

Research Paper

Efficiency of Stakeholders in Agricultural Innovation System

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ABSTRACT

Efficiency is an ability to do things well, successfully and without waste of time and energy. It is a measurable concept that can be determined by using the ratio of useful output to total input. The resources might be men, money, machines and materials that are being used within time for accomplishment of desired activity. Being efficient means the system uses inputs in a right way. If the input-output ratio is adverse then system may work inefficiently. In present study, technical efficiency, cost-effective efficiency and allocative efficiency of stakeholders were identified. The present study was carried out in seven districts of South Gujarat during 2020. The six types of stakeholder were playing pivotal role in AIS hence the list of each type of stakeholder were obtained from the concerned authorities. A simple random sampling method was adopted to obtain respondents sample size. Thus, 30 researchers, 50 extensionists, 30 In-charge of NGOs, 30 managers of private agencies, 50 owner of agro-service providers and 50 progressive farmers were selected. All the 240 stakeholders were randomly selected. The statistical tools and method was used to analyze the data were frequency, percentage and arbitrary method. It can be concluded that more than two fifth (47.50%) of the stakeholders equally had good and excellent level of efficiency among stakeholders in Agricultural Innovation System.

Highlights

- More than two fifth of the stakeholders equally had good and excellent level of overall efficiency in Agricultural Innovation System.

Keywords: Technical, cost-effective, allocative efficiency, stakeholders

Agricultural sector is in central stage of global development dialogues throughout the world due to climate change, food security and uncertain markets. The rural population in developing countries are merely depending on agriculture. This sector is playing significant role in development, but the challenges are wide spectrum, ranging from local infrastructure to global trade. To urge for the agricultural development the existing stakeholders of Agricultural Innovation System (AIS) need new efficiency, capacities and innovativeness to respond effectively and efficiently to the new challenges such as declining water availability, increasing soil degradation and changing uncertain climate and market (FAO, 2017). The efficiency can be achieved under the conditions of maximizing the results of

an action in relation to the resources used, and it is calculated by comparing the effects obtained in their efforts.

Efficiency is an ability to do things well, successfully and without waste of time and energy. It is a measurable concept that can be determined by using the ratio of useful output to total input. The resources might be men, money, machines and materials that are being used within time for accomplishment of desired activities. Being efficient means the system uses inputs in a right way to

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enabling environment hence, the stakeholder of AIS having knowledge and understood their role in AIS so, they work efficiently. If the input-output ratio is adverse then system may work inefficiently.

Technical efficiency, cost-effective efficiency and allocative efficiency of stakeholders were identified for the present study. Technical efficiency is concerned with technical competence to achieving maximum outputs without wasting resources. Cost effective efficiency concerned with producing goods and render services with least cost. Allocative efficiency concerned with output which people valued the most.

Stakeholders performed their activities in AIS with qualities and in quantity without wasting time and resources. They offer their products / services on one's desire or need. In this regards, an attempt was carried out to measure the efficiency of stakeholders in Agricultural Innovation System.

RESEARCH METHODOLOGY

The present study was conducted in Gujarat state. All seven districts of South Gujarat viz., Navsari, Valsad, Surat, Tapi, Narmada, Bharuch and the Dangs were selected. The AIS has been playing their roles with six types of stakeholders. They are Researchers of university, Extensionist of line Departments, In-charge of agricultural oriented Non-Government Organization, manager of agricultural oriented private agencies, Agro-Service Providers and Progressive farmers.

The six type of stakeholder were playing pivotal role in AIS hence their list of each type of stakeholder were obtained from the concerned authorities. The mode of study area of research force to work was vertically as well as horizontally therefore; a simple random sampling method was adopted to obtain respondents sample size. Thus, 30 researchers, 50 extensionist, 30 In-charge of NGOs, 30 managers of private agencies, 50 owner of agro-service providers and 50 progressive farmers were selected. All the 240 stakeholders were randomly selected for present study.

In the present study, efficiency was operationalized as it is a peak level of performance that uses the least amount of inputs to achieve the highest amount of output. It minimizes the waste of resources such as physical materials, energy and time while

accomplishing the desired output in AIS for enabling environment.

To measure the efficiency of stakeholders, a structured scheduled was prepared consisting of 21 items or statements. After discussing with extension specialists, scientists, private extension agents and farmers questions were prepared and it was measured in three aspects of efficiency viz., technical efficiency, cost- effective efficiency and allocative efficiency. Each aspect was assessed based on responses received from the different stakeholders on 5 point continuum by putting tick mark in 10 to 20%, 21 to 40%, 41 to 60 %, 61 to 80% and 81 to 100%. These responses were quantified by giving 1, 2, 3, 4 and 5 score respectively. The scores obtained under various aspects were summed up both respondent-wise and as well as aspect-wise calculated.

The aspects wise responses were collected from each stakeholders and classified into three categories as, (i) poor efficiency (ii) good efficiency and (iii) excellent efficiency on the basis of their obtainable score by using arbitrary method.

		Class range (Score)			
		Technical efficiency	Cost-effective efficiency	Allocative efficiency	Pooled efficiency
1	Poor efficiency	Up to 16	Up to 16	Up to 16	Up to 49
2	Good efficiency	17 to 25	17 to 25	17 to 25	50 to 77
3	Excellent efficiency	26 to 35	26 to 35	26 to 35	78 to 105

For that the higher score is subtracted from the lower score and divided by the number of categories. The obtained score is added into the lower score until you get the highest score. Moreover the figures in decimal were round up in this case. The classified data are presented in table 1.

RESULTS AND DISCUSSION

Table 1 presents the efficiency of stakeholders about technical, allocative and cost effective efficiency in Agricultural innovation system.

In case of researchers, table 1 reveals that majority (76.67%) of the researchers had excellent and 23.33 of them had good level of technical efficiency whereas, majority (70.00%) of the researchers had

Table 1: Aspect wise efficiency of stakeholders in Agricultural Innovation System n = 240

Sl. No.	Types of Stakeholders	Categories	Technical efficiency	Cost-effective efficiency	Allocative efficiency
1	Researchers (n=30)	Poor	00 (00.00)	00 (00.00)	00 (00.00)
		Good	07 (23.33)	09 (30.00)	09 (30.00)
		Excellent	23 (76.67)	21 (70.00)	21 (70.00)
		Total	30.00 (100.00)	30.00 (100.00)	30.00 (100.00)
2	Extensionists (n=50)	Poor	00 (00.00)	00 (00.00)	00 (00.00)
		Good	32 (64.00)	20 (40.00)	37 (74.00)
		Excellent	18 (36.00)	30 (60.00)	13 (26.00)
		Total	50.00 (100.00)	50.00 (100.00)	50.00 (100.00)
3	In-charge of NGOs (n=30)	Poor	00 (00.00)	00 (00.00)	00 (00.00)
		Good	02 (06.67)	08 (26.67)	03 (10.00)
		Excellent	28 (93.33)	22 (73.33)	27 (90.00)
		Total	30.00 (100.00)	30.00 (100.00)	30.00 (100.00)
4	Manager of private agencies (n=30)	Poor	00 (00.00)	00 (00.00)	00 (00.00)
		Good	14 (46.67)	12 (40.00)	16 (53.33)
		Excellent	16 (53.33)	18 (60.00)	14 (46.67)
		Total	30.00 (100.00)	30.00 (100.00)	30.00 (100.00)
5	Agro-service providers (n=50)	Poor	18 (36.00)	13 (26.00)	19 (38.00)
		Good	26 (52.00)	30 (60.00)	22 (44.00)
		Excellent	06 (12.00)	07 (14.00)	09 (18.00)
		Total	50.00 (100.00)	50.00 (100.00)	50.00 (100.00)
6	Progressive farmers (n=50)	Poor	00 (00.00)	00 (00.00)	00 (00.00)
		Good	22 (44.00)	13 (26.00)	21 (42.00)
		Excellent	28 (56.00)	37 (74.00)	29 (58.00)
		Total	50.00 (100.00)	50.00 (100.00)	50.00 (100.00)

Figures in parentheses indicate percentage to total.

excellent and 30.00 per cent of them had good level of cost-effective efficiency while, majority (70.00%) of the researchers had excellent and 30.00 per cent of them had good level of allocative efficiency.

Table 1 also indicates about the efficiency of extensionists. The majority (64.00%) of the extensionists had good and 36.00 per cent of them had excellent level of technical efficiency whereas, majority (60.00%) of the extensionists had excellent and 40.00 per cent of them had good level of cost-effective efficiency while, majority (74.00%) of the extensionists had good and 26.00 per cent of them had excellent level of allocative efficiency.

In case of In charge of NGOs, table 1 reveals that majority (93.33%) of the In-charge of NGOs had excellent and 6.67 per cent of them had good level of technical efficiency whereas, majority (73.33%) of the In-charge of NGOs had excellent and 26.67 per cent of them had good level of cost-effective efficiency while, majority (90.00%) of the In-charge

of NGOs had excellent and 10.00 per cent of them had good level of allocative efficiency.

In case of manager of private agencies, more than half (53.33%) of the manager of private agencies had excellent and 46.67 per cent of them had good level of technical efficiency. Majority (60.00%) of the manager of private agencies had excellent and 40.00 per cent of them had good level of cost-effective efficiency while, more than half (53.33%) of the manager of private agencies had good and 46.67 per cent of them had excellent level of allocative efficiency.

Table 1 further depicts that more than half (52.00%) of the agro-service provider had good level of technical efficiency, followed by 36.00 and 12.00 per cent of them had poor and excellent level of technical efficiency whereas, majority (60.00%) of the agro-service provider had good level of cost-effective efficiency, followed by 26.00 and 14.00 per cent of them had poor and excellent level of

Table 2: Distribution of respondents according to their overall efficiency in AIS (n = 240)

Sl. No.	Type of Stakeholders	Poor efficiency	Good efficiency	Excellent efficiency	Total
1	Researchers (n=30)	00 (00.00)	09 (30.00)	21 (70.00)	30 (100.00)
2	Extensionists (n=50)	00 (00.00)	39 (78.00)	11 (22.00)	50 (100.00)
3	NGOs (n=30)	00 (00.00)	03 (10.00)	27 (90.00)	30 (100.00)
4	Private Agencies (n=30)	00 (00.00)	12 (40.00)	18 (60.00)	30 (100.00)
5	Agro-service providers (n=50)	12 (24.00)	38 (76.00)	00 (00.00)	50 (100.00)
6	Progressive farmers (n=50)	00 (00.00)	13 (26.00)	37 (74.00)	50 (100.00)
Pooled (n=240)		12 (05.00)	114 (47.50)	114 (47.50)	240 (100.00)

Figures in parentheses indicate percentage to total.

cost-effective efficiency while, more than two fifth (44.00%) of the agro-service provider had good level of allocative efficiency, followed by 38.00 and 18.00 per cent of them had poor and excellent level of allocative efficiency.

In case of progressive farmers, more than half (56.00%) of the progressive farmers had excellent and 44.00 per cent of them had good level of technical efficiency whereas, majority (74.00%) of the progressive farmers had excellent and 26.00 per cent of them had good level of cost-effective efficiency while, more than half (58.00%) of the progressive farmers had excellent and 42.00 per cent of them had good level of allocative efficiency.

The pooled data presented in table 2, indicates that majority (70.00%) of the researchers possessed excellent level of efficiency and 30.00 per cent of them had good level of efficiency in AIS. Whereas, majority (78.00%) of the extensionists had good level of efficiency and 22.00 per cent of them had excellent level of efficiency in AIS. However, majority (90.00%) of the In-charge of NGOs had excellent level of efficiency and 10.00 per cent of them had good level of efficiency in AIS. Further, majority (60.00%) of the manager of private agencies had excellent level of efficiency and 40.00 per cent had good level of efficiency in AIS. The majority (76.00%) of the agro-service providers had good level of efficiency and 24.00 per cent of them had poor level of efficiency in AIS. While, the majority (74.00 %) of the progressive farmers had excellent level of efficiency and 26.00 per cent of them had good level of efficiency in AIS.

The pooled data from the table 2, further reveals that more than two fifth (47.50%) of the stakeholders equally had good and excellent level of efficiency

and only 5.00 per cent of them had poor level of efficiency in AIS.

Thus, from the above result it can be determined that overwhelming majority (95.00%) of the respondents as stakeholders possessed good to excellent level of efficiency in AIS. The probable reason might be that the stakeholders who had high level of management orientation and cohesiveness due to this they complete their work in the least amount of time possible with the least amount of resources and waste feasible by utilizing certain time period and cost saving strategies for increasing the productivity of AIS.

CONCLUSION

As the study showed that majority of the researchers had excellent level of technical, cost-effective and allocative efficiency, whereas extensionists had good level of technical, allocative and excellent cost-effective efficiency. Further, majority of the In-charge of NGOs had excellent level of technical, cost-effective and allocative efficiency. More than half of the manager of private agencies had excellent technical and good allocative efficiency and majority of them had excellent cost-effective efficiency. More than half of the agro-service provider had good technical and majority had good cost-effective efficiency, while more than two fifth of them had good level of allocative efficiency. More than half of the progressive farmers had excellent technical and allocative efficiency while majority had excellent cost-effective efficiency. Further, more than two fifth of the stakeholders equally had good and excellent level of overall efficiency.

Much of the research has not been conducted

on efficiency of stakeholders in Agricultural innovation system, so this was a maiden and novel investigation in Gujarat state, which tries to analyze the efficiency of stakeholders on some important aspect like technical, cost-effective and allocative efficiency. Efficiency leads to quality work and the study showed that stakeholders had really excellent efficiency in AIS which they have been utilizing in their fields.

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