

Vol III Issue II August 2013

Impact Factor : 1. 2018

ISSN No :2231-5063

Monthly Multidisciplinary Research Journal

Golden Research Thoughts

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RNI MAHMUL/2011/38595

ISSN No.2230-7850

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IMPACT OF IRRIGATIONAL CHANGES ON AGRICULTURE CHARACTERISTICS OF AHMEDNAGAR DISTRICT

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Abstract: The transformation in the pattern of agriculture in Ahmednagar district, which has been transformed from extensive to intensive use of land owes largely to the extension of irrigational facilities. The district facing rainfall vagaries and wide variability of rainfall from the last few decades. The changes owe a great deal to variety of infrastructural developments and increase inputs in general and extensive and intensive irrigational role in particular. An attempt is made here, to study the impact of imitational changes on agricultural characteristics of the district which is existed after the advent of irrigation. Ahmednagar district has different sources of irrigation sources well, canal lift and other sources. The important sources available in the district are well and canal. Jowar, Bajore, Wheat account for a major share of cropping of land under tillage in the district. With the advent of irrigation, the shares of commercial crops are increased in total cultivated area of the district. The traditional subsistence agricultural structure of the study region appears to be crumbling or is in the process of transformation into market oriented, semi-commercial ized pattern.

Keyword: Irrigation, crop combination, drought prone area.

OBJECTIVES :-

- i) To find out spatio-temporal changes in sources of irrigation.
- ii) To study the impact of irrigational changes on agricultural characteristics.
- iii) To highlight on the transformation in the pattern of agriculture in the district.

INTRODUCTION :-

Irrigation is a vast subject and both its content and impact vary with the source of irrigation crop cultivation in the district either depends on natural rainfall or extended irrigational facilities. Artificial irrigation, although costly, has many advantages including an ensured regular water supply and thereby increase the overall productivity of district's land. Over the years, irrigation has encouraged multiple cropping during the three cropping seasons and helped in maintaining the required optimum soil moisture during all stages of crop growth. Irrigation act as a catalytic agent for the adoption of modern technology. It is common picture that the improved form machinery is used in the irrigated agriculture, as the farmer is capable to purchase machinery resulted from high purchasing power irrigation responds the shift from seasonal cultivation to permanent and promotes more intensive cultivation. As part from the development of agricultural practices and techniques since historic times, the principal means of irrigation in the district have been the ubiquitous wells, canal etc. out of the total rainfall in the year, about 80% rainfall is received from the month of June to September, there fore, there is close association between irrigational facilities on one hand and agricultural characteristic on the other.

DATABASE AND METHODOLOGY:-

The work is based on secondary sources of data. The data collected and used for the period 1984-85 to 2004-2005. The secondary data is obtained from socio-economic review, District Statistical Abstract of Ahmednagar district, irrigation department. The collected data are processed and tabulated Index of crop diversification is determined by Jasbir Singh (1976) method, where as, weaver's technique is applied (1954) to find out crop combination regions of the district

STUDY AREA :-

The district of Ahmednagar lying between 1802' And 1909' North latitudes and 7309' And 7505' East longitudes, is situated partly in the upper Godavari basin and partly Bhima basin the Godavari in north and the Bhima in the South. The Godavari has an overall length of 200 km within the district. Ahmednagar is the largest district of the state in area, occupying a somewhat central position in Maharashtra. Ahmednagar district consists 14 tahsils i.e. Jamkhed, Pathardi, Newasa, shrigonda, akola, karjat, shevgaon, Sangmher Ahmednagar, Rahata, Kopargaon, Parner, Shrirampur, Rahuri But new tahsil Rohata is consideret in this study. The district has varied topography, with an either side of the Ahmednagar plateau and its high crested rim are two river plain sloping toward the Godavari and Bhima rivers, respectively. The climate of the Ahmednagar district is characterized by not summer and general dryness throughout the year, except during the south-west monsoon.

RESULT AND DISCUSSION :-

Persently ahmednagar district has different sources of irrigation where the well and canal irrigation are significant position in the overall irrigation. In the years 1984-85, the area irrigated by well was about 1,65,730 hectares. The total area irrigated by well has increased by 86,298 hectares during the period of investigation. There is large scale concentration of well irrigation in Ahmednagar, Pathrdi, Yamkhed, Karjat, Akola tahsils. It rages between 60 to 80%. During 1984-85, the area immigrated by canals is about 1,15,782 hectares. As against. 1,60,782 hectors in 2004-05. Canal irrigation is more then 55% to total area irrigated in Kopargaon, Rahuri, Shrirampur, and Nevasa where as, it is not yet so, developed in Jamkhed, Pathardi and Ahmednagar tahsils. The percentage of canal irrigation is also medium in Karjat and Akola tahsils. There is a conspicuous decline in the canal irrigated area due to vagaries of monsoon rains during last fewdecades. Heavy irrigation-input through available mechanical-technical know-how has helped a great deal in maintaining the desired agricultural production balance though at a much higher cost.

CHANGING CROPLANDUSE :-

The analysis of land use pattern of the Ahmednagar district, shows that the major utilization of land is for agriculture. Due to available spatioal variation of climate, physiography, soil and rainfall in the district, a variety of crops are grown. Howerer, traditionally, rice, Jowar, Bajara, Wheat, Sugarcane etc. are grown in the district. Number of cash crops i.e. as fruits, vegetables, spices are cultivated some other crops like oil seeds, puses etc. are also grown in the study area. A comparative account of changing crop landuse of the year 1984-85 to 2004-05 are presented in the table-1

Table : 1 Ahmednagar District Changes in Selected Crop landuse (Figure in %)

Sr.No.	Crops	1984-85	2004-05	Dfference in 2004-05 over
1	Jawar	59.62	38.3	-21.29
2	Wheat	4.84	9.97	5.13
3	Bajara	13.88	21.5	7.59
4	Other cereals	1.09	1.81	0.72
5	Tur	0.37	1.8	1.43
6	Gram	1.65	2.73	1.08
7	Other pulses	3.4	3.77	0.37
8	Sugarcane	4.85	6.19	1.34
9	Cotton	0.73	0.14	-0.59
10	Groundnut	0.8	1.18	0.18
11	Other oilseed	7.37	6.08	-1.33
12	Other crops	1.4	6.57	5.17
	Total	100	100	23.21

Source :-

Socio-economic review of Ahmednagar Dist. 1984-85 & 2004-05. Table-1 Reveals that food crops like Jowar, Bajara, Whaeat account for major share of cropping of land under tillage in the district Jowar is one of the dominant crop in the district. But te sare of Jowar in the total cultivated area of the district is marked (21:29%) declined during the period under study. On contrary the share of Bajara crop in the total cultivated area is recorded 7.59% in crease during the same periodand still continues to be its most importand Kharif crop. Wheat as its tird position in the district and chief rabi cereal with 9.97%. commond area in 2004-05. Nearly 5.13% increases in area under wheat during this period was related with the improved intensity of irrigation and introduction of high yielding variety of seeds in the district. In Sugarcane is recorded increase in area from 4.85% in 1984-85 up to 6.19% in 2004-05. Incase of cotton a fall in area from 0.73% (1984-85) to 0.14% (2004-05) marked 0.59% decrease during the period of investigation.

Crop Combination :-

The study of crop combination in the district for 1984-85 and 2004-05, following weaver's (1954) method reveals that the monoculture crop combination was found in seven tahsil in the year 1984-85. Where Jowar was the single dominant crop.

Table-2 Transformation in Crop combination over 1984-85 in 2004-05.

Sr. No.	tahsil	1984-85 crop combination	Name of the crop	2004-05 crop combination	Name of the crop	Shift	Reamarks
1	Ahmednagar	monoculture	Jowar	2	Jowar, Whaet	1 to 2	Wheat entered in crop combination
2	Newasa	monoculture	Jowar	4	Sugarcane, Jawar, Wheat, Bajara	1 to 4	Sugarcane replaced by jowar
3	Jamkhed	monoculture	Jowar	monoculture	Jawar	no change	Jawar remain one dominatnt crop
4	Shevagoan	monoculture	Jowar	4	Jowar,Bajara,wheat , sugarcane	1 to 4	Bajara, Wheat, Sugarcane, entred in crop comb.
5	Parner	monoculture	Jowar	5	Jowar,Bajara,wheat , sugarcane, Grass crop	1 to 5	Jowar Remained same position.
6	Shrigonda	monoculture	Jowar	5	Jawar, Sugarcane, Wheat, Bajara, Grass Crop	1 to 5	Jawar Remained same position.
7	Karjat	monoculture	Jowar	3	Jwar, Wheat, Bajara	1 to 3	Wheat and Bajara entered in crop combination
8	Sanmamner	2	Jowar, Bajara	4	Sugarcane, Jowar, Wheat, Potatoes	2 to 4	Sare of Bajara Crop has gone down
9	Rahuri	5	Jowar, Sugarcane, Wheat, Gram, Sunflower	5	Sugarcane, Jowar, Wheat, Bajara, Grass Crop	no change	Sugarcane replaced by jowar in first position
10	Kaopargaon	4	Jowar, Sugarcane, Wheat, Bajara	5	Sugarcane, Wheat, Bajara, Jowar, Gram	4 to 5	Sugarcane replaced by jowar in first position
11	Akola	4	Bajara, Rice, Wheat, Grass crop	4	Sugarcane, Wheat, Grass crop, oil seed	no change	Sugarcane replaced by jowar in first position
12	Shrirampur	2	Jowar, Sugarcane	4	Jowar, Wheat, Sugarcane, Bajara	2 to 4	Wheat replaced by sugarcane in second position.
13	Pathardi	2	Jowar, Bajara	4	Wheat, Sugarcane, Jowar, Bajara	2 to 4	Wheat replaced by Jowar in First position.

**Source :-
Complied by Author.**

The area under Jowar (Table-2) was confined in Ahmednagar, Newasa, Shevagaon, Parner, Shrigonda, Karjat and Jamkhed tahsils all these tahsils have less irrigation development two crop combination was observed in three tahsils, namely Shrirampur, Pathardi, and Sangamner during the 1984-85 whereas, four crop combination was noticed in two tahsils i.e. Kopargaon, and Akola tahsils, while five crop combination was found only in Rahuri tahsil during the same year. Spatio-temporal changes in crop combination regions are found during the period of investigation. There is recorded increase in number of tahsils (10 tahsils) under four and five crop combination. Out of the thirteen tahsils, in six tahsils sugarcane is replaced by Jowar in first position some commercial crops are new entered in the crop combination of the district. This change has resulted, due to increasing irrigation facilities, which helped to bring several crops under cultivation. It is even necessary to produce more crops in agricultural area where population density is high that's why only a suitable crop combination can satisfy, the increasing demand for food, with the development of better irrigation facilities few varieties of crops can be introduced to the traditional unprofitable crop combination.

Crop Diversification:-

Crop diversification means raising a variety of crops from arable land. The level of crop diversification largely depends on the geo. Climatic, socio-economic conditions and technological development in region. During 1985-85 the index of diversification was above 22 in eight tahsils Particularly, Sangamner, Kopargaon, Rahuri, Newasa, Shevgaon, Pathardi, Parner and Jamkhed. These were mostly specialized area in three to four crops, whereas in Akola tahsil index of diversification was below 22, indicating tahsil has very low and low index of diversification (Fig. 1)

The crop diversification in the district has changed during the year 2004-05. The number of crops grown varies from three to seven, thereby indicating the high to moderate index in almost of the tahsils. The crop diversity is low and very low in Ahmednagar, Parner Tahsils, which happen to be the areas of specialized crops. This insufficient rainfall and lack of irrigation facility (Fig. 2)

CONCLUSION :-

The foregoing discussion and analysis of the including crop combination in particular in Ahmednagar district, in 2004-05 over 1984-85 is reflective of the overall Indian agricultural characteristic scene. The district is facing rainfall vagaries and its uneven distribution, therefore the changes owe a great deal to variety of infrastructural development and increased inputs in general and extensive and intensive irrigational role in particular. In spite of evident and conspicuous fall in water table throughout the district. And rainfall failures for 5 years in succession, the persistent intensification of irrigational means by deepening of wells, their increasing mechanization is another evidence of the changes being brought about in agricultural characteristics

of the district, Particularly dependent on growing irrigational inputs.

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