambala Cantonment.

(iii) **Babyal Bund.**—It is a 7,701.25 metre long bund on the right side of the Dangri (Tangri) extending from village Rangarh to Ambala-Jagadhri road. It protects Ambala Cantonment, Ambala City and the adjoining villages.

(iv) **New Cantonment Bund.**—It is a 2,776.11 metre long bund extending from Ambala-Jagadhri road to Ambala-Saharanpur railway line on the right side of the Dangri (Tangri). This bund protects the newly developed colonies of Mahesh Nagar, Gobind Nagar and other parts of Ambala Cantonment.

(v) **Dangri (Tangri) Right Marginal Bund Downstream G.T. Road.**—It is a 17,031.20 metre long bund on the right bank of the Dangri (Tangri) extending from Shahpur to Naggal. It protects Ambala-Pehowa road and the adjoining villages.

(vi) **Dangri (Tangri) Right Marginal Bund across Narwana Branch of Bhakra Main Canal.**—It is 11,513.75 metre long bund and extension of Right Marginal Bund beyond Ambala-Pehowa road and Narwana Branch of Bhakra Main Canal. It protects *abadis* of Segta, Bishangarh, Niharsi, Jagoli, Shekhupur, Kachhawa, etc.

(vii) **Babyal Sadhaura Bund.**—It is 2,135 metre long bund constructed on the left side of the Dangri (Tangri). It protects *abadis* of Rawalan, Chandpur, Munerheri, etc.

(viii) **Naggal Mardhan Bund.**—It is 1,677.5 metre long bund constructed along the left bank of the Dangri (Tangri). It extends from Ambala-Jagadhri road to village Kardhan. It protects *abadis* of Naggal, Kardhan, Brahaman Majra and other adjoining villages.

(ix) **Left Marginal Bund Downstream Narwana Branch of Bhakra Main Canal.**—It is 11,971.25 metre long bund constructed on the left bank of the Dangri (Tangri). It protects village *abadis* of Gaursia, Niharsi, Jansuj and Jansua.

(x) **Dangri (Tangri) Left Marginal Bund Downstream G.T. Road.**—The left marginal bund is 12,200 metre long and extends from downstreams G.T. road along the left bank of the Dangri (Tangri). The bund protects Dhangri, Fazailpur and other adjoining villages. As the villages of Baraula, Barauli and Malwa are also under the direct hit of the stream, it is proposed to extend the bund for another 2,115 metre.

(xi) **Segti Bund.**—It is 1,609 metre long bund constructed on the left side of the Dangri (Tangri) extending Dangri (Tangri) Diversion Bund up to the Narwana Branch. It protects the *abadis* of Segti and other adjoining villages besides saving the Narwana Branch banks.

(xii) **Dangri (Tangri) Diversion Bund.**—It is 5,795 metre long bund constructed to divert flood waters of the Jodha and Omla and back spill of the Dangri (Tangri). It starts from Ambala-Pehowa road and goes up to Shahabad in Kurukshstra district. It protects *abaadis* of Segti and Jalalpur.

(xiii) **Kukrali Bund.**—It is 335 metre long bund constructed on Omla Nullah, a tributary of the Dangri (Tangri). It protects Kukrali village.

(xiv) **Bagwala Bund.**—It is 229 metre long bund constructed on Balioli Nullah, a tributary of the Dangri (Tangri). It protects Bagwala village.

(xv) **Murad Nagar Bund.**—It is 229 metre long bund constructed on a tributary of the Dangri (Tangri). It protects Murad Nagar village.

(xvi) **Narainpur Bund.**—It is 915 metre long bund constructed on the left side of the Dangri (Tangri). It protects Narainpur and Raipur Rani.

Bunds along the Markanda and its tributaries

(i) **Toka Bund.**—It is 579.5 metre long bund constructed on the left bank of the Roon, a tributary of the Markanda, for the protection of Toka and adjoining villages and Kala Amb-Narayangarh road.

(ii) **Pando Bund.**—It is 790 metre long bund along the left bank of the Sadhaura Wali Nadi. It protects the *abaadis* of Pando and Sadhaura.

(iii) **Nizampur Galori Bund.**—It is 762.50 metre long bund on the right bank of a tributary of Markanda lying in the Himachal Pradesh territory to save the villages of Nizampur and Galori.

(iv) **Sarawan Bund.**—It is 1,311.50 metre long bund on the left side of Sadhaura Wali Nadi. It protects Sarawan village.

(v) **Haveli Bund.**—It is 2,745 metre long bund along the left bank of a tributary of the Markanda. It protects Haveli village.

(vi) **Khanpur Bund.**—It is 1,205 metre long bund on the left bank of Sadhaura Wali Nadi. It protects the abadi of Khanpur.

(vii) **Saidoopur Tibri Bund.**—It is 2,745 metre long bund constructed on the right bank of Sadhaura Wali Nadi to protect Saidoopur Tibri and adjoining villages.

(viii) **Sadhaura Bund.**—It is 1,418 metre long bund on the left side of Sadhaura Wali Nadi. It protects Sadhaura town.

(ix) **Mullana Bund.**—It is 3,873 metre long bund along the left bank of the Markanda. It protects Mullana town.

(x) **Hamidpur Bund.**—It is 610 metre long bund constructed along a tributary of the Markanda. It protects abadi of Hamidpur and Kala Amb-Narayangarh road.

(xi) **Sehla Bund.**—It is 2,379 metre long bund constructed on the left side of the Markanda and right side of Sadhaura Wali Nadi. It protects Sehla village.

(xii) **Markanda Right Marginal Bund.**—It is constructed in two sections along the right bank of the Markanda. The section upstream the Ambala-Jagadhri railway line is 66,980 metres long. The section downstream the Ambala-Jagadhri railway line is up to G.T. road in Kurukshetra district. This bund protects villages lying on the right side of the Markanda.

(xiii) **Markanda Left Marginal Bund.**—It is 4,117.50 metre long bund constructed on the left side of the Markanda. It protects villages of Hema Majra, Tandwal, Barara and adjoining villages.

(xiv) **Barondi Bund.**—It is 915 metre long bund constructed on the right side of the Begna Nadi. It protects villages of Barondi and Tandwal.

(xv) **Chhoti Rasaur Bund.**—It is 610 metre long bund constructed on the left side of Roon Nadi, a tributary of the Markanda. It protects Chhoti Rasaur.

Bund along the Chautang

Malikpur Habitpur Bund.—It is 1,525 metre long bund constructed on right side of the Chautang. It protects Malikpur and Habitpur.

Besides these bunds, many stone studs have been constructed to protect the villages and divert main current of streams.

FAMINES

The first famine in the district of which any information is available occurred in 1783-84 (Sambat 1840) and is popularly called *Chalisa Kal*. Famines again occurred in 1833-34 and 1837-38 and 1860-61. In subsequent years, there were bad failures of crops in 1868-69, 1884-85, 1890 and 1899-1900. Though the distress was undoubtedly severe in these years, it was hardly of so acute a nature as to deserve the name of famine. Again in 1907-08, the crops were poor. The district has been less prone to vicissitudes because it was rare for two crops in succession to fail badly over a large area of the district.

Famine is now a thing of the past, because means of transport are sufficiently developed to cope with any emergency and food can be easily transported from one place to another in case of shortage of supply in any part of the country.