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Sustainability impact of the Watershed Development Programme on Agriculture Development in Karnataka

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Abstract

The article focuses on the agriculture development and Watershed Development Programme (WDP) in the State. The study analysed that the rain-fed policy and its main objectives on agriculture development. Karnataka has been given an important place for WDP, because 75 per cent of the cropped area in Karnataka depends upon low and uncertain rainfall. The WDP was main objective is to conserve soil and moisture as well as to put the lands to the best use according to their capabilities to improve the overall productivity of the catchment in a holistic manner/way. The programmes primarily consider land as a single entity and help in synchronizing all the land-based activities to achieve productive potentials. To sustain the assets created under the programme, the participation of the community as well as Panchayat Raj Institutions is also need. In Karnataka, several bodies and Departments were implementing WDPs, which needed greater co-ordination in planning, implementation and supervision necessitating a concerted thrust on watershed approach. This study observation on the impact of the WDP in the agriculture development and it improve in the working of the programme for long term sustainability in the arid and semi-arid areas.

Keywords: Growth of WDP, Rain-fed Farming Policy, Financial, and Sustainability Agriculture Development.

Introduction

India is one of the major agricultural countries with more than 70 per cent of the population depending on it. Indian agriculture is dependent on monsoon which is not uniform over the years. Nearly three fourths of the cultivable land in India is dependent on monsoon, which is contributing nearly 42 per cent of the total production from agriculture. The productivity of any crop mainly depends on two natural resources-land and water in addition to management practices. Therefore, the conservation, up gradation and utilization of these two natural resources on scientific principles is need for the sustainability of rain fed agriculture. The watershed concept for development of rain fed agriculture is gaining importance over the years and it amply demonstrated that watershed developmental tools are very effective in meeting the objectives and mission. Karnataka has been given an important place for WDP because 75 per cent of the cropped area in Karnataka depends upon low and uncertain rainfall. The geographical area of the State is 190.50 lakh ha. of which 129.70 lakh ha. is available for watershed development. Out of this area, 39.20 lakh ha is treated up to end of the year 2006-07. It is

estimated that 90.50 lakh ha is available for watershed development.

Objectives of the Study

1. To study the performance of watershed development programme in the agriculture sector in Karnataka.
2. To study the growth and development of agricultural sector through watershed development programme in Karnataka.

Methodology of the Study

The research study was mainly based on secondary data. The secondary data has been collected from various annual reports of Government of India (2018) Ministry of Rural Development, Department of Watershed in Karnataka, Karnataka Watershed Development Project, Economic Survey of India and Karnataka 2018-19, Planning Commission and Ministry of Watershed Department, publications of journals, articles, book etc.

Karnataka Rain-fed Farming Policy 2014

Karnataka formulated an ambitious "Karnataka Rain-fed Farming Policy 2014" to address the dry land issues with more focus. The new policy aims to harness small water sources, integrate with affordable technologies, information and to access markets to achieve significant improvement in rural livelihoods, based on the principle of production of crop for every drop of rain water. In addition to having more efficient markets and improved delivery channels from farmers to consumers, the policy has underlined the importance of concerted efforts to increase value addition and processing to agricultural produce.

Salient Features of Karnataka Rain-fed Farming Policy 2014

Salient features of the Karnataka Rain-fed Farming Policy 2014 are as follows:

a. Focus on small and marginal farmers who account for 76% of the holdings and operate 40 % of the area;
b. Increasing public investment under rain-fed agriculture;
c. Integration of existing programs of line departments;
d. Discouraging imbalanced use of chemical fertilizers and pesticides, and critical input management;
e. Preservation of germplasm of dry land crops and developing resource conservation technologies;
f. Strengthening of extension at RSK level;
g. Agro-processing;
h. Developing systems for efficient medium- and long-term prediction of weather;
i. Market intelligence, price forecasting ahead of sowing season.

Implementation of Watershed Development Programme: An Overview

Watershed Development Programme (WDP) was set up during the 1984-85. It is initial impetus to watershed development in Karnataka came from Kabbalnala Watershed in Kanakapura taluk of Bangalore rural District. Later, four Dry Land Development Boards were set up, one in each Revenue Division to implement WDPs in all the 19 districts in the State. Karnataka is predominantly a rural and agrarian State. Agriculture

plays a key role in State's economy. Karnataka has given an important place for Watershed Development, because, 75% of the cropped area in Karnataka depends upon low and uncertain rainfall. It has a geographical area of 19.049 M.Ha. Net cropped area is 10.79 M. Ha. Out of this 2.32 M. Ha. is irrigated and 8.479 M.Ha. is rainfed area. This rainfed area is without any prospect of ever being able to receive any irrigation facilities. The State depends on dry land for more than half of its food production. In view of the above situation more emphasis is given for dry land farming in the State by way of developing dry land areas on watershed basis. In Karnataka 5 Rivers basins 218 Watershed have been identified for development.

Objectives of the WDP

The WDP was main objective is to conserve soil and moisture as well as to put the lands to the best use according to their capabilities to improve the overall productivity of the catchment in a holistic manner/way. The programmes primarily consider land as a single entity and help in synchronizing all the land-based activities to achieve productive potentials. To sustain the assets created under the programme, the participation of the community as well as Panchayat Raj Institutions is also need. In Karnataka, several bodies and Departments were implementing WDPs which needed greater co-ordination in planning, implementation and supervision necessitating a concerted thrust on watershed approach/management.

Organization of the WDP in Karnataka: The Government of Karnataka has therefore considered various aspects and decided that better co-ordination in planning, implementation and supervision in watershed programmes would be achieved by setting up a separate Department and hence the Government of Karnataka has created the Watershed Development Department with effect from 1.4.2000. All the watershed schemes and projects under State Sector, Central Sector Schemes, externally aided Projects as well as District Sector Schemes relating to watershed development are expected to be implemented through this Department.

Benefits of WDP for Agriculture Sector

a. Large extents of barren hill slopes were covered by vegetation.
b. Large tracts of marginal lands brought under dry land Horticulture.
c. Development of Agro-Horti and Agro-Forestry systems.
d. Water resources were harvested through nala bunds, farm ponds, gully embankments.
e. Regeneration of grass lands for more fodder and grass.

Present Scenario of WDP in Karnataka

The WDP based on the success of the Sujala- I, Sujala- II the World Bank assisted Karnataka Watershed Development Project-II, Sujala-III is existence implemented during the period from 2012-13 to 2018-19 (up to Dec-2019) for a period of six years in eleven districts of Karnataka namely - Bidar, Chamarajnagar, Davangere, Gadag, Kalburgi, Koppal, Yadgiri, Chikkamagalur, Vijayapura, Tumkur and Raichur. To implement this project totally 2531 micro watersheds have been

identified aiming to increase the income of farmers in rainfed areas by encouraging dry land agriculture farmers to cultivate Horticulture crops.

Financial Allocation of WDP on Sustainability Agriculture Development

A budget of Rs.3200.00 lakh is allocated for the year 2015-16 and Rs.2435.71 lakh was spent. During the 2016-17, Rs. 630.00 lakh was allocated and amount spent of Rs.593.75 lakh on dry land farming. During the 2017-18, Rs.2200.00 lakh was allocated out of which Rs.1901.68 lakh was spent. During the 2018-19, an amount of Rs.3303.00 lakh was allocated. Out of this Rs.1298.53 lakh has been spent up to November 2018. Since inception of the project (2012-13) a cumulative total of Rs.7079.03 lakh has been spent up to November-2018. The WDP has the predominately role in the agriculture sector and its impact of dry land farming in the rural areas of Karnataka state. Government of Karnataka has also proposed the implementation of Phase-II of ISPWD-K in four districts viz., Bijapur, Koppal, Bidar and Gulbarga to tackle an area of 30,000 Ha, at a cost of Rs.28.00 crores. The negotiations are now under way and the project is likely to get the clearance during the current financial year. Government of Karnataka has entered into an agreement with to utilize a sum of Rs.30.00 Crores from the Watershed Development Fund. WDP will be implemented in 10 districts, namely Bangalore rural, Davanagere, Gadag, Raichur, Koppal, Gulbarga, Mysore, Chamarajanagara, Bidar and Ballari. The selection of other districts for further phases of this project is under the consideration of the Government. Table-1 details of the components-wise financial allocation on agricultural development in the State.

Table-1 Component wise Financial Allocation

(Rs. in Crore)

Sl. No	Project Components	GoK (30%)	Bank (70%)	Total	%
1	Improved Program Integration in Rain-fed Areas	44.30	103.37	147.67	28.00
2	Research, Development and Innovation	64.68	150.91	215.59	41.00
3	Institutional Strengthening	5.92	13.83	19.75	4.00
4	Horticulture	33.20	77.47	110.67	21.00
5	Project Management and Coordination	10.21	23.81	34.02	6.00
	Total Project Costs	158.31	369.39	527.7	100.00

Source: Government of Karnataka (2018-19), Economic Survey of Karnataka, Planning, Progrmme Monitoring and Statistics Department, Bangalore.

As agreed with the World Bank during November 2016 Mission, the revised project outlay is Rs.527.70 crores (85.70 US$ m, Credit No. 5087 IN). The component-wise financial allocation is as indicated in Table-1. It is help to financial support for dry land agriculture farmers are presented in Table-2 and Graph-1.

Table-2 and Graph-1 give the data of year-wise fund released of WDP in the agricultural development in Karnataka during the period from 2009-

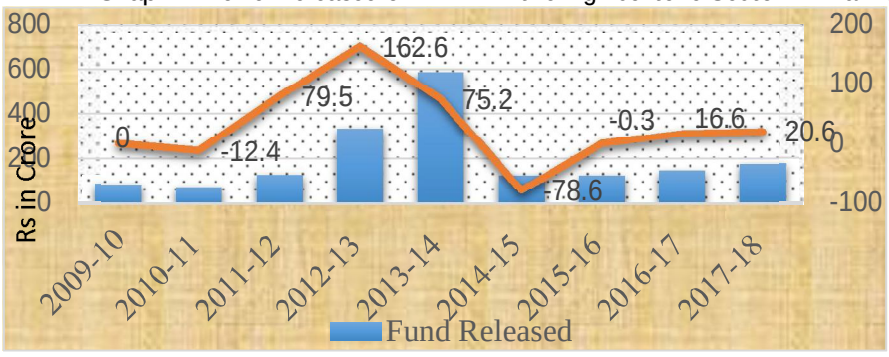
10 to 2017-18. During the 2009-10, Rs.81.00 crore fund released of WDP in the agriculture sector, which increased to 175.69 crore during the 2017-18. It seen from the above table, the AGR and CAGR for the fund allocation of WDP in the agriculture sector in Karnataka. The AGR for the fund released of WDP in the agriculture sector is -12.4 per cent in 2010-11, it has changed to 20.6 per cent in 2017-18. The CAGR for the fund released of WDP in the agriculture sector is positive, i.e., 7.32 per cent.

Table-2 Fund Released of WDP in the Agriculture Sector in Karnataka
(Period: 2009-10 to 2017-18) (Rs. in Crore)

Year	Fund Released	AGR
2009-10	81.00	-
2010-11	70.97	-12.4
2011-12	127.41	79.5
2012-13	334.55	162.6
2013-14	586.11	75.2
2014-15	125.43	-78.6
2015-16	125.00	-0.3
2016-17	145.72	16.6
2017-18	175.69	20.6
CAGR	7.32	

Source: Government of India (2018), Annual Report of Ministry of Rural Development.

Graph-1 Fund Released of WDP in the Agriculture Sector in Karnataka



Agriculture Production through WDP in Karnataka

The details of the crop-wise area and area sown during Kharif and Rabi in 2018-19 are presented in Table-3. The crops-wise details of the targeted by the Kharif and Rabi seasons various types of the major crops namely cereals, pulses, oilseeds, and commercial crops in Karnataka. However, these are all improvement through WDP.

Table-3 revealed that the crops-wise irrigated and rainfed of agriculture area sown in Rabi season in 2018-19. It seen from that the above table, area sown is in irrigated and rainfed seasons i.e., rainfed season (21.72 hectares) is majority of the crops used area in

agriculture crops and the reimaging irrigated area (5.75 hectares) in the crops in 2018-19. The details of the of the targeted by the Kharif and Rabi seasons several types of the major crops such as - cereals, pulses, oilseeds, and commercial crops in Karnataka and other details are presented in Table-.

Table-3 Crop-wise Targeted Area and Area Sown During Rabi 2018-19 Area in lakh hects.

Sl. No.	Crops	Targeted Area	Area Sown			% Coverage	Corresponding Coverage of last year (30.09. 2017).	*Normal Coverage by end of Sept.	% of Normal coverage
			Irrigated	Rainfed	Total				
I	Cereals:								
1	Paddy (Rice)	0.23	0.11	0.01	0.117	51.66	0.23	0.29	40.64
2	Jowar	10.10	0.66	7.84	8.496	84.08	10.05	9.63	88.27
3	Ragi	0.32	0.08	0.29	0.368	114.82	0.42	0.29	126.14
4	Maize	1.05	0.69	0.13	0.814	77.79	0.99	0.96	84.92
5	Bajra	2.10	0.98	0.52	1.497	71.41	1.89	1.82	82.09
6	Minor Millets	0.05	0.00	0.00	0.004	8.12	0.01	0.01	53.96
	Total Cereals	12.85	2.51	8.79	11.296	81.57	13.59	13.00	86.92
II	Pulses								
1	Bengal gram	12.18	1.78	10.60	12.38	101.63	13.95	12.18	101.65
2	Horse gram	1.18	0.00	1.31	1.31	110.67	1.15	1.11	118.13
3	Black gram	0.06	0.00	0.03	0.03	53.92	0.04	0.05	70.97
4	Green gram	0.05	0.00	0.02	0.02	49.02	0.03	0.03	84.81
5	Cowpea & others	0.17	0.02	0.06	0.09	50.93	0.13	0.13	64.14
6	Avare	0.09	0.00	0.07	0.07	73.49	0.10	0.07	103.80
	Total Pulses:	13.74	1.81	12.09	13.90	101.20	15.39	13.56	102.49
I+II	Total food grains:	27.59	4.32	20.88	25.20	91.35	28.98	26.56	94.88
III	Oilseeds:								
1	Sunflower	1.86	0.12	0.51	0.63	34.12	1.24	1.78	35.67
2	Safflower	0.50	0.01	0.19	0.20	39.29	0.35	0.40	48.80
3	Linseed	0.07	0.00	0.02	0.02	23.25	0.04	0.05	32.05
4	Soyabean	0.0007	0.0013	0.0000	0.0013	200.00	0.00	0.00	106.86
5	Castor	0.00	0.00	0.00	0.00	9.30	0.00	0.00	0.00
6	Niger	0.025	0.000	0.002	0.002	8.33	0.00	0.01	14.42
7	Others (Mustard)	0.003	0.0000	0.0021	0.0021	68.21	0.00	0.00	49.35
	Groundnut	0.71	0.68	0.04	0.72	101.60	1.13	0.66	108.85
	Total Oilseeds:	3.16	0.81	0.76	1.57	49.74	2.76	2.91	54.03
IV	Commercial Crops								
1	Cotton	0.65	0.00	0.08	0.08	12.48	0.26	0.46	17.55
2	Sugarcane	0.402	0.610	0.001	0.611	152.18	0.44	0.50	122.92
3	Tobacco (Beedi)	0.0046	0.0000	0.0021	0.0021	45.49	0.01	0.04	4.98
	Total Com. Crops	1.05	0.62	0.08	0.69	65.95	0.70	1.00	69.52
	Grand Total	31.80	5.75	21.72	27.47	86.37	32.44	30.47	90.14

Source: Weekly/Monthly Reports from District Joint Director of Agriculture.

* Normal area coverage: Average of five years-2013-14 to 2017-18, Sowing % excluding Sugarcane.

It seen from that the above table, production periods are divided into four categories like 1980-81 to 1989-90, 1990-91 to 1999-00, 2000-01 to 2010-11 and 2011-12 to 2017-18, i.e., CAGR for Rice is 0.24 per cent, 3.64 per cent, 4.33 per cent, and 17.62 per cent respectively. Wheat is -6.44 per cent, 3.96 per cent, 7.90 per cent, 6.17 per cent during the period from 1980-81 to 1989-90, 1990-91 to 1999-00, 2000-01 to 2010-11 and 2011-12 to 2017-18 respectively. CAGR for the coarse

cereals is 1.69 per cent during the years 1980-81 to 1989-90, it has changed to 20.58 per cent during the years 2011-12 to 2017-18. The pulses are 5.75 per cent during the years 1980-81 to 1989-90, it has changed to 20.41 per cent during the years 2011-12 to 2017-18. During the period from 1980-81 to 1989-90, CAGR for the foodgrains is 3.28 per cent, it has changed to 23.19 per cent during the period between 2011-12 and 2017-18. The other details of the production of major crops in agriculture sector in Karnataka are presented in Table-4.

Table-4 CAGR for the Production of Major Crops in Agriculture Sector in Karnataka

Periods	Rice	Wheat	Coarse Cereals	Pulses	Food Grains	Oilseeds	Cotton (Lint)	Sugarcane
1980-81 to 1989-90	0.24	-6.44	1.69	5.75	3.28	8.91	4.38	4.97
1990-91 to 1999-00	3.64	3.96	3.26	-3.75	2.73	-2.15	0.48	5.16
2000-01 to 2010-11	4.33	7.9	7.59	8.82	6.57	1.43	12.34	3.3
2011-12 to 2017-18	17.62	6.17	20.58	20.41	23.19	18.52	19.61	30.38

Source: Reserve Bank of India

Note 1. Oilseeds data comprises total for nine oilseeds out of eleven in all.
2. Cotton data measured in thousand bales of 170 kg. each.

Conclusion

It can be concluded that the one of the impacts of the WDP is on the structural changes in the activities. It is perceived that with more importance given to the based activities, there will be increased area under cultivation, reduction in the migration condition, improvement in the livestock condition and other rural non-farm activities. In the WDO areas, there has been an increase in the cultivated area since the pre project situation. The state has accorded very high priority to watershed management of farm areas including farm pond development. Growing of fruit crops such as borehannu, seetaphal, sapota, jamun, halsu, etc. holds promise and could be an excellent way one of crop diversification in dry land which will also help in mitigating the climate change effects. Dry land farming not only provides higher income but also provides more stable returns to agriculture farmers.

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