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IMPACT ANALYSIS OF DESERT DEVELOPMENT PROGRAMME (DDP) ON AGRICULTURAL ECONOMY IN HARYANA

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Abstract

The study has conducted in Haryana to examine the impact of DDP watershed development programme on agricultural production, productivity, cropping pattern, cropping intensity and economics of main crops. To get first hand information, 240 respondents were interviewed from four micro watershed areas and Non-watershed areas. The study has revealed that watershed area have more agriculture production and productivity of all crops except mustard and cotton crops. The cropping pattern also slightly changed in favour of more productive crops in WSA as compared to Non-WSA from less productive crops like cotton. The benefit-cost ratio was higher in WSA for the wheat and paddy crops as compared to Non-WSA.

Key words: Watershed development programme, WSA, Non-WSA, Production, Productivity, Cropping pattern, Benefit-Cost ratio

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Introduction

The desert areas of the country had remained backward in many respects due to difficult physiography varying agro-climatic conditions and distinct socio cultural features. Since the people living in these areas were facing hardships owing to geo-climatic conditions, the desert development programme was introduced as a centrally sponsored scheme in 1977-78. This is a special programme for the hot desert areas; the Desert Development Programme (DDP) was launched by the Ministry of Rural Development, Government of India during the year 1977-78. In Haryana, this programme has been launched by the Ministry of Rural Development, Government of India during the year 1995-96. The Centre share under the funding pattern under DDP is 75 per cent and State share is 25 per cent (till 1998-99 100 per cent share of Centre for hot arid sandy areas). This programme is implemented in 45 blocks of the 7 districts that are Bhiwani, Hisar, Fatehabad, Sirsa, Rewari, Jhajjar and Mahendergarh. Now this scheme is completed in Haryana 31 Dec, 2012 (HRDD, 2014). and watershed development projects going under the Integrated Watershed Management Programme (IWMP). The activities being taken up for the districts are need based keeping in the view of the conditions of the area to be covered. Generally water conservation work, stock ponds, water channels, gully plugging, percolation embankment, field bunding, afforestation, check dams, pasture development, land levelling, piped water supply for irrigation etc. The main objectives of watershed development projects are developing wasteland/degraded lands, drought prone and desert areas; promoting overall economic development and improving socio-economic condition of the resource poor and disadvantage sections; mitigate the adverse affects of the extreme climate conditions such as drought and desertification of crops; harvesting every drop of rain water for the purpose of irrigation, plantations, fisheries, pasture development etc; resorting ecological balance by harnessing, conserving and developing natural resources i.e. land, water, vegetative cover; encouraging village community toward sustained community action for operation and maintenance of the assets created and further development of the potential of the natural resources in the Watershed.

From the above discussion DDP could be recognized for increasing the production possibilities in agriculture sector through integrated natural resources management so that increase the security of livelihood. Keeping this view in mind thus, to know the impact of DDP watershed

development programme on the agricultural economy so that living standard of rural population improved; this study has been taken up the following specific objectives:

Objectives:

1. To analysis the impact of DDP watershed development programme on Agriculture productivity, cropping pattern and cropping intensity in WSA and Non-WSA.
2. To examine benefit and cost ratio in WSA and Non-WSA.

Methodology:

Sampling Design:

In Haryana, the Haryana Rural Development Department has implemented the watershed development programs under the Desert Development Program and Integrated Wasteland Development Program. The watershed projects under IWDP and DDP have been completed in three (Rohtak, Yamuna Nagar, Kaithal) and five (Bhiwani, Hissar, Sirsa, Narnaul, Rewari) districts respectively till 31-07-2013 which were implement under Haryali Guidline, 2003. So DDP programme has been selected for the impact analysis of watershed development programmes as covered maximum districts under completed projcets. So, Bhiwani and Hisar districts from DDP have been selected purposively for the study, which have maximum completed projects and maximum covered area. Two Micro watersheds from each district have been randomly selected. 30 beneficiaries and 30 non-beneficiary households were selected by the following random sampling from each micro watershed. A total of 240 respondents, 120 beneficiaries and 120 non-beneficiaries have been selected.

Source of data:

The study has been made an intensive reference to the primary data in trying to analyse the study objective. Interview schedule method has been used as the main tool for the data collection. Reference year of the study is 2014-15.

Analytical techniques:

For analyzing the impacts of watershed development programme on production, productivity, cropping pattern and cropping intensity simple analytical techniques average and percentage methods have been used.

For analysing the result the study used following concepts have been used:

$$\text{Cropping Intensity} = \frac{\text{gross cropped area}}{\text{net sown area}} \times 100$$

Net Area Sown:

This represents the total area sown with crops. Area has sown more than once in the same year is counted only once.

Gross Cropped Area:

This represents the total area sown once and/or more than once in a particular year, i.e. the area is counted as many times as there are sowings in a year. This total area is also known as total cropped area or total area sown.

Estimation of Production Cost:

In this study, criteria given by Directorate of Economics and Statistic (DES), Ministry of Agriculture, Government of India (2007) has been used with one minor change in Machinery and Farm implements used (owned) as removing the effect of own machinery & farm implements and providing the same cost conditions in respect of machinery & implements for estimation of production cost.

Production Total Cost has been included following Costs:

Variable Cost = Operational Cost + Interest of Working Capital (12.5 % p.a. for half the period of crop)

Total Cost = C2 [Variable Cost + Rental Value of Land + 10 % p.a. of present value of fixed assets] + 10 % of C_2 as managerial input

Results and Discussions:

In this section, a comparison of WSA and Non-WSA under DDP watershed development programme related to production, productivity of different crops, cropping pattern, cropping intensity, cost and returns of different crops has been done. Then find out percentage deviation between them so that impacts of DDP watershed development programme have been examined. The details of comparison have been discussed below:

Table 1 explains that DDP programme has the positive impact on production and productivity of most of crops in Haryana. DDP programme has positive impact on productivity of all crops except paddy crop. The production of wheat and cotton crops under DDP programme was lower in WSA as compared to Non-WSA as because diversification of crops from wheat and cotton crops to cash and vegetable crops. The productivity of crops were ranged 0.14 quintals per acre in case of cotton crop to 44.67 quintals per acre in case of carrot (vegetable) crop in WSA as compared to Non-WSA in under DDP programme. The results related to the productivity of DDP watershed development programme corroborated with the findings of the Sreedevi et al. (2006) that productivity of most of crops increased in the watershed area.

This table 2 explains that area under mustard, millet, paddy, gavar, sugarcane and gajar vegetable crops have been higher and area under wheat and cotton crops have been lower in WSA as compared to Non WSA under DDP watershed development programme that means cropping pattern changed from low water required crops to more water required crops because water resources has been increased in WSA due to interference of DDP watershed development programme. Thus, this cropping pattern has suggested that under DDP watershed development programme has sufficiently increased the water resources in WSA as compared to Non-WSA. The results related to the productivity of DDP watershed development programme corroborated with the findings of GOI (2005), Gowda and Sathish (2011) that the cropping pattern from traditional crops to other crops with higher cash value.

Table 3 explains that cropping intensity under DDP watershed development programme was lower in WSA as compared to Non-WSA as because farmers shift from half yearly cotton crop to yearly sugarcane crop after water resources increased due to implementation of DDP programme.

Table 4 explains that benefit cost ratio of wheat and paddy crops were higher in WSA as compared to Non-WSA and benefit cost ratio of cotton crop was lower in WSA as compared to Non-WSA. The net return per acre of wheat and paddy crops were higher in WSA as compared to Non-WSA and it worked out at Rs. 8700.83, Rs. 23050.24 as compared to Rs. 7012.43, Rs. 19522.38 respectively in Non-WSA as productivity higher in WSA as compared to Non-WSA but, variable cost was high of both crops in WSA as compared to Non-WSA as DDP programme has not provided a significantly irrigation facility through making low cost rain water harvest structure and not properly improved the additional irrigation facilities. The cost benefit ratio of wheat and paddy was higher as 0.33 and 0.53 in WSA as comparison to 0.25 and 0.41 respectively in Non-WSA as land rent was lower due to less availability of irrigation facilities and other crops have the lower cost benefit ratio in WSA as compared to Non-WSA. The net return on cotton crop was lower in WSA as compared to Non-WSA as productivity low in WSA and benefit cost ratio was lower in WSA as compared to Non-WSA even land rent was lower in WSA due to less availability of irrigation facilities as cost of irrigation was higher in WSA as compared to Non-WSA. The DDP watershed development has not played significant role in increasing the benefit as compared to cost in WSA for all main crops.

Conclusions

General finding of present study suggests that DDP programme have positive impact on the production of crops and agriculture production has been higher in WSA for those crops which were cropped at higher percentage of gross cropped area as compared to Non-WSA under both programmes. DDP watershed development programme has significant positive impact on the productivity of most of crops and the productivity of crops were ranged 0.14 quintals per acre in case of cotton crop to 44.67 quintals per acre in case of carrot (vegetable) crop in WSA as compared to Non-WSA. DDP watershed development programme has positive impact on cropping pattern due to water resources increased so that cropping pattern changed in favour of cash, vegetable and more water required crops. DDP watershed development programme has negative impact on cropping intensity because farmer shift from cotton half yearly crop to yearly sugarcane crop.

Table 1

Impact of DDP on Agriculture Production and Productivity in Haryana

(Area in Acres & Production and Productivity in Quintals)

Name of Crops		**DDP**				**Deviation in Production**	**Deviation in Productivity**
		WSA		**Non-WSA**			
		***Production**	**Productivity**	***Production**	**Productivity**		
Rabi crops	Wheat	671.63	18.04	709.60	17.78	-37.97	0.26
	Mustard	86.54	8.01	74.04	7.79	12.50	0.23
	Barley	0.00	0.00	0.00	0.00	0.00	0.00
Kharif crops	Millet	33.19	7.34	25.65	6.21	7.54	1.13
	Paddy	396.01	16.70	273.20	16.89	122.81	-0.19
	Gavar	20.40	3.79	13.05	2.92	7.35	0.87
	Cotton	70.66	5.84	130.99	5.70	-60.32	0.14
	Sugercane	1672.91	289.43	740.95	286.08	931.96	3.35
Vegetable crops	Carrot	96.60	210.00	41.33	165.33	55.27	44.67

(Source: Field Survey)

* Taking 100 acres as base of total Gross Cropped Area for all crops multiplied by Productivity of per Acre for each crop

Table 2

Impact of DDP on Cropping Pattern and Cropping Intensity in Haryana

(Area in Acres)

Name of Crops		**DDP**		**Deviation**
		Area under the crops in WSA	**Area under the crops in Non-WSA**	
Rabi crops	Wheat	37.23	39.91	-2.68
	Mustard	10.80	9.51	1.29
	Barley	0.00	0.00	0.00

Kharif crops	Millet	4.52	4.13	0.39
	Paddy	23.72	16.18	7.55
	Gavar	5.39	4.47	0.92
	Cotton	12.10	22.98	-10.87
	Sugarcane	5.78	2.59	3.19
Vegetable Crops	Gajar	0.46	0.25	0.21
Total Gross Cropped Area		100	100	

(Source: Field Survey)

Table 3

Impact of DDP and IWDP on Agricultural Cropping Intensity in Haryana

(Area in Acres)

Particulars		**DDP**
WSA	Total Gross Cropped Area	2051.19
	Total Net Cropped Area	1106.67
	Cropping Intensity	185.35
Non-WSA	Total Gross Cropped Area	1616.13
	Total Net Cropped Area	846.75
	Cropping Intensity	190.86
% deviation in Cropping Intensity		-5.51

(Source: Field Survey)

Table 3

Impact of DDP on Economics of Main Crops in Haryana

(In Rupees per acre)

S. N	**Name of Cost**		**Wheat**		**Paddy**		**Cotton**	
			WSA	NWSA	WSA	NWSA	WSA	NWSA
1	Preparation of Land		1575	1538.13	2125	2437.5	1471.88	1413.13
2	Sowing and Seed		1672.64	1631.08	2247.5	2322.5	2526.25	2572.68
3	Fertilizer	Uria	622.05	682.95	652.50	772.85	573.48	507.50
		DAP	1140.00	1140.00	1140.00	1140.00	1385.10	1402.20
		Sulphur+Zi	62.50	150.00	0	47.50	0	0

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4	Irrigation	4362.5	4592.88	10375	12750	3775	3625
5	Hoeing	0	0	0	0	1271.88	1396.88
6	Plant Protection (Sprays)	838.54	887.5	2600	3650	3414.29	3948.13
7	Harvesting/plucking	1787.5	1726.79	3375	3375	4503.63	4951.8
8	Working Capital (WC) 1 to 7	12060.73	12349.33	22515	26495.35	18921.51	19817.32
9	12.5 % interest on WC for half of crop period	329.79	337.68	586.33	689.98	665.21	696.70
10	Variable Capital (8 to 9)	12390.52	12686.99	23101.33	27185.33	19586.70	20514.00
11	Rental Value of Land	10843.75	11318.75	14500.00	15450.00	10843.75	11318.75
12	10 % p.a. of present value of fixed assets	542.19	565.94	725.00	772.50	542.19	565.94
13	C_2 Cost (10 to12)	23776.46	24571.68	38326.33	43407.83	30972.63	32398.69
14	10 % of C_2 as Managerial Input	2377.65	2457.17	3832.63	4340.78	3097.26	3239.87
15	Total Production Cost (13 to 14)	26154.10	27028.85	42158.96	47748.62	34069.90	35638.56
16	Selling Price of Main Crops	25978.88	24650.63	65170.00	65821.00	27824.44	27052.50
17	Income from By-Product	10108.50	10052.50	1450.00	1450.00	875.00	875.00
18	Gross Income (16 to 17)	36087.38	34703.13	66620.00	67271.00	28699.44	27927.50
19	Net Income (18 minus 15	9933.27	7674.28	24461.04	19522.38	-5370.46	-7711.06
20	B:C Ratio (19 upon 15)	0.38:1	0.28:1	0.58:1	0.41:1	-0.16:1	-0.22:1

(Source: Field Survey)

References:

1. Haryana Rural Development Department (http://www.haryanarural.gov.in/Detail-Ddp.htm), view on 15, Dec.2014.

2. Cost of Cultivation of Principal Crops in India (2007) Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops, Ministry of Agriculture, Government of India. Available at http://eands.dacnet.nic.in/costofcultivation.pdf

3. Manual on Cost of Cultivation Surveys (2008), Central Statistical Organisation (CSO), Government of India. Available at (http://mospi.nic.in/Mospi_New/upload/ manual_cost_cultivation_surveys_23july08.pdf)

4. National Watershed Development Programme (http://www.archive.india.gov.in/sectors/agriculture/index.php?id=7) view on 12 Dec.2014

5. Sreedevi, T. K., Wani S. P., Sudi R., Patel M. S., Jayesh T, Singh S. N. and Tushar Shah (2006) On-site and Off-site Impact of Watershed Development: A Case Study of Rajasamadhiyala, Gujarat, India, Global Theme on Agroecosystems Report no. 20, Patancheru 502 324, Andhra Pradesh, India, International Crops Research Institute for the Semi-Arid Tropics. (http://oar.icrisat.org/2380/1/On-site_and_off-site_impact_of_watershed_development__a_case_study_of_Rajasamadhiyala__Gujarat_India.pdf). Viewed on 15th October, 2014.

6. Government of India (2005), Evaluation of NWDPRA Programme Implemented During IXth Five Year Plan in Tripura in Dhani Cherra Watershed, Nurnagar Cherra Watershed, Final Report, Submitted to Rainfed Farming System Division, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India. (http://www.icrisat.org/what-we-do/agroecosystems/CA_Watersheds/ pdfs/tripura.pdf). Viewed on 16th September, 2014**.**

7. Gowda, V. Govinda and A. Sathish (2011) "Socio-Economic and Natural Resources impacts of Sujala Watershed Project in Karnatka", International Journal of Science and Nature, **2** (1).

8. Singh, Abhey and Rajdeep Kaur (2017) "Factor Affecting the Adoption of Rotavetor Technology for Wheat and Paddy Crops and its Adoption Level in Haryana" International Education and Research Journal (IERJ), **3** (5), May: 578-579.

9. Singh, Abhey and Rajdeep Kaur (2016) "Impact Assessment of Zero- Tillage on Production, Productivity and Cost Benefit Ratio of Wheat Cultivation in Sirsa District", Abhinav National Monthly Refereed Journal of Research in Science & Technology, **5** (1), January: 1-6.