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CHAPTER III

CHANGES IN AREA, PRODUCTION AND YIELD

3.1 - INTRODUCTION

The ultimate aim of any irrigation project is to bring about the dynamic changes in cropping pattern and modern agricultural practices. Farmers prefer to grow include commercial crops such as sugarcane, cotton, groundnut, grapes and also food crops/ food grains of high yielding varieties. Cropping pattern is developed on the basic of commercial principal rather than subsistence.

An effort is made in this chapter to analyze area under main crops, production and yield of main crops. Washi Irrigation scheme is one of major scheme in the Walwa Taluka. Cropping pattern in command area has absolutely changed. Production and yield of various crops increased in the command area. Before scheme period when irrigation was not available farmers used to take mainly food grain crops especially Hybrid Jowar and Groundnut during Kharip season. But after establish and starting Washi irrigation scheme, farmers started taking cash crops in place of traditional or food grain crops.

3.2 AREA UNDER MAIN CROPS IN COMMAND AREA:

Area under main crops in the command area has shown in tables 3.1 to 3.7 of Hybrid Jowar, Groundnut, Wheat, Rice, Sugarcane, Soyabean and Rabi Jowar respectively. The changes in area of Hybrid Jowar are shown in table no.3.1 as given below.

Table No.3.1 Changes in Area under Hybrid Jowar (Figures in acre)

Sr. No.	Particulars	Before	%	After	%	% Changes
1	Marginal farmer	18.05	7.27	0.30	4.07	-98.34
2	Small farmer	29.78	12.00	2.08	28.18	-93.01
3	Medium farmer	52.75	21.25	2.00	27.10	-96.21
4	Large farmer	147.00	59.23	3.00	40.65	-97.96
	Total	**248.18**	100.00	**7.38**	100.00	-97.03

Source: Field work

Table no. 3.1 shows before scheme area of hybrid Jowar was 248.18 acres and it was 7.38 acres scheme started further it shows that marginal farmers share was 7.27 % in the total area under Hybrid Jowar. It was 4.07 only after irrigation. Small farmers share was 12% in before period and 28.18% after scheme period. Medium farmers share was 21.25% in total area under Hybrid Jowar before scheme started and it was 27.10% after period. Large farmers' share was 59.23% before irrigation and 46.65% in after irrigation period. Thus it shows the reduction in areas under Hybrid Jowar after scheme was started, it was more pronounced in case of big farmers.

Groundnut:

Table No.3.2 Area under Groundnut (Figures in acre)

Sr. No.	Particulars	Before	%	After	%	% changes
1	Marginal farmer	11.05	5.41	0.00	0.00	-100.00
2	Small farmer	21.35	10.45	0.00	0.00	-100.00
3	Medium farmer	44.75	21.90	0.00	0.00	-100.00
4	Large farmer	127.15	62.24	0.00	0.00	-100.00
	Total	**204.30**	100.00	0.00	0.00	-100.00

Source: Field work

Groundnut was most important crop during the before scheme period. But after scheme period this crop was ignored totally. It was second largest crop before scheme was initiated and after scheme. Farmers given up to grow groundnut. Out of total area of Groundnut before scheme, marginal farmers had 11.05 acres of land under this crop. Its percentage was 5.41%. Small farmers had 21.35 acres land under this crop with 10.25% while medium farmers had 127.15 acres with 21.90% and large farmers had 127.15 acres with 62.24%. It was highest percentage in area under groundnut crop. After irrigation scheme farmers was started to grow cash crop in place of groundnut.

Wheat:

Table No. 3.3 Area under Wheat. (Figures in acre)

Sr. No.	Particulars	Before	%	After	%	% changes
1	Marginal farmer	0.00	0.00	0.00	0.00	0.0
2	Small farmer	0.00	0.00	2.0	8.62	0.0
3	Medium farmer	3.10	60.78	5.2	22.41	67.7
4	Large farmer	2.00	39.22	16.0	68.97	700.0
	Total	**5.10**	**100.00**	**23.2**	**100.00**	**354.9**

Source: Field work

Table no. 3.3 shows area under wheat crop increased from 5.10 acres before scheme to about 23.20 acres of land the after scheme period. Which show change was 354.9%. Land under wheat the marginal farmers do not grow this crop small farmers were 2 acres of land under wheat. In case of medium farmers 3.10 acres land was under wheat and 5.2 acres after scheme. The maximum land was under wheat crop in case of large farmers in the command area. It was 2.0 acres under wheat crop before scheme, which raised to 16.0 acres after scheme. Its percentage share was 39.22% before scheme and 68.97% after scheme. Thus, big farmers prefer to grow wheat crop in the command areas.

Rice:

Rice is most important food crop. Its area under cultivation was only 3.0 acres before scheme and it was 10.20 acres of land after scheme. Mostly, grow this crop, followed by medium farmers. The 4.0 acres land was brought under rice by of medium farmers 5.0 acres land was brought by large farmers. Its percentage share was 39.32%, and 49.02% respectively. Details are given in table no. 3.4

Table No. 3.4 Area under Rice (Figures in acre)

Sr. No.	Particulars	Before	%	After	%	% changes
1	Marginal farmer	0.00	0.00	0.00	0.00	0.00
2	Small farmer	0.00	0.00	1.20	11.76	0.00
3	Medium farmer	0.00	0.00	4.00	39.72	0.00
4	Large farmer	3.00	100.00	5.00	49.02	66.67
	Total	**3.00**	**100.00**	**10.20**	**100.00**	**354.9**

Source: Field work

Sugarcane:

Area of sugarcane has substantially after scheme was initiated. Because of its profitability, farmers are taking this crop very much in Washi command area also. Area under this crop is shown in following table 3.5.

Table No. 3.5 Area under Sugarcane (Figures in acre)

Sr. No.	Particulars	Before	%	After	%	% changes
1	Marginal farmer	0.00	0.00	28.03	7.12	00
2	Small farmer	0.00	0.00	48.23	12.25	00
3	Medium farmer	1.00	21.05	86.50	24.41	9510.00
4	Large farmer	3.75	78.95	221.38	56.22	5803.47
	Total	**4.75**	**100.00**	**393.74**	**100.00**	**8189.26**

Source: Field work

Table No. 3.5 depicts that area of sugarcane was increased from 5.35 acres to about 394.34 acres land between before scheme and after scheme period. Marginal and small farmers share was 0% in before scheme but it was 7.12% and 12.25% respectively after scheme. Medium farmers had only 1.0 acre before scheme it was about 96.10 acres land in after scheme period. Its

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percentage share was 21.05% in total area under sugarcane before scheme and it was 24.41% after scheme period. The large farmers had 3.75 acres before scheme and it was about 221.38 acres of land after scheme period. The percentage share was 78.95% before scheme and 56.22% after scheme.

From the above table, it reveals that area sugarcane increased tremendously. This is happened due to availability of water of Washi irrigation scheme. More importantly all farmers are growing this crop because as compared to other crops, it is more profitable.

Soyabean:

Soyabean is one of the cash crops recently being grown in the region. The area under this crop was increased from 0 to 61.22 acres. The percentage share of both periods is shown in following table no. 3.6.

Table No. 3.6 Area under Soyabean

(Figures in acre)

Sr. No.	Particulars	Before	%	After	%	% changes
1	Marginal farmer	0.00	0.00	0.10	0.16	0.00
2	Small farmer	0.00	0.00	1.39	2.29	0.00
3	Medium farmer	0.00	0.00	8.10	13.36	0.00
4	Large farmer	0.00	0.00	51.03	84.18	0.00
	Total	**0.00**	**00.00**	**61.22**	**100.00**	**0.00**

Source: Fieldwork

Table No. 3.6 shows that soyabean was produced only after scheme period was started. Area under soybean was nil before scheme which increased up to 61.22 acres after scheme period. All categories of farmers now have started to grow this crop.

Rabbi Jowar:

In command area this crop is not being produced barring few farmers. It was noticed that during recent period some farmers produce this crop. It was 12.05 acre, brought under rabbi Jowar.

Table No. 3.7Area under Rabbi Jowar

(Figures in acre)

Sr. No.	Particulars	Before	%	After	%	% Changes
1	Marginal farmer	0.00	0.00	0.00	0.00	0
2	Small farmer	0.00	0.00	3.05	25.31	0
3	Medium farmer	0.00	0.00	4.00	33.20	0
4	Large farmer	0.00	0.00	5.00	41.49	0
	Total	**0.00**	**00.00**	**12.05**	**100.00**	**0**

Source: Fieldwork

Table no. 3.7 shows that small, medium and large farmers started growing rabbi Jowar recently. It was 3.05 acres, 4.0 acres, 5.00 acres used for rabbi Jowar by small, medium and big farmers respectively.

3.3 PRODUCTION OF MAIN CROPS IN COMMAND AREA:

The present section deals with crop wise productions of main crops in command area. In this region crops are Hybrid jowar, Groundnut, Wheat, Rice, Sugarcane, Soyabean and Rabi Jowar. In irrigated areas cash crops are mainly produced followed by food crops. Table no. 3.8 to 3.14 deals with production of main crops before and after irrigation scheme was initiated.

Table No. 3.8 Production of Hybrid Jowar (Figures in quintal)

Sr. No.	Particulars	Before	% share	After	% share	% Change
1	Marginal farmer	200.00	8.82	5.00	4.81	-97.60
2	Small farmer	317.00	13.98	17.00	16.35	-94.84
3	Medium farmer	517.00	22.81	51.00	49.04	-90.51
4	Large farmer	1233.00	54.39	31.00	29.81	-97.58
	Total	**2267.00**	**100.00**	**104.00**	**100.00**	**-95.59**

Source: Field work

Table3.8 shows that production of hybrid jowar before scheme and after scheme period. Out of total hybrid jowar production 2267 quintals, marginal farmers produced 200 quintals, small farmers produced 317 quintals, medium farmers produced 517 quintals and large farmers produced 1233 quintals before scheme. After scheme was started, farmers have reduced area under hybrid Jowar, consequently, as compared to previous period there has substantial reduction in the production of hybrid Jowar. It was 5 quintals, 17 quintals, 51 quintals and 31 quintals of marginal, small, medium and large farmers respectively.

The highest percentage in producing hybrid jowar was 54.39% by large farmers before scheme and 49.0% of medium farmers after scheme. Total production of hybrid jowar was 2267 quintals before scheme and 104 quintals after scheme Thus it shows that production of hybrid jowar tremendously decreased from 2267 quintals to 104 quintals after scheme. It was occurred due to transfer of area under hybrid Jowar to cash crops in the command areas.

Table No. 3.9 Production of Groundnut (Figures in quintal)

Sr. No.	Particulars	Before	% share	After	% share	% Change
1	Marginal farmer	168.00	8.65	0.00	0.00	-100.00
2	Small farmer	236.00	12.15	0.00	0.00	-100.00
3	Medium farmer	442.00	22.75	0.00	0.00	-100.00
4	Large farmer	1097.00	56.46	0.00	0.00	-100.00
	Total	**1943.00**	**100.00**	**0.00**	**0.00**	-100.00

Source: Field work

Production of groundnut was second important crops before scheme period. But after scheme period it was totally neglected. The Groundnut production was 1943 quintals and it was nil after scheme. Out of total Groundnut production 1943.00 quintals, marginal farmers produced 168 quintals before scheme and no output after scheme period. Small farmers, medium farmers, and large farmers used to produce. 236 quintals, 442 quintals and 1097 quintals respectively before scheme. But farmers did not produce Groundnut after scheme. Because the irrigated area was shifted for cash crops so that farmers could not take Groundnut production after scheme period.

Out of total production 8.65% marginal farmers, 12.15% by small farmers, 22.75% by medium farmers and 56.46% by large farmers produced output. Since this crop is not comparatively profitable crop, farmers in the command areas, given up to the cultivation of groundnut.

Production of Wheat:

Table No. 3.10 Production of Wheat (Figures in quintal)

Sr. No.	Particulars	Before	% share	After	% share	% Change
1	Marginal farmer	0.00	0.00	2.00	2.08	0.00
2	Small farmer	0.00	0.00	17.00	17.71	0.00
3	Medium farmer	33.00	68.75	44.00	45.83	38.9
4	Large farmer	15.00	31.25	33.00	34.38	129.00
	Total	**48.00**	**100.00**	**96.0**	**100.00**	108.00

Source: Field work

Above table 3.10 shows wheat production of farmers in command area before and after scheme period. Before scheme period, total wheat production was 48 quintals and which increased to 96.0 quintals after scheme period. Out 48 quintals production before scheme, marginal and small farmers did not produce wheat crop. While medium and big farmers produced 33.0 quintals and 15 quintals respectively. However recently along with medium and big farmers, marginal and small farmers started growing wheat in the command areas.

It showed that, total production of wheat crop was double after scheme was initiated because of availability of irrigation facility.

Production of Rice

The Production of rice before and after scheme period has shown in table no. 3.11. The total rice production was 70 quintal before scheme and it was 241 quintal after scheme. Out of total production, large farmers produced 70 quintals, production before scheme. But after scheme out of total production, 135 quintals production produced by medium farmers which were highest production. Small farmers produced 66 quintals, large farmers 40 quintals and marginal farmers did not produce after scheme period also. Out of 70 quintals total production, 100% production was of large farmers before scheme but it was 56.2% of medium farmers, 27.39% of small farmer and 16.60% of large farmers after scheme.

Table No. 3.11 Production of Rice **(Figures in quintal)**

Sr. No.	Particulars	Before	% share	After	% share	% Change
1	Marginal farmer	0.00	0.00	0.00	0.00	0.00
2	Small farmer	0.00	0.00	66.00	27.39	0.00
3	Medium farmer	0.00	0.00	135.00	56.02	0.00
4	Large farmer	70.00	100.00	40.00	16.60	-76.29
	Total	**70.00**	100.00	241.00	100.00	42.86

Source: Fieldwork

It showed that large farmers reduced rice production due to shift over to cash crop i.e. sugarcane, soyabean etc.in the command areas.

Production of Sugarcane:

Sugarcane is main and crucial cash crop in command area. Sugarcane production was taken by farmers in command area after irrigation scheme but sugarcane was very low before but it increased after scheme. The position of sugarcane production is shown in table no. 3.12. Total sugarcane production was 122 tonnes before and it was about 15534.50 tones after scheme period. Out of total sugarcane production 112 tonnes before scheme, marginal and small farmers did not produce medium farmers produced 35 tonnes and large farmers produced 77 tonnes. But after scheme started marginal farmers produced 1087.50 tones, small farmers produced 2247 tonnes, medium farmer 3600 tonnes and large farmer 8600 tonnes. The Before and after scheme large farmers were produced highest production of sugarcane followed by medium, small and marginal.

Table No.3.12 Production of Sugarcane (Figures in tone)

Sr. No.	Particulars	Before	% share	After	% share	% Change
1	Marginal farmer	0.00	0.00	1087.50	7.00	0.00
2	Small farmer	0.00	0.00	2247.00	14.46	0.00
3	Medium farmer	35.00	31.25	3600.00	23.17	0.00
4	Large farmer	77.00	68.75	8600.00	55.36	-28.10
	Total	**112.00**	**100.00**	**15534.50**	**100.00**	-100.00

Source: Field work

The percentage share in sugarcane production was nil in case of marginal and small farmers 31.35% of medium farmers and 68.75% of large farmers before scheme. It was 7% of marginal farmers, 14.46% of small farmers, 23.17% of medium farmers and remained 55.36% was of large farmers.

Sugarcane production was increased tremendously was initiated after scheme due to availability irrigation facility, farmers preferred sugarcane crop, rather than low yield crops.

Production of Soyabean:

Table No. 3.13 Production of Soyabean (Figures in quintal)

Sr. No.	Particulars	Before	% share	After	% share	% Change
1	Marginal farmer	0.00	0.00	0.00	0.00	0.00
2	Small farmer	0.00	0.00	19.00	6.13	0.00
3	Medium farmer	0.00	0.00	17.00	5.48	0.00
4	Large farmer	0.00	0.00	274.00	88.39	0.00
	Total	**0.00**	**0.00**	**310.00**	**100.00**	**0.00**

Source: Field work

Above table shows, soyabean production was not produced by farmers before scheme but due to availability of irrigation facilities farmers were produced soyabean after scheme. Before scheme, total production was nil. However after

scheme farmers produced about 310 quintals percentage share of large farmers was 88.39%. Followed by small farmers (6.13%) and medium farmers (5.48%) in fact soybean is recent realizing its importance to the farmers.

Production of Rabbi Jowar:

Table No. 3.14 Production of Rabi Jowar (Figures in quintal)

Sr. No.	Particulars	Before	% share	After	% share	% Change
1	Marginal farmer	0.00	0.00	0.00	0.00	0.00
2	Small farmer	0.00	0.00	33.00	8.42	0.00
3	Medium farmer	0.00	0.00	56.00	14.29	0.00
4	Large farmer	0.00	0.00	303.00	77.30	0.00
	Total	**0.00**	**0.00**	**392.00**	**100.00**	**0.00**

Source: Field work

Production of Rabi Jowar before and after scheme has shown in Table No. 3.14. Before scheme total Rabi Jowar production was nil for each farmer group. After scheme, total production of rabbi jowar was 392 quintals and its percentage, 8.42% for small farmers, 14.29% for medium and 77.30% for large farmers. In the total production of rabbi jowar the highest production was produced by large farmers followed by medium and small farmers thus it could be observed that

From the above tables, each crop production was increased to compare with before scheme. Washi irrigation project has created positive impact on production of crops.

3.4 YIELD OF MAIN CROPS IN COMMAND AREA

in this section , an effort is made to study the changes in yields of various crops in command area. Crop wise yield is given tables no. 3.15 to table no. 3.21 Hybrid jowar and Groundnut were main crop before scheme but on initiating scheme, irrigated land being used for sugarcane and soyabean.

Yield of Hybrid Jowar:

The yield of hybrid Jowar is given in table 3.15 before and after scheme

Table No. 3.15 yield of Hybrid Jowar: **(Figures in qui/acre)**

Sr. No.	Particulars	Before scheme	After scheme
1.	Marginal Farmer	11.08	50.00
2.	Small Farmer	10.65	8.17
3.	Medium Farmer	9.80	42.50
4.	Large Farmer	8.39	10.33
	Average Yield	**9.98**	**27.75**

Source: Field work

Table no. 3.15 shows yield of hybrid jowar was increased from 9.98 quintals per acre before to 27.75 quintals per acre after scheme. Moreover there has been variation in the yield of jowar across various categories of farmers for instance. Out of total sample farmers, the marginal farmers produced 11.08 before and which reduced to 50.00 quintal per acre after scheme. Small farmers produced 10.65 quintal per acre which reduced to 8.17 quintal per acre after scheme period. Medium farmers produced 9.80 quintal per acre and raised to 42.50 quintals per acre after scheme. Large farmers produced 8.39 quintals per acre and it was increased to 10.33 quintal acre after scheme.

Yield of Groundnut:

Table No. 3.16 Yield of Groundnut **(Figures in qui/acre)**

Sr. No.	Particulars	Before scheme	After scheme
1.	Marginal Farmer	15.2	0.00
2.	Small Farmer	11.05	0.00
3.	Medium Farmer	9.88	0.00
4.	Large Farmer	8.63	0.00
	Average Yield	**11.19**	**0.00**

Source: Field work

Groundnut was second important crop in command area before scheme. Due to shifted irrigated land to sugarcane and other cash crops farmers have given up to cultivated groundnut. Average yield was 11.19 quintal per acre before scheme but after scheme farmers did not cultivated groundnut. Before scheme marginal farmers used to produce 11.05 quintals per acre, medium farmers produced 9.88, quintals and large farmers produced 8.63 quintal per acre.

Yield of Wheat:

Table No. 3.17 Yield of Wheat **(Figures in qui/acre)**

Sr. No.	Particulars	Before scheme	After scheme
1.	Marginal Farmer	0.00	0.00
2.	Small Farmer	0.00	8.5
3.	Medium Farmer	10.65	8.46
4.	Large Farmer	7.5	2.06
	Average Yield	**4.54**	**4.76**

Above table 3.17 shows average yield was 4.54 quintals per acre before scheme and it was 4.76 quintals per acre after scheme. Marginal farmers were not producing wheat before and after scheme. Small farmers were not producing wheat before but after scheme then started producing wheat 8.50 quintals per acre medium farmers produced 10.65 quintals per acre while large farmers produced 7.50 quintals per acre before scheme. It was merely 2.06 quintals per acre after scheme. Although, irrigation facility was available after scheme, wheat production did not increase satisfactory.

Yield of Rice:

Table No. 3.18 Yield of Rice (Figures in qui/acre)

Sr. No.	Particulars	Before scheme	After scheme
1.	Marginal Farmer	0.00	0.00
2.	Small Farmer	0.00	55.00
3.	Medium Farmer	0.00	33.00
4.	Large Farmer	23.33	8.00
	Average Yield	**5.83**	**24.19**

Source: Field work

Table No. 3.18 shows average yield of rice increased from 5.83 quintals per acre before to 24.19 quintals per acre after scheme. Before scheme, used to large farmers produce rice production and while other were not cultivated rice. The yield of rice of large farmers was 23.33 quintal per acre before scheme. It was 8 quintal per acre from before to after scheme. The yield of rice across medium, small and large farmers showed that it was 55 quintals per acre, 33.75 quintals per acre and 8 quintals per acre respectively after scheme.

Table 3.19 Yield of Sugarcane: (Figures in tone/acre)

Sr. No.	Particulars	Before scheme	After scheme
1.	Marginal Farmer	0.00	38.00
2.	Small Farmer	0.00	46.59
3.	Medium Farmer	35.00	37.46
4.	Large Farmer	20.53	38.85
	Average Yield	**13.88**	**40.43**

Source: Field work

Sugarcane is the most important crop in command area. Table 3.19 depicts average yield of sugarcane. It is increased from 13.88 tonnes per care to 40.43 tonnes per acre. Marginal and small farmers had not produce sugarcane before scheme but after scheme they started to grow sugarcane. They produced 38.80 tones and 46.59 tonnes after scheme respectively. Before scheme highest yield was achieved by medium farmers. It was 35.00 tonnes before scheme but it was increased only 2.46 tonnes per acre after scheme. Large farmers produced 20.53 tonnes per acre before scheme which increased to 38.85 tonnes after scheme.

In case of yield of sugarcane, highest yield was reduced by small farmers after scheme. It was 46.59 tonnes per acre followed by 38.85 tonnes of large farmer 38.80 tonnes per acre of marginal and medium farmers 37.46 tonnes per acre.

ield of Soyabean:

Table No. 3.20 Yield of Soyabean (Figures in qui/acre)

Sr. No.	Particulars	Before scheme	After scheme
1.	Marginal Farmer	0.00	0.00
2.	Small Farmer	0.00	55.00
3.	Medium Farmer	0.00	33.00
4.	Large Farmer	0.00	8.00
	Average Yield	**0.00**	**24.19**

Source: Field work

Soyabean was not cultivated before scheme in command area. Table no. 3.20 shows yield of soyabean crop. The average yield of soyabean was 55 quintals per acre in case of small farmers. It was 5.29 quintals per acre after. The medium farmers not produced soyabean.

Yield of Rabi Jowar:

Table No. 3.21 Yield of Rabi Jowar (Figures in qui/acre)

Sr. No.	Particulars	Before scheme	After scheme
1.	Marginal Farmer	0.00	0.00
2.	Small Farmer	0.00	10.00
3.	Medium Farmer	0.00	14.00
4.	Large Farmer	0.00	60.00
	Average Yield	**0.00**	**21.36**

Source: Field work

Rabi Jowar is one of the neglected crops in command area because before scheme it was not cultivated due to quality of land and water storage problem. And after scheme due to availability water facility, irrigated land was shifted to cash crops so it was neglected. Table No. 3.21 shows, average yield of Rabi Jowar. Across various categories of farmers large farmers produced yield of rabbi jowar in the term of 60 quintals per acre, followed by medium farmers after scheme was started.