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IMPACT OF IWMP ON AGRICULTURE: A CASE STUDY OF JAMUI DISTRICT OF BIHAR

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ABSTRACT

Agriculture is the main source of income of the people in India; Approximate 75% of population resides in rural areas. The main occupation of mass group of population is agriculture. Bihar's economy is based on agricultural products and its growth is continuing with high growth rate. Thus Bihar proves its efficiency in agriculture and becomes leading suppliers of agricultural products in recent years. Jamui district is one of the most important district of Bihar has great potential to become a leading agro-producer in India. IWMP has provided the needful resources for agricultural development in this district. Impact of IWMP is being measure on the basis of previous and current agricultural land use pattern and agricultural production status of 10 blocks in the district. This study is an important contribution towards the development of rural and backward agriculture areas.

KEYWORDS

Jamui, IWMP- integrated watershed management programme.

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INTRODUCTION

Watersheds was used for irrigation and water conservation, now the uses of watershed is not limited to irrigation and water conservation, watershed development programmes facilitates irrigation facilities, construction of water conservation structures, training programmes to the beneficiaries, formation of Self Help Groups, community participation, sustainable livelihood promotion techniques and self-employment generation skills etc. Watershed development programmes are adopted by governments for the development of agriculture and its aligned activities. Watershed development programmes are launched by the collaboration of central and state government in India. Watershed development programmes are guided by Ministry of Agriculture under the National Watershed Development Project for Rainfed Areas (NWDPA). Ministry of Rural Development (MORD) is also engaged in watershed development programmes.

Jamui district of Bihar is one of the backward districts in the state; main occupation of the resident is agriculture, Jamui district formed on 21st Feb 1991, separated from Munger district. The population of the district is about 17, 60,405 as per census 2011. Administration of Jamui district is divided into 10 Blocks:-1-Jamui, 2 – Khaira, 3- Sikandra, 4- Islamnagar Aliganj, 5- Laxmipur, 6- Giddhaur, 7- Barhat, 8- Sono, 9- Chakai, 10- Jhajha.

The main aim of this research paper is to measure the impact of IWMP on the agriculture and village economy. In Jamui district no small or large industry is presently existed, the overall development of the district is possible only by the development of agriculture, so watershed development programme can be consider as a great source for the development of agriculture and the community dependent on agriculture.

If agricultural production is increased the income of the farmers will increase, the impact and effectiveness of IWMP is measure by assessing the performance of the programme within the project implementation period.

LITERATURE REVIEW

The existence of watershed management is reflected in old human civilization, watershed management is defined by the various Greek Philosophers in 400 B.C. watershed management is also found in 1200 B.C. and 200 B.C. In India the Mughal Emperor and British Empire was also worked on watershed management programme. Watershed management was used for the purpose of irrigation and water conservation.

In India after independence during the year 1949 – 1950, watershed management programme was launched by Damodar Valley Corporation (DVC). Union Ministry of Agriculture was also enforced the watershed management programme in 1954. During the period of 1961-1962 a programme named soil conservation was launched by the soil and water conservation Division of Union Ministry of Agriculture, Government of India.

The importance of watershed management in India is explained by many authors like :- (Saikia 2013),(Murty 2013), (Devasia 2008),(Khan 2001), (R.S Kurothe n.d.). The importance of watershed management is not limited to the water conservation techniques. Watershed management is a wide programme which contents many components of watershed like :- “conservation and preservation of ground and surface water, participatory rural appraisal in watershed programme, soil erosion and soil conservation, management of natural drainage in watershed areas, management and treatment of arable and non-arable land, development of production system in wasteland, estimation of design flood and design storm in wasteland, flood routine in watershed through channels and reservoirs, water harvesting in watershed areas etc. instead of such things watershed management programme is implemented for the development of rural and backward areas dependent on agriculture.(Saikia 2013)

According to **J.V.S Murty**, the watershed management is working on the concept of maintain the environmental degradation “little effort is made to modify the development process in a manner that will bring in greater harmony with the growing needs of the poor and to maintain ecological balance”. The needs of watershed in various approaches are depending on the needs of residents of watershed area. Simply watershed can be understood as programme which is implemented for the development of agriculture and allied activities for the increasing production and the promotion of sustainable livelihood.

In the book of **Leelamma devasia**, “watershed management is help in mobilizing the tribal community, mainly the tribal women community is participating in the development programme implemented by watershed development programmes. The development of tribal community resides under watershed areas are done through the watershed livelihood programmes, the formation of Self Help Groups (SHGs) for the empowerment of tribal or backward community. Watershed development approaches are focus towards the development of sustainable techniques of income generation”.

NEED AND IMPORTANCE OF THE STUDY

This study is focused on the agricultural development in rural and economically backward areas, which are facing problem of livelihood, labour migration, education and social development.

The importance of the study are as follows:

1. This study will able to prove the effectiveness of IWMP on agricultural development.
2. This study is an important contribution towards the development of rural and backward agriculture areas.

OBJECTIVES OF THE STUDY

Objectives behind this study are as follows:

1. Find out the impact of IWMP on agriculture in Jamui District.
2. Implementation of IWMP in agriculture.

HYPOTHESIS OF THE STUDY

The hypothesis of this study is based on the performance and impact of IWMP in Jamui district.

H1: Agricultural production is increased with the implementation of IWMP.

RESEARCH METHODOLOGY

The study is based on the secondary data, data obtained from Bihar watershed development society, district data handbook, district agriculture contingency plan and Directorate of statistics and evaluation government of Bihar, from 2010-2016.

Analysis and presentation of data in this study is being with the help of MS Excel.

ANALYSIS AND DISCUSSION

In Jamui district IWMP is implemented since 2010, IWMP is implemented in different batches from 2010 – 2016. From the following table it is clearly stated the implementation of IWMP batches with different Blocks of Jamui district.

TABLE 1

S. NO	BLOCKS	IWMP BATCH I	IWMP BATCH II	IWMP BATCH III 2011-12	IWMP BATCH IV 2012-13	IWMP BATCH V 2013-14	IWMP BATCH VI 2014-15	TOTAL BATCH
1.	Barhat	Vacant	vacant	vacant	Implemented	vacant	vacant	1
2.	Chakai	Vacant	Vacant	Implemented	Implemented	vacant	vacant	2
3.	Giddhaur	Vacant	Vacant	Implemented	Implemented	vacant	vacant	2
4.	Islamnagar Aliganj	Vacant	Vacant	Implemented	Implemented	vacant	vacant	2
5.	Jamui	Vacant	Vacant	Vacant	vacant	vacant	vacant	-
6.	Khaira	Vacant	Vacant	Vacant	Implemented	vacant	vacant	1
7.	Laxmipur	Vacant	Vacant	Vacant	vacant	Implemented	Implemented	2
8.	Sikandra	Vacant	Vacant	Implemented	Implemented	vacant	vacant	2
9.	Sono	Vacant	Vacant	Implemented	vacant	Implemented	Implemented	3
10.	Jhajha	Vacant	Vacant	Implemented	Implemented	Implemented	vacant	3

Source: Compiled from data of Bihar watershed development society.

After analysing the above table, IWMP is implemented in 10 Blocks of Jamui District. During the period of Batch I and II all blocks was vacant. In Batch III during the period of 2011- 2012, 6 blocks are under the IWMP project implementation. In batch IV during the period of 2012-2013, 7 blocks was covered under IWMP. In batch V during 2013-2014, 3 blocks were covered under the IWMP and in batch VI during 2014-2015, 2 blocks were covered under the IWMP programme. Barhat block was allotted one batch (IV), Chakai block was allotted two batches (III, IV), Giddhaur block allotted two batches (III, IV), Islamnagar Aliganj block allotted two batches (III, IV), Jamui block was not under IWMP. Khaira block allotted one batch (IV), Laxmipur block allotted two batch (V, VI), Sikandra Block allotted two batches (III, IV), Sono block allotted three batches (III, V & VI) and Jhajha Block allotted three batches (III, IV and V).

After analysing the above table of block wise project implementation, the agricultural land use pattern of jamui district is presented in the following table.

TABLE 2: AREA OF THE JAMUI DISTRICT AGRICULTURAL LAND USE PATTERN

S.NO	Name of block	No: of Panchayat	No: of villages	Total geographical area. (hectare)	Average cultivated area.(hectare)	% of cult. Area. (approx)
1.	Barhat	9	43	22163	4784	22%
2.	Chakai	21	567	81471	12279	15%
3.	Gidhaur	8	20	8171	4606	56%
4.	Islamnagar- aliganj	13	69	16866	8342	49%
5.	Jamui	12	81	17554	11468	65%
6.	Khaira	21	94	42539	11644	27%
7.	Laxmipur	13	85	24679	6784	15%
8.	Sikandra	14	68	18336	14788	80%
9.	Sono	19	249	38534	7208	25%
10.	Jhajha	20	197	4238	2330	55%
	Total	150	1530	274551	84233	31%

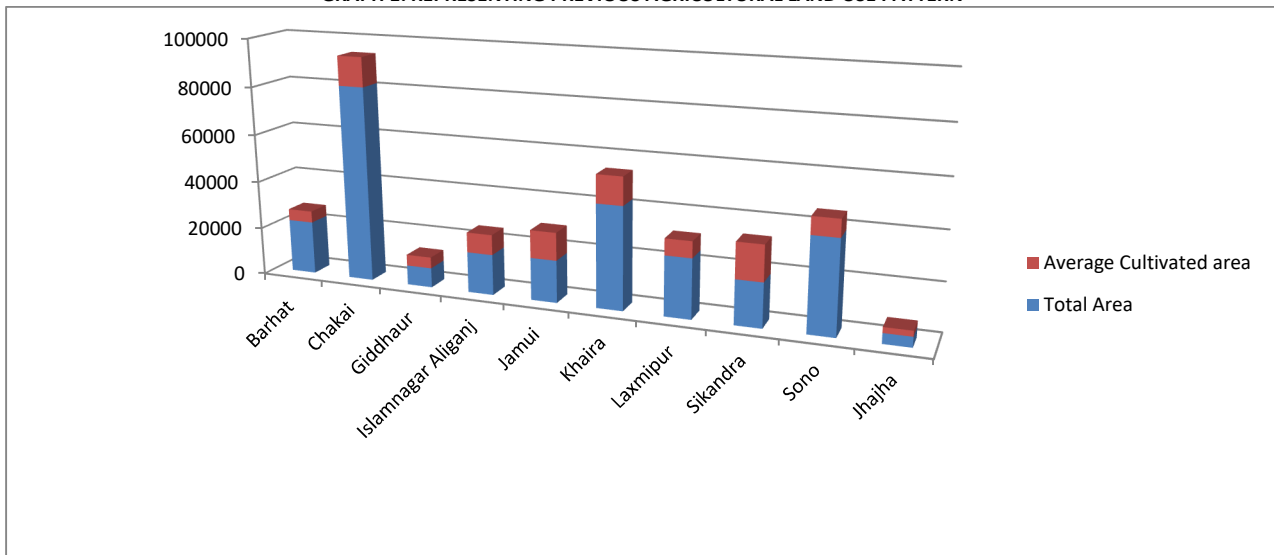
*Source: - District Census Handbook 2011

TABLE 3: AREA OF THE JAMUI DISTRICT AGRICULTURAL LAND USE PATTERN AFTER IMPLEMENTATION OF IWMP

S.NO	Name of block	No : of Panchayat	No: of villages	Total geographical area.(hectare)	Average cultivated area.(hectare)	% of cult. Area. (approx)
1.	Barhat	9	43	22163	9086	41%
2.	Chakai	21	567	81471	25256	31%
3.	Gidhaur	8	20	8171	6455	79%
4.	Islamnagar- aliganj	13	69	16866	12649	75%
5.	Jamui*	12	81	17554	11410	65%
6.	Khaira	21	94	42539	17866	42%
7.	Laxmipur	13	85	24679	15794	64%
8.	Sikandra	14	68	18336	14336	80%
9.	Sono	19	249	38534	20423	53%
10.	Jhajha	20	197	4238	3983	94%
	Total	150	1530	274551	137258	49.99%

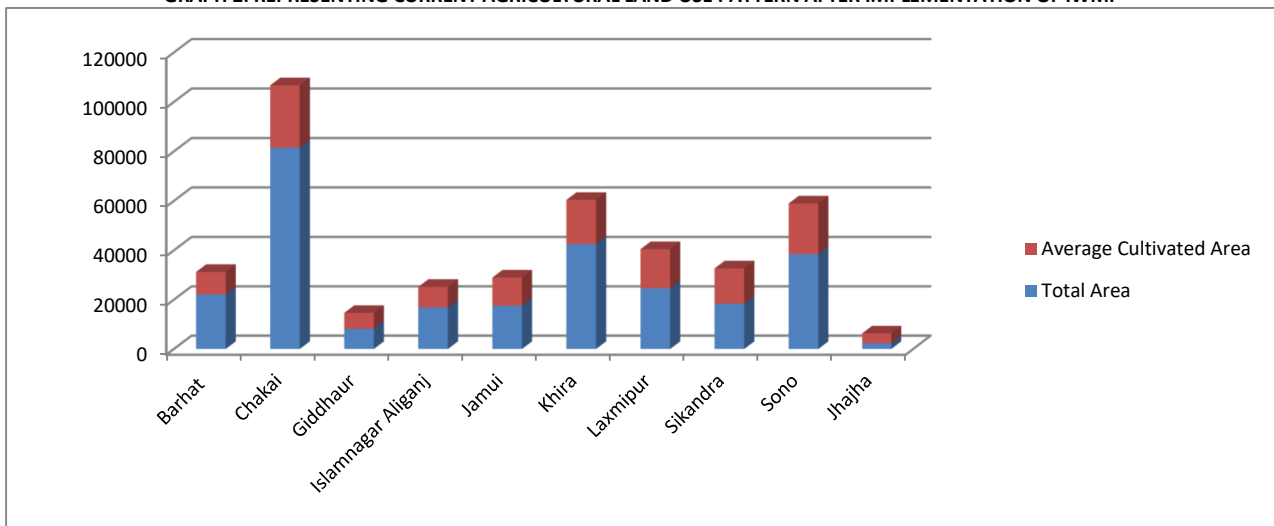
*Source: - Self compiled from data of District Census Handbook 2011, Department of Agriculture GOB and Bihar Watershed Development Society

GRAPH 1: REPRESENTING PREVIOUS AGRICULTURAL LAND USE PATTERN



*Source: - Self compiled from data of District Census Handbook 2011, Department of Agriculture GOB and Bihar Watershed Development Society

GRAPH 2: REPRESENTING CURRENT AGRICULTURAL LAND USE PATTERN AFTER IMPLEMENTATION OF IWMP



*Source: - Self compiled from data of District Census Handbook 2011, Department of Agriculture GOB and Bihar Watershed Development Society

The agricultural land use pattern is increased after the implementation of IWMP, Barhat block is increased by 19 %, Chakai block is increased by 16%, Giddhaur Block is increased by 23%, Islamnagar Aliganj Block is increased by 26%, Jamui is not under IWMP, Khairra Block is increased by 15 %, Laxmipur Block is increased by 49%, Sikandra Block is maintained at 80%, Sono Block is increased by 28% and Jhajha Block is increased by 39%. Total geographical area of the Jamui district is about 274551 hectares, after the implementation of IWMP batches from 2010- 2016; average cultivated area is increased from 84233 hectares to 137258 hectares i.e. increased up to 18% in comparison to previous figure.

During the implementation of IWMP, the crop production details of Jamui district of last several years were as follows:

TABLE 4: PRODUCTION OF MAJOR CROPS DURING YEAR – 2012-2013

Name of crops	Area -Ha	Production –M.T
Rice	49963	73315
Wheat	7523	15722
Maize	2661	3736
Gram	469	435
Lentil	227	304
Moong	45	28
Arhar	90	172
Other pulses	524	393
Mustard	55	112
Other oil seeds	88	76
Sugarcane	671	27745
Total	62316	122038

*Source: Self Compiled Department of Agriculture – GOB, Directorate of Statistics and Evaluation.

TABLE 5: PRODUCTION OF MAJOR CROPS DURING YEAR 2013-2014

Name of crops	Area- Ha	Production – M.T
Rice	50344	91627
Wheat	8673	17453
Maize	2781	4254
Gram	1006	853
Lentil	217	329
Moong	72	83
Arhar	217	420
Other pulses	414	311
Mustard	211	175
Other oil seeds	66	56
Sugarcane	680	27750
Total	64681	143311

*Source: -Self Compiled Department of Agriculture – GOB, Directorate of Statistics and Evaluation

TABLE 6: PRODUCTION OF MAJOR CROPS DURING YEAR 2014-2015

Name of crops	Area – Ha.	Production – M.T
Rice	42837	87453
Wheat	11332	13236
Maize	2798	6350
Gram	2140	950
Lentil	1553	1407
Moong	634	367
Arhar	505	954
Other pulses	418	308
Mustard	693	938
Other oil seeds	261	225
Sugarcane	667	28000
Total	63838	140188

*Source: -Self Compiled Department of Agriculture – GOB, Directorate of Statistics and Evaluation

TABLE 7: PRODUCTION OF MAJOR CROPS DURING YEAR 2015-2016

Name of crops	Area- Ha.	Production – M.T
Rice	70381	132219
Wheat	52120	78852
Maize	5410	14781
Gram	4316	4152
Lentil	2836	3193
Moong	952	835
Arhar	4212	6453
Other pulses	35	26
Mustard	350	407
Other oil seeds	100	92
Sugarcane	671	27750
Total	141383	268760

*Source: -Self Compiled Department of Agriculture – GOB, Directorate of Statistics and Evaluation.

TABLE 8: PRODUCTION OF MAJOR CROPS DURING YEAR 2016-2017

Name of crops	Area- Ha.	Production – M.T
Rice	71386	220013
Wheat	46108	102980
Maize	4434	11991
Gram	2942	2601
Lentil	2701	1685
Moong	877	895
Arhar	4343	7523
Other pulses	72	54
Mustard	3644	3192
Other oil seeds	-	-
Sugarcane	675	27749
Total	137182	378683

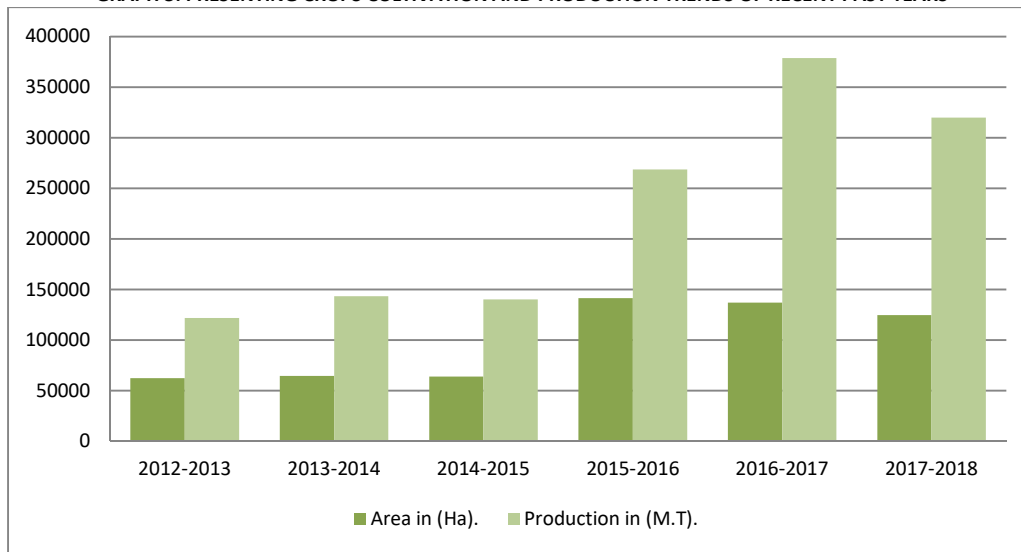
*Source: -Self Compiled Department of Agriculture – GOB, Directorate of Statistics and Evaluation.

TABLE 9: PRODUCTION OF MAJOR CROPS DURING 2017-2018

Name of crops	Area- Ha.	Production – M.T
Rice	65798	165663
Wheat	42920	105711
Maize	3417	9746
Gram	2754	3294
Lentil	1855	1143
Moong	889	654
Arhar	2561	2625
Other pulses	80	68
Mustard	3675	3300
Other oil seeds	98	80
Sugarcane	670	27745
Total	124717	320029

*Source: -Self Compiled Department of Agriculture – GOB, Directorate of Statistics and Evaluation.

GRAPH 3: PRESENTING CROPS CULTIVATION AND PRODUCTION TRENDS OF RECENT PAST YEARS



*Source: - Self compiled from data of District Census Handbook 2011, Department of Agriculture GOB and Bihar Watershed Development Society

TABLE 10: CONSOLIDATED TABLE SHOWING PRODUCTION OF MAJOR CROPS ON THE BASIS OF ABOVE GRAPH

Year	Area in (Ha)	Production in M.T
2012-2013	62316	122038
2013-2014	64681	143311
2014-2015	63838	140188
2015-2016	141383	268760
2016-2017	137182	378683
2017-2018	124717	320029

*Source: - Self compiled from data of District Census Handbook 2011, Department of Agriculture GOB and Bihar Watershed Development Society
 Area occupied for cultivation during 2012-2013 was 62316 hectares, in 2013-2014 was increased to 64681 hectares, 2014-2015 was decreased to 63838 hectares, 2015-2016 was increased to 141383 hectares, during 2016-2017 decreased to 137182 hectares and during 2017-2018 decreased to 124717 hectares. Production of major crops was increased during 2013-2014, 2015-2016 and 2016-2017.

FINDINGS AND RECOMMENDATION

After the implementation of IWMP, agricultural land use pattern of Jamui district is increased. During the period of first phase of six batches 9 blocks of Jamui district is covered under watershed programme. Average cultivated area is increased up to 18%. In Production of major crops positive trends are recorded in recent years, production of Rice crops is average about 128381 M.T, Wheat crops are 55569 M.T, Maize crops are 8476 M.T, Pulses crops are 7085 M.T, Oilseeds crops are 1442 M.T and Sugarcane crops are 27789 M.T. Increasing in production of major crops helps in improving the economic condition of backward community resides in the watershed areas. Watershed development programmes facilitates irrigation facilities, providing training to the farmers, helps in group formation and community participation. Implementation of watershed development programmes promotes the sustainable development of rural and backward areas. Development of agricultural activities promotes the income of farmers, wage labours, landless farmers. Migration of labours from Bihar is increasing Day by day, there is need to provide employment opportunities to prevent the migration of labours. So it is recommended to continue such programmes to promote the agricultural activities for the sustainable development of village economy.

CONCLUSION

Watershed development programmes helps in promoting the agricultural activities in the district. The recent cultivation trends showing positive progress in the production of major crops. Jamui district needs a stable market for the agricultural products. Interest of farmers are declining in cultivation because unavailability of market in the district. So establishments of agro-based food and non food industries in the district will also promote the investments in agriculture. For sustainable growth of income of the farmers it is necessary to provide a market for agro-products and watershed development programmes should be continued for the prosperity and development of village economy.

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