Chapter-III

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Chapter - III

CHANGES IN AGRICULTURAL ECONOMY OF DHOM COMMAND AREA

3.1 Agricultural Economy of Maharashtra

The state of Maharashtra is highly industrialized; still agriculture continues to be the main occupation of the rural people. Agriculture is an important economic activity, in which nearly 62.0 percent of working population is engaged. Moreover, of the total domestic products of the state, agriculture sector contributes nearly 17 percent. It is observed that during the last forty years the relative share of agriculture to state GDP has been continuously declining. This, it reflects the fact that other sectors i.e. industrial and tertiary sectors are leading sectors in contribution to states GDP. On the contrary, agricultural sector in the state though making progress, however, its performance did not show much satisfactory growth. It is due to that land productivity did not improve much. Moreover, the soil and climatic conditions in the state are such that it has both inferior cropping and relatively low yield in respect most of the important crops. Major part of its territory fall on the plateau where the rainfall is low and highly unstable for the vast tracts. Moreover, the productive capacity of the soil has progressively deteriorated as a result of decades of unchecked erosion.

Land use statistics shows that out of the total geographical area nearly 178.76 lakh hectares of which 58% of the total area is used for raising agricultural crops net crop Area is 17,619,000 hectare, total Crop area is about 22,381,000 hectares total Irrigated area is 3,667,000 hectares ratio of total irrigated with cropped areas is 16.4% only area under cereals 9,411,00 hecters, Area under pulses 33,88,000he. Total area under

foodgrains is 12,798,00 area under Horticulture was 10.14 lakh hec. Moreover, in the state there is no further scope to bring additional land for increasing agricultural production. In this situation, expansion of multiple cropped areas is the only solid and enduring way to increase agricultural production. In this regard, agriculture in the state did not achieve much progress. Because the level of cropping intensity about 121 indicates that only 21 percent cultivated land is at present being used for multiple crops, which in turn depends on the irrigation facilities. Out of the total cultivated area, nearly 16 percent area brought under irrigation. Therefore, the success of agriculture in the state is carried out under dry condition. Moreover, climatic conditions in the state are such that they contribute both an inferior cropping pattern and relative low yields of the crops. The major crops grown in the state include rice Jowar, Bajra, Wheat, Pulses, cotton, sugarcane, several oil seeds including sunflower, groundnut and soybean, turmeric, onions and other vegetables. Maharashtra is also famous for its fruit production. The major fruits produced in the state are mangoes, bananas, grapes and oranges. Nagpur and Nashik are the major producers of fruits

Moreover, due to low irrigation facilities, the application of new agricultural technology remained restricted. In fact, the state has not been able to participate in the green revolution at substantial level that occurred in some other states since mid sixties, still majority of cultivators do not have much scientific knowledge of agricultural inputs especially in rain-fed area Thus, lack of such improved technology resulted in stagnant agricultural productivity.

3.2 Agricultural Economy of Satara District

Maharashtra state has been divided into seven divisions for administrative purpose. They are Aurangabad, Amaravati, Konkan,

Nagpur, Pune, Nasik and Latur. There are 35 districts in Maharashtra Satara district is one of them.

The district has compact shape with an east west stretch of about 150 k.m. and north south about 120 K.m., administratively it is bordered by the Pune district on the whole of the northern side by the Solapur district on the east, by the Sangali district on the south east and south and by Ratnagiri district on the west only over length of about 24 k.m. The Raigad district borders on the north west.

The area of the district is 10492 sq.km. and population as per 2001 census is 24,38667 out of which urban population is 4,65,782 and rural population 19,72,885. Satara district is situated partly in Nira basin and partly in Krishna basin. The Sahyadries and Mahadeo range are main hills range of the district. In addition to Krishna and Nira, there are other rivers namely Kudali, Venna, Urmodi,Tarali, Koyna, Vasana and Yerala, Koyana Hydro Project is on Koyana River located in Satara district at Koyananagar near Helwak village in Patan block, other dams of the district are Khodashi dam on Krishna at Khodashi village near Karad in karad block, Veer dam on Nira river at Vathar in Phaltan block, Kaneher dam at kaneher on Venna river in Jaoli block, Dhom dam of Krishna river at dom in Wai block which is selected for intensive study. All these dams except koyana supply water for irrigation and expected to bring about to 38990 hectares of land under irrigation. Forest occupy is bout to 1469 sq.km.which form 14% of the total area and scattered over the entire district. The rainfall for the district is an average about 80cm. but it is not uniform over the district .

The Koregaon, Man, Phaltan, Khandala and Khatav block of the district have very short rainfall and hence identified as drought prone area Agriculture is the main pursuit of the people in district. The cropping pattern of the district divided into two sesons i.e. Kharip and Rabbi. The

important crops othe district are Jowar, Wheat, Bajra, Groundnut, Cotton Sugarcane, Patatoes, Pulses, Paddy,Onion and Chilies about 10% othe states production of groundnut is produced in Satara district

3.3 Agricultural Economy of Wai Taluka

3.3.1 Physical features

A vast plain area of Krishna valley slopping eastward and southeastward and southeastward is noted in the central part of the region. The plain area permits to develop the canal irrigation. Due to the plain area it is observed that the intensity of irrigation is high as compared to other parts of the region. The river valley is bounded by hill ranges. Spurs of these hill rages enter the river valley. The western part of the region is mountainous with steep slopes, cliffs and ridges. Average height of this area is about 1,000 meters from the sea level. It is source region of Krishna. Several swift flowing streams are also used for irrigation purpose. Most of the western part of the region is irrigated by private canal irrigation. Private canal irrigation provides water to the kharif crops particularly to the rice cultivation.

3.3.2 Rainfall Condition

The necessity of irrigation is determined by the amount of rainfall received during the period when plants require water most and hence demand for irrigation depends on the spatial and seasonal disruption of rainfall. The variation in rainfall characteristics affects agriculture as whole. Total geographical area of Wai taluka is 61600 hectares remained constant between the periods of 1971 to 2007. Total population in 1971 was 1,25,099 thousand with 59,608 thousand male and 65,491 thousand female populations. Population density of Wai taluka was 262 per sq.km in 1971 with increased to 306 per sq.km in 2007. In 2007 which increased to 189336 with 107898 male and 81438 female popuolation in

the Wai taluka. Rainfall conditions are good in Wai taluka. Average rainfall was 973 mm and total rainfall was 1352 mm in 2007.

3.3.3 Land use pattern

Land is an important factor of production. Land resources from the most important natural wealth of the country and their proper utilization is a matter of utmost concern to its people. The utilization of the land according to its use capability ensures that this resource is utilized to the best advantage. Its improper use leads to wastage and can lead to progressive deterioration and loss of productivity of this vital resource. It is the moral obligation of the present generation to pass this valuable resource on the future generations as nearly unimpaired and over exploited as possible. One of the most significant features of land use in the region is the large proportion of area suitable for agriculture that already has been brought under cultivation.

Land use pattern shows that the geographical area of the taluka 61588 hectares. In 1975 area under forest was 12800 hectares, which was increased to 15676 hectares in 2007.

Area not available for cultivation shows an increasing trend during the period 1975 to2007. In 1975, land not available for cultivations was 5911 hectares, land under non-agricultural uses was 2600 hectares and barren and uncultivable land was 5,500 hectares. In 1975, 11700 hectares land not available for cultivation shows increasing trend in 2007, land not available for cultivation was 12838 hectares and land under non-agricultural uses was 2431 hectares, land under barren and uncultivable land was 7400 hectares.

Other uncultivated land was 8,200 hectares In 1975-76 and culturable waste land was 1,700 hectares and 6,500 hectares land was brought under permanent pastures and grazing land. In 2007 it shows that other uncultivated land was hectares and culturable waste land was 5911

hectares land under permanent pastures and grazing land was 4496 hectares.

Total fallow land in 1975 was 14300 hectares, which decreased to 5911 hectares in 2007. The gross cropped area in 1975 was 35,900 hectares, which increased to 36643 in 2007.

3.3.4 Cropping pattern

Cropping pattern simply means the proportion of area under different crops at a point of time, whereas changes in cropping pattern refer to change in proportion of area under different crops at two different times.

Such changes, though governed by ecological situation, socio-economic and technological factors also determine which of the feasible crops the farmers will choose. In case of irrigated crops, the choices are directly governed by the specific purpose for which the irrigated crops are to be grown and these are also conditioned by the geographical factors and modified by the emergent, social and economic circumstances.

The choice for growing a particular crop in a particular region is an outcome of these factors :-

i) Physical and Technical Factors :- Physical characteristics of a region like soil, climate, weather, rainfall, etc., determine its crop pattern. For instance, millets like jowar and bajara are suitable for dry regions, as these crops can be managed with a small quantity of water. Rice is suitable for waterlogged regions since it can withstand extra water. It is mainly an irrigated crop in areas with an average rainfall of about 100cms.

Physical characteristics of a region can be changed through technical improvements, like irrigation facilities and capital investment.

ii) Economic Factors :- A farmer is influenced in the choice of crops by such considerations as price parities between different commodities, maximization of income, and relative profitability per

hectare. Small farmers normally prefer food crops, because small farmers are interested in producing, foodgrains for their own requirements. An ordinary farmer will always prefer a crop that involves less risk in its fruition to a crop that involves more risk.

Availability of inputs like seeds, fertilizers, irrigation, storage, marketing, transport etc., is an important factor that influences a farmer's choice for a particular crop.

Support prices take the form of a minimum guaranteed return to the producer. By changing the relative rate of return on different crops, support prices help to give a boost to some crops at the expense of others.

Foodgrains include cereals and pulses. In 1975, area under total foodgrain was 30,429 hectares, which decreased to 22,300 in 2007, Area under cereals was 24,023 hectares, Area under rice was 2,323 hectares and area under wheat was 1,412 hectares. Area under jowar was 17,827 hectares. Area under maize was 240 hectares, area under ragi was 677 hectares and area under other cereals was 3,074 hectares. In 2007 area under total cereals was 3519 hectares and area under rice was 3676 hectares. Area under wheat was 3474 hectares, area under jowar was 11753 hectares, area under bajra was 1030 hectares, area under ragi was 183 hectares, area under maize was 432 hectares and area under other cereals was 92 hectares.

Total area under pulses was 4,679 hectares in 1975 while area under gram was 828 hectares, area under tur was 134 hectares, area under udadh was 403 hectares and area under other pulses was 3,074 hectare. In 2007 area under total pulses shows a decrease by 2680 hectares in which area under gram was 2312 hectares, area under tur was 100 hectares, area under udadh was 200 hectares, and area under moong was 200 hectares. In the year 1975 to 2007 comparison shows that area under total foodgrain has increased with comparison to 1975 while under

pulses has decreased during same period. Area under sugarcane was 586 hectares in 1975, which increased to 44900 hectares in 2007. In 1975 area under total oilseeds (groundnut, soyabean, kardai) was only 5,385 hectares, which notable increase to hectares in 2007. Total area under groundnut was 9488 hectares. Total irrigated area was 5,501 hectares in 1975, which increases to 9530 hectares in 2007.

3.3.5Agricultural Machinery and Implements

Agricultural machinery and implements play the important role in the process of land cultivation. Agricultural machinery and implements shows an increasing trend with the increase in gross command area. In 1975 the total number of plough was 5210 of which wooden ploughs was 3,289 and 1,921 wooden irons. In the year 2007 the total number of plough was 4540 of which 2259 wooden plough and 2281 is wooden iron. Total number of bullock carts was 3,069 in 1975 Total number of sugarcane crushed was 20 in 1975 which decreased to 7 in 2007 in 1975 the total number of oil engines with pump set used for irrigation was 337 which increased to 953 in 2007 . However, the total number of electric pump sets for irrigation was 817 in 1975, which increased to 3790 in 2007 The total number of tractors was only 14 which was increased to 478 in 2007 Thus, it shows that there has been increasing use of modern agricultural implements in place of traditional one in the Wai taluka. It was mainly caused by the increasing availability of irrigation.

3.3.6 Co-operative Societies

The cooperative societies play a vital role in agricultural development of Wai taluka. Total number of Co-Operative societies was 328 in the year 2007 in which, number of PACS was 59 and their membership was 31488. Total share capital of these societies was Rs. 9,87,50690 and it distributed the loan to the tune of Rs.24,97,91000

thousand, total 90 Co-operative lift Irrigation societies in Wai taluka in 2007 and their membership was 6419 and paid capital was Rs. 20,16000,total 36 Co-operative housing societies, and their membership was 1305 and share capital was Rs. 13,25000 Thus, in Wai taluka there has been technological change in agriculture, which helped to bring dynamic change in land use and cropping pattern. Majority of farmers, in the Wai taluka grow sugarcane as cash crop due to irrigation facility made available through irrigation project.

3.4 Changes in Agricultural Economy of Dhom Command Area in Wai Taluka

3.4.1 Land Holding Pattern

The availability of irrigation in agricultural sector brings about technological changes and hereby leads to improve the economic condition of farmers. In rural area land is considered as main source of income. In India 80% farmers are marginal and small farmer having land holding below the one hectare. Land holding pattern in the sample areas shows the number of farmers across the various categories in the command areas of the project.

Table No. 3.1

Classification of Farmers by Size of Own Land

Categories	No. of Farmers	Percentage
Marginal farmers (0 to 1 ha.)	76	38
Small farmers (1 to 2 ha.)	83	41.5
Medium farmers (2 to 3 ha.)	21	10.5
Big farmers (Above 3. ha.)	21	10.5
Total	200	100

Source :- Fieldwork

Table No.3.1 shows classification of farmers by size of own land. Out of total (200) samples farmers 83 farmers were in the small farmers group it was highest of the total it's percentage was 41.5, followed by marginal farmers 76, its percentage was 38, followed by medium farmers 21,its percentage was 10.5 and big farmers 21, its percentage also 10.5. Due to the low of inheritance, subdivision and fragmentation of land it leads to increase the number of marginal farmers.

3.4.2 Change in Cropping Pattern

Cropping pattern refers to the proportion of area under different crops at a point of time. A change in the cropping pattern means a change in the proportion of area under different crops. Cropping pattern is determined by natural factors like climate, soil conditions rainfall as well as land size of land holding irrigation facilities, income from crops etc.

As a result of increased irrigation facilities most of the farmers have gone in favour of the cultivation of more profitable commercial crops than traditional food crops particularly sugarcane. Table No.3.2 indicates the changes in cropping pattern of the study area.

The area under study grows a variety of crops. However, foodgrains constitute a major produce of agricultural land, 42.5 percent. The main foodgrains grown are jowar 18.1 percent, wheat 14.2 percent, percent rice 4.4 percent, bajara 0.6 percent, beans 3.5 percent, gram 1.8 percent, area under oilseeds was 13.5 percent in which groundnut was 6.3 percent and soybean was 7.2 percent.

Among the irrigated crops sugarcane was major cash crop area under this crop was 24.2 percent, followed by turmeric 7.3 percent, Ginger 2.3 percent. However, area under other crops like cereals, pulses fruits and vegetables was 10.1 percent. The concentration of individual crop is largely influenced by the degree of development and nature of water resources.

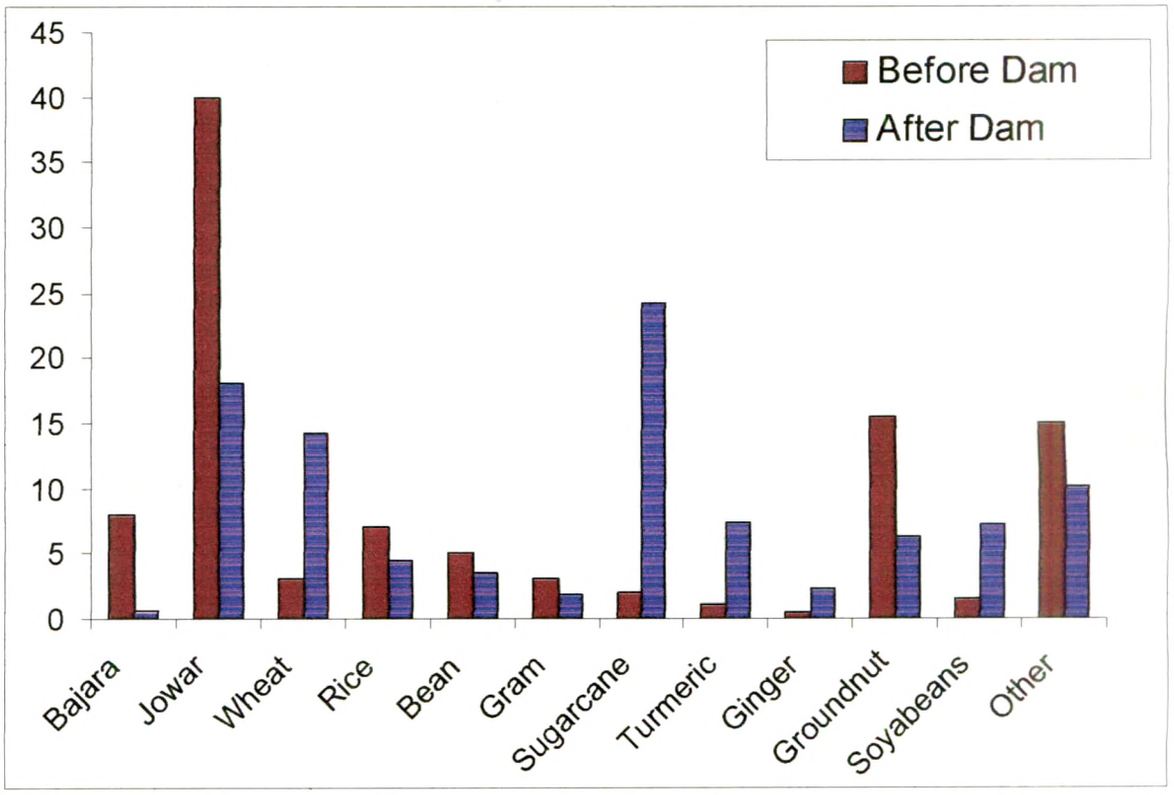
Table No.3.2

Changes in Cropping Pattern in Dhom Irrigation Project Command Area in Wai Taluka

Sr. No.	Crops	Before Dam		After Dam	
		Area (acres)	Percentage	Area (acres)	Percentage
1	Bajara	76.05	8	5	0.6
2	Jowar	380.24	40	160.5	18.1
3	Wheat	28.52	3	125.85	14.2
4	Rice	66.54	7	38.75	4.4
5	Beans	47.53	5	31.25	3.5
6	Gram	28.52	3	15.75	1.8
	Total Foodgrains	613.14	64.5	377.1	42.5
7	Sugarcane	19.01	2	215.25	24.2
8	Turmeric	9.51	1	65.25	7.3
9	Ginger	4.75	0.5	20.75	2.3
	Total Cash Crops	33.27	3.5	301.25	33.9
10	Groundnut	147.34	15.5	55.95	6.3
11	Soya beans	14.26	1.5	64.35	7.2
	Total Oilseeds	161.60	17	120.30	13.5
12	Other	142.59	15	89.45	10.1
	Grand Total	950.6	100 %	888.1	100 %

Source :- Fieldwork

Graph No.3.1 Change in Cropping Pattern In Dhom Irrigation Command Area.



3.5 Use of Farm Implements and Farm Machinery

Improved seeds and fertilizers become more effective and their potential better utilized if appropriate energy and power sources ate made available to the farmer. As a result of progressive mechanization of agriculture the region has been able to experience an agricultural revolution. Mechanization of an agriculture means the replacement of animal and human power by machinery, ploughing is to be done by tractors, sowing, putting of fertilizer by the drill, reaping and threshing by the combined harvest thresher and so on.

Agricultural Machinery and implements play the important role in the process of land (farm) cultivation. Agricultural machinery and implement shows an increasing trend with the increase in gross command area.

Table No.3.3

Use of Farm Implements and Farm Machinery

Sr.No	Particulars	No.of Farmers	Percentage
	I) Farm Implements		
1	Bullock Cart	123	61.5
2	Steel Plough	133	66.5
3	Seed drill	132	66
	II) Farm Machinery		
1	Tractor	65	32.5
2	Trolley	56	28
3	Power Tiller	5	2.5
4	Electric Pump set	110	55
5	Oil Engine	15	7.5
6	Sprayer	72	36

Source :- Fieldwork

Information regarding farm implements and farm machinery was obtained from the farmers. Table No.3.3 presents the details of these implements and machinery. The overall situation as far as farm implements are concerned is not very encouraging and 40% of the farmers are not having the implements like bullock cart, steel plough, seed drills, etc. As regards the situation of farm machinery, it is seen that 65(32.5%) farmers possess tractors and 56 farmers have trollies, only 5 farmers possess power tiller. 110 (55%) farmer possess electric pump set, only 15 (7.5%) farmers possess oil engine and 72 (36%) farmers possess sprayer. This shows that mechanization in farming has not taken place in this area to the desired extent. Similarly, the farm implements also are not adequate. Therefore the farmers must be experiencing difficulties in the important agricultural activities like land preparation, tillage, etc.

3.6 Capital Investment in Agriculture

Agricultural investment covers long-term capital investment for enhancing the agricultural production such investment may be classified as Govt. and private investments. Government investment covers mega investment like investment in Irrigation projects infrastructure development, investment in institutional setup of various other development projects etc. Private investment covers induced investment in Agricultural activities.

Following Table No.3.4 shows the Actual investment of sample farmers in the study region. Investment of 40.5 % of farmers was upto Rs. 20,000 of 30.5% of farmers were between 20 to 40 thousand and investment of 12.5% of farmers was between 40 to 60 thousand. Investment of 3.5% of farmers was between 60 to80 thousand, investment of 2.5% of farmers was between 80 to 1 lakh and investment of 7.5 % of farmers above 1lakh in study region.

Table No.3.4

Agriculture Investment

Sr.No	Actual Investment Per Year (In Rs.)	Beneficiaries	Percentage
1	0 to 20,000	81	40.5
2	20,000 to 40,000	67	30.5
3	40,000 to 60,000	25	12.5
4	60,000 to 80,000	7	3.5
5	80,000 to 100,000	5	2.5
6	Above 100,000	15	7.5
	Total	200	100

Source :- Fieldwork

3.7 Investment in Agricultural Inputs

The following items of individual investment in farm activities made by sample units on their farms or related to their farm activities.

Table No.3.5 shows that out of total farmers, 33 farmers have made no investment in their land. 15% of farmers invested in irrigation facility, 31% of farmers invested for land leveling, 32% farmers invested in purchasing tractors, 5% of farmers invested in purchasing of land.

Table No. 3.5

Investment in Agricultural inputs

Sr.No	Investment	Beneficiaries	Percentage
1	No Investment	33	16.5
2	Irrigation (Wells)	30	15
3	Land Leveling	62	31
4	Tractors	65	32
5	Investment in Land	10	5
	Total	200	100

Source :- Fieldwork

3.8 Use of Agricultural Inputs

Uses of agricultural inputs include fertilizer like manure, chemical and seeds, pesticides, insecticides, etc. This is used by the sample units in the study area. Use of Agricultural inputs brings a favorable result and returns to the farmers. The yield rate change as a result of use of inputs. Crop productivity had increased. Phenomenally the use of all above inputs was possible, only because of the irrigation in the region. Changes in the yield rates reflect direct and tangible impact of irrigation on the farmers.

Use of Agricultural Inputs :

A successful green revolution, as experience has shown, cannot be accomplished with the help of traditional agricultural techniques and practices. A change in them is almost a necessary condition for agrarian growth. A number of agricultural techniques and practices have been evolved over the years. Agriculture is being called upon to meet new challenges posed by the development process. It needs to be given a new scientific and technological base. Further growth of the agricultural sector to any appreciable degree with the help of the current HYV, fertilizers-water technology is neither feasible nor desirable. It is not feasible because the key element in the successful application of this technology is water, and it is clear to us that irrigation facilities cannot be extended further to any appreciable extent.

Table No.3.6
Use of Agricultural Inputs

Sr. No.	Particular	No.of farmers	Percentage
1	Use of High Yield Variety of Seeds	185	92.5
2	Use of Chemical Fertilizers	197	98.5
3	Seed Processing before sowing	21	10.5
4	Spraying the Pesticide on crop to protect them	122	61
5	Use of Modern Methods of Irrigation	54	27

Source :- Fieldwork

Table No.3.6 shows use of agricultural inputs, in study area. Out of total (200) respondents 92.5% farmers were using HYVS, 98.5% farmers were using chemical fertilizers 10.5% farmers were using seed processing before sowing, 61% farmers were using pesticide to protect the crop and 27% farmers were using modern methods of irrigation.

3.8.1 Use of Manure

This is the traditional manure and is mostly readily available to the farmers. Farm yard manure is a decomposed mixture of Cattle dung and urine with straw and litter used as bedding material and residues from the fodder fed to the cattle. The waste material of cattle shed consisting of dung and urine soaked in the refuse of the shade is collected daily and placed in trenches about 6-7 m long, 1.5-2 m broad and 1 m deep. Animal manures are an excellent source of plant nutrients. Approximately 70-80% of the nitrogen, 60-85% of the phosphorus and 80-90% of the potassium in feeds are excreted in the manure. The amount of nutrients available for recycling to plants varies widely being dependent upon the composition of the feed ration, the amount of bedding and water added or lost the method of manure collection and storage, the method of land application, and characteristics of the soil, crop and climate. Manure contains all the plant nutrients needed for crop growth including trace elements. The availability or efficiency of manure utilization by a crop is determined by the method of application, time to incorporation and the rate of manure decomposition by microorganisms in soil.

The Planning Commission noted that "in tropical soils, organic manures like farmyard manure, which is a by-product in farming by bullocks, helps the soil by increasing its water holding capacity, improving soil aeration, and by changing the plant nutrients through slow decomposition into forms readily available to plants. There are other advantages in the use of organic manures namely (a) steadiness in yield over a period of time (b) benefit to the succeeding crops by their residual effects, and (c) ability to withstand unfavorable weather conditions"

Table No. 3.7 indicates use of manure by farmer in command area. Out of total farmers, maximum farmers 20% were using 0 to 5 tonnes

manure followed by 18% farmers were used manure above 25 tonnes,17.5% farmers were not using manure,15% farmers were using manure 10 to 15 tonnes, 14.5% farmers were using manure ranged 5 to 10 tonnes and 7.5% farmers using manure ranged 15 to 20 , 20 to 25 tonnes.

Table No. 3.7

Use of Manure

Sr.No	Use of Manure (In Tonnes)	Beneficiary	Percentage
1	Not using	35	17.5
2	0 to 5 (Tonnes)	40	20
3	5 to 10 (Tonnes)	29	14.5
4	10 to 15 (Tonnes)	30	15
5	15 to 20 (Tonnes)	15	7.5
6	20 to 25 (Tonnes)	15	7.5
7	Above 25(Tonnes)	36	18
	Total	200	100

Source :- Fieldwork

3.8.2 Use of Chemical fertilizer (NPK)

The use of chemical fertilizers is now widely accepted as one of the key elements in the strategy for accelerating the growth of agricultural productivity, especially in the short run. According to one estimate, the use of one tonne of plant nutrients would be equivalent to adding about 4 hectares crop-land in terms of additional production.

Fertilizers, a land saving and labour saving input play predominant role in increasing the fertility of soils. After water, it constitutes the next most vital input for modern agriculture. Three types of chemical fertilizers are used which is phosphatic, nitrogenous and potassic. Although such fertilizers are applied to crops like hybrid, jowar, rice,

wheat, garden crops, their proportion seems to be always high in case of irrigated crops like sugarcane, turmeric ginger. It is observed that of the total application of fertilizer, sugarcane crop shares about 80% per cent of in the region.

Table No. 3.8

Use of Chemical fertilizer (NPK)

Sr.No	Use of Chemical fertilizer (In Kg.)	Beneficiaries	Percentage
1	Not using	03	1.5
2	0 to 500 (Kg.)	89	44.5
3	500 to 1000 (Kg.)	60	30
4	1000 to 1500 (Kg.)	14	7
5	1500 to 2000 (Kg.)	22	11
6	Above 2000(Kg.)	12	6
	Total	200	100

Source :- Fieldwork

Table No.3.8 indicates that use of chemical fertilizer (NPK). Only 1.5% out of total 200 farmers 3 farmers was not using chemical fertilizer. Out of total farmers 44.5% farmers were using chemical fertilizer between 0 to 500 k.g., followed by 30% farmers were using 500 to 1000 k.g. fertiliser, 11% farmers were using 1.5 to 2 tonnes fertilizer, 7% farmers were using 1 to 1.5 tonnes fertilizer and 6% farmers were using chemical fertilizer above 2 tonnes.

3.8.3 Use of Seeds (HYVS)

Improved strains of seeds are essential for increasing agricultural production. Unless the farmer has good seeds of suitable varieties, he cannot get the best out of other inputs, such as irrigation, fertilizers, insecticides and machinery with HYV seeds, it becomes possible for him to take to intensive agriculture because of the resultant high yield and

good economic returns. When one sees in retrospect, it becomes clear that much of the stagnation that prevailed in indian agriculture till the mid- 1960s could have been explained in terms of the availability of poor and low- yielding variety seeds. The evolution of HYV seeds not only helped to change the entire scene of agricultural economy. But it also brought into focus the importance of hitherto neglected, but a significant input of agriculture.

High yielding seed breeding technology is a revolutionary transition from pessimism, conservation and age-old traditions to innovations, dashing adventurism and hope. In fact, the real benefits of irrigation come out when improved seeds are used. The present status of agriculture in the region is essentially the outcome of the use of high yielding improved strains, particularly those of jowar, wheat, maize groundnut, sugarcane., Soyabean, Turmeric, The adoption of these HYV seeds has increased as they respond more rapidly to the fertilizers and water input.

Table No.3.9 shows that use of seeds by respondents. Out of total 200 farmers 42.5 % farmers using seeds 10 to 20 k.g., per hectare, followed by 18% farmers were using seeds ranged 20 to 30 k.g.,14.5 % farmers using seeds 40 t0 50 k.g., 12.5% farmers were using seeds 30 to 40 k.g.6.5% farmers using seeds ranged 0 to 10 k.g.and only 6% farmers were using seeds above 50 k.g.

Table No. 3.9
Use of Seeds

Sr.No	Use of Seeds (In Kg.)	Beneficiaries	Percentage
1	0 to 10 (Kg.)	13	6.5
2	10 to 20 (Kg.)	85	42.5
3	20 to 30 (Kg.)	36	18
4	30 to 40 (Kg.)	25	12.5
5	40 to 50 (Kg.)	29	14.5
6	Above 50 (Kg.)	12	6
	Total	200	100

Source :- Fieldwork

3.8.4 Use of Pesticides

Along with better seeds, fertilizers and irrigation plant protection has been accepted as one of the major factors in increasing the productivity of a land. As the improved verities of crops are highly susceptible to pests and diseases, a serious damage and even annihilation of crops are likely if adequate preventive and curative measures are not taken.

Table No. 3.10
Use of Pesticides and Insecticides

Sr.No	Use of Pesticides (Litres)	Beneficiaries	Percentage
1	Not using	40	20
2	5 to 10 (Liters)	59	29.5
3	10 to 15 (Liters)	55	27.5
4	15 to 20 (Liters)	12	6
5	20 to 25 (Liters)	2	1
6	Above 25 (Liters)	32	16
	Total	200	100

Source :- Fieldwork

Above Table No.3.10 indicates that the use of pesticides and insecticides by respondents. 20 percent farmers were not using pesticides and insecticides. Out of total farmers 29.5 percent farmers were using 5 to 10 litres pesticides, followed by 27.5 percent farmers were using 10 to 15 litres pesticides, 16 percent farmers were using pesticides above 25 litres, 6 percent farmers were using 15 to 20 litres pesticides and only 1perecent farmers were using 20 to 25 litres pesticides.

3.9 Need of Agricultural Technology

The region has to go in for more suitable technology for the transformation of its agricultural economy. There are two major considerations which should be kept in view while making the choice of technology in agriculture for further use:

i) A reduction in the cost of production without sacrificing yield.

ii) Optimizing the economic benefits from the available resources of land, water and labour to a farming family through multiple cropping, mixed cropping, mixed farming, etc.

Table No. 3.11 shows that need of agricultural technology to the farmers for various reasons. Out of total 200 farmers 112 farmers reported that they were need of new agricultural technology to increase their agricultural production, followed by 67 farmers reported that the need agricultural technology for increase their agricultural income. 13 farmers said that they need agricultural technology to save their labour in agricultural activities and 8 farmers responded that they need for agricultural technology for decrease in cost of agricultural production.

Table No.3.11
Need of Agricultural Technology

Sr. No.	Particular	No.of farmers	Percentage
1	To increase in Agricultural Production	112	56
2	To increase in Income from Agricultural	67	33.5
3	To save labour in Agriculture	13	6.5
4	To decrease cost of production	8	4
	Total	200	100

Source :- Fieldwork

3.10 Livestock

Livestock is an important source of income for the majority of farmers in the region. In fact, pastoral production is far more resilient than crop production and more remunerative too. The share of livestock production in the aggregate agricultural output in some of the west European counties is about 60 to 80% in recent years. In India, however, the gross value of output from livestock sector i.e. animal husbandry and dairy development is now placed around Rs.70,000 crores which is 25% of the total agricultural output that year. Livestock products like meat, milk and milk products have prominent place in the diets of people in the advanced countries

The significance of animal husbandry in the Indian economy arises because of its assistance to tackle the serious problems of unemployment and underemployment for weaker sections in the country and for providing subsidiary occupations for income generation animal husbandry and dairy development are being used as a poverty eradication measure i.e. to provide additional employment and increase family income of the rural people.

The livestock has occupied an important position in DIP command area. Most of the farmers in the region have been engaged in the livestock activities even though there are number of difficulties such as lack of facilities to the development of livestock activities.

Table No.3.12

Livestock

Sr.No	Particulars	No. of Respondents N=200	No. of Animals	% of Farmers	Average Animals/Family
1	Bullock Pair	106	227	53	2.14
2	Cow	73	130	36.5	1.78
3	Buffalo	73	132	36.5	1.81
4	Sheep/Goat	25	43	12.5	1.72
5	Poultry Birds	44	327	22	7.43

Source :- Fieldwork

Table No.3.12 gives the details of livestock possessed by the sampled farmers such as bullock pairs, cows, buffaloes, etc. It is seen from the table 3.12 that about 53% farmers were self sufficient in carrying out the necessary agricultural operations. Higher percentages of owning cows, buffaloes indicate that dairy activities are quite popular among farmers, 25 farmers possess Sheep, and 44 (22%) farmers are also engaged in poultry activities. This shows that livestock rearing is quite significant activity in the command.