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FARM MECHANIZATION IN KOLHAPUR DISTRICT

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ABSTRACT:

Agricultural mechanization is the process whereby equipment, machineries and implements are utilized to boost agricultural and food production. It is the application of implements in the day to day farm activities to increase marginal output in food production and poverty eradication. It also helps in the conservation of the produce and byproducts from qualitative and quantitative damages; enables value addition and establishment of agro processing enterprises for additional income and employment generation from farm produce. It is one of the important inputs to lead in all round development in the rural in Kolhapur district.

INTRODUCTION:

Farm mechanization has been helpful to bring about a significant improvement in agricultural productivity. Thus, there is strong need for mechanization of agricultural operations. This study seeks to examine the microregional variation in the spatial distribution of agricultural implement & machinery in Kolhapur district.

The traditional animal operated wooden & iron plough although give low output and require higher number of field operations are still being used by majority of the farmers. Improved implements such as oil engines with pump for irrigation, electric pumps for irrigation & tractor being more efficient, have been adopted. The growth in the number of sprayers and dusters for plant protection equipments has also been significant.

OBJECTIVE:

1. To study Spatio-temporal characteristics of agricultural implements in Kolhapur district. during the 1991-2010.

METHODOLOGY:

The study is based on data collected from primary and secondary sources. The collected data from different sources were processed and represented by employing different statistical and quantitative techniques like percentage change. Most of secondary sources of data collected from reports published by institutions like Directorate of Economics and statistics, Department of agriculture and co-operation, Ministry of agriculture, Government of India, National sample survey, State Statistical Abstracts, Gazetteer of Kolhapur district etc.

THE REGION:

The Kolhapur district is one of the southernmost districts of Maharashtra state. The district's courtiers a total area of 7,685 sq. kms. It lies between 16° 0' 0"N to 17° 0' 0" North latitude and 74° 0' 0" to 75° 0'0" East longitude. The length of the district south to north is 160 Kms. and east to west is 60 Kms. The Sahyadri ranges to the west and Warna river to the north, the river Krishna and Belgaum district to the south and east, forms the natural boundaries of the district. The region receives average rainfall 1900 mm. Total population in Kolhapur district is 3876001. Out of the total Kolhapur population for 2011, 31.73% lives in urban regions of district. In total 1230009 people lives in urban area of which males are 631843 & females are 598166. The district is consisting of 12 revenue tehsil's namely Shahuwadi, Panhala, Hatkanangale, Shirol, Karvir, Gaganbavada, Radhanagri, Chandgad, Ajra, Gadhinglaj, Kagal, and Bhudhargad.

FARM TOOLS:

Implement are broadly divided under four categories on the basis of utilization & economic status of farmers. First man operated implement, second animal operated implement, third power operated implement and the last is tractor operated implement.

MAN OPERATED IMPLEMENT:

MAN OPERATED PLANT PROTECTION EQUIPMENT:

Man operated plant protection equipment in Kolhapur district (2013-14)

Tehsil	Plastic knapsack spray Pump	Powar spray pump	Battery spray pump	
Karvir	9.51	4.41	12.83	
Panhala	7.60	13.22	8.27	
Hatkanangale	5.70	13.22	13.17	
Shirol	5.70	0.00	9.75	
Kagal	13.69	15.42	4.33	
Gadhinglaj	13.31	11.01	7.64	
Chandgad	17.11	28.63	7.81	
Ajra	5.70	0.00	8.21	
Bhudargad	5.70	7.49	3.65	
Radhanagari	3.42	0.00	12.31	
Gaganbavada	3.04	0.00	2.11	
Shahuwadi	9.51	6.61	9.92	
Total	100.00	100.00	100.00	

Source-Zilla Parishad Kolhapur District,(2013-14)



Maximum plastic knapsack spray pump and power spray pump used in Chandgad. Battery spray pump highly used in Hatkanangale and Karvir. The details distribution of plant protection equipments in Kolhapur district are shown in above table and graph.

Animal Operated Implement:

Animal operated implements are several e.g. wooden plough and iron plough etc.

Wooden Plough:

Wooden plough is a traditional implement which is widely used by the farmers in the Shahuwadi, Bhudargad, Chandgad and Panhala tehsils, due to its availability and suitability for the poor farmer and is traditional.The use of wooden plough is low in the Karvir, Kagal, Gadhinglaj, Radhanagari, Gaganbavada and Shirol tehsils of the study region.

There is a significant decrease in the number of wooden plough of cultivated land in Kolhapur district from 89514 in the year 1991, to 45007 in the year 2010. Very high i.e. above 0 % of proportion to the cultivated land is significantly noted in the eastern part of the region .i.e. Hatkanangale tehsils. The high declines in proportion are observed in Bhudargad, Panhala, Shahuwadi, Ajra and Chandgad. The very low in Shirol, Kagal, Karvir, Gadhinglaj,Radhanagari and Gaganbavada tehsils of cultivated area. This is due to increase in the adoption of modern implement by the farmers. The increase in wooden plough is noted exceptionally in Hatkanangale tehsil.

Iron Plough:

In 2010 high proportion (Above10%) of iron plough use is recorded in the Chandgad and Gadhinglaj can be attributed to the improved steel made iron plough drawn by bullocks, and hence increasing its durability. The moderate proportion (5 % to 10%) of iron plough use is recorded in Panhala, Karvir, Hatkanangale, Kagal, Bhudargad, and Ajra. Low proportion of iron plough (below 5 %) use is found in Radhanagari,Shahuwadi, Gaganbavada and Shirol tehsils. The remaining tehsils show average proportion of iron plough use in the region. The above figure shows that spatio temporal change in Kolhapur district.



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Tehsil Change Wooden Iron Carts worked by powe worked by bullocks worked purpose fump for purposes (used for purpose) Marker 1991 7474 2282 6459 318 58 1270 946 1163 Karvir 2010 2104 1361 1934 137 181 629 2528 1609 Panhal 2010 6576 187 2579 91 22 778 2235 846 Change -24.36 28.35 -42.65 24.66 340.00 -7.27 15.68 121.47 Matkanangal 2010 6576 157 78 2235 846 Delay 2.22 3068 5597 15 6 455 3139 589 Hatkanangal 2010 2.020 1057 2782 1341 0 193 2376 6895 Shirol 2.011 2.355 30 0 1281 1461	Tehsil	Change	Ploughs			Sugarcane Crushers		Oil Engines	Electric	Tractors
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Radhanagari 2010 1546 863 474 207 0 170 162 53 Change -87.61 -46.96 -84.27 2857.14 0.00 -71.99 -86.79 -78.10 Gaganbavada 1991 2936 6 724 11 0 14 281 23 Gaganbavada 2010 1157 104 120 0 0 166 357 52 Change -60.59 1633.33 -83.43 -100.00 0.00 1085.71 27.05 126.09 Shahuwadi 1991 12940 1022 1924 84 4 850 1049 126 Shahuwadi 2010 8872 398 2418 56 13 690 1091 332 Shahuwadi 2010 8872 398 2418 56 13 690 1091 332 Total 1991 89514 27269 68873.6 635 198 9699 20979 3799 Total 2010 45007 22		1991	12481	1627	3013	7	0	607	1226	242
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Intersection <td< td=""><td></td><td></td><td>-87.61</td><td>-46.96</td><td>-84.27</td><td>2857.14</td><td>0.00</td><td>-71.99</td><td>-86.79</td><td>-78.10</td></td<>			-87.61	-46.96	-84.27	2857.14	0.00	-71.99	-86.79	-78.10
Gaganbavada 2010 1157 104 120 0 0 166 357 52 Change -60.59 1633.33 -83.43 -100.00 0.00 1085.71 27.05 126.09 Shahuwadi 1991 12940 1022 1924 84 4 850 1049 126 Shahuwadi 2010 8872 398 2418 56 13 690 1091 332 Change -31.44 -61.06 25.68 -33.33 225.00 -18.82 4.00 163.49 Total 1991 89514 27269 68873.6 635 198 9699 20979 3799 Total 2010 45007 22618 25837 1034 230 8062 23498 5932 Change -49.72 -17.06 -62.49 62.83 16.16 -16.88 12.01 56.15	Gaganbavada Shahuwadi	1991	2936	6	724	11	0	14	281	23
Change -60.39 1633.33 -33.43 -100.00 0.00 1083.11 21.03 126.09 1991 12940 1022 1924 84 4 850 1049 126 Shahuwadi 2010 8872 398 2418 56 13 690 1091 332 Change -31.44 -61.06 25.68 -33.33 225.00 -18.82 4.00 163.49 1991 89514 27269 68873.6 635 198 9699 20979 3799 Total 2010 45007 22618 25837 1034 230 8062 23498 5932 Change -49.72 -17.06 -62.49 62.83 16.16 -16.88 12.01 56.15		2010	1157	104	120	0	0	166	357	52
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		1001	-00.39	1033.33	-ðj.4j	-100.00	0.00	1083.71	21.03	120.09
Shanuwadi 2010 8812 398 2418 36 13 690 1091 332 Change -31.44 -61.06 25.68 -33.33 225.00 -18.82 4.00 163.49 1991 89514 27269 68873.6 635 198 9699 20979 3799 Total 2010 45007 22618 25837 1034 230 8062 23498 5932 Change -49.72 -17.06 -62.49 62.83 16.16 -16.88 12.01 56.15		1991	12940	1022	1924	84	4	068	1049	126
Change -31.44 -01.00 23.08 -33.35 223.00 -13.82 4.00 163.49 1991 89514 27269 68873.6 635 198 9699 20979 3799 Total 2010 45007 22618 25837 1034 230 8062 23498 5932 Change -49.72 -17.06 -62.49 62.83 16.16 -16.88 12.01 56.15		2010	0072 21 44	398 61.00	2418	00 99 99	13	690 10 09	1091	332 162.40
Total 2010 45007 22618 25837 1034 230 8062 23498 5932 Change -49.72 -17.06 -62.49 62.83 16.16 -16.88 12.01 56.15	Total	1001	-51.44 90514	-01.00	2 3.08	-33.33 025	109	-18.8Z	4.00	103.49 2700
10tal 2010 40007 22010 20037 1034 250 6002 25498 5932 Change -49.72 -17.06 -62.49 62.83 16.16 -16.88 12.01 56.15		2010	45007	21209	00010.0	1094	190	8069	20313	5022
		Change	-49.72	-17.06	-62.49	62,83	16,16	-16.88	12.01	56,15

Source-Socio-Economic Review, 1991-2013



Carts:

Significant variations in the distribution of carts are discernible in Kolhapur district. There are about 25837 carts in the study area. The distribution of carts varies from tehsil to tehsil. The above table shows that spatio temporal change in Kolhapur district

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Sugarcane crusher worked by Bullocks:

Spatial distribution of sugarcane crusher worked by bullock in Karvir Panhala. The distribution of moderate crusher worked by bullock in Shahuwadi. The low distribution of sugarcane crusher worked by bullock in Shirol. Gadhinglaj, Kagal, Bhudargad, Hatkanangale, Radhanagari Ajra ,Chandgad and Gaganbavada. Because low centre. The above table and figure shows that spatio temporal change in Kolhapur district during 1991-2010.

POWER OPERATED IMPLEMENT:

Electric Pumps:

Spatial distribution of electric pump is varied. The high distribution of electric pump (above10 %) in Gadhinglaj, Karvir and Hatkanangale. The moderate distribution of electric pump (5 to 10 %) in Panhala, Chandgad, Kagal and Shirol . The low distribution of electric pump (0 to 5 %) in Bhudargad, Shahuwadi, Ajra, Gaganbavada, and Radhanagri.

Above table shows that the great variation in electric pumps in Kolhapur district.

Oil Engines with Pumps:

The high spatial distribution of oil engines with pump (above 10 %) in Chandgad, Bhudargad and Kagal. The low spatial distribution of oil engines with pump (0 to 5 %) in Hatkanangale, Radhanagari,Gaganbavada and Shirol because electric pump are widely used.

The great varaition high distribution of oil engines with pump (above 500 %) in Gaganbavada. The moderate distribution of oil engines with pump (0 to 500 %) in Ajra, Shirol and Bhudargad. The below figure shows that spatio temporal change in power operated implement in Kolhapur district.



Sugarcane Crusher worked by Power:

These sugarcane crushers mainly used to extract liquid or juice from sugarcane. Significant variation in the distribution of sugarcane crusher shows above figure.

Tractor:

Significant variation in the distribution of tractors shows above figure.

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There is a significant increase in the number of tractor of cultivated land in Kolhapur district from 3799 in the year 1991 to 5932, an increase of about 2133 tractors in 2 decades.

CONCLUSION:

Agricultural mechanization implies the use of different power sources and improved farm tools, tractors, with a view to decrease the labor of the human beings and enhances the cropping intensity, accuracy and timelines of efficiency of utilization of various crop inputs and reduces the losses at different stages of crop production. Farm mechanization is to enhance the overall production and productivity with the lowest cost of production. The proper utilization of basic inputs like water, seeds and fertilizers will be possible only when proper farm implements are used. Irrigation facility is basic factor and it encourages other important factors like implementation of modern technology in agriculture use of chemical fertilizer, pesticides, HYV seeds etc.

REFERENCES:

- 1. Integrated crop Management. (2013)
- 2. Joginder Singh(2002): Scope, Progress and Constraints of Farm Mechanization in India
- Patil, P.V. (2000): Geographical Analysis of Agricultural Technology in Sangli District, Ph.D. Thesis Submitted to Shivaji University, Kolhapur.
- 4. Socio-Economic Review, 1991-2013