

Micro-level (village level) analysis of the aspects discussed earlier has been attempted here to represent region under study. Two villages are selected as case study villages, one from traditional irrigated area and another from newly developing area regarding irrigation.

The landuse cropping pattern for 1959-60 and 1993-94, of both the villages, was recorded on the cadastral maps obtained from the village talathi (revenue) records of the respective villages. The interviews of the farmers and other relevant persons were conducted to generate the data relating to irrigation, cropping pattern, production, fertilizer consumption, water supply, use of implements. Thus, following analysis is concerned with the study of two villages viz. Gunaware and Veloshi selected from Assua and Girvi circles respectively (Fig.6.1).

1. GUNAWARE VILLAGE :

1) Location :

The village Gunaware located in the lower part of the Nira basin, at a distance of 25 kms from tahsil place Phaltan (Fig.6.1-A). It is situated on the right bank of the Nira river and also left side of Nira right bank canal. The height is 546 metres above the mean sea level.

PHALTAN TAHASIL

Villages selected for case studies 1993-94

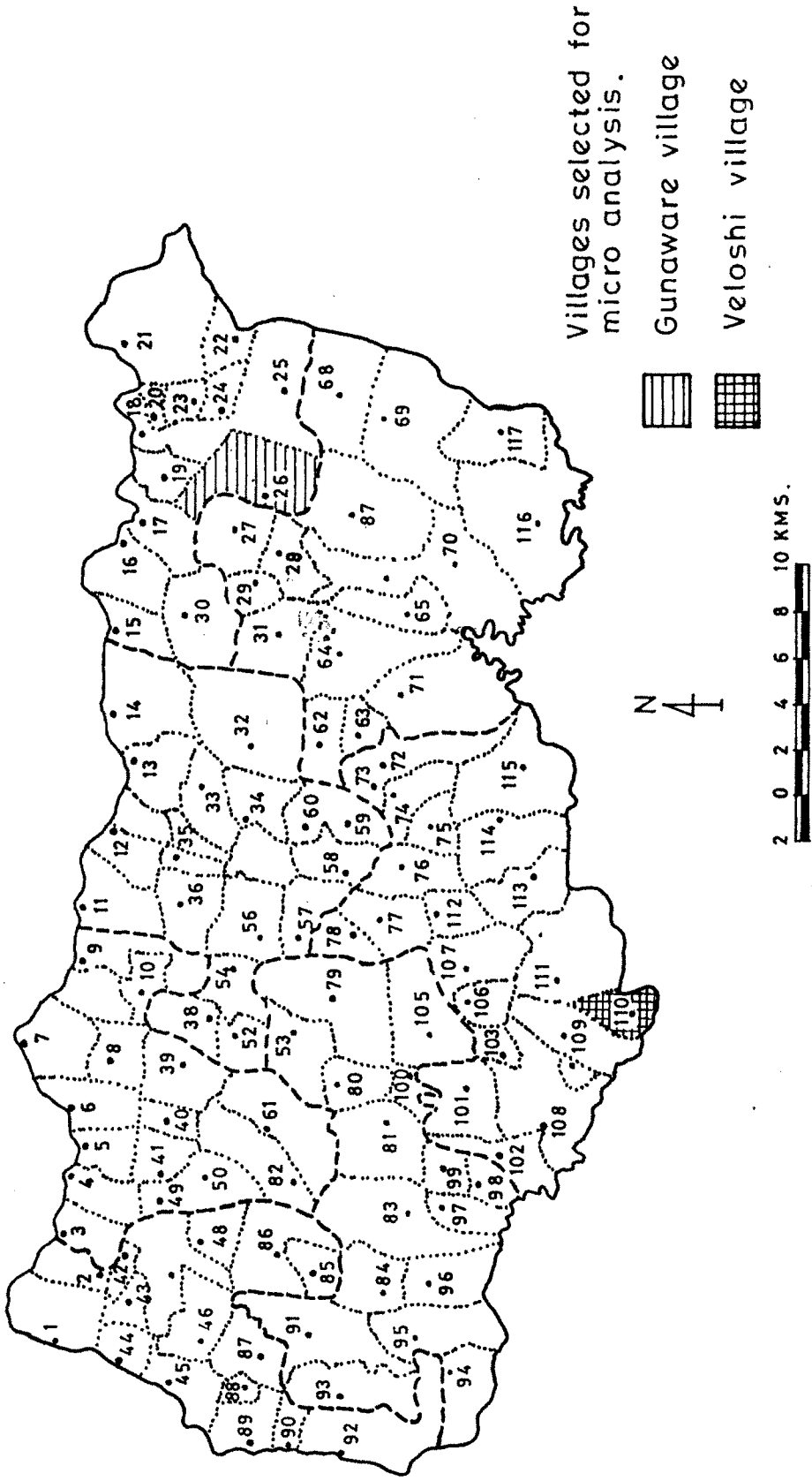


FIG. 6.1

2) Physical setting :

The village area is generally flat with a gentle slope towards the north. The slope in the western and southern part of the village area is having relatively steeper slope than the north. Northern part of the village is gently slopping which is favourable for the development of irrigation facilities. Deep black soils have attained high fertility offering suitabilities for the cultivation of sugarcane and wheat crops. Naturally, this zone possesses high agricultural productivity.

3) Climate :

The village receives rainfall from monsoon which is about 710.30 mm and it occurs in the month of September. The hottest months are April and May and the coldest are December and January.

4) Soils :

The following are the main soil groups observed in the village area (Fig.6.2-A).

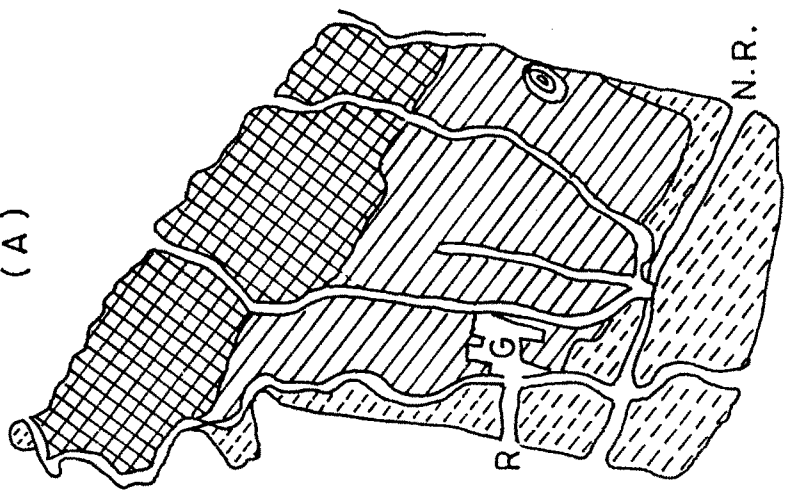
i) Laterite soil -

This soil is confined to the southern and western parts of the village area, particularly, the southern portion from (Gaonthan'. It is light brown colour and less productive.

GUNAWARE VILLAGE

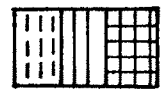
Soil (1993 -94)

(A)



- G - Gaonthan
- R - Road
- NR - Nira right bank canal
- ⊙ - Hill

Soil groups

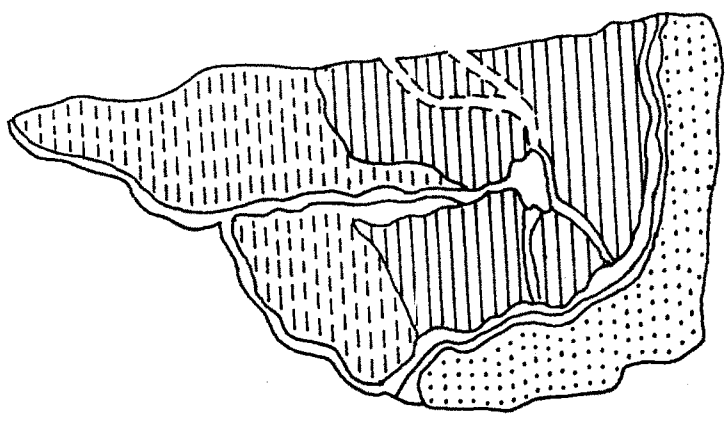


- Laterite soil
- Medium black soil
- Black soil

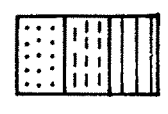
VELOSHI VILLAGE

Soil (1993 -94)

(B)



Soil groups



- Coarse shallow laterite
- Medium and deep laterite
- Alluvial soil
- G - Gaonthan
- R - Road
- ⊙ - Hill ranges

FIG.6.2

ii) Medium black -

It covers a small portion of the northern and eastern parts of the Gaonthan. Jowar, wheat and sugarcane crop are dominant.

iii) Black soil -

It covers the northern parts of the village area. With the help of irrigation the crops like sugarcane, wheat and jowar kharif and rabi are grown in this fertile soil. It is also high productive zone.

5) Water resources :

The surface as well as ground water resources are comparatively rich in the village area. Both the water resources of the village includes the water from Nira right bank canal and by wells. It is almost perinnial because one nala run from south to north. The ground watertable in post monsoon (November) surface level and in pre-monsoon it deepens to about 5 meters in the village area.

6) Agricultural profile :

The agricultural activity in the village is controlled by physical, social and economic aspects. The agricultural and socio-economic aspects of the village are discussed below.

1) Landuse :

Table 6.1 shows the general landuse pattern of Gunaware village area in 1993-94.

Table 6.1 : General landuse pattern of village
Gunaware, 1993-94.

Sr. No.	Land category	Area in hect.	Percentage to total
1	Forest	5.58	0.32
2	Area not available for cultivation	301.01	17.45
3	Cultivable waste	12.50	0.73
4	Fallow	20.09	1.16
5	Pastures	12.08	0.70
6	Net area sown	1374.25	79.64
	Total	1275.51	100.00

SOURCE : Compiled by the author, 1994.

The farming is the major activity of the village, the proportion of net area sown is high (79.64%). The other categories of landuse cover only 20.36 percent of the total area (Table 6.1).

ii) Cropping pattern :

The cropping pattern of the village consists mainly of the cultivation of cash crop of sugarcane (Table 6.2).

Table 6.2 : Cropping pattern in Gunaware village, 1993-94.

Sr. No.	Crops	Area in hectare		Percentage to net sown area	
		1993-94	1959-60	1993-94	1959-60
1	Jowar	190.65	129.00	13.87	25.29
2	Sugarcane	690.85	50.84	50.27	9.27
3	Groundnut	18.35	15.53	1.34	3.05
4	Pulses	15.05	54.10	1.09	10.61
5	Fodder crop	18.50	11.38	1.35	2.23
6	Wheat	230.84	15.45	16.79	3.03
7	Other crops	18.45	15.00	1.34	2.94
	Total	1182.69	291.30	100.00	100.00

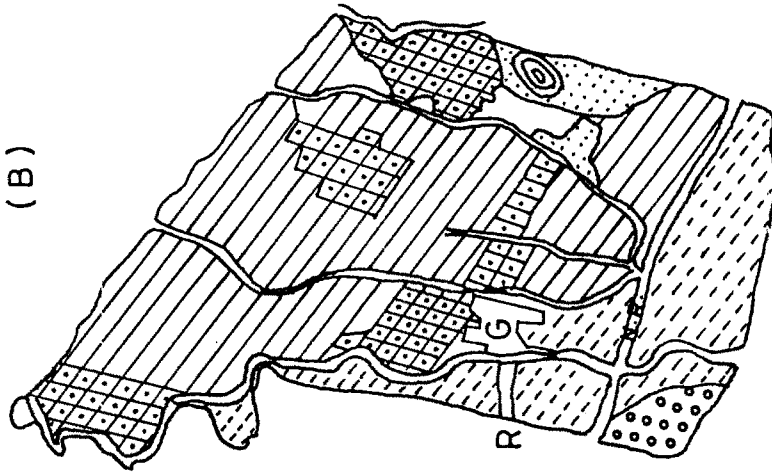
SOURCE : Compiled by the author, based on the fieldwork, 1994.

Table 6.2, indicates that sugarcane is the dominant crop of the village which covers more than 50 percent of the new area sown. Second ranking crop is wheat (16.79%) and jowar together cover 80.46 percent of the net area sown in 1993-94. The hectareage under sugarcane is increased whereas it is decreased in case

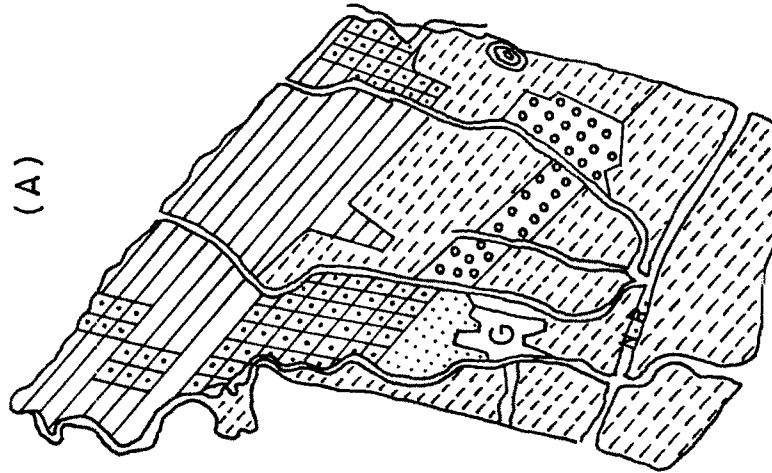
GUNAWARE VILLAGE











Irrigated cropping pattern

1993 - 94
(B)



1959 - 60
(A)



-  Sugarcane
-  Wheat
-  Jowar
-  Groundnut
-  Other
-  Hill
-  Nala
-  Road
-  N.R.
-  G

N

0 600 MET.

FIG. 6.3

of jowar. It is due to the availability of adequate water during summer months which is resulted into the increase in irrigated rabi crops (Table 6.2). The wheat, pulses, jowar are the other major rabi crops in the village.

iii) Population :

The population of the village was 6140 (1991) including of 3089 males and 3051 females. The main occupation of the people is agriculture. The per head cultivated land is about 0.25 hectare. The village is electrified and having good drinking water supply. The literacy is 35 percent which is below regions average (40%).

iv) Agricultural implements :

The main occupation of the people is agriculture. The village has the scope to use modern implements as the proportion of fertile cultivated area is high. It has 230 electric motors, 69 diesel engines, 18 tractors and 118 iron ploughs.

v) Sources of irrigation :

Three sources of irrigation canal, well and lift are found in the village area. Canal irrigation is the dominant source covering 71 percent of the total irrigated area of the village. It follows well sources (17.10%) and lift irrigation (11.90%). There are seven irrigation schemes on the canal on co-operative basis. Nearly, 170 perinnial wells are being

utilized for irrigation. The water of the canal in the north and the east is used to irrigate sugarcane and wheat fields.

vi) Intensity of irrigation :

The intensity of irrigation of the village is 60.63 percent which remarkably varies spatially. The northern side of the village is highly developed in irrigation due to the canal water and good soil. The southern part from the village is unfertile and unfavourable for the development of irrigation facilities.

7) Impact of irrigation :

a) Irrigation and Agricultural productivity :

There is much variation in agricultural productivity as it is observed in broad patches which is mainly related to irrigation and soil conditions. The overall productivity of the area (Fig.6.4-A) is grouped into three categories, high, moderate and low.

High productivity zone :

The high productivity (ranking co-efficient) is observed in the northern part particularly as associated with the deep black soil (Fig.6.2). The canal supplies perennial water encouraging farmers to take irrigated crops. This zone is mostly devoted for sugarcane cultivation where average per hectare yield of sugarcane is 80 tonnes.

Moderate productivity zone :

The zone is observed along the canal in the eastern and western parts of the village. The western patch of this zone is mostly devoted to rabi crops. The declining fertility of soil in the south, less opportunity for more turns of irrigation in the irrigated area have resulted into moderate productivity.

Low productivity zone :

This zone (ranking co-efficient below 4) comprises comparatively moderate slopes. The zone passes through some constraints like poor soils, inadequate and irregular water supply, less turns of canal water and associated problems of soils.

b) Irrigation and Fertilizer consumption :

Irrigation is positively correlated with the consumption of fertilizers in the village. The average fertilizer consumption per hectare of irrigated land in the village area is about 1.5 tonnes as it varies from 2.5 tonnes in sugarcane area in the northern side and 1.1 tonnes in the area of rabi crops and 1.0 tonnes along the southern side. The decrease in fertilizer consumption away from the canal is due to decrease in irrigation facilities.

VELOSHI VILLAGE

GUNAWARE VILLAGE

Irrigated crop productivity 1993-94

(A)

(B)

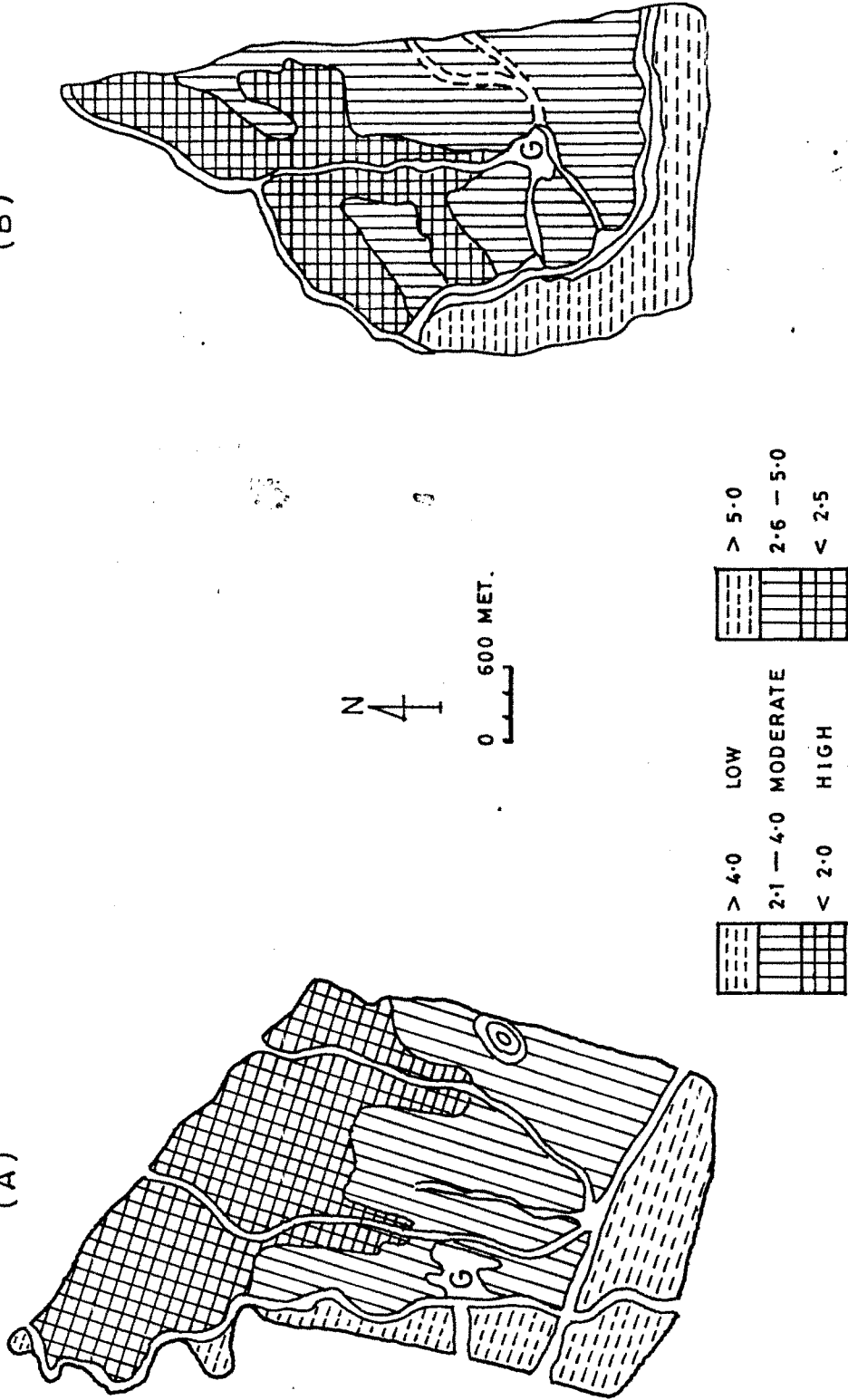


FIG. 6.4

c) Irrigation and Mechanization :

Mechanization of agriculture is the essential characteristic of irrigated areas. The irrigated area has been increased since 1958-59 (Table 6.2). It might have resulted into the improvement in farmer's ambition and income. It is reflected in the use of modern farm implements like electric pumpset, tractors etc. It is observed that the diesel engines were important before 1959-60 due to the absence of rural electrification in the village. But, in 1993-94 the number of electric pumpset is increased.

d) Irrigation and Irrigated cropping pattern :

The development of irrigation leads to the change in irrigated cropping pattern. Table 6.3 shows the temporal changes in irrigated cropping pattern. The area under sugarcane in this village is increased by 37.61 percent to that of 1959-60. The area under wheat is increasing by 13.18 percent and area under jowar is decreased by 40.51 percent that fallows groundnut and other crops too. It may be due to the development of irrigation facilities.

Not only sugarcane but wheat also shows remarkable change during the period under investigation. Fig.6.3-A and Fig.6.3-B show spatial change in irrigated cropping in the village area. The sugarcane has kept it's dominancy in the irrigated cropping pattern as it has covered about 60.12 per cent of the village area.

**Table 6.3 : Irrigated cropping pattern in village
Gunaware, 1959-60 to 1993-94.**

Sr. No.	Crops	1959-60		1993-94		Increase or Decrease in %
		Area in hect.	Percentage to total irrigated area	Area in hect.	Percentage to total irrigated area	
1	Sugarcane	50.84	22.51	690.85	60.12	+ 37.61
2	Wheat	15.45	6.84	230.84	20.02	+ 13.18
3	Jowar	129.00	57.13	190.65	16.62	- 40.51
4	Groundnut	15.53	6.88	18.35	1.62	- 5.26
5	other crop	15.00	6.64	18.45	1.62	- 5.02
		225.82	100.00	1149.14	100.00	

SOURCE : Compiled by the author based on field data, 1994.

2. VILLAGE VELOSHI

1) Site and situation :

Veloshi village is located at the bottom of Shambhu Mahadeo ridgeline (Fig.6.1). It is situated on the left side of Sitamai ranges at the height of 700 metres above the mean sea level. It has 641 hectares of geographical area associated with two nalas one flow in central part and another one is in northern side.

2) Physical setting :

The village area can be divided into three physical divisions.

i) Southern and Western hilly region -

The hills follow the southwest direction and steepness of slope southwards. It covers about 25 percent of the total village area. The height is about 900 meter above sea level.

ii) Foot-hill zone -

It covers 25 percent of village area. The terraced cultivation has been developed on the slope.

iii) Plain region -

It includes flat area between the two nalas and covers 50 percent of the village area. It is gently sloping land favourable for the development of irrigation facilities.

3) Climate :

The isohyetal-line of 600 mm value crosses the village and almost all rainfall occurs during June to September, mainly from south-west monsoon, with a heavy concentration in September. The hottest months are April and May and the coldest being December and January.

4) Soils :

The village possesses the three soil types (Fig.6.2-B).

i) Coarse shallow laterite -

It covers south and western portion. 25 percent area is covered by this group which is infertile and mostly devoted to grasslands.

ii) Medium and deep laterite -

This group is confined to the southern and western parts of village area. It covers 35 percent of the village area. Though not fertile, these soils yield good when water is provided.

iii) Alluvial soils :

This soil is confined to northern and eastern parts of the village area. It is stretched along with both nalas of the village and covers 40 percent of the village area. It is light brown in colour which is fertile and productive land of the village (Fig.6.2-B).

5) Water resources :

The village is having satisfactory water resources. The surface water resources are seasonal. The water is stored within the course of nala by constructing wall and is provided to the fields. The nala course at Veloshi remains perennial

upto mid-March. The nala gets dried-up after January and the water is used for rabi crops. The ground watertable prevails during post-monsoon season (November). The surface level, in pre-monsoon (May), goes down upto 5 meter to the central portion and 8 meters to the northern portion of the village area.

6) Agricultural profile :

The agricultural activity, in the village, is controlled by the physical, social and economic aspects of the village in the recent past.

i) Landuse :

Table 6.4 shows the general landuse pattern of Veloshi village area in 1993-94. Farming is the major activity of the village and the proportion of net sown area is high (87.20%) 449.80 hectare. The other categories of landuse cover only 13.8 percent of the total area (Table 6.4).

Table 6.4 : General landuse in Veloshi village, 1993-94.

Sr. No.	Land category	Area in hectare	Percentage to total area
1	Area not available for cultivation	24.44	4.74
2	Cultivable waste	12.00	2.33
3	Fallow	14.00	2.71
4	Pastures	15.58	3.02
5	Net area sown	449.80	87.20
	TOTAL	515.82	100.00

SOURCE : Compiled by the author, based on fieldwork, 1994.

ii) Cropping pattern -

The cropping pattern of the village consists mainly of the cultivation of food crops (Table 6.5).

Table 6.5 : Cropping pattern in Veloshi village, 1993-94.

Sr. No.	Crops	Area in hectare		Percentage to net area sown	
		1993-94	1959-60	1993-94	1959-60
1	Jowar	155.0	109.08	34.45	30.30
2	Bajara	25.0	18.0	5.59	5.00
3	Groundnut	12.0	15.0	2.67	4.16
4	Sugarcane	19.18	23.18	4.26	6.44
5	Pulses	96.00	70.50	21.34	0.19
6	Grassland	19.83	22.40	4.41	6.22
7	Wheat	25.05	19.12	5.57	5.31
8	Other crops	19.5	9.5	4.34	2.64

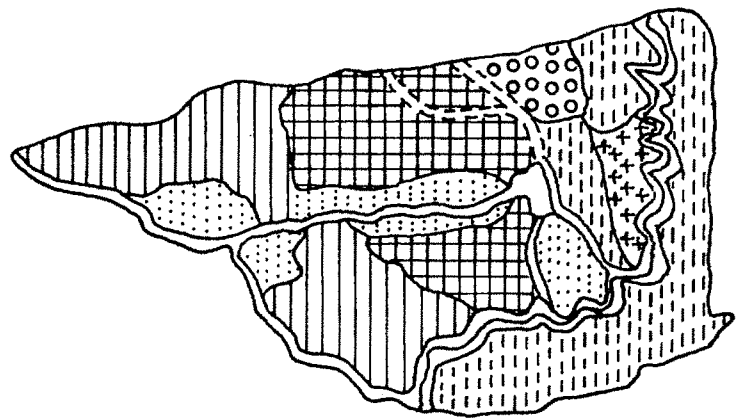
SOURCE : Compiled by the author, based on fieldwork, 1994.

Table 6.5 reveals that jowar is the dominant crop of the village covering more than 34.45 percent of the net area sown. The second ranking crop is pulses with 21.34 percent and covering 55.79 percent of the net area sown in 1993-94. The hectareage under jowar is increased and decreased in case of sugarcane. It is due to the scarcity of water in summer months which is resulted into the increase in irrigated rabi crops (Table 6.5). The jowar, bajara, pulses are the major rabi crops in the village.

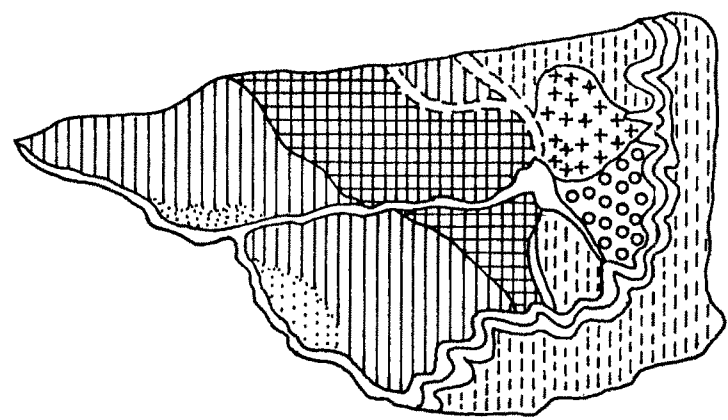
VILLAGE VELOSHI







Irrigated cropping pattern

1959 - 60
(A)



1993 - 94
(B)



-  Jowar
-  Sugarcane
-  Wheat
-  Bajara
-  Groundnut
-  Other

N
4

0 600 MET.

FIG. 6-5

iii) Population -

The population of the village was 1332 (1991 census) with 595 males and 737 females. Majority of the people are engaged in agriculture and many people leave the village for seeking job elsewhere. The ratio of land available per head is 0.48 hectare and cultivated land is about 0.34 hectare. The literacy of the village is high (48%) as compared to the region's average (40%). It has 18 landless families. 60 percent families possess below 1 hectare of land occupying 8 percent of cultivated land in the village. The village is also electrified.

iv) Agricultural implement -

Main occupation of the village is agriculture. Recently the farmers are awared to use improved agricultural implements. There are 21 electric motors, 15 diesel engines and 150 wooden and iron ploughs in the village.

v) Sources of irrigation -

The village Veloshi has well, lift and other sources of irrigation. The total irrigated area is 255.73 hectares in 1993-94. Out of which 65 percent (166.15 hect.) is under well. 28 percent (71.58 hect.) under lift and 7 percent (19.45 hect.) under other sources of irrigation. There are 13 wells in the village but faces the problem of water scarcity during summer months. The water of the nalas is stored with

the help of nala bunding and provided to rabi crops. The village has 12 lift irrigation schemes located on the bank of the nala.

vi) Intensity of irrigation -

The intensity of irrigation in the village is 30 percent. The intensity of irrigation is 90 percent in the northern parts of the village area whereas it decreases sharply towards the west. There is no irrigation in the western and southern portion of the village area.

vii) Impact of irrigation -

i) Irrigation and Agricultural productivity

Fig.6.4-B shows overall productivity of irrigated area which can be grouped into three categories.

(a) High productivity zone -

It is mainly confined to the nala side of the village area. Good alluvial soils, adequate water resources have led to high productivity. Individual farmers, who have their own irrigation schemes, enjoy more number of turns of irrigation. There are some patches of this category in the village area which are well irrigated where the farmers pay full attention to the farm. Secondly, the wells being perennial, the fields receive more number of turns of irrigation. This high productivity zone is mainly devoted to jowar, wheat and sugarcane cultivation (Fig.6.4-B).

(b) Moderate productivity zone -

This is located at three different places (Fig.6.6-B). The northern portion of this category is having fertile alluvial soils and the southern having medium deep black soils but both the areas face water scarcity. In spite of having good soils and water for irrigation, in the southwestern portion of the village, the attitude and ignorance of the farmers have resulted this part as moderate productivity zone.

(c) Low productivity zone -

The low productivity is confined to the southern sides of the Gaonthan. In the south, it is observed that the use of fertilizer is very less due to the poor economic conditions of the farmers.

ii) Irrigation and fertilizer consumption

The average per hectare fertilizer consumption in the village of irrigated land is 1.2 tonnes which is varying from crop to crop and field to field. It is observed that the fertilizer use for sugarcane is high (1.5 tonnes) in the areas near to the nala course and in well irrigated areas whereas it decreases markedly (0.50 tonnes) in the areas of moderate and low productivity due to the scarcity of water.

iii) Irrigation and Mechanization

Mechanization of agriculture is the essential characteristic of irrigated areas. Table 6.6 shows irrigated cropping pattern of Veloshi and points out that there is no remarkable increase in net irrigated area since 1959-60. But still it has certainly improved the farm income which has resulted in increasing use of different machines. It is observed that in 1960 there was no single electric pumpset. The picture was quite different in 1993-94 when the number is reached to 37, and diesel engine 18. The high use of electric motors have reduced the power cost, repair cost and ultimately the production cost too.

Table 6.6 : Irrigated cropping pattern in Veloshi village, 1959-60 to 1993-94.

Sr. No.	Crops	1959-60		1993-94	
		Area in hect.	Percentage to total irrigated area	Area in hect.	Percentage to total irrigated area
1	Jowar	109.08	56.26	155.00	60.61
2	Sugarcane	23.18	11.96	19.18	7.50
3	Wheat	19.12	9.86	25.05	9.80
4	Bajara	18.00	9.28	25.00	9.78
5	Groundnut	15.00	7.74	12.00	4.69
6	Other	09.50	4.90	19.50	7.63
	Total	193.88	100.00	255.73	100.00

SOURCE : Compiled by the author, based on field data, 1994.

iv) Irrigation and irrigated cropping pattern

The irrigated cropping pattern has been dominated by jowar since 1959-60. The figures 6.5-A and 6.5-B show that the irrigated area is spatially extending towards the north because of the large scale irrigation schemes and construction of new irrigation wells.

Table 6.6, shows that the traditional cropping pattern has undergone into changes through time. The sugarcane area is decreased by 4 hectares from 1959-60 when the jowar area has increased by 4.35 percent (45.92 hect.). The area under other irrigated crops has shown an increasing trend. This change may be due to the scarcity of water to perennial crop like sugarcane and therefore, the farmers of the village have chosen alternatives to grow rabi crops which require less water. In general, irrigation has brought about drastic changes in cropping pattern and has encouraged mechanization.
