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Sources of Information of Farmers on Modern Agricultural Technology in Punjab: Their Status and Effectiveness

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Abstract

Punjab holds place of pride among the Indian States for its outstanding achievements in agricultural development. The state has witnessed tremendous increase in the agricultural production during the Green Revolution period, mainly due to healthy mix of institutional and technological factors. The agricultural extension, which has developed strong research-extension-farmer linkages, also considered to be an important instrument in the process of diffusion and adoption of new farm technology. Punjab state despite having a smaller geographical area contributes a significant share to national income from agriculture. The study explored the role of sources of information of agricultural technology viz, T.V., radio, newspaper, extension workers, input dealers and progressive farmers, which played an important role in spreading the knowledge of modern technology in Punjab. The study is based on the data of National Sample Survey Organization which took up the special study on Indian farmers and conducted the Situation Assessment Survey (SAS) of farmers during 2003 in the rural areas as part of the NSS 59th round. 'Access to modern technology for farming was one of the components of SAS. The studys revealed that the progressive farmers, input dealers and the radio are the main sources of information of modern technology in Punjab state. They provide all type of information to the farmers and played an important role in effective adoption of new technology among the farmers. The relative performance of extension worker is comparatively lower in Punjab with respect to access to the number of farmers and modeling the mind of the farmers in adoption and trying recommended practices in the State.

Keywords: Source of information, Technology access, Punjab agriculture, Progressive farmers

JEL Classification: O33, O47

Introduction

At the onset of new farm technology in mid 1960's when India stepped towards self sufficiency in foodgrains, Punjab state was at the forefront in generation, promotion, adoption and evaluation of the new technology, which resulted in green revolution. In Punjab, the adoption level of HYVs of wheat and paddy reached up to 100 per cent till early eighties irrespective of size categories as about

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97 per cent area is irrigated, a prerequisite for the adoption of HYVs and availability of other infrastructural facilities viz. fertilizers, insecticides, pesticides, credit facility to all the size categories of farmers (Westley, 1986). Agriculture in Punjab grew at a high growth rate of 5.7 per cent during 1971-72 to 1985-86 which was more than double the all India growth rate (2.31 %) during this period. Punjab is one of the smallest states of India covering only 1.53 per cent of the geographical area of the country; it alone contributed about 59 per cent of wheat in central pool during the year 1967-68. During the last 40 years, the average annual wheat contribution of Punjab to central pool was about 60 per cent. As for rice is concerned the share was 60 per cent in 1979-80 but after that declined to 29 per cent in 2007-08 (Ghuman *et al*., 2010; Govt. of Punjab, various issues). The achievement made by the agriculture in Punjab has been possible through significantly positive trends in input use supported by major rural investments by public sector and strong institutional network. The agricultural extension, which has developed strong research-extension-farmer linkages, also considered to be an important instrument in the process of diffusion and adoption of new farm technology. Since its official inception on October 2, 1952, agricultural extension has grown substantially, at least in size if not in quality in each state (Mazi and Haque, 1979). There are many other sources of information of agricultural technology viz, T.V., radio, newspaper, input dealers and progressive farmers which played an important role in spreading of the knowledge of modern technology. Sharma and Singh (2015) analyzed the impact of the access of modern agricultural technologies on farmer household welfare, measured by per capita consumption expenditure in rural India and found the access to modern technology has a significant positive impact on consumption expenditure in rural India. The present study evaluates the relative contribution of Gross Value Added (GVA) from agriculture among different states to national GVA from agriculture along with cultivated area, indicating status of development of agricultural sector in Punjab. The main emphasis was laid on to examine the access to source of information of farmers on modern agricultural technology in Punjab state, effectiveness of the source in terms of adoption and subjective assessment of the source in term of quality.

Data Sources and Methodology

The study is based on secondary data. State wise Gross Value Added has been obtained from Statistics at a Glance, Ministry of Agriculture, GOI. The information regarding sources of information of farmers on modern agricultural technology was culled from 59th National Sample Survey Organisation round. National Sample Survey Organization took up the special study on Indian farmers and conducted the Situation Assessment Survey (SAS) of farmers during 2003 in the rural areas as part of the NSS 59th round. 'Access to modern technology for farming' was one of the components of SAS. It dealt with accessing of information on modern technology related to farming through different sources among different states. Descriptive statistics such as averages and percentages were used for analysing the data.

Results and Discussion

State-wise Gross Value Added (GVA) from agriculture sector and its share in national

GVA from agriculture was discussed depicting the development status of agriculture sector among different states. Main emphasis of the discussion was on sources of information on new agricultural technologies in Punjab vis-a-vis. India.

Share of agricultural GVA among different states to National GVA from agriculture

Agriculture plays an important role in national economy of India though its share

Table 1: Relative importance of agriculture among different states, triennium ending, 2014-15 (At 2011-12 prices)

States	State wise GVA from agri. & allied activities (Rs. crores)	Per cent share of states in national GVA from agri. & allied activities	Rankings of states acc. to share in national GVA from agri	Percentage of Total Cultivated Area (TCA) of each state to the TCA in India	Ranking of states acc. to share in TCA to the total TCA in India
Andhra Pradesh	106747.06	6.82	6	3.38	9
Assam	32499.59	2.08	15	2.06	15
Bihar	62423.47	3.99	11	3.87	13
Chhattisgarh	29294.46	1.87	16	2.89	7
Gujarat	108715.55	6.94	5	6.44	6
Haryana	64439.09	4.12	10	3.30	17
Jammu & Kashmir	12312.07	0.79	18	0.59	5
Jharkhand	23733.32	1.52	17	0.78	14
Karnataka	75930.78	4.85	9	6.17	8
Kerala	46811.72	2.99	13	1.32	18
Madhya Pradesh	116049.06	7.41	4	12.00	2
Maharashtra	145938.42	9.32	2	11.83	3
Orissa	44238.63	2.83	14	2.61	10
Punjab	79851.11	5.10	8	2.95	16
Rajasthan	127121	8.12	3	12.22	1
Tamil Nadu	89847.07	5.74	7	3.02	11
Telangana	59209.20	3.78	12	0.24	12
Uttar Pradesh	189222.23	12.09	1	13.18	4
India	1565642.67			100.00 (198360, 000 ha)	

Note: Total cultivated area in India is 198360, thousand hectares

to Gross Value Added (GVA) declined continuously from 27.84 per cent in 1982-83 to 24.45 per cent in 1992-93 and further reached to 19.50 per cent in 2014-15. Still agriculture contributes significant income to the national income. Gross State Value Added (GSVA) from agriculture for different states for the triennium ending 2014-15 is given in Table 1.

GVA from agriculture for India was Rs. 15.66 lakh crores during triennium ending 2014-15 at 2011-12 prices. The Punjab state's contribution was of Rs. 79851.11 crores constituting 5.10 per cent of the total GSVP from agriculture in India whereas it covers 2.95 per cent of the total cropped area of the country. It is ranked 8th in the terms of its contribution to the national GSVA from agriculture and 11th in share of total cropped area to total TCA of the India. Uttar Pradesh, Maharashtra, Rajasthan, Madhya Pradesh, Gujarat, Andhra Pradesh and Tamil Nadu were the states in order whose contribution was higher than the Punjab state but these states occupied much larger area than the Punjab state. The contribution of these states was 12.09, 9.32, 8.12, 7.41, 6.94, 6.82 and 5.74 to national GSVA from agriculture respectively whereas these states occupied 13.18, 11.83, 12.22, 12.00, 6.44, 3.38, and 3.02 per cent of the total cropped area of the country respectively. Thus, it is clear that the Punjab state despite having a smaller geographical area contributes a significant share to national income from agriculture indicating its developed agricultural status.

Sources of information

In the survey report of 'Access to Modern Technology for Farming' the extension worker, TV, radio, newspaper, input dealers and progressive farmers were the important sources among the sixteen sources identified. The information was published on different aspects of technology diffusion i.e. number of persons having access to different sources of information, good quality of information received, trying recommended practices and adopting recommended practices for 18 states of the country.

It was found from the survey reports that at All India level, 40 per cent farmer households accessed various sources of information for modern technology for farming whereas this percentage was about 27 per cent for the Punjab state. Table 2 incorporates the percentage of farmer households accessing to different sources of modern agricultural technology and their effective adoption in dissemination of knowledge regarding new technology in India and the Punjab state (see Appendix I). It is clear from the table that the percentage of farmer households who access information on modern agricultural technology is the highest in case of TV (16.5) followed by newspaper (8.1), radio (5.4), progressive farmers (4.3) and input dealers (3.6). The least number of farmers have access of extension workers (1.4)[1] as sources of information on modern technology. The number of farmers reporting the good quality of information received from different sources; worked out as percentage of the household who has accessed that source, was the highest in case of progressive farmers (85.5) followed by newspaper (70.5), TV (67.8) and radio (63.4) (see Appendix II). The extension workers were placed at second last number i.e. 51.6 per cent farmers reported that the quality of information was good from the extension workers, as a source of information. The survey also showed the percentage of farmers who tried and adopted

Table 2: Sources of information of modern agricultural technology and their effectiveness among Punjab Farmers (Per cent)

Particulars	Extension workers	TV	Radio	News-papers	Input dealers	Progressive farmers
Accessing information on modern agril. Tech.	1.4 (5.7)	16.5 (9.3)	5.4 (13.0)	8.1 (7.0)	3.6 (13.1)	4.3 (16.9)
Reporting good quality information received*	51.6 (51.1)	67.8 (59.0)	63.4 (55.5)	70.5 (55.9)	44.8 (50.5)	85.5 (52.8)
Trying recommended* practices on modern agril. Tech. Through different sources	55.5 (65.3)	56.8 (53.3)	45.3 (56.3)	62.4 (54.1)	71.0 (81.5)	97.2 (82.8)
Adopting recommended practices*	29.8 (62.5)	56.0 (33.1)	42.3 (54.5)	59.8 (53.8)	66.7 (81.7)	92.2 (85.1)

*Notes: Multiple response, *These are percentage to the number of farmers accessing information on modern technology at S.No.1, Figures in parentheses relates to All India level*

the recommended practices on modern agriculture technology given by different sources. The number was again the highest for progressive farmers i.e. 97.2 per cent and 92.2 per cent followed by input dealers i.e. 71.0 and 66.7 for both the features of technology adoption. Hence the percentage of farmers is second lowest (55.5) for the extension workers in trying recommended practices and lowest (29.8) for adopting recommended practices in Punjab whereas at national level the percentage was 65.3 and 62.5 for both the features of technology adoption for extension workers as a source of information. Thus it is concluded from the above discussion that the access of farmers to different sources of information in Punjab is the highest for TV followed by newspaper and radio and good quality information, trying recommended practices and adopting recommended practices is the highest in case of progressive farmers followed by input dealers. Overall progressive farmers and input dealers played an important role in effective dissemination of modern technology in modeling the mind of the farmers in trying and adopting recommended practices in the Punjab state.

Relative status of different sources of information in Punjab

The information relating to various features of technology dissemination from different sources has been given for 18 states of India. The ranking of different states with respect to different features of technology adoption has been done and incorporated in Table 3. Relative position of Punjab state in respect of different sources of information of modern agricultural technology indicate that the progressive farmers played a significant role in relation to giving information of new technology. Though the rank of progressive farmers in accessing the information is 16th but in case of reporting good quality information, trying and adopting recommended practices its rank is 1st, 2nd and 4th respectively. The rank of newspaper and TV as a source of

Table 3: Rank of Punjab among different states regarding different features of sources of information of modern agricultural technology.

Particulars	Extension workers	TV	Radio	News-papers	Input dealers	Progressive farmers
Accessing Information on modern Agril. Tech.	14	5	15	5	14	16
Reporting Good quality Information Received	7	3	5	2	11	1
Trying recommended practices on modern agril. Tech. Through different sources	13	7	14	6	15	2
Adopting recommended practices	15	9	13	6	15	4

information was also better it remained between 6 and 9 ranks respectively for all the features of technology dissemination (Also see Annexure I-IV). As per the survey report the extension workers in Punjab do not have significant access to the farmers in the state, their rank is 14th in terms of accessing information, 13th in trying recommended practices and 15th in adopting recommended practices among the 18 states under study.

Thus it is concluded that the progressive farmers, newspapers and radio are important source of information of farmers on modern agricultural technology and are playing effective and appreciable role in Punjab state in dissemination of new technology.

Types of information provided by different sources

The type of information given by three sources viz. progressive farmers, input dealers and radio is also reported by the NSS survey. The type of information includes getting information on cultivating, improved seeds, fertilizer, plant protection and other. The access of these sources is 5.4 per cent in case of radio followed by 4.3 per cent and 3.6 per cent in case of progressive farmers and input dealers respectively. Maximum information provided by these sources related to cultivation i.e. 96 per cent in case of progressive farmers. It is interesting to note that the input dealers also provide information related to cultivation aspect i.e. 93 per cent of the information provided by the input dealers related to cultivation. Next aspect of information provided by these sources is related to improved seeds; 68 per cent of the households were given information relating to improved seeds by progressive farmers followed by input dealers (36.6%) and radio (33.8%). About 47 per cent of the farmers (who access this source) were given information relating to fertilizers by input dealers. It is interesting to note that the information relating to plant protection is provided to the highest number of households by progressive farmers rather than input dealers in Punjab. Thus overall it is concluded that progressive farmers provide all type of information to the farmers and played an important role in diffusion of new technology. Input dealers

Table 4: Distribution of farmers according to type and source of information in Punjab (% of households)

Type of information	Source of information		
	Progressive farmers	Radio	Input dealers
Accessing the source	4.3	5.4	3.6
*Getting information on cultivation	96.0	78.0	93.0
*Getting information on improved seeds	68.9	33.8	36.6
*Fertilizers	5.8	52.2	47.3
Plant protection	18.2	4.0	9.8
Others	7.0	10.0	6.3

*Notes: Multiple response, * are per cent of the farmers accessing the source of information.*

and radio also played an important role in this aspect.

Conclusion and Policy Implications

It is concluded from the above discussion that Punjab state, a progressive agriculture state contributing more than 5 per cent of the national income from 1.5 per cent of the geographical area of the country. In the state the adoption of HYVs is 100 per cent irrespective of the size of the holding. As per 59th NSS survey including state wise information on Access to Modern Technology for Farmers, the progressive farmers, input dealers and the radio are the main sources of information of modern technology in Punjab state. They provide all type of information to the farmers and played an important role in effective adoption of new technology among the farmers. The relative performance of extension worker is comparatively lower in Punjab with respect to access to the number of farmers and modeling the mind of the farmers in adoption and trying recommended practices in the State.

Note:

1 As per survey definition the extension worker would mean an employee of the govt. in the Department of Agriculture/ Horticulture/Animal Husbandry/Forestry/ Soil Conservation or Agricultural Universities as ICAR institutes who provide necessary information and guidance to the farmers. Para technician/Para veterinarians visiting from government department are also classified as extension workers. Krishi Vigyan Kendra (these are the centers set up by the state Agricultural University, Indian council of Agricultural Research and Agricultural Research institute of state Govt.), Government Demonstration (demonstration/exhibitions on farming by any govt. agency, e.g. State Govt., ICAR or Govt. of India), Kisan Mela or a stall set up by govt./private agency visited by farmers and among other are included into the head 'Other Sources' and not included as a part of extension worker.

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Annexure I : Comparative status of Punjab with respect to Accessing Information on modern agricultural technology (Per 000, number of farmer household)

Source	Maximum		Minimum		Average for India	Punjab's rank
	No	State	No	State		
Extension worker	219	Gujarat	0	Jharkhand	57	14
TV	300	J l& K	21	Rajasthan	93	5
Radio	363	J & K	28	Rajasthan	130	15
Newspapers	378	Kerala	39	Orissa	70	5
Input dealers	356	West Bengal	2	Chhatisgarh	131	14
Progressive farmers	341	Andhra Pradesh	7	Bihar	167	16
Any other	627	Andhra Pradesh	147	Rajasthan	404	15

Annexure II: Comparative status of Punjab with respect to number of households Reporting Good Quality Information from different sources

Source	Maximum		Minimum		Average for India (%)	Punjab's rank
	Per cent	State	Per cent	State		
Extension worker	78.7	Tamil Nadu	51.0	Kerala	51.1	7
TV	73.7	Gujarat	10.4	Bihar	59.0	3
Radio	82.8	Chhatisgarh	36.4	Assam	55.5	5
Newspapers	71.0	Rajasthan	36.2	Jharkhand	55.9	2
Input dealers	73.4	Gujarat	0.0	Chhatigarh	50.5	11
Progressive farmers	85.5	Punjab	14.5	Jharkhand	52.8	1

Note: Percentages are to the number of farmers having access of that source.

Annexure III: Comparative status of Punjab regarding number of households Trying Recommended Practices. (Per 000 number of farm household)

Source	Maximum		Minimum		Average for India (%)	Punjab's rank
	Per cent	State	Per cent	State		
Extension worker	88.4	Rajasthan	3.5	Bihar	65.3	13
TV	74.0	Rajasthan	37.4	Karnataka	53.3	7
Radio	73.7	J & K	26.0	Maharashtra	56.4	14
Newspapers	88.2	Rajasthan	27.2	Jharkhand	54.1	6
Input dealers	100	J & K	30.3	Chhatisgarh	81.5	15
Progressive farmers	100	J & K	60.0	Karnataka	82.8	2

Note: Percentages are to the number of farmers having access of that source.

Annexure IV: Comparative status of Punjab in Adopting Recommended Practices (Per 000, number of farmer household)

Source	Maximum		Minimum		Average for India (%)	Punjab's rank
	Per cent	State	No	State		
Extension worker	87.2	Rajasthan	267	J & K	62.5	15
TV	70.5	Gujarat	316	Chhatisgarh	53.1	9
Radio	75.8	J &K	303	Chhatisgarh	54.5	13
Newspapers	80.9	Rajasthan	276	Jharkhand	53.8	6
Input dealers	100	J & K	303	Chhatisgarh	81.7	15
Progressive farmers	100	J & K	448	Jharkhand	85.1	4

Note: Percentages are to the number of farmers having access of that source.