

Development Based Extension Systems in India - a Study

G.R. Desai¹ and P.L. Manohari²

Abstract

Management of agricultural extension has special relevance to meet the needs of the farmers. Speedy transfer of technological innovations to the farm level, necessitates emphasis on building synergy among the delivery systems. The extension activities in the country are carried out through Line Departments based on various sectors. To take advantage of the opportunities offered by the changing scenario, it is necessary to understand the present working modalities of Line Departments with farmers. This paper attempts to study the present status of line departments in order to understand the organizational aspects, extension activities and services undertaken, infrastructure availability apart from departmental linkages with other institutions, aspects related to training, capacity building, income generation and suggest suitable measures for improving the performance of the system. The study revealed different aspects that need to be addressed to make the systems professionally competent, to play their roles effectively. These include reducing levels of hierarchy, filling up vacant staff positions, offloading some of the services on a public private partnership mode, promoting alternate service providers and allocating sufficient funds for capacity building.

Introduction

The changing economic scenario with the opening up of world markets has resulted in creating greater challenges. The possible inflow of various agricultural products from other countries has an implication on our own production systems at the farmer level. There is an urgent need felt to build the efficiency of the farmers to compete with external products in the local environment. The second implication is the opening up of opportunities for our farmers to route their products to other countries. Both the competitive challenges demand improving the capacity of the farmers to address the upcoming challenges to take advantage of the changing market scenario, considering the diversity of natural resources and agro climatic situations within the country.

¹ Director (OD & PC), National Institute of Agricultural Extension Management (MANAGE), Hyderabad

² Research Associate, National Institute of Agricultural Extension Management (MANAGE), Hyderabad

Management of agricultural extension has special relevance in India to meet the needs of the farmers. The major fact remains that the farmers are not utilizing all of the technologies generated. Hence, to sponsor speedy transfer of technological innovations to the farm level, emphasis has to be placed on building synergy among the delivery systems.

Agricultural development in India is basically a state subject with each one of the states setting up their own priorities and systems to undertake the developmental activities. The extension activities in the country are carried out through a separate set of organizations termed as Line Departments based on various sectors such as Agriculture, Horticulture, Animal Husbandry, Fisheries, and Sericulture etc.

To take advantage of the opportunities offered by the changing scenario, it is necessary to understand the present working modalities of line departments with farmers. Hence an attempt was made to study the present status of line departments with the following objectives:

Objectives

1. To understand the organizational aspects such as levels of organization, staff position, work allocation, and support facilities provided to the extension personnel at various levels.
2. To know the extension activities and the services undertaken, infrastructure availability apart from departmental linkages with other institutions.
3. To know the aspects related to training and capacity building and income generation aspects in line departments.
4. To suggest suitable measures for improving the performance of the system.

Methodology

The study followed an ex-post-facto research design. Five major development based extension systems operating at the field level were the domain of the study. The data was collected through mailed questionnaire along with follow up visits apart from discussions with a cross section of officials. Simple analytical tools were used for analysis and presentation of the data. The data was collected during 2006-07.

Results and Discussion

Development based extension systems consist of all line departments such as Agriculture, Horticulture, Animal Husbandry, Sericulture and Fisheries. The comparative status of all line departments with regard to the work allocations, support services to the extension personnel and extension activities etc. are explained below.

1. Organizational Levels in Various Departments

The extension services of various line departments have been organized at different levels over a period of time, depending upon the intensity of activity and the resource base of the organization as shown below.

Table 1. Organizational Levels in Various Departments (nos.)

Sl.No.	Line departments	Avg. number of levels
1.	Agriculture	7
2.	Horticulture	6
3.	Animal Husbandry	5
4.	Sericulture	5
5.	Fisheries	5

Since agriculture has been the main occupation of the farmers in rural areas, the department has been organized into seven levels on an average, starting from state level, regional level, district, sub-division, mandal and village.

The Department of Horticulture (DOH) was found to have six levels of organization up to the block level. There are no specific extension workers allotted at the village level. The horticultural extension activities are also to be supported by the Village Level Workers (VLWs). Similarly, the Animal Husbandry, Fisheries and Sericulture departments had only five levels starting from the state up to the blocks or service centres.

The sectoral extension departments were found to be organized in 5-7 levels across different states. With the development of communication and transport infrastructure across the states, the number of levels in the hierarchy of line departments providing extension services to the farmers may be reduced to four basic levels such as state, district, block and panchayat.

2. Staff Position in Various Departments

The information relating to the staff position in various line departments is presented in Table 2. (Data collected during 2006-07)

Table 2. Staff Position in Various Departments

Sl. No.	Line departments	Sanctioned (average)	Filled in (average)	Vacant (average)	Vacant (%)
1.	Agriculture	5937	4183	1757	32
2.	Horticulture	3742	2923	817	22
3.	Animal Husbandry	1913	987	1080	23
4.	Sericulture	1070	930	195	24
5.	Fisheries	388	268	120	23
	Average	2610	1858	794	25

It could be observed that the Department of Agriculture (DOA) had the largest number of sanctioned positions followed by Department of Horticulture, Animal Husbandry, Sericulture and Fisheries. The minimum positions were found in Department of Fisheries, since the activity was limited in most of the states. The average position of sanctioned posts was found to be around 2600, irrespective of the sectors. From among these positions, it could be further observed that maximum number of filled in positions again followed the same pattern with Department of Agriculture being on the top followed by Department of Horticulture and Fisheries being the least. The average number of positions in place was found to be around 1850. Accordingly, the percentage of vacancies was found to range between 22-32 per cent. The average vacancy position stood at 25 per cent, considering all sectors.

The pattern of extension and development work in the country has been mainly based on person-to-person contact, since the level of understanding and education of the farming community has been comparatively low. In view of this, there is a greater need to have more personnel at the operational level to undertake field extension work. Hence it is necessary to fill up all the vacant positions in the organizations on priority. There is also a need to promote alternate service providers such as para-techs, farmers organizations, farmer to farmer extension, farmers field schools, farmers schools, lead farmer programme, agri consultants etc. as support to extension work.

3. Work Allocation for Village Level Officers

It can be observed from Table 3 that specific allocation of the village level staff is there in the agricultural department only; however the Department of Animal Husbandry (DOAH) also has allocation of village responsibilities to their staff in the AI centers.

Table 3. Work Allocation for Village Level Officers

S.No. Parameters	Departments (Av)				
	Agri.	Hort.	AH	Seri.	Fish.
1. No.of villages covered	14	-	4	-	-
2. No. of visits/month	8	-	4	-	-
3. No. of schemes implemented	11	-	3	-	-
4. No. of reports submitted / month	4	-	1	-	-
5. Provision of supporting staff	-	-	-	-	-

The village level workers in the agricultural department had an allocation of 14 villages on an average where as in the DOAH it was only 4 Villages. The other organizations like Horticulture, Sericulture and Fisheries indicated lack of specific village level workers and allocation of villages to them. The results highlight that a representative of the public extension system is available in Agriculture only. The allocation of villages to the Village Extension Workers (VEWs) was found to be high due to the large number of vacancies after withdrawal of the T&V system. This demands specific mechanism to share the responsibility with others.

The VEWs of DOA were found to undertake 8 visits to the villages during the month in contrast to 4 visits by the field personnel of DOAH. It could also be observed that 11 schemes were being implemented by the VEWs of DOA where as the field personnel in DOAH implemented 3 schemes. It was observed that no support staff was provided to the village level personnel since it was the last cadre in the hierarchy. There is a mismatch of area allocation and provision of support staff in the DOA. This calls for introducing some mechanism to overcome the issue. Four reports were being submitted by the VEWs per month in contrast to one in DOAH.

All the developmental works in Agriculture are the result of farmers' activities spread over different villages. Accordingly support to the farming

communities should be available either at the village or nearer to the village. Hence in the present context, village panchayats could be used as mechanisms to house panchayat extension officers with them. These officers could be deputed by the line departments to work within the panchayats and take care of agricultural development planning, implementation and reporting from the panchayat. This would help bring in village panchayats to play the role of agricultural development in planning, implementation, monitoring and coordination of inputs and services as per the statutory requirements. The block level team of farm advisors can support them.

4. Support Facilities provided to Village Level Extension Workers (%)

Various support services provided to the village level extension workers has been presented in Table 4.

Table 4. Support Facilities provided to Village Level Extension Workers (%)

S.No.	Parameters	Agri.	Hort.	AH	Seri.	Fish.
1.	Office	27	-	50	-	-
2.	Publications	36	-	20	-	-
3.	Residence	27	-	0	-	-
4.	Mobility	18	-	0	-	-

0 = No facility; (-) = No staff at village level

It could be observed that 27 per cent of the VEWs indicated having an office in comparison to 50 per cent of Department of Animal Husbandry personnel. This was mainly so since the last level in the Department of Animal Husbandry is the AI center which has some infrastructure housing the personnel. Thirty six per cent of the VEWs and 20 per cent of the Department of Animal Husbandry personnel indicated the support of the publications apart from 27 per cent of VEWs indicating residence and 18 percent indicating mobility. None of the departments provided telephone, cell phone, fax or computer facility to the village level personnel. With the advent of the communication revolution it will be helpful to provide mobile phone facility for the VEWs so that they can be in contact with the farmers and the officials at the same time, apart from the facility of a two wheeler for mobility.

5. Work Allocation for Block/Taluk/Mandal Level Officers

It can be observed from the results presented in Table 5, that the average number of villages covered by the officials was 41 in Department of Agriculture, 21 in Department of Horticulture, 23 in Department of Animal Husbandry, 37 in Department of Sericulture and 119 in Department of Fisheries. The maximum village coverage among Department of Fisheries was mainly due to the low level of staff, high vacancy position apart from spread of fishermen in the hamlets across the coast. The Department of Agriculture officials followed by Department of Sericulture and others covered the maximum villages.

Table 5. Work Allocation for Block/Taluk/Mandal Level Officers

S.No.	Parameters	Departments				
		Agri.	Hort.	AH	Seri.	Fish.
1.	Av. No. of villages covered	41	21	23	37	119
2.	Av. no. of farmers covered	8540	3933	All	861	All
3.	Av no. of visits/village/month	2	2	3	5	1
4.	Av. no. of schemes implemented	14	18	9	7	9
5.	Provision of supporting staff (%)	60	40	40	60	100
6.	Av. no. of reports to be submitted / month	2	6	1	9	2

The average number of farmers covered ranged from 8540 in Department of Agriculture, nearly 4000 in Department of Horticulture, 861 in the Department of Sericulture. In others it was general coverage of all since they assisted whoever came to them. They were operating more as a service providing organization rather than an extension organization.

The officials of the block or mandal undertook on an average, two visits per month in the Department of Agriculture and Department of Horticulture, three in the Department of Animal Husbandry, five in the Department of Sericulture and one in the Department of Fisheries. Since sericulture is an intensive activity continuously undertaken by the farmers in specific areas, it demands a large number of supervisory visits by the officials. On the contrary, in the Department of Fisheries, since the area coverage was large and the activity was seasonal, officials followed one visit per month. The officials of the Department of Animal Husbandry followed three visits since the requirement of service provision especially for A.I. services demanded their supervisory visits.

The number of schemes implemented by the officials was found to be high (18) in Department of Horticulture followed by 14 in the Department of Agriculture, 9 in the Department of Animal Husbandry and Department of Fisheries and 7 in the Department of Sericulture. The maximum number of schemes in Department of Agriculture and Department of Horticulture was due to the emphasis being placed in these sectors by the Government of India and the states. Various schemes for farmers are ultimately routed through these departments. Hence, the central focus of extension service seems to be the Department of Agriculture with large number of field level staff as compared to other departments.

All the departments at the block level indicated provision of support staff to a certain extent. Maximum support staff was available in the Department of Fisheries, which indicates that the last unit of operation of the services is from the block. So also, 60 per cent of the unit in Department of Agriculture and Department of Sericulture were found to have support staff at block or mandal level. The support staff was found to be available in 40 per cent of the blocks in the Department of Horticulture and Department of Animal Husbandry. There is need for strengthening the staff position in Department of Animal Husbandry, since it is service oriented. The results reveal that block seems to be the cutting edge level for planning and implementation of various developmental activities in all departments. As such, provision of adequate supporting staff is a necessity for effective programme implementation through various mechanisms.

The number of reports to be submitted per month varied for different organizations, with one in Department of Animal Husbandry, two in Department of Agriculture and Department of Fisheries, six in Department of Horticulture and nine in Department of Sericulture. These depended upon the schemes being implemented. However, there is need to streamline the reporting mechanism with one report on the progress and achievements per month at all the levels.

Hence it is suggested that the block level extension officers will have to provide leadership for planning and implementation of development programmes in their own sector. It is suggested that two farm advisors (one for crops and another for animals) be made available at the panchayat level to coordinate the activities. They will operate from the panchayat and work with the farmers' groups, covering 4-5 villages, and report to the FIAC at the block level.

6. Support Facilities provided to Block Level Extension Workers

It is interesting to note from the data in Table 6 that 100 per cent of the officials at the block level in Department of Agriculture, Department of Horticulture and Department of Fisheries had their office premises. However, this was found to be 86 per cent among Department of Sericulture and 70 per cent among Department of Animal Husbandry.

Table 6. Support Facilities provided to Block Level Extension Workers (%)

S.No.	Parameters	Agri.	Hort.	AH	Seri.	Fish.	Avg.
1	Office	100	100	70	86	100	91
2	Telephone	27	57	20	14	20	28
3	Cell phone	9	29	0	14	0	10
4	Fax	0	0	10	14	0	5
5	Computer	36	14	0	14	0	13
6	Internet	9	14	0	0	0	5
7	Publications	73	100	30	71	60	67
8	Residence	55 (few)	43	20 (few)	29 (few)	20	33
9	Mobility	27	29	0	57 (few)	60	35

Since block is the cutting edge level of planning and implementation, it is necessary to provide full-fledged support to maintain the identity, continuity and credibility.

Further, it was observed that only 57 per cent of the offices in Department of Horticulture had telephone facility followed by 27 per cent in Department of Agriculture and less than 20 per cent in others. This was followed by provision of cell phone in nine per cent of Dept. Department of Agriculture, 29 per cent of Department of Horticulture and 14 per cent of Department of Sericulture, officially. Since telephone and cell phones are the lowest and cheaper means of communication, all the field officers at the block level need to be provided with this facility. They can keep in touch with institutions, farmers and other service support organizations.

It could also be observed that only 10 per cent of Animal Husbandry, 14 per cent of Department of Sericulture officers had the fax facility at block level.

Computers are being promoted among 36 per cent of block officials in Department of Agriculture followed by 14 per cent each in Department of Horticulture and Department of Sericulture, which is a very healthy sign. This needs to be further improved. However, the internet availability is limited among the departments which should be opened up. Support of publications was found among more than 60 per cent of the offices across all the line departments. A few officials have indicated provision of residence across all the departments. The provision of mobility was found among 60 per cent and 57 per cent of the officials of Department of Fisheries and Department of Sericulture. It was not found among Department of Animal Husbandry and limited in Department of Agriculture and Department of Horticulture. Since mobility is the basis of effective extension services, it is necessary to extend this facility to all the officials of all departments at the block level.

At the panchayat level, since the extension advisors will have to undertake field visits continuously and interact with the farming community, they should be provided appropriate support facilities of an office space in the panchayat, telephone / mobile phones apart from a motor cycle for undertaking field visits.

A common resource center is to be created at the block level where all the officials can operate, meet and interact. The center will house telephone, computer, internet, xerox, training hall, literature, offices of the farm advisors apart from providing continuous mobility for all the block level staff. Since the block advisors are also on the move, they should be provided with mobile telephone facility. Similar support services are to be provided at ATMA level also.

7. Schemes implemented by the Line Departments

Schemes implemented by different line departments are presented in the following table.

Table 7. Schemes implemented by the Line Departments

S.No.	Type of scheme	Departments (Avg.nos.)					
		Agri.	Hort.	AH	Seri.	Fish	Avg.
1	State plans	12	7	7	6	11	9
2	Central sector schemes	10	4	3	3	2	4
3	Centrally sponsored schemes	10	3	4	4	6	5

Twelve schemes under state plan are being implemented by the DOA followed by 11 from DOF, 7 in DOAH and DOH and 6 in DOS. Each of the departments is implementing state plan schemes. Apart from this, all the departments are implementing central sector and centrally sponsored schemes with maximum being in DOA followed by DOF and others. The data reveals that majority of the schemes being implemented are mainly funded from GOI. Keeping in view the growth potential, it would be worthwhile to promote more interventions in the areas like animal husbandry, horticulture and sericulture that can create larger employment opportunities for the rural population.

8. Involvement of Extension Workers and Farmers in Scheme Preparation

The data presented in Table 8 indicates involvement of more than 60 per cent of the extension personnel in preparation of schemes.

Table 8. Involvement of Extension Workers and Farmers in Scheme Preparation

S.No.	Involvement	Departments (%)				
		Agri.	Hort.	AH	Seri.	Fish.
1	Extension Workers	82	86	60	71	100
2	Farmers (in consultation process)	36	71	60	71	100

The least involvement was expressed in the Department of Animal Husbandry, followed by Department of Sericulture, Department of Agriculture, Department of Horticulture and Department of Fisheries. Similarly, involvement of farmers in the scheme preparation through the consultative process was expressed to be 36 per cent in Department of Agriculture, 60 per cent in the Department of Animal Husbandry, 71 per cent in Department of Horticulture and Department of Sericulture and 100 per cent in Department of Fisheries. Though the schemes are developed at state and national levels, it is felt that the feedback is routed through the consultation process.

The basic objective of extension is to address the needs of the farmers at the local level. The field extension personnel should have the flexibility and authority to develop innovative intervention programmes, depending on the field requirements. These bottom up programmes need to be supported by the

organizations through appropriate funding. As such, it is recommended that the pattern of bottom up planning of extension programmes has to be promoted as a strategy rather than top down schemes.

9. Extension Activities by the Departments

Thirteen types of extension activities are being undertaken by various departments for promoting the technologies to the farmers as indicated in Table 9. It could be observed that demonstrations, exhibitions, field days and exposure visits are being undertaken by all the five organizations.

Table 9. Extension Activities by the Departments

S.No.	Parameters	Departments (%)				
		Agri.	Hort.	AH	Seri.	Fish.
1.	Demonstrations	100	71	60	43	20
2.	Mini-kits	55	14	30	-	-
3.	Farm trials	55	14	20	-	-
4.	Campaigns/DTVs	73	14	50	-	20
5.	Kisan Melas	82	71	50	-	40
6.	Exhibitions	64	71	80	57	80
7.	Field days	64	43	20	57	20
8.	Exposure visits	73	71	10	71	20
9.	Training Programmes	100	43	70	-	-
10	Kisan Forum	9	14	30	-	-
11	Farmers awards	18	-	-	-	-
12	Health camps	-	-	100	-	-
13	Enlightenment progs.	-	-	-	71	-

The major emphasis in DOA is on demonstrations, training programmes, kisan melas, exposure visits and campaigns. In the DOH, the major emphasis was found on demonstrations, kisan melas, exhibitions and exposure visits. In the DOAH, greater focus was on health camps, exhibitions and training programmes. In DOS, it was on exposure visits and enlightenment programmes. In the DOS, it is mainly on exhibitions.

One common pattern found among all the line departments in the field situation was the lack of continuity of the farmers in the series of programmes to make them specialized in a particular technology. Each one of the activities is considered independent and different farmers are involved in these activities; thereby the focus of development is diluted even though the coverage is very large. Hence, there is need to identify specific intervention strategies for the groups of farmers and build activities to achieve the objectives of capacity building of the farmers groups.

Hence, it is suggested that a flexible mechanism for responding to farmers requirements may be operationalized by allowing the field extension workers to identify needs of the farmers and suggest their own creative interventions for fulfilling the requirements.

Since the focus of extension is on capacity building of the farmers, it is suggested that sequential intervention strategy for the specific group of farmers, involving them in meetings, farmers training, exposure visits, demonstrations etc. would not only help in building their capacities but also influence the adoption of technologies in a major way.

1. Infrastructure availability

The available infrastructure in all the line departments is presented below.

(a) Agriculture

Over the years, various types of infrastructure facilities have been built up in the Department of Agriculture as presented below.

Table –10 a . Agriculture (avg.nos)

S.No.	Infrastructure Units	(Avg. nos.)
1.	Training Centres	16
2.	Bio - control labs	5
3.	Soil testing labs	30
4.	Water testing labs	8
5.	Fertilizer testing labs	6
6.	Pesticide testing labs	3
7.	Farms	56
8.	Nurseries	3
9.	Bio-fertilizer labs.	1
10.	Bio-production units	21

It can be seen from the above table that the departmental farms constitute the largest number in terms of infrastructure support within each state on an average. This was mainly so because in the initial years of development, the farms were the main source of seed production, multiplication and supply for the farming community. Apart from this, farms were also used for multi-location testing. In the present context, large-scale seed production units have come up in the private sector. Hence, there is a need to look at the departmental farms in terms of their roles in the coming years. Most of these farms engage large manpower, have investments and are not operating at a profitable level. As such, there is a crucial need to examine the possibility of sustaining them effectively.

The second infrastructure facility most commonly found in all the states was found to be Soil Testing Labs. Most of these labs were operationalized in the earlier period and have been undertaking soil sample testing and providing feedback to the farmers. The infrastructure in these units was built up years ago and many of them have operational deficiencies of funds apart from personnel. In view of this, their own level of efficiency is not up to the mark. Though soil testing is a crucial requirement, the farmers are not following it rigorously at present. Hence, it would be useful to outsource this function of operationalizing effective soil testing labs under Public Private Partnership mode of contract with the private sector partners either in the form of corporate units or ACABC consultants or others. This would help to reduce the public system investments.

DOA also has training centers both for farmers and the officials, as one of their infrastructure requirements. Since, this activity is crucial for capacity building as a part of the technical assistance role of the DOA, there is need to strengthen these centers both in terms of manpower and physical resources, so as to make them effective channels for extension work.

Since the objective of the extension organizations is to build capacity of farmers, it is suggested that these systems may off load role of providing services and support in areas of input management, processing, value addition, marketing etc. to private sector personnel like Agripreneurs, Corporates, NGOs, Farmers Organizations, Input dealers, Para-technical workers etc. on a Public Private Partnership (PPP) mode. This would help reduce the operational expenditure of maintaining the infrastructure and operating the same by the public systems. It would also release staff for effective extension work.

(b) Horticulture

The main infrastructure facilities built up in the DOH were farms, nurseries, and testing labs for soil, fertilizer, pesticides, leaf analysis apart from the training centers and are presented below:

Table –10 b . Horticulture (Avg. Nos)

S.No.	Parameters	Avg. Nos.
1.	Training Centres	14
2.	Bio - control labs	2
3.	Soil testing labs	10
4.	Fertilizer testing labs	2
5.	Pesticide testing labs	1
6.	Farms	25
7.	Nurseries	11
8.	Others (Leaf analysis Lab., Progeny cum Demonstration Orchard, Hort.Unit).j	17

It is interesting to observe that on an average, the states have 14 training centres for training of officials and farmers. Most of these training centres operate with limited manpower and resources apart from operational funds. Since, training has a crucial role to build the capacity of the personnel, as an investment for the future, it is necessary to strengthen these training centres in terms of physical infrastructure, operational funds and manpower.

The other supporting infrastructure in terms of farms, nurseries, testing labs., and bio-production labs., etc., have also been generally functioning under resource constraints within the DOH. Since, these functions could be operated effectively by personnel in the private sector, efforts should be made to outsource these functions to private service providers through an MOU on a PPP mode under the overall guidance and supervision of the DOH. This would help to reduce the expenditure and withdraw the manpower resources for extension work with the farmers.

(c) Animal Husbandry

Three types of infrastructure facilities such as training centers, farms and labs have been created within the DOAH in various states. The training centers offer capacity building services both to the farmers and extension personnel and hence a necessary component of the technical assistance role being played by the department.

Table –10 c. Animal Husbandry (Avg. Nos)

S.No.	Parameters	Avg. (Nos.)
1.	Training centres	11
2.	Vaccines & Biological labs	1
3.	Semen banks	11
4.	Semen quality testing labs	4
5.	Cattle Farms	3
6.	Buffalo Farms	1
7.	Sheep Farms	4
8.	Goat Farms	2
9.	Poultry Farms	7
10.	Fodder farms	3
11.	Rabbit farm, piggery, feed production units, etc	2
12.	Milk processing units	4

Hence, these centers need to be made effective by providing adequate resources of manpower and operational funds. Since, development and promotion of different breeds of animals is the responsibility of scientific institutions such as SAUs and ICAR institutes, it would be helpful if these farms were under the overall supervision and control of the scientific organizations. This needs to be examined. The move could help to reduce the burden of the department by focusing their attention on technical assistance to the farmers than managing farms.

(d) Sericulture

Various types of infrastructure have been built up in the states to stabilize sericulture as an enterprise.

Table –10 d. Sericulture Avg. (Nos.)

S.No.	Parameters	Avg. (Nos.)
1.	Farms	29
2.	Kisan nurseries	2
3.	Chawky rearing centres	31
4.	Govt. cocoon markets	14
5.	Seed areas	3
6.	Grainages	18
7.	Reeling units	21
8.	Research Stations	1
9.	Training Centers	3
10.	Silk exchange, Govt. silk reeling units, nurseries etc.	7

It could be noted from the table that a large number of farms and chawkie rearing centers were found in the states. This is mainly so since sericulture activity is limited to specific areas in the state and the DOS has been the agency to promote the enterprises. Apart from these reeling units, grainages, cocoon markets and silk exchanges have also been operationalized by the DOS. Some of the states also have research stations, seed areas and kisan nurseries. Since, sericulture is a crucial enterprise, for maintaining the quality of the silkworm race for getting quality cocoons, the Department of Sericulture is taking up the responsibility of managing the input services.

Apart from this, there is need to promote private sector participation in service provision through involvement of farmers groups or farmers organizations, private consultants for production and supply of crucial inputs under the overall guidance of the DOS. This would help withdrawal of some of the services from the sphere of DOS activities, enabling it to focus attention on providing technical assistance service to the farming community.

(e) Fisheries

The following infrastructure facilities have been developed by the Department of Fisheries in different states as mentioned below.

Table –10 e. Fisheries Avg. (Nos.)

S.No. Parameters	Avg. (Nos.)
1. Fish Disease Diagnostic Labs	2
2. Shrimp Disease Diagnostic Labs (PCR Labs)	1
3. Freshwater Fish Farms	38
4. Water and Soil testing labs	11
5. Microbiology labs	1
6. Feed Testing Labs	1
7. Fish Hatcheries and Fish Seed Farms	17
8. Freshwater Prawn Hatcheries	4
9. Shrimp Hatcheries	35
10. Cold Stores	10
11. Ice Plants	60
12. Fish Marketing Outlets	2
13. Freezing Plants	19

Most of the states have promoted fish farms for providing fish seed supply to the farmers. Various types of fish farms depending on the requirement of the state and hatcheries have been developed and operated within the state. The second type of infrastructure relates to setting up of labs for diagnosis and testing of various aspects related to fisheries. The third type of infrastructure relates to provision of cold storage, ice plants and freezing plants as a support mechanism for fisheries.

Most of the infrastructure indicated is mainly to provide a supportive environment to the fish producers than building up their capacity in fish production. This is mainly due to the fact that the DOF emerged as the service provider rather than an extension organization. Hence, it is necessary to promote a greater extension role for the DOF and outsource majority of the service provision to other service providers under the PPP mode.

A general review of the infrastructure in various sectoral departments reveals three major patterns. The training or capacity building infrastructure, the service providing infrastructure and the input support infrastructure. Since the objective of the extension organizations is to build capacity of farmers, it is suggested that

these systems may off load role of providing services and support in areas of input management, processing, value addition, marketing etc. to private sector personnel like Agripreneurs, Corporates, NGOs, Farmers Organizations, Input dealers, Para-technical workers etc. on a Public Private Partnership (PPP) mode. This would help reduce the operational expenditure of maintaining the infrastructure and operating the same by the public systems. It would also release staff for effective extension work.

11. Types of Services provided by the Departments

Various types of support services are being provided by the organizations depending on the requirements of the farmers. The DOA and DOH are providing seven types of support services mainly dealing with soil, seed, water, pesticide and fertilizer testing, crop insurance apart from advisory services and others. The DOAH is providing seven types of support services mainly relating to diagnosis, treatment, vaccination, insurance, A.I., distribution of birds on subsidy apart from advisory services. The DOS is providing mulberry cuttings, seed material, marketing assistance, advisory and information services for the sericultural farmers. The DOF is providing advisory services apart from water testing, PCR testing, insurance etc.

Table 11. Types of Services provided by the Departments (%)

S.No.	Parameters	Departments (%)				
		Agri.	Hort.	AH	Seri.	Fish.
1.	Soil testing	100	57	-	-	-
2.	Seed testing	100	57	-	-	-
3.	Water testing	45	14	-	-	-
4.	Fertilizer testing	82	14	-	-	-
5.	Pesticide testing	64	14	-	-	-
6.	Crop insurance	64	14	-	-	-
7.	Farmers old age scheme, Bio fertilizer testing; Advisory services, Plant health clinic	45	43	-	-	-
8.	Treatment	-	-	100	-	-
9.	Artificial Insemination	-	-	90	-	-
10.	Diagnosis	-	-	90	-	-

S.No.	Parameters	Departments (%)				
		Agri.	Hort.	AH	Seri.	Fish.
11.	Vaccination	-	-	80	-	-
12.	Insurance	-	-	40	-	-
13.	Advisory services	-	-	20	71	80
14.	Dipping, giriraj birds on subsidy	-	-	20	-	-
15.	PCR testing	-	-	-	-	20
16.	Water and Soil testing	-	-	-	-	40
17.	Insurance	-	-	-	-	20
18.	Any others (Pathology)	-	-	-	-	20
19.	Information on alternate use of mulberry	-	-	-	43	-
20.	Information on type of sericulture promoted	-	-	-	71	-
21.	Providing information on subsidies	-	-	-	57	-
22.	Marketing	-	-	-	71	-
23.	Seri. Seed	-	-	-	100	-
24.	Mulberry cuttings	-	-	-	100	-

Since the objective of the extension organizations is to build capacity of farmers, it is suggested that these systems may off load role of providing services and support in areas of input management, processing, value addition, marketing etc. to private sector personnel like Agripreneurs, Corporates, NGOs, Farmers Organizations, Input dealers, Para-technical workers etc. on a Public Private Partnership (PPP) mode. This would help reduce the operational expenditure of maintaining the infrastructure and operating the same by the public systems. It would also release staff for effective extension work.

12. Institutional Linkages

The linkages between various developmental institutions are presented in Table12.

Table 12. Linkages of Line Departments with other Institutions (%)

S.No.	Institutions	Departments (%)				
		Agri.	Hort.	AH	Seri.	Fish.
1	ICAR	100	71	-	57	100
2	SAU	100	71	-	71	80
3	Line departments	100	71	60	71	80
4	Marketing department	91	71	30	57	80
5	Private sector	100	57	-	57	60
6	Mass media	91	57	20	57	80
7	NGOs	18	-	-	-	-
8	Banks	-	-	50	-	-
9	DRDA	-	-	30	-	-
10	Sheep federation	-	-	30	-	-
11	Dairy federation	-	-	20	-	-
12	Poultry federation	-	-	30	-	-
13	District collector	-	-	20	-	-
14	Weaving sector	-	-	-	14	-
15	Silk board	-	-	-	14	-

It could be observed from the table that the DOA was found to have good linkages with research organizations like ICAR, SAU, other line departments, private sector and marketing. The DOH, DOS and DOF, who indicated better linkages with research organizations, followed a similar pattern. On the contrary, the DOAH did not indicate linkages with researchers and private sector but had forged linkages with commodity federations, banks and DRDAs mainly from the point of view of promoting the enterprises in the rural areas.

Since, agriculture development is a comprehensive process and the farmers' requirement is envisaged in all the sectors, there is need to build in a specific mechanism of linkages between research, extension and other service providers, especially in the districts and below. The ATMA model of extension with expanded versions of built in linkages would help to bring in this concept in practice.

13. Training of Personnel

Table 13 shows the average number of personnel trained in the organizations. Among all the five line departments, Department of Animal Husbandry and Sericulture have the highest number of personnel trained (55 %) followed by Department of Fisheries (54%). The Department of Agriculture had only 40 per cent of trained personnel and the lowest was found in the Department of Horticulture (32 %).

Table 13. Training of Personnel (%)

Sl.No.	Line Departments	Personnel trained (%)
1.	Agriculture	40
2.	Horticulture	32
3.	Animal Husbandry	55
4.	Sericulture	55
5.	Fisheries	54
	Average	47

The results from the above table clearly indicate that the average number of personnel trained in the public extension systems is only 47 percent. This can be improved, by nominating the extension personnel in all the departments under various schemes, to improve their capacity and efficiency.

14. Place of Training

Continuous skill upgradation through training of the officials in the delivery system is found to be one of the requirements. Accordingly, the data in Table 14, highlights that 90 per cent of the officials in DOA were found to be trained within the state and the rest of them outside. In contrast to this, more than 50-60 per cent of the officials in DOH, DOAH and DOF were found trained within the state and the rest outside. Majority of the officials of DOS were trained outside the state.

Table 14. Place of Training

S.No	Parameters	Departments (%)				
		Agri.	Horti.	AH	Seri.	Fish.
1.	Within the state	90	65	52	38	61
2.	Outside the state	10	35	48	62	39

The main reason for majority of the officers receiving training within the state relates to the limited financial resources allocated to the training function. Since, exposure outside the state will provide an opportunity to broaden their vision and understanding, it would be helpful to make allocations sufficient enough to sponsor at least 40 per cent of the officials outside the state every year.

15. Adequacy of Funds for Training

The data relating to adequacy of funds for training as presented in Table 15 highlights that 71 per cent of the DOH and DOS had adequate training funds, followed by 50 per cent among DOAH, 46 per cent among DOA and 40 per cent among DOF.

Table 15. Adequacy of Funds for Training (%)

Sl.No.	Line departments	Adequacy of funds (%)
1.	Agriculture	46
2.	Horticulture	71
3.	Animal Husbandry	50
4.	Sericulture	71
5.	Fisheries	40
	Average	56

Since, capacity building of the delivery system is a must considering the fast changing technologies and development processes. It is necessary to allocate sufficient resources to undertake the training activity well ahead of the season.

16. Required Areas of Training

The information relating to upcoming areas of training as perceived by the officials of the department are presented in Table 16. Four major thematic areas of training such as technical, managerial, marketing and ICT have been identified to be the requirements.

Table 16. Required Areas of Training

Sl.No.	Agriculture	Horticulture	Sericulture	Fisheries
1.	Technical:			
a)	Technical skills upgradation in seed production, (INM, IPM)	Hi-tech floriculture and vegetable production	Upgradation of technical skills	Upgradation in technical management practices
b)	Post harvest and value addition	Organic farming for quality production	Water management for mulberry production	Optimum utilization of water bodies
c)	Diversification in farming systems	Upgradation of technical knowledge		Diversifying fishing methods
d)	Organic farming			Post harvest technology
2.	Managerial :			
a)	Participatory management	Motivation skills	Farmers organizations	Human resource management
b)	Alternate models of extension		Communication skills	Motivation
c)	Farmers organizations		Human resource management	Extension methodologies
d)	Public private partnership		Managerial skills	Gender issues
e)	Motivation and communication skills			
f)	Gender sensitization			
3.	Marketing:			
a)	Market led extension	Marketing of horticultural produce		Domestic fish marketing
b)	Contract farming			
4.	ICT:			
a)	IT in agriculture	ICT skills		ICT skills

The agricultural sectoral personnel focus their technical training needs in the areas of INM, IPM, post harvest and value addition, organic farming and diversification in line with the present day requirements. Similarly, the personnel from horticulture focussed on hi-tech floriculture and vegetable production, organic farming for quality production apart from general upgradation of technology. In the sericultural department, the major focus was on upgradation of technical skills apart from water management. The fishery officials have indicated diversification, post harvest technology, optimum water utilization apart from upgradation in technical skills. Overall it could be observed that technical areas of training depending upon the context and need had to be provided continuously for the people working in the organization.

The second area of skill upgradation indicated in terms of priority relates to managerial aspects. The managerial themes that are recognized as a requirement are participatory management, alternate models and approaches of extension, farmers' organizations, public private partnership, motivation and communication skills, gender sensitization.

The third area of skill upgradation related to marketing aspects such as market led extension, contract farming, marketing approaches and improvement in the domestic marketing of fish.

The fourth major area of training was found to be ICT, indicated by DOA, DOH and DOF organizations. Since application of IT tools is expanding widely, it will be helpful to integrate these tools to support the field extension work in all the sectors. To address the emerging areas of training, it is necessary to have a nodal agency at the national and state level to provide sufficient allocation of funds and plan, execute and monitor the capacity building activities

17. Income Generation Activity undertaken by the Departments

Income generation by the organizations has been introduced for certain services provided to the farmers. It can be observed from Table 17 that the sectors of horticulture, animal husbandry and fisheries have undertaken some type of income generation activity.

Table –17 Income Generation Activity

Sl. No.	Line departments	Undertaking income generation activity (%)
1.	Agriculture	46
2.	Horticulture	90
3.	Animal Husbandry	86
4.	Sericulture	57
5.	Fisheries	80

This is mainly due to the fact that the input support for these activities is mainly being routed through the concerned departments in a major way. However, income generation in agriculture and sericulture has been undertaken comparatively less than in the others.

18. Main areas of Income Generation to the Departments

The main areas of income generation in DOA relate to few items such as service charges for seed and soil testing, seed sale and subscription to farm journal. Since agriculture has been a sector with development focus since a long time, many of the private service providers have come into play in this sector. In the DOH, the main areas of income generation were sale of seed, plant material and bio-fertilizers apart from training and consultancy services. As in agriculture, horticulture activities also have many private sector service providers in the rural areas. The DOAH is generating income through issue of health certificates for animals, diagnostic fee apart from service charges for various treatments for animals. Since, these are specialized activities, the department has been playing a major role for providing services. However, many private sector para vets have emerged in the rural areas as a link between the farmers and DOAH, taking a share of the service provision.

Table –18 Main Areas of Income Generation to the Department

Sl.No.	Agriculture	Horticulture	Animal Husbandry	Sericulture	Fisheries
1	Service charges for seed and soil testing	Sale of seed, plant material and bio fertilizers	Issue of health certificates	Market fee	Sale of fish, fish seeds and other materials
2	Seed sale	Training and Consultancy services	Diagnostic fee,	Grainage receipts	License fee, rent, auction of reservoirs
3	Subscription to Farm Journal		Service charges for Operations, Castration, Vaccination, Treatment, Culling Livestock.	Farm receipts	
4				License fee	
5				Sale of cocoons and silk products	
6				Supply of materials	
7				Training and consultancy	

In the Sericulture department, the key input supply like mulberry cuttings, silkworm seeds, supply of materials for cocoon production is with the DOS. Efforts are made to generate income from these services. Further, other areas of income generation are license fee, sale of silk products, training and consultancy services. The private sector is yet to make headway in the service provision for sericulture in majority of the states. The DOF has the main responsibility of auction of reservoirs, collection of license fee / rent for water bodies and sale of fish and fish seeds apart from providing materials to the fishermen. All these services are being used as a channel for collecting income to a certain extent.

19. Amount generated through Income Generation Activities

Table 19 highlights the average amount generated by the departments through income generation.

Table 19. Amount generated through Income Generation activities

Sl. No.	Line departments	Avg. Amount (Rs. in lakhs/year)
1.	Agriculture	84
2.	Horticulture	191
3.	Animal Husbandry	126
4.	Sericulture	74
5.	Fisheries	175
6	Average	130

The DOA was found to generate Rs. 84 lakhs per year mainly from seed farms and other activities. In contrast to this, the DOH generated the highest amount of Rs.191 lakhs followed by DOF Rs.175 lakhs, DOAH Rs.126 lakhs and DOS Rs.74 lakhs. However, the income generation has to be analyzed from the point of view of expenditure incurred also in operating certain services; like the farms also have an investment of resources on personnel, labour, inputs and various other operations. Considering the overall expenditure, the extent of income generated through provision of services seems to be meager and at times negative.

Since the extension organizations in the public sector domain have a responsibility of providing cost free services as representatives of the government, their expenditure has to be met from the public funding. Further various activities relating to service provision to the farmers at cost may be outsourced under PPP mode to the private sector reducing the burden on the government system.

Conclusion

The study of extension organizational systems under public sector in India revealed different aspects that need addressing to make the systems professionally competent, to play their roles effectively. Following are the conclusions and suggestions for improving the extension systems:

1. It was found that the sectoral extension systems were found to have 5-7 levels of hierarchy. With the advent of infrastructural development like roads, communication, IT, it is necessary to reduce the levels to four such as state, district, block and panchayat to make it operationally efficient across all the sectoral systems.

2. It was observed from the study that the average vacancy position across sectoral systems stood at 25 per cent, more so at the field level. Considering the need for greater provision of staff at field level to support the farming community, it is suggested that : (a) all the vacant positions are to be filled up on priority, (b) the sectoral extension systems may off-load role of providing services and support in areas of input management, processing, value addition etc. to private sector personnel on a PPP mode and withdraw the staff for extension work, (c) there is need to promote alternate service providers such as para techs, farmers organizations, farmer to farmer extension, agri consultants, farmers schools etc.
3. Since field extension work demands mobility and contact of the extension worker with farmers, scientists, officials of other departments for supporting the farmers' information need, it is suggested that support services for mobility, communication, extension literature etc. will have to be provided in all the sectoral organizations at various levels.
4. Most of the sectoral extension systems have built in infrastructure facilities over the years for providing services to farmers. The facilities consume limited departmental resources such as personnel and money for being operational. With the development of private sector over the years, it is possible that these facilities could be off-loaded for their operation and maintenance to the private sector on a public private partnership (PPP) mode, thereby releasing the scarce financial and personnel resources
5. It could be observed from the study that, on an average, 47 per cent of the staff in public extension systems are being trained either within the state or outside. Since, capacity building especially in the new and emerging areas is a specific requirement on a continuous basis, it is necessary that sufficient funds be allocated with a training policy for reorientation of all the extension personnel and the farming community on a continuous basis.
6. The public extension systems have a greater responsibility to achieve the national objective of promoting food production and sufficiency apart from assisting the farmers in improving their economy. Hence, considering their role in achieving the national objective, their expenditure has to be met from the public funding and they need not be compelled to generate income from their side, lest they become commercial.

References

- Anonymous (2000) National Agricultural Policy, Ministry of Agriculture, Govt. of India
- Anonymous (2000) Policy Framework for Agricultural Extension, Ministry of Agriculture, Govt. of India
- Desai.G.R. (1999) India Country Paper on Research Extension Linkages in Agricultural Development, in Agricultural Research and Extension Interface in Asia, APO, Tokyo.
- Desai. G.R. Operational Impact of Training and Visit Extension System, unpublished report, NIRD, Hyderabad
- Sharma, Rita (1999) Agricultural Research and Extension Interface – Indian Experience, in Agricultural Research and Extension Interface in Asia, APO, Tokyo.
- Swanson B.E. and Mathur P.N. (2003) Review of the Agricultural Extension System in India – unpublished report

