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Economic Impact of Agriculture Technology (A Special Reference to Selected District of Bihar)

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Abstract

The new technology is used for higher output that's why the cost of new innovation could be high and its application could also be expensive and all expenses and extra costs during its practices is primarily to be borne by small tenants farmers. However, in those cases where the landholder shares both the output and cost input of the agricultural practices in equal or appropriate proportion with the tenants, or in that condition where tenant farmers has to pay a definite amount of cash or agricultural output to the landowners not matter what is the whole production, tenancy will not produce adverse effect on adoption of new innovation and tenants may prefer to use new adverse technology.

Keywords: Agriculture Technology, Agriculture Economics, Transfer of Technology.

Introduction

Agriculture is the single largest private sector occupation in Bihar. Agriculture is the key to the overall development of the state economy. Agriculture is still an important sector in Bihar since it contributes about 24.84 percent to State Gross Domestic Product and provides employment to about 77 percent of working force in rural area. The Goal of the agriculture production system should be to maximize income of land owing and landless rural populace to improve their livelihoods. The susceptibility to income and consumption shocks makes it imperative to develop formal agriculture insurance mechanisms to cope with such risks. The objective of the agriculture policy in the state is to increase productivity of major crops so as to bring it close to national average. Opening up of markets has necessitated increased production at competitive prices. Adapting as well as popularizing proven Research and Development efforts is also important. The principle agricultural crops are rice, paddy, wheat, and jute, maize, and oil seeds.

Implementation of technological changes in traditional agriculture

To select an appropriate way of technological development is only the first step in the process of technological changes in traditional agriculture. Implementation of technologies changes in traditional agriculture. Implementation of technologies for transformation of traditional agriculture in reality includes multidimensional issues as it involves the participation of different groups and institution of society like related scientist, research institute, workers, agencies for distribution of farm inputs, agencies involve in marketing of farm products, institution giving financial supports, planners and policy makers and most important farmers. The new and advance technique of cultivation can be developed natively through continuous research or it can also be implemented from those countries which are developed in the field of agricultural technology, like having advance and efficient machinery and equipment's etc. in order to save time and expenses on research work in developing the new technology, a lower developed country has option to import advance technology from abroad. But it does not eliminate the importance of agricultural research in the country like India. Most of innovations done in the field of agriculture are completely suited to some particular range of conditions. Differences in the soil, climate, elevation, rainfall and other factor are responsible for particular approaches of studies and researches for different regions. Innovations which are accelerating the rate of

production in one environment may not suit the other environment and may be responsible for less productivity.

Review of literature (Table Summary)

Review of literature shows, past research work, idea generation and provides valuable information related to the research works:

S.N.	Author	Title	Year	Journal	Objective	Finding
1.	Radhika Kapur	Usage of Technology in the Agricultural Sector	2018	Scientific Agriculture.	The advanced technologies in agriculture.	In the agriculture sector the food requirement of the farmers leads to the significance usage of technology in the agriculture sector. India deficits due to lack of knowledge in technology used for horticulture crops in comparison to other countries.
2.	A. V. Sakhare	Agricultural development and India economy.	2017	Pune research Discovery An international journal of advanced studies.	1. To study the Concept of Agricultural Development. 2. To Study the Importance of Agricultural Development. 3. To study the Role of Agricultural Sector in National Economy.	In India 56% of population is workforce in agricultural field. The growth of the commercial crops increased in few decades.Through agriculture people can get employment and can remove poverty from the country. Agriculture sector also supports to the economy of the country.
3.	V. M. Abdul Hakkim, E. Abhilash Joseph, A. J. Ajay Gokul, K. Mufeedha	Precision Farming: The Future of Indian Agriculture	2016	Applied biology and biotechnology.	1.Need of precision farming 2.Tools and equipment	Crop productivity can be increased by using sustainable technology. Through technology and sustainable tools we can reduce the energy inputs, reduce the environmental impact and can increase the economic returns.
4.	Madhusudhan L	Agriculture Role on Indian Economy.	2015	Business and Economics.	Agriculture in Indian economy	Large population depends upon the agriculture in India directly or indirectly. People also making profit by the farming and also by doing business of crops. Food grain is produced in large amount in India that supports the economy,

Need for Continuous Research and Improvement in Implementation of Innovation

It is already remarked that only the replacement of traditional method of agriculture by a set of advanced new farm practices, will not solve the purpose of agricultural growth completely. In order to maintain a long term agricultural growth, it is very essential to upgrade the new technology continuously with respect to time and condition. For that, it is to be focused on two things. First one is that the agricultural scientist should keep their research works continue even after the new innovations; this will give long term benefits to the agricultural development.

Need of the Study

Agriculture sector plays a very important role in providing employment and food production. InBihar, a large proportion of population depends on agriculture and agriculture related activities.Economic

growth of Bihar largely depends on development of agriculture. Over a period of timeextensive use of technology has led to growth in agriculture production all over the world. Biharis also benefited from technological infusion in agriculture.

Objective of the Study

The present study is undertaken with the following specific objective:

To analyze inter-dependence of agriculture technology and agriculture production in selected districts of Bihar.

Research Methodology

In order to achieving the above objective the following research methodology will be adopted: Average, Sum product, Bar & Diagrams etc.

Data period Three years (2016-17 to 2018-19)

Sample size: For attaining objective, the following Agro-climatic zones and represented Districts will be taken for the studypurpose

S. No.	Bihar Agro-climate zones	District	Total cropped area in Hectare
1.	Agro-climate zone (I)	West Champaran	399802
2.	Agro-climate zone (II)	Araria	268913
3.	Agro-climate zone (III) (A)	Banka	165784
4.	Agro-climate zone (III) (B)	Rohtas	320244

Source: Directorate of Economics & Statistics, Bihar, Patna.

Justification of Sample Selection

1. On the basis of Agro climate zones ofBihar.
2. On the basis of use of Techno-Agriculture inBihar.
3. On the basis of highest cropped area in selected Districts of Agro-climate zones ofBihar.
4. On the Basis of Marginal Districts of Bihar.

Data collection

The relevant data will be collected from secondarysources.

Secondary Data will be collected mainly from Department of Bihar Agriculture controlled by Ministry of Bihar agriculture. In addition data and information will be also collected from, Agriculture Economics Journals and Government Publications of Biharetc.

Selection of crop: Wheat

Uses of Machineries in Agricultural Production (Data year Wise)

Agro-climate zone (I) West Champaran

Year	Farm Implement	Cambine Harvestar	Zero Tillage	Pumpset	Power Tiller	Manually Operated Tools	Thresher	Total Technologies Used
2016-17	4023	4	27	246	40	1273	191	5804
2017-18	3572	6	3	258	29	669	95	4632
2018-19	3367	2	2	473	6	362	124	4336
AVG	3654	4	10.67	325.67	25	768	136.67	4924.00

Source: Directorate of Economics & Statistics, Bihar, Patna.

According to the table use of high number of technologies year 2016-17 and low number of technologies use in year 2018-19. Total technologies used in year 2016-17 are 5804 and lowest number of technologies used in 2018-19 value is 4336.

Agricultural Wheat Production Data Year Wise

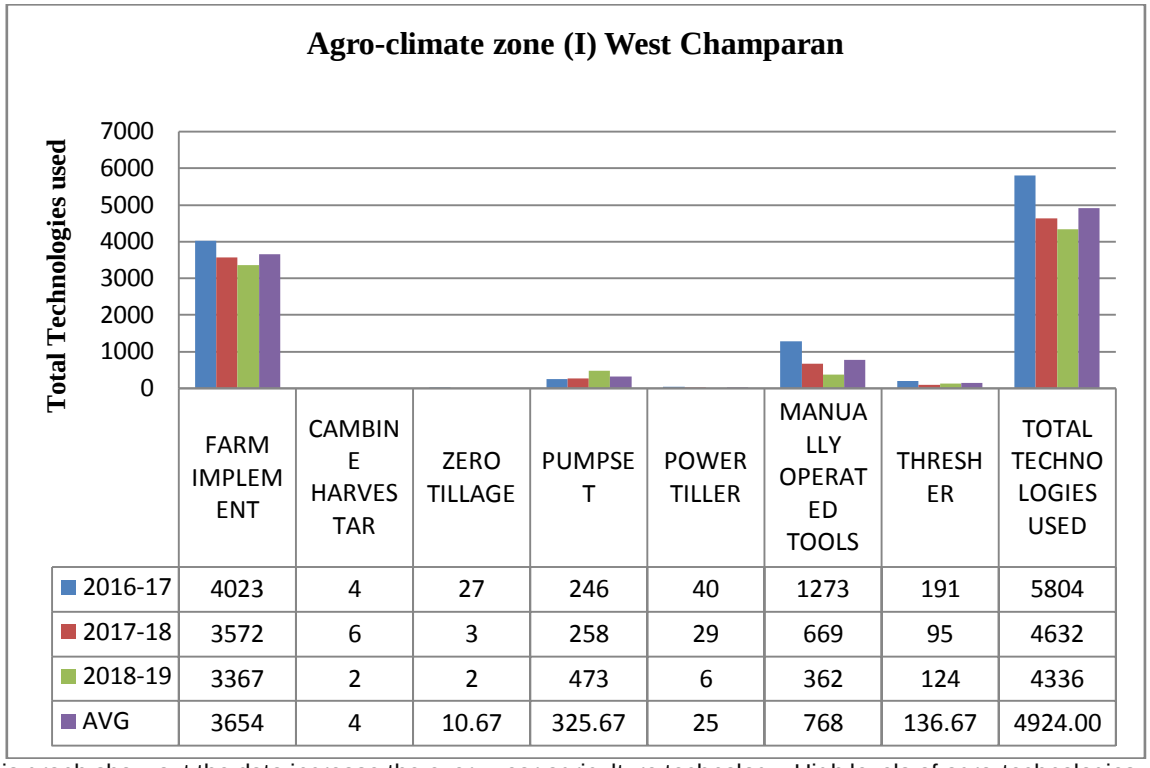
Agro-climate zone (I) West Champaran

Year	Season	Area(Hectare)	Production(Tonnes)	Yield(Tonnes/Hectare)
2016-17	Rabi	69571	154237	2.22
2017-18	Rabi	70313	160940	2.29
2018-19	Rabi	70134	192919	2.75

Source: Directorate of Economics & Statistics, Bihar, Patna.

According to the table of production data increase the value of every year, in production year 2018-19 highest production in wheat, value of production is 192919 tonnes and lowest production 154237 tonnes in year 2016-17.

According to the both table year 2016-17 increase the farm implement when increasing wheat productivity year 2016-17. In both table of analysis of agro climate zone (1) west Champaran, when increase the production of wheat the increase the use of Agro-Technologies.



	FARM IMPLEMENT	CAMBINE HARVESTAR	ZERO TILLAGE	PUMPSET	POWER TILLER	MANUALLY OPERATED TOOLS	THRESHER	TOTAL TECHNOLOGIES USED
2016-17	4023	4	27	246	40	1273	191	5804
2017-18	3572	6	3	258	29	669	95	4632
2018-19	3367	2	2	473	6	362	124	4336
AVG	3654	4	10.67	325.67	25	768	136.67	4924.00

In this graph show out the data increase the every year agriculture technology. High levels of agro-technologies used in year 2016-17.

Uses of Machineries in Agricultural Production (Data year Wise)

Agro-climate zone (II) Araria

Source: Directorate of Economics & Statistics, Bihar, Patna.

Agricultural Wheat Production Data Year Wise:

Year	Farm Implement	Cambine Harvestar	Zero Tillage	Pumpset	Power Tiller	Manually Operated Tools	Thresher	Total Technologies Used
2016-17	3052	0	313	184	0	686	634	4869
2017-18	1145	0	1	45	0	263	32	1486
2018-19	1788	2	10	171	1	141	95	2208
AVG	1995	0.67	108	133.33	0.33	363.33	253.67	2854.33

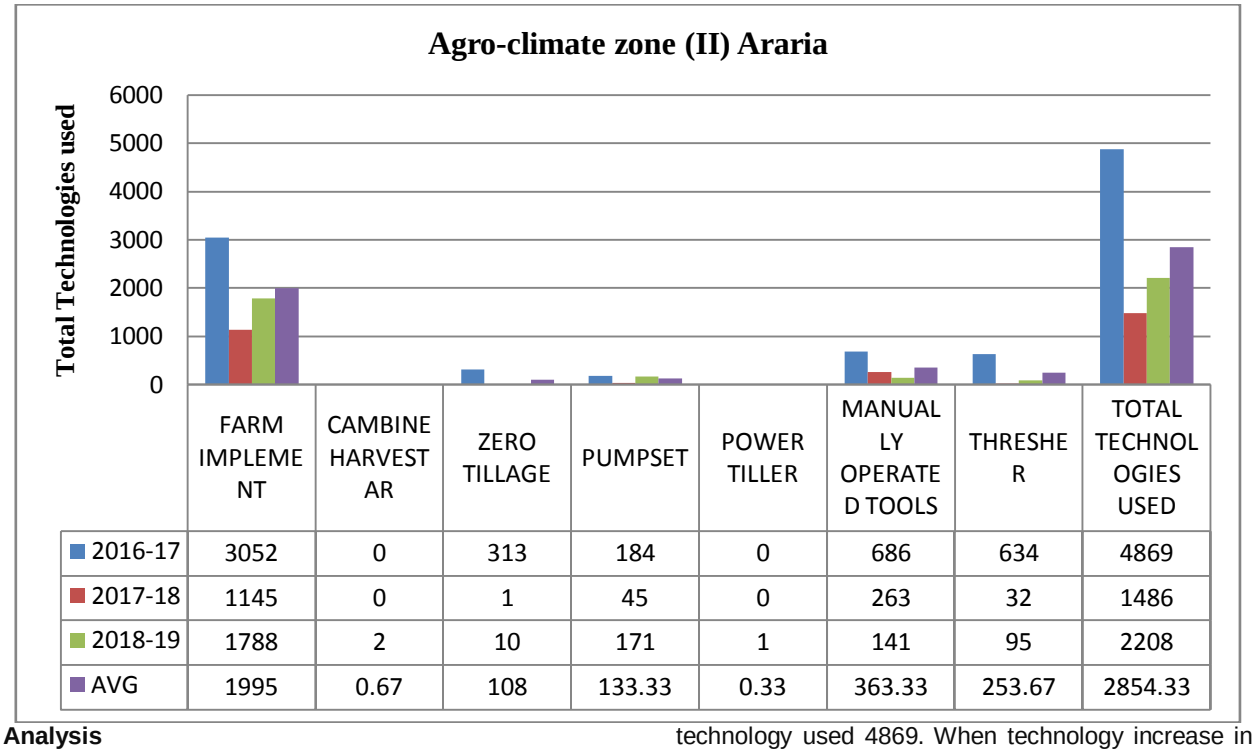
Agro-climate zone (II) Araria

Year	Season	Area (Hectare)	Production(Tonnes)	Yield(Tonnes/ Hectare)
2016-17	Rabi	36223	88806	2.45
2017-18	Rabi	25358	58140	2.29
2018-19	Rabi	23361	61687	2.64

Source: Directorate of Economics & Statistics, Bihar, Patna.

Analysis

In the use of agriculture technology in year 2016-17 increase when production levels of wheat 2016-17 increase. High level of technology use in year 2016-17 when increase in production of wheat. Year 2018-19 less area use in wheat production when increase the wheat productivity.



Analysis

In this graph show out the different technology in year wise. 2016-17 High level of technology used in wheat production. Total technology used 4869. When technology increase in agriculture production system then agriculture wheat production output increase.

Uses of Machineries in Agricultural Production (Data year Wise)

Agro-climate zone (III) (A) Banka

Year	Farm Implement	Cambine Harvestar	Zero Tillage	Pumpset	Power Tiller	Manually Operated Tools	Thresher	Total Technologies Used
2016-17	2049	3	32	183	105	995	85	3452
2017-18	1912	1	20	171	47	720	66	2937
2018-19	1210	1	12	401	32	146	38	1840
AVG	1723.67	1.67	21.33	251.67	61.33	620.33	63.00	2743.00

Source: Directorate of Economics & Statistics, Bihar, Patna

Agricultural Wheat Production Data Year Wise:

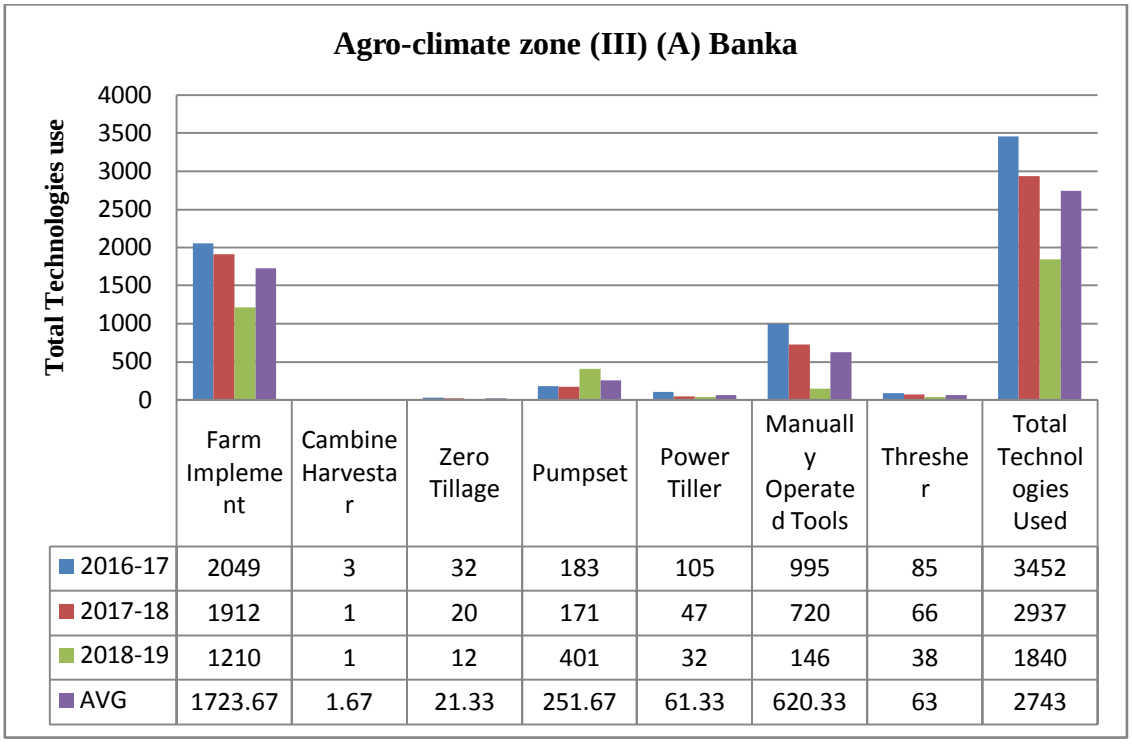
Agro-climate zone (III) (A) Banka

Year	Season	Area(Hectare)	Production(Tonnes)	Yield(Tonnes/ Hectare)
2016-17	Rabi	32959	88201	2.68
2017-18	Rabi	33131	90876	2.74
2018-19	Rabi	22625	65438	2.89

Source: Directorate of Economics & Statistics, Bihar, Patna.

Analysis

In the both table use of machineries in agriculture production in agro-climate zone (3) Banka, show out the highest productivity in year 2018-19 when use of agriculture technology is increase. In year 2018-19 wheat productivity is high when less area use in wheat production system. In year 2018-19 highest production is 65438tonnes and total technology use in 2018-19 is 1840.



	Farm Implement	Cambine Harvestar	Zero Tillage	Pumpset	Power Tiller	Manually Operated Tools	Thresher	Total Technologies Used
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AVG	1723.67	1.67	21.33	251.67	61.33	620.33	63	2743

Analysis

In year 2018-19 wheat productivity is high when less area use in wheat production system. In year 2018-19 highest production is 65438tonnes and total technology use in 2018-19 is 1840.

In this graph use of technology in wheat production, in year wise when use of technology is high then output of wheat productivity is increase.

Uses of Machineries in Agricultural Production (Data year Wise)

Agro-climate zone (III) (B) Rohtas

Year	Farm Implement	Cambine Harvestar	Zero Tillage	Pumpset	Power Tiller	Manually Operated Tools	Thresher	Total Technologies Used
2016-17	2483	31	170	174	4	148	84	3094
2017-18	1656	73	239	59	1	62	144	2234
2018-19	639	31	134	108	0	7	2	921
AVG	1592.67	45	181	113.67	1.67	72.33	76.67	2083.00

Source: Directorate of Economics & Statistics, Bihar, Patna

Agricultural Wheat Production Data Year Wise

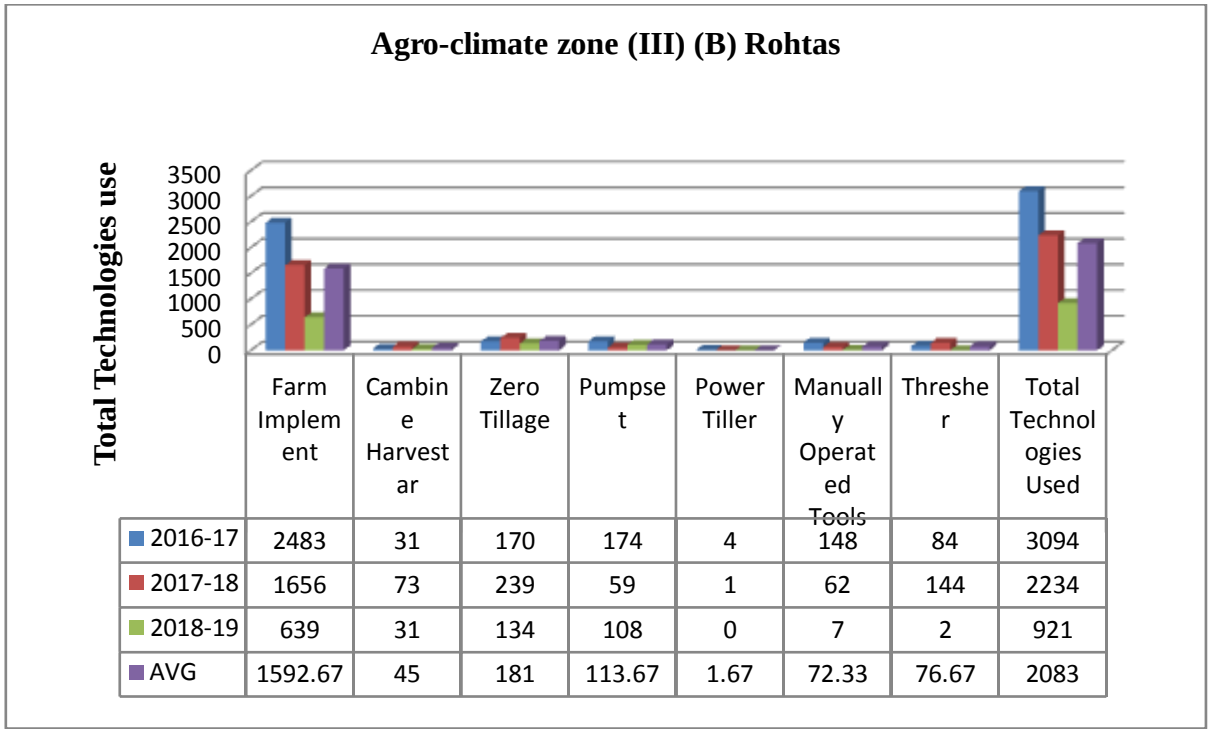
Agro-climate zone (III) (B) Rohtas

Year	Season	Area (Hectare)	Production (Tonnes)	Yield (Tonnes/ Hectare)
2016-17	Rabi	140549	460383	3.28
2017-18	Rabi	140752	472043	3.35
2018-19	Rabi	140733	517855	3.68

Source: Directorate of Economics & Statistics, Bihar, Patna.

Analysis

In the both table of data show out in year 2018-19 output of wheat production is high when high level of technology used. In year high output of production is 517855tonnes and total technology is 2083.



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AVG	1592.67	45	181	113.67	1.67	72.33	76.67	2083

Analysis

In year 2018-19 wheat productivity is high when less area use in wheat production system. In year 2018-19 highest production is 65438tonnes and total technology use in 2018-19 is 1840.

In this graph use of technology in wheat production, in year wise when use of technology is high then output of wheat productivity is increase.

Conclusion

Mass and uniform distribution of new agricultural technologies in Selected districts and Bihar depends for much on the extension of effective channels of communication between agricultural researcher and farmers. Agricultural extension service is an important part of this communication network. The researchers work in experiment station and after a continuous study they find some innovation and profitable practices for agricultural of selected region. But farmers who are not aware of these innovation and practices, due to weak communication channels, will certain follow traditional mode of agricultural method for farming better communication is also must to teach farmers about the effective use of newly invented technologies to get maximum agricultural output. In the process of making aware farmers about the modern technologies, the agricultural extension service plays a vital role. Once farmers find the positive results of new technology on small scale, through experience or exposure, they adopt it on big scale. Villages level extension workers also convince farmers about the benefits of new technology, which works as base of farmers awareness.

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