REVIEW OF RESEARCH

ROLE OF INFRASTRUCTURE IN AGRICULTURE DEVELOPMENT OF BIHAR

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ABSTRACT:

It is necessary that rural households should identify their needs and then place their demands as a matter of right before the elected representatives. Government has sponsored so many schemes for improving infrastructure in Bihar. But rural people will have to be conscious of these facilities. Government will also have to allocate funds and resources in their annual budget but it is our duty to make sure that the fund should go in the hands of right people.

KEYWORDS: *Fertilizer Position, Gross State Domestic Product, Irrigation, Rural Households,*

INTRODUCTION:-

Bihar is the state with 10.8 million population in 2011, and 1,102 persons living per sq km of its area. About 53.5% of its population lives below poverty line (Planning commission figures of 2009-10) with a poverty ratio of 55.3%. After the bifurcation of the state, the present Bihar was left only agriculture to depend on as vast mineral sector and big industries went to Jharkhand.

About 90% of the population lives in rural areas, naturally agriculture is the main source of their livelihood. Though the share of agriculture in the GSDP (Gross State Domestic Product) has been decreasing over the years still it contains a major portion in it. For example, in 2006-07 yearly growth rate of agriculture was 27.5% which became 10.89% in 2010-11 (Provisional) and 17.16% (Quick) in 2011-12 (Directorate of Economics and Statistics, Government of Bihar).In 2015-16, it was 7.3 % which became 14.3% in 2016-17.

Here there is fertile Gangetic alluvial soil and abundant water resources especially ground water resources. Because of different categories of soil and agro-climatic zones, farmers grow different types of crops here. Horticulture and floriculture are the examples of agricultural diversification here.

Table-1: Production of Major Crops in Bihar (2014-15 to 2016-17)

Crops	Production in '000 tons			Percentage Change over previous year
	2014-15	2015-16	2016-17	
Total Cereals	14321.11	14087.25	18099.11	28.5
Total Coarse Cereals	25091.28	2548.58	3874.50	52.0
Total Pulses	428.93	420.78	461.67	9.7
Total Oil Seeds	127.01	126.52	125.86	-0.5
Ground Nut	0.59	0.50	0.99	98.0
Total Fiber Crops	1637.12	1630.60	1571.00	-3.7

Source: Website of Directorate of Economics and Statistics, Government of Bihar-www.dse.bih.nic.in

Table-1 shows that Compound Aggregate Growth Rate (CAGR) in almost all crops is positive from 2016-16 to 2016-17 and in some cases it has negative trend also. Therefore, we have to see the infrastructure prevailing in agriculture sector of Bihar. Some of the important parts of agricultural infrastructure are:

IRRIGATION IN BIHAR

One of the major input requirements of agriculture is the availability of water resources. The average annual rainfall is more or less adequate for the state's agricultural operations. This causes serious damage to crop production because 50% of the farmers depend on monsoon for their agricultural operations to maximise agricultural production and to free agriculture from the vagaries of monsoon, Government has taken so many initiatives for increasing major medium and minor irrigation facilities. In Bihar only 52% of the total geographical area has irrigation facility.

IRRIGATION AREA IN BIHAR

Between 2000-01 & 2008-09, the total irrigated area in Bihar increased from 44.6 lakh hectares to 49.20 lakh hectares. This increase is of 10% over a period. But in 2011-12 the total irrigated area was of the order of 47.94 lakh hectares and was 63.42 lakh hectares in 2017 (upto March).

Following table-2 shows the irrigated area in Bihar by different methods of irrigation:

This table shows that there still exists a large potential of exploration of ground water resources through extensive use of pump sets. Data reveals that after government efforts there is a decreasing trend in almost all the source of irrigation. The other thing which is clears that tank and other sources are becoming less important over the time. Tube wells in Bihar are an extremely important source of irrigation, providing more than 50% total production in 30 districts. In Rohtas, Kaimur, Bhojpur, Buxar, Aurangabad, Banka, Munger and Lakhisarai irrigation from surface canal is more important providing 50% of the irrigation facilities. These 8 districts are rice producing districts although irrigation availability is not adequate in Bihar.

Table-2: Irrigated Area in Bihar

(Area in ha.)

Source	2014-15	2015-16	2016-17
Surface Canal	9310	0	2600
Tank (Including Arhars and Pynes)	10934	28631	20500
Tube Wells (Private and State)	15610	38440	86200
Other Sources	2564	5055	18000

Source: Website of Department of Water Resources and Minor Irrigation, Government of Bihar-www.wrd.bih.nic.in

Due to recurring shortage of power in the state, tube wells are often run on diesel which is expensive. It increases the cost of irrigation here. The other major problem is the non-completion of major projects. It also increases the cost of irrigation.

During XI Five Year Plan, state Government has initiated so many schemes as Micro Irrigation Schemes, Bihar Ground Water Irrigation Schemes (BIGWIS) and Water generating ponds for regeneration of ground water utilization and Bihar Shatabadi Neeji Nalkup Yojana' in Samastipur and Nalanda districts. In 2005 the central government has also sanctioned a national project for repair, renovation and restoration of water bodies directly related to agriculture for covering a large area under irrigation. Its cost of 300 crores will be shared by centre and states in 3:1 ratio.

Seeds

Seeds of high quality are a very important for increasing productivity in agriculture. Since there is dearth of firms for the supply of certified seeds, the Seed Replacement Ratio (SRR) is often low in

Bihar (**Economic Survey Report of Bihar, 2012-13**) and low Seed Replacement Rates (SRR) is one of the major causes of low agricultural productivity in Bihar.

Table-3: Requirement and Supply (in '000 qntl) and SRR (in %)

Crops	2015-16			2016-17		
	Requirement	Supply	SRR	Requirement	Supply	SRR
Paddy	324.8	273.96	39.13	431.25	317.54	42.88
Maize	90.0	9.05	10.45	90.0	11.96	13.82
Arhar	5.84	1.5	15.01	6.02	1.05	8.72
Wheat	912.00	616.39	27.12	930.00	465.16	20.30
Gram	29.44	6.58	8.32	30.36	2.99	3.58
Mustard	3.59	2.28	36.33	8.21	4.44	58.65

Source: Website of Department of Agriculture, Government of Bihar-www.krishi.bih.nic.in

Requirement of certified seeds arid Seed Replacement Rate (SRR) for important crops in Bihar for the period 2016-16 to 2016-17 is shown in Table-3.

It is clear from the given table that SRR has increased from 39.13% to 42.88% in 2016-17 for paddy, and for maize also. There is a huge increases from 36.33% to 58.65% in 2016-17 for mustard. Though, in other crops, decrease in seen. So, there is a vast scope for improvement in the supply of certified seeds in Bihar.

State Government has taken some initiatives for providing high quality seeds. Chief Minister's Crash Seed Program, Beej Gram Yojana, Revival of Rajya Beej Nigam (BRBN) are some of the steps taken by government in this regard. In recent years the scheme called 'Mukhyamantri Tibr Beej Vistar Karyakaram' has helped the farmers for hybrid paddy cultivation.

Fertilizer Position in Bihar

The consumption of fertilizer in Bihar has been steadily increasing in recent years. This has been shown with the help of the given table:

Table-4: Consumption of Fertilizers in Bihar

(Kg/Ha)

Period	Kharif	Rabi	Total
2014-15	138.1	181.8	160.8
2015-16	160.4	240.2	201.1
2016-17	137.00	205.29	173.18

Source: Website of Department of Agriculture, Government of Bihar-www.krishi.bih.nic.in

The table 1.4 shows that the point of view of total consumption of fertilizer the trend is fluctuating over the years. Although for Rabi crops the use of chemical fertilizer is comparatively higher than Kharif crops, while Kharif crops are the more important crops in Bihar. In recent years, government has been trying to increase the use of bio-fertilizers at a greater scale. This would have a long term effect on maintenance of soil fertility for crop production.

Mechanization of agriculture and use of farm implements is the most important infrastructure in agriculture. It is not only helpful in efficient labor use but also increasing capital intensity in field operations. The Government is providing subsidy for increasing their use in fields.

This table shows that there is an increasing trend in the distribution of zero tillage while the distribution of pump sets and plant protection equipments on subsidy have decreased. There is a similar trend in threshers. Although it is true that these equipments were very uncommon in rural areas about ten years ago but due to government subsidy they have become the part of agriculture households. Therefore, in Bihar, growth in the agriculture sector has shown wide variation. It is from

19.85% in the year 1997-98 to as high as 34.40% in the year 2000-01. The trend growth rate for the period 2004-05 to 2008-09 for the agriculture was 6.8% against the GSDP growth rate of 12.8%. Still agriculture is the main source of income for rural poor.

In this situation, improvement in the agriculture infrastructure will be an important step for increasing productivity in Bihar. It is all the more pertinent that the government expenditure is made on the creation of infrastructure in agriculture sector in Bihar.

Table-5: No. of Farm Implements distributed on Subsidy

Farm Implements	No. Of Implements Distributed		
	2011-12	2015-16	2016-17
Tractors	3848	4617	Nil
Combine Harvesters	109	177	158
Zero Tillage	3787	1537	833
Pump Sets	28615	5788	5080
Power Tiller	7567	1637	1225
Threshers	4857	2314	2654

Source: Website of Department of Agriculture, Government of Bihar- www.krishi.bih.nic.in

REVIEW OF LITERATURE

The importance of good infrastructure for agricultural development in developing economies is an important issue of discussion today. In a study report of 1996, Food Agricultural Organization of the United Nations (FAO), stated that better communications are a key requirement because they reduce transportation cost, increase competition, reduce marketing margins and in this way can directly improve farm income and private investment opportunities.

According to the World Bank, a one percent increase in the stock of infrastructure is associated with a one per cent increase in GDP across all countries. A sectoral study by Deichman et. al for Mexico shows that a lot of increase in market access leads to an increase in labor productivity by 6%. Studies on this issue prove that development of rural infrastructure increases productive efficiency, employment opportunities and thus provide more earning opportunities to the rural poor. But in India the State Government because of the precarious nature of its finances has not been able to maintain even the existing infrastructure. Similarly, **World Bank Studies (1993)** observed that the growth of farm productivity and non-farm rural employment is closely linked to infrastructure position. **Morton (1995)** state that, the development of infrastructure leads to the commercialization of agriculture and rural sector.

Thorat and Sirohi (2002) found that fertilizer, sale points, market, credit and extension facilities are related with the development of transport infrastructure. Dhawan, Sah and Vaidyanathan in their study found that irrigation infrastructure increases the land use and cropping intensity. By so many studies on Punjab agriculture, it was found that Punjab where there exists the highest index of infrastructure has the highest yield of food grains and value of agricultural production per hectare. While in Rajasthan and Madhya Pradesh which have a lower index of infrastructure also have a low yield of food grains. Bhatia in 1999 in his study proved this. So, there is a positive relationship between infrastructure and agricultural production.

In order to achieve major objectives of increasing the farm income while assuring food and nutritional security and enhancing agricultural growth with justice, the need of the hour is to

- Enhance the soil productivity
- Improve the physical condition of soil,
- Increases fertilizer use efficiently,
- Supply quality seeds at time,
- Make available irrigation facility.
- Reduce crop losses due to insect – pests and diseases.

- Promote farm mechanization for reducing cost and time,
- Transfer technical information's from scientific laboratories of ICAR/RAU to farmers field,
- Have set up for management and execution of agricultural programmes (with the help of efficient delivery system) at Panchayat level etc.

Public private partnership and proper governance will be a more effective tool in this direction. Proper governance needs proper role of Panchayat for improving agricultural infrastructure base in Bihar. The infrastructure sector has both backward and forward linkage with the agriculture and industrial sector. Thus, the development of this sector is linkage with the agriculture and industrial sector. Thus, the development of this sector is a must for development of Bihar. At this juncture, an appraisal of management of agricultural infrastructure development in Bihar with special reference to Darbhanga District is being undertaken.

OBJECTIVES OF STUDY

The present study has been undertaken to

- Examine the present status of agricultural infrastructure and its impact in the agricultural development in Darbhanga district of Bihar.
- Identify and examine the existing constraints in the agricultural development of the study area.
- Highlight the role of agricultural infrastructure in the development of agriculture as well as rural economy of the district, and
- Study the role of government and other non-government agencies in managing the components of agricultural infrastructure.

IMPORTANCE OF STUDY

Bihar with a geographical area of about 94.2 thousand square km is divided by river ganges into two parts,

I. The North Bihar with an area of 53.3 thousand square km. and
II. The South Bihar having an area of 40.9 thousand square km.

Though endowed with good soil, adequate rainfall and good ground water availability Bihar has not realized its full agriculture potential. Its agricultural productivity is one of the lowest in the County, leading to rural poverty, low nutrition and migration of labour. The weather conditions – heat wave, cold wave, drought and flood play havoc in Bihar agriculture.

The study covers aspects of agricultural infrastructural development in Bihar and recommend/ suggest remedial measures for

- Soil health management
- Seed Management
- Strengthening irrigation facilities
- Timely supply of fertilizer
- Crop protection and
- Promotion of farm mechanization.

CONCLUSION

Thus, the study will help to evaluate management of infrastructure for agricultural development in Bihar in general and Darbhanga District in particular.

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