Performance Efficiency of Agricultural Extension Systems

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Introduction

Agricultural extension as a means to bring in positive changes among the farming community was introduced in India, formally in 1952 under the community development programme. Further, for providing an independent level playing field for each of the sectors, the departments were operationalized in each of the states. As such, at present the departments of agriculture, horticulture, animal husbandry, fisheries and sericulture are operated to support sectoral growth through extension efforts with the farming community apart from promotion of new technological inputs and knowledge. Though the systems are in operation since the past five decades and more, the efficiency of these systems is found to be at variance. Hence the present study was undertaken with the objective of examining the internal efficiency of these systems to achieve the overall objectives.

Methodology

The study was conducted in the year 2005 and covered five sectoral extension systems like agriculture, horticulture, animal husbandry, soil conservation and fisheries in the state of Orissa. The respondents for the study included field officers and field level extension personnel of the departments. In all 135 respondents participated in the study. The data was collected using a structured questionnaire administered in four one day workshops held in the state after explaining the objectives and other modalities of the questionnaire.

As a first step, efforts were made to identify major system indicators. Accordingly four major system indicators such as institutional mechanism, programme planning, programme implementation, linkages and feedback were identified and used in the study. As a second step, the sub items depicting each of the major system indicators were identified. There were seven institutional indicators, five indicators for planning, four for implementation and four for linkages and feedback. The third step related to preparation of the response pattern on all the sub-indicators, Accordingly the response pattern

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was arranged on a five point continuum of highly effective, very effective, effective, moderately effective, and not effective respectively, with a scoring pattern of 5,4,3,2,1 for the responses. The fourth step related to the collection of primary data on the sub-items from a cross section of the respondents for each of the sectors. The respondents were field officials and functionaries of the line departments in each of the sectoral organizations of agriculture, animal husbandry, horticulture, fisheries and sericulture. The responses thus obtained were converted into percentages for each of the sectoral departments. The analysis of performance of the systems was undertaken at three levels i.e. four system indicators, individual efficiency of each of the sectoral organizations apart from overall efficiency of the extension systems in the state. The following formulae were used for the analysis.

1. Efficiency of major system indicators was undertaken for four major areas like institutional linkages, programme planning, programme implementation and feed back and linkages. The efficiency of the system was worked out by applying the formula :

$$IEI = \frac{\sum (D_1/P_1 + D_2/P_2 + D_3/P_3 \ldots\ldots + D_n/P_n) \times 100}{N}$$

Where $\sum$: Summation of all the values on the numerator

$D_1, D_2, D_3, \text{-----}D_n$: Total scores obtained by all the respondents on a particular dimension of the indicator

$P_1, P_2, P_3, \text{------}P_n$: Refer to the potential scores obtainable on each dimension of the indicator

N : Refers to the total number of dimensions included in the study

2. Efficiency of sectoral extension systems was worked out as a second step incorporating scores on the four major system indicators using the following formula:

$$SEI = \frac{\sum (I_1 + I_2 + I_3 \ldots\ldots + I_n) \times 100}{N}$$

Where $\sum$: Summation of all the values on the numerator

$I_1, I_2, I_3, \text{-----}I_n$: Total scores obtained by all the respondents on a particular dimension of the indicator

N : Refers to the total number of indictors included in the study

3. The total system efficiency: For calculating the overall system efficiency, the following formula has been used.

$$TSE = \frac{\sum (SEI_1 + SEI_2 + SEI_3 \text{ ---------- } + SEI_z)}{Z}$$

Where $\sum$ Summation

SEI_1, SEI_2, SEI_3 refers to the Sectoral Extension System efficiency values for all the items from 1-Z included in the programme and Z refers to the total number of systems included in the study.

Results and Discussion

1.Institutional Mechanism

The data in Table 1 relates to the performance of the extension systems on seven indicators in respect of the institutional mechanism. The first indicator relates to the staff strength within the organizations. It could be observed from the data that all the four sectoral extension systems such as agriculture, horticulture, AH and fisheries were found to be below 50 per cent efficiency as compared to soil conservation, which touched the 55 per cent level. Since all the extension systems in the state are oriented to personal contact between the farmers and the extension personnel, the efficiency of the systems is reduced due to the large number of vacant positions.

With respect to the second indicator viz., roles prescribed for extension functionaries to meet the needs of the farming community the respondents of soil conservation gave the highest score i.e. 57.6 per cent on the efficiency index, followed by fisheries (48.2 per cent) and Veterinary & Animal Husbandry (47.6 per cent), where as horticulture officers gave the lowest response i.e. 35.6 per cent. The overall efficiency index was found to be 40.6 per cent. The results indicate the fact that the focus of soil conservation is specific in terms of its activities, as such have specific roles? whereas in agriculture and horticulture there are many schemes and activities resulting in multiple roles. So also since the agricultural personnel are found to be available up to the villages many of the other programmes are loaded on them? resulting in dilution of focus. Hence there is need to clearly specify the roles and adhere to them to achieve greater effect.

Table 1. Extension System Performance on Institutional Indicators

Sl. No.	System Indicators	Agril.	Hort.	Soil Cons.	Vety. & AH	Fisheries	Overall
1.	Staff strength in meeting the needs of the farming community	39.6	36.7	55.3	39.1	46.3	42.2
2.	Roles prescribed for extension functionaries to meet the needs of the farming community	36.5	35.6	57.6	47.6	48.2	40.6
3.	Present system of decision making	37.5	42.2	52.9	46.7	52.7	44.0
4.	Pattern of fund flow mechanism	33.7	34.4	72.9	36.2	39.1	40.0
5.	Infrastructure support in meeting the needs of extension workers	30.2	35.6	63.5	38.1	39.1	34.8
6.	Support of communication and IT in meeting the needs of extension workers	37.9	37.8	54.1	46.7	34.5	41.3
7.	Scope for building the capacity of extension functionaries	48.1	43.3	62.4	46.7	43.6	47.7
	Average	**34.78**	**37.94**	**59.81**	**43.01**	**43.35**	**43.78**

The present system of decision-making was found to be 44% efficient among all the line departments. This was found to be highest in Soil Conservation i.e. 52.9 per cent, followed by fisheries (52.7 per cent). The lowest was recorded with agriculture department i.e. 37.5 per cent. In the agricultural extension system there are more number of levels in the hierarchy and most of the schemes are thrust down for implementation with the targets, thereby hardly allowing any scope for the lower levels to have a say in the decision making pattern. Further as the number of levels increase, the tendency of delay is there to get the guidance to the lower levels This needs a sea change in the attitude and functioning of the systems to make the system bottom up and responsive to the field situations.

- One of the system indicators i.e. Pattern of fund flow mechanism was found to record highest efficiency in the soil conservation department i.e.72.9 per cent. On the contrary the lowest was recorded in the agriculture department i.e. 33.7 per

cent. The other three departments were also below 40 per cent efficiency. When probed in the focused group discussion exercise, the reasons for such a distinctly high score in Soil Conservation was attributed to easy fund flow mechanism in watershed development programs helping the functionaries get better management opportunity.

- Similar to the above system indicator, the infrastructure support in meeting the needs of extension workers was found to be best (63.5 per cent) in the Soil Conservation department and such logistics support was lowest (30.2 per cent) in Agriculture. In the department of Horticulture it was found to be relatively better than Agriculture i.e. 35.2 per cent. The average efficiency score recorded for all the five line departments was 34.8 per cent .Since extension demands frequent and close interaction with the farming community by the extension personnel at the field level, it is necessary to strengthen the infrastructure in each of the extension systems.
- The indicator support of communication and IT in meeting the needs of extension workers, recorded an average score of 41.3 per cent among all line departments taken together. The lowest was found to be in Fisheries sector, where as agriculture and Horticulture departments scored almost at par i.e. 37.9 per cent and 37.8 per cent respectively. The Veterinary & Animal Husbandry sector scored relatively better efficiency i.e. 46.7 per cent. This was attributed to availability of telephone facility in the Veterinary Dispensaries. With the communication facilities improving in the rural areas, it would be necessary to provide greater access to these facilities for the extension personnel.
- In the Department of Soil Conservation the extension functionaries have indicated highest scope (62.4 per cent) for building their capacities, where as it was found to be lowest in Horticulture (43.3 per cent). This was relatively better in Agriculture and Veterinary & Animal Husbandry departments i.e. 48.1 per cent and 46.7 per cent respectively. The performance of the soil conservation system indicates greater positive atmosphere as compared to others.

2. Extension System Performance on Programme Planning

The data in table 2 highlights the performance of the indicators on the five programme planning indicators. The average score among all the line departments recorded with respect to the process adopted in deciding the needs of the farming community was 40 per cent. The least efficient process (35.5 per cent) was found to be in the Fisheries sector , which might be due to non-availability of the mechanism to do so. The efficiency in Agriculture, Veterinary & Animal Husbandry, Horticulture and Soil Conservation Departments were 37.5 per cent, 39.1 per cent, 40 per cent respectively, which were

below 50 per cent. In the soil conservation system the efficiency was found to be 55.3 per cent, which was highest as compared to all the sectors. This was mainly due to the watershed development programmes being implemented wherein the guidelines highlight the need to identify the farmers' needs and link interventions, accordingly. In others it was more of a top-down approach.

The second indicator related to the process adopted in deciding the extension priorities of the farming community. This was found to be more efficient in Soil Conservation and fisheries (>50) in comparison to others which were less than 43.per cent. The average efficiency score obtained was 41.3 per cent. The results reveal the fact that with the introduction of participatory watershed programmes through the soil conservation department, the process of consultation with the farmers as user groups, beneficiaries and watershed associations, has resulted in improving the process of setting the priorities of the farming community. Similarly in the fisheries sector the interventions are more in tune with the requirement of the beneficiary since the investments are greater. There is a need to improve the process of decision making with greater involvement of the beneficiaries at various levels. The ATMA type of an approach if adopted properly can bring in the change.

Table 2. Extension System Performance on Programme Planning Indicators

Sl. No.	Indicators	Agril.	Hort.	Soil Cons.	Vety. & AH	Fisheries	Overall
1.	Process adopted in deciding the needs of the farming community	37.5	40.0	55.3	39.1	35.5	40.0
2.	Process adopted in deciding the extension priorities	40.0	43.3	50.6	36.2	50.0	41.3
3.	Farmers involvement in preparation of action plans	41.4	45.6	38.8	44.8	34.5	40.7
4.	Process of program planning	38.2	45.6	54.1	37.1	48.2	42.8
5.	Programs for addressing the needs of women in agriculture	39.3	40.0	55.3	42.9	45.5	43.3
	Average	**39.28**	**42.90**	**50.82**	**40.02**	**42.74**	**41.62**

The third aspect relating to programme planning refers to the farmers' involvement in preparation of action plans. This aspect has received a score of 45.6 per cent in Horticulture followed by 44.8 per cent in AH sector, 41.4 per cent in agriculture,38.8 per

cent in soil conservation ,and 34.5 per cent in fisheries. The trend in all the extension systems is found to be below 50, which indicates lack of farmer oriented approach in planning of the programmes. The present pattern has its roots in the way the development schemes are planned and executed, either at the national level or at the state level. Even in soil conservation, though the farmers are consulted, the process of involvement of farmers in decision making seems to be limited.

The process of program planning was recorded to be least efficient in Veterinary & Animal Husbandry department i.e. 37.1 per cent. However the highest was in case of Soil Conservation sector (54.1 per cent) as against scores obtained in agriculture, horticulture and fisheries which were 38.2 per cent, 45.6 per cent and 48.2 per cent respectively. The AH extension system is more oriented to provision of veterinary services than the actual extension guidance and promotion of knowledge in the larger context. Hence, programme planning is more internal to the system at the top level whereas the lower levels deliver the services. This is a similar pattern in other systems except soil conservation wherein the planning is done at the implementation level as per the scheme requirements.

The average efficiency score obtained in relation to the programs with focus on women was 43.3 per cent. The least efficient sector in this front has been the Department of Agriculture, which scored only 39.3 per cent. The priority for women related issues was highest in Soil conservation department (55.3 per cent) followed by Fisheries sector (45.8 per cent) mainly due to the focus on women groups under the watershed approach. Since most of the farming community is dominated by male-headed households, the focus on women extension is yet to pick up in all the sectors.

3. Extension System Performance on Programme Implementation

The information relating to extension system performance on four indicators in respect of programme implementation is provided in table 3. In the first indicator viz., farmers' involvement in program implementation, the Department of Agriculture was found to have scored the least in terms of efficiency (27.7 per cent). On the contrary, the Veterinary & Animal Husbandry sector obtained the highest score amounting to 40 per cent and the average was found to be only 33 per cent efficient. The basic reason for the least scores in all the sectoral systems is the fact that the programmes planned are considered to be for the system and farmers are considered only as the beneficiaries or recipients of some subsidies or doles or inputs free of cost .This tendency among the extension personnel has resulted in the results. On the contrary, the farmer should

be considered as an active partner in the development process. There is a need for attitudinal shift among the extension personnel.

Table 3. Extension System Performance on Programme Implementation

Sl. No.	Indicators	Agril.	Hort.	Soil Cons.	Vety. & AH	Fisheries	Overall
1.	Farmers involvement in program implementation	27.7	36.7	36.5	40.0	34.5	33.0
2.	Present set up of extension approaches followed	31.2	27.8	38.8	42.9	30.9	33.5
3.	Programs and activities undertaken by your department to meet the needs of farming community	41.8	36.7	48.2	39.1	44.5	41.9
4.	Guidelines supplied for implementation of various programs and schemes	61.1	60.0	54.1	49.5	51.8	56.7
	Average	**40.45**	**40.30**	**44.40**	**42.87**	**40.42**	**41.27**

The present set up of extension approaches followed across all the line departments scored an average efficiency of 33.5 per cent. The best score obtained was in Veterinary & Animal Husbandry department (42.9 per cent) followed by Fisheries sector (39 per cent). The lowest recording was made in Horticulture (27.8 per cent). The main reason for the comparatively better scores in AH system was due to the veterinary services being provided which provides a feeling of relief for the farmers immediately. Apart from this, the field extension person has an office and facilities for taking up his activity at a notified place which is not so in other sectors.

- With regard to the programs and activities undertaken by the departments to meet the needs of farming community the results reveal the efficiency level to be 41.9 per cent efficient, with the highest being in Soil Conservation (48.2 per cent) followed by fisheries, agriculture AH and horticulture. The results indicate that programmes are tending to meet half of the needs of the farmers tentatively thereby indicating that the remaining half is not met. Secondly within the sectors there are variations. The main reason for this result is the pattern of planning and implementation that is top down. If this could be reversed through bottom up planning there is a possibility

of developing and implementing programmes relevant to the needs of the farming community within the same budget structure.

- With a view to implement various schemes and programs guidelines were made available to extension functionaries. Efficiency of this system indicator gave the highest score in the Agriculture department i.e. 61.1 per cent, followed by Horticulture (60 per cent). The average obtained for all the line departments taken together was 56.7 per cent. Since most of the programmes are top down and implemented as schemes the provision of guidelines has been found to be effective for the lower levels to follow.

4. Extension System Performance on Linkages and Feedback

Though operation of sectoral extension systems has been in vogue for sectoral development, there is a need for inter institutional linkages for mutual development. In this direction the results relating to linkages and feed back are presented in table 4.

The linkages of one particular department were analyzed in the context of linkage with other developmental departments, research organizations, NGOs and private sector. It could be observed from the table that the soil conservation system indicated the highest score on the linkages with other departments (61.2 per cent) followed by AH, Agriculture, horticulture and fisheries. The main reason was due to the watershed activity wherein the system has to interact with others, whereas other systems have independent activities, which do not demand much linkage.

Table 4. Extension System Performance on Linkages and Feedback

Sl. No.	Indicators	Agril.	Hort.	Soil Cons.	Vety. & AH	Fisheries	Overall
1.	Linkage of your department with other developmental departments	49.8	47.8	61.2	53.3	45.5	50.2
2.	Linkage of your department with OUAT (KVKs and RRTTS) and ICAR institutions	50.9	56.7	52.9	51.4	45.5	49.8
3.	Linkage of your department with private sector and NGOs	35.4	37.8	47.1	39.1	40.9	38.7
4.	Feedback mechanism	41.1	40.0	48.2	40.0	40.0	41.5
	Average	**44.30**	**45.57**	**52.35**	**45.95**	**42.97**	**45.04**

The second indicator of linkages of the extension systems with the research systems like SAU, ICAR revealed that the highest score was observed in horticulture system (56.7 per cent) followed by soil conservation, AH, Agriculture and Fisheries. The overall score for this item was found to be 49.8 per cent.

The linkages of the extension systems with private sector and NGOs was found to be lower than 50 per cent among all the extension systems with the lowest being in agriculture and the highest in soil conservation. Since development is a multidisciplinary phenomenon, involvement of various sectoral agencies could help substantially.

The average efficiency recorded on the feedback mechanism, which was the next indicator, was 41.5 per cent, with the highest being in soil conservation, followed by AH, Horticulture, Agriculture and the last being Fisheries. Since feedback is an important factor for improving the efficiency of the systems, the aspect needs greater thrust in all the sectoral extension systems. Efforts are to be made to implant the feedback mechanism as a part of the ongoing programme management.

Taking the individual efficiency of all the 20 system indicators, the average score towards efficiency of public extension system for all the agriculture and line departments put together was found to be 42.2 per cent. The highest average efficiency score obtained for any department was 52.9 per cent for Soil Conservation and the lowest was recorded in Agriculture sector i.e. 39.9 per cent.

5. Total Extension System Efficiency

An attempt was made to understand the individual extension system efficiency apart from the total system efficiency. Accordingly, the information in table 5 highlights the system efficiency scores on four indicators, the sectoral system scores apart from the overall system efficiency.

Table 5. Total Extension System Efficiency

Sl. No.	Indicators	Agril.	Hort. & AH	Soil Cons.	Vety.	Fisheries	Overall
1.	Institutional mechanism	34.78	37.94	59.81	43.01	43.35	43.78
2.	Programme planning	39.28	42.90	50.82	40.02	42.74	41.62
3.	Programme implementation	40.45	40.30	44.40	42.87	40.42	41.27
4.	Linkages and feed back	44.30	45.57	52.35	45.95	42.97	45.04
5.	Overall system efficiency	39.90	41.20	52.90	42.80	42.50	42.20

It could be observed from the data that the efficiency of the agricultural extension system was found to be perceived as 39.9 per cent, which was the lowest among all

the sectoral systems. The horticultural extension system stood at 41.2 per cent, AH and Fisheries at 42 per cent and the soil conservation at 52.9 per cent. The low score of the agricultural extension system relates to the greater demand placed on it by the farmers in comparison to the existing capacities both in terms of infrastructure, facilities and the capacity. The overall extension system efficiency of all the systems is indicated as 42.2 per cent, which also is below 50 per cent. There is a tremendous need to improve the system performance by bridging the gaps in the existing systems. The tendency over the years has been to load the system with programmes and activities in all the sectors without considering the greater need for system upgradation resulting in lower performance ratings.

Summary and Conclusions

The study has indicated a methodology for assessment of the extension performance on various system indicators, which could be applied to any other state. The assessment of sectoral system performance has highlighted the present level and the need to improve them. There is need to strengthen areas of weaknesses in each of the sectoral systems. The results provide a feedback to the policy makers and programme administrators to keep a vigil on their systems and take steps to improve them.

References

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