Extension Approaches Adopted by the Agri-allied Sector Departments of Karnataka State

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Abstract

The extension approaches followed by different extension organizations have resulted into wider spread of modern technologies and increase in agricultural production. However, in the agri-allied sector these extension approaches are not fully adopted due to several reasons.It has been seen that majority (85%) of the animal husbandry officers in Karnataka visited the farmers field daily, followed by sericulture officers (60%) and 50 per cent of horticulture officers and fisheries officers. Nearly 45 per cent of the horticulture officers, 40 per cent of the sericulture and fisheries officers and 10 per cent of the animal husbandry officers were involved in formation of farmer groups. General Extension Approach was the most popular among the agri-allied sector officers. It has been noticed that 90 per cent of horticulture officers, 85 per cent of animal husbandry officers and 70 per cent of the sericulture and fisheries officers were aware of the Agricultural Technology Management Agency (ATMA). However most of them; viz., 70 per cent of the sericulture officers, 50 per cent of the fisheries officers, 65 per cent of both animal husbandry and horticulture officers had no knowledge about the key functions of ATMA. Cent per cent of all the department officers in Karnataka stated that extension services were not system based and not converged with the other line departments. None of the officers recommended any farming systems to the farmers. Participatory approach and ICT approach were not much practiced by the allied sector officers as only 25 per cent were affirmative about the details of the participatory approach. Commodity approach and project approach of extension were least popular with the agri-allied officers of Karnataka State. Thus, it can be concluded that to promote adoption of other extension approaches among the agri-allied department officers, capacity building through induction training and refresher training programs on extension management aspects and well defined job chart inclusive of frequent field visits is the need of the hour for Karnataka State.

Keywords: Agricultural Technology Management Agency (ATMA), Commodity Approach, Extension Reforms Approach, Farming System, General Extension Approach, Information and Communication Technology (ICT), Participatory Approach, Project Approach

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Introduction

Indian agriculture sector is the backbone of the rural economy but in the past few years it is showing a declining trend in contribution to the national Gross Domestic Product (GDP). On the contrary, agri-allied sectors like Animal husbandry, Fishery, Horticulture and Sericulture are emerging in a commercial way and enriching the food basket of consumers.

Animal Husbandry is the major player among the allied sectors and plays an important role in the Indian economy. About 20.5 million people depend upon livestock for their livelihood. The Livestock sector contributes 4.11 per cent to national GDP and 25.6 per cent to Agriculture GDP. Animal Husbandry sector has always played a significant role in the State's economy through supplementing assured family incomes and generating gainful employment in the rural areas. The major problems being faced by the sector include shortage of fodder, inadequate and inaccessible credit, shortage of technical labour force for veterinary services and lack of infrastructure such as buildings, equipment, veterinary institutions, abattoirs, milk collection centres etc.

The area under the horticulture production in 2016-17 was 249 lakh hectares, which resulted in 93 million tonnes fruit production and 175 million tonnes vegetable production. (Times of India, May 2017). Karnataka is a predominant player in the horticulture sector in India. Although the sector accounts for only 15 per cent of total net area sown in the State, its contribution to gross value of output of agricultural sector is over 40 per cent. The area under various fruit crops in the state during 2016-17 was 20.7 lakh ha, and the production output was 21.29 MMT (National Horticulture Board). Karnataka is the largest producer of spices, aromatic and medicinal crops. Since the past decade, India has witnessed a huge demand for horticultural produce from domestic and international markets due to increase in per capita income and shift in consumption pattern of the population. This phenomenon has provided a big opportunity to the farmers for fetching higher income through high value horticultural crops. The sector also provides excellent opportunities to farmers in rainfed areas, where a significant shift in horticultural area and production is evident. The major constraints of horticulture production in India are; inadequate post-harvest infrastructure and processing facilities, poor marketing infrastructure, and weak extension support.

India is the second largest producer of raw silk after China and the biggest consumer of raw silk and silk fabric. An analysis of trends in international silk production suggests that sericulture has better prospects for growth in the developing countries rather than in the advanced countries. Indian silk industry, contributes nearly 28,700 tonnes (16.12 per cent) of silk to the total world output. At present, India imports 6,000 to 8,000 tonnes/year of raw silk and silk fabric from China to meet the growing domestic demand. (The Hindu, 2015). Karnataka is a pioneer State in production of raw silk. The sector not only shares almost 50 per cent of the total raw silk production in the country, but also provides employment to 13 lakh work force in the State. Even though silk production in the State is rising in terms of quantity, its share in the

country's total output has declined by 15 per cent over a decade, consequent upon Andhra Pradesh and Tamil Nadu increasing their respective shares. Historically, the cultivation of mulberry has remained confined to 8 traditional districts in the southern region of the State. However, recently northern region as well as some other non-traditional districts of southern region have also witnessed some expansion in the area under mulberry. The districts of Dharwad and Tumkur are the most popular silk producing regions as they possess the perfect sub-humid to dry semi-arid climate most suitable for silk production. (Govt. of Karnataka).

India is the second largest producer of fish in the world. Fisheries provide livelihood opportunities to millions of people directly and through a number of subsidiary industries. The total fish production in 2016-17 was 11.4 million metric tonnes (3.6 million metric tonnes from marine fisheries and 7.8 million metric tonnes from inland fisheries). The per capita availability of fish is 9 kg per person per year, which is quite low as compared to other developing nations. (GoI, DAHD&F, 2017-18). The fishery sector also plays an important role in the socio-economic development of Karnataka state. The sector contributes around 2-3 per cent in agricultural GDP and provides employment to nearly 7.49 lakh fisherman. Besides, the State also earns a large amount of foreign exchange through exports of fish particularly marine. Historically, marine sector dominates the State fishery sector and only three districts viz. Dakshina Kannada, Udupi and Uttara Kannada have a coastal line. Inland fishery has witnessed an increase in its share from 30 to 42 per cent and is spread in all the districts of the State, according to Karnataka Agriculture & Rural Development Vision 2020 document.

The extension approaches followed by service providers mainly State Departments have resulted into a wider spread of modern technologies and increase in agricultural production worldwide. However, it has been repeatedly observed by the researchers that, the extension components in allied sector are generally weak. In this context an in-depth study was taken up by the Center for Extension in Agri-Allied Sector (EAAS), MANAGE, Hyderabad on "Analysis of Extension Approaches adopted by Agri-allied sector departments**"** to explore the reasons for weakness of the extension component in the allied sector.

Methodology

Locale of the study

The study was conducted in four major Indian states viz., Maharashtra, Uttar Pradesh, Odisha and Karnataka. The states were selected purposively wherein; all the allied sectors viz., Animal Husbandry, Horticulture, Sericulture and Fisheries department were present and operational. A total of 480 respondents (240 Government Officers and 240 Farmers) were selected randomly from two districts of each state. The details of the sampling procedure is as follows;

Table 1. State -wise distribution of respondents

State	Uttar Pradesh				Odisha				Maharashtra				**Karnataka**			
Districts	**Basti**		Faizabad		Sonepur		Bargarh		Ahmednagar		Aurangabad		**Kolar**		**Chikkaballapur**	
	O	**F**	**O**	**F**	**O**	**F**	**O**	**F**	**O**	**F**	**O**	**F**	**O**	**F**	**O**	**F**
Animal Husbandry	10	10	10	10	10	10	10	10	10	10	10	10	**10**	10	**10**	10
Horticulture	5	5	5	5	5	5	5	5	5	5	5	5	**10**	5	**10**	5
Sericulture	5	5	5	5	5	5	5	5	5	5	5	5	**5**	5	**5**	5
Fisheries	10	10	10	10	10	10	10	10	10	10	10	10	**5**	10	**5**	10
Total	30	30	30	30	30	30	30	30	30	30	30	30	**30**	30	**30**	30
Gross Total	480								**(30+30=60) sample size for present paper**							

*(O: Officers, F: Farmers)

In view of the enormousness of the research, it is difficult to discuss all the research findings comprehensively, in a single research paper. As such one of the objectives of the research study was to explore the "Extension approaches adopted by the officers of allied sector departments in providing extension services to farmers". The following extension approaches were considered for the study viz. General Extension Approach or Public Extension Approach**,** Extension Reforms Approach, Farming Systems Approach (FSA), Participatory Approach, ICT Approach, Commodity Approach and Project Approach. The scope of this paper is limited to discussing the above objective i.e., Extension approaches adopted by the agri-allied department officers in Karnataka state and the total sample size for the present paper is 60 agri-allied department officers.

Data collection tool

Taking into consideration, the scope and objectives of the study, a draft interview schedule was prepared after perusal of available literature and through consultation with experts in the field of agri-allied extension and other related fields. After incorporating their suggestions, a well-structured interview schedule was finalized and pre-tested on agri- allied department officers of Ranga Reddy district of Telangana. The observations made in the pre-test of the schedule were incorporated and a final version of the interview schedule was prepared to be used for data collection, which was carried out through personal interview.

Statistical analysis

The data collected from the respondents were scored, tabulated and in relevance to the objective of the study the data was subjected to different statistical tools like frequency, percentage and correlation coefficient.

Findings of the study

Socio-economic and personal profile

In social research socio-economic and personal profile of the respondents is generally important to establish relationship between the dependent and independent variables.

Table 2. Socio-economic and personal profile characteristics of officers in the state of Karnataka

Sl	Socio-personal variables	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n= 20)	
		f	%	*f*	%	*f*	%	*f*	%
A	**Age**								
1	Young (up to 35 years)	2	20	3	30	7	35	12	60
2	Middle (36 -45 years)	4	40	4	40	5	25	5	25
3	Old (> 45 years)	4	40	3	30	8	40	3	15
B	**Education**								
1	Metric	0	0	0	0	0	0	0	0
2	12^{th}	0	0	0	0	0	0	2	10
3	Degree	3	30	4	40	14	70	17	85
4	Masters Degree	6	60	3	30	5	25	1	5
5	PhD	1	10	3	30	1	5	0	0
C	**Experience**								
1	0-10 years	4	40	5	50	10	50	16	80
2	11-20 years	6	60	2	20	3	15	3	15
3	> 20 years	0	0	3	30	7	35	1	5

Sl	Socio -personal variables	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n= 20)	
		f	%	*f*	%	*f*	%	*f*	%
D	**Frequency of visit**								
1	Daily	6	60	0	0	17	85	3	15
2	Once in a week	1	10	4	40	0	0	4	20
3	Once in a fortnight	0	0	0	0	1	5	1	5
4	Once in a month	0	0	1	10	1	5	1	5
5	Irregular	2	20	5	50	0	0	10	50
6	Never	1	10	0	0	1	5	1	5
E	**Formation of groups**								
1	No	6	60	6	60	18	90	11	55
2	Yes	4	40	4	40	2	10	9	45
	Linking of group/s to a financial institute								
3	Yes	0	0	0	0	0	0	1	5

From table 2, it is evident that 40 per cent of the sericulture officers belong to middle and old age group. Similarly, 40 per cent of the fisheries officers belong to middle age group. Likewise 40 per cent of the animal husbandry officers belong to old age group. Majority (60 %) of the horticulture officers belong to young age group.

Majority (60 %) of the sericulture officers had a postgraduate degree. Nearly, 40 per cent of the fisheries officers in the state of Karnataka had completed undergraduate degree. Majority (70 %) of the animal husbandry officers had finished undergraduate degree and 85 per cent of the horticulture officers had undergraduate degree.

As much as 60 per cent of the sericulture officers had 11 to 20 years of experience. Likewise, half of the respondents (50%) in fisheries and animal husbandry had less than 10 years of experience. Majority (80 %) of the respondents in horticulture had less than 10 years of experience.

Majority (60 %) of the sericulture officers visited the farm field on daily basis. Nearly, 50 per cent of the fisheries officers had irregular visits to the farm field. As much as 85 per cent of the animal husbandry officers visited the farm field daily and nearly 50 per cent of the horticulture officers visited the farm field at irregular time intervals.

Nearly 40 per cent of the sericulture and fisheries officers, 10 per cent of the animal husbandry officers and 45 per cent of the horticulture officers were involved in formation of farmer groups. It was further

noted that, only 5 per cent of the horticulture officers were involved in linking of farmers groups to financial institutes.

Knowledge level of officers of agri-allied departments of Karnataka about various extension approaches

The knowledge level of officers working in agri-allied departments has been studied with respect to different extension approaches and the results are presented below;

A. General Extension Approach: The approach is centralized and government-controlled. Success is measured in the adoption rate of recommendations and increase in national production. (Axinn, 1988).

Table 3. General Extension Approach followed by the agri-allied department officers in Karnataka

Sl	General extension approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (N=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Central and State level schemes being implemented by the respective departments	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	0 (0)	**60 (100)**	**0 (0)**
2	Knowledge about different schemes	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	0 (0)	**60 (100)**	**0 (0)**
3	Farmers adopt a new technology without subsidiary component	10 (100)	0 (0)	6 (60)	4 (40)	20 (100)	0 (0)	19 (95)	1 (5)	**55 (92)**	**5 (8)**
4	Farmers participate in implementation of the schemes without their participation in planning	8 (80)	2 (20)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	0 (0)	**58 (97)**	**2 (3)**

Sl	General extension approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (N=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
5	Beneficiary selection is a difficult task in the prevailing political situations in the villages	3 (30)	7 (70)	1 (10)	9 (90)	4 (20)	16 (80)	7 (35)	13 (65)	**15 (25)**	**45 (75)**
	Total average of agri -allied department (%)									**82.8**	**17.2**

*Figures in parenthesis indicate percentage to the total

It is clear from table 3, that cent per cent of all the four agri-allied department officers were implementing different central and state level schemes and had knowledge about schemes. Simillarly100 per cent of the sericulture and animal husbandry officers, 95 per cent of the horticulture and 60 per cent of the fisheries officers stated that farmers adopt a new technology without subsidiary component. Cent per cent of the fisheries, animal husbandry and horticulture officers and 80 per cent of the sericulture officers stated that farmers participate in implementation of the schemes without their participation in planning. As much as 90 per cent of the fisheries, 80 per cent of animal husbandry, 70 per cent of sericulture and 65 per cent of and horticulture officers stated that selection of beneficiaries was a difficult task in the prevailing political situation of the villages.As all the officers in the study area knew and were implementing different Government sponsored schemes related to the allied sector, it can be concluded that this approach was adopted by the allied sector departments.

B. Extension Reforms Approach: This approach based on ATMA model launched in May, 2005 in all the States/UTs, by the Department of Agriculture & Farmers Welfare, Ministry of Agriculture, Government of India, was a major intervention in addressing the constraints as observed in T &V and post T & V system by making the extension system farmer driven and farmer accountable through process and institutional reforms mechanism in the form of Agricultural Technology Management Agency (ATMA) at district level.

ATMA is a multi – agency platform designed for addressing all the shortcomings of agricultural extension including convergence of agriculture and allied sector services, gender equity, linking farmers to markets, bottom-up planning process, farmers' participation in planning and implementation, farming system based extension, public –private partnership, demand driven, strengthening Research-Extension-Farmer linkages and increasing the use of ICT etc.

Table 4. Extension Reforms Approach i.e. ATMA followed by the agri-allied department officers in Karnataka

Sl	Extension reforms approach	Sericulture officers(n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (N=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Awareness about ATMA	7 (70)	3 (30)	7 (70)	3 (30)	17 (85)	3 (15)	18 (90)	2 (10)	**49 (82)**	**11 (18)**
2	Key functions of ATMA	3 (30)	7 (70)	5 (50)	5 (50)	7 (35)	13 (65)	7 (35)	13 (65)	**22 (37)**	**38 (63)**
3	Attending ATMA meetings	3 (30)	7 (70)	6 (60)	4 (40)	7 (35)	13 (65)	4 (20)	16 (80)	**20 (33.3)**	**40 (67)**
3a	Other line department officers attend the ATMA meetings	3 (30)	7 (70)	6 (60)	4 (40)	7 (35)	13 (65)	4 (20)	16 (80)	**20 (33)**	**40 (67)**
3b	Convergence with other line departments helps in carrying out your own department works	3 (30)	7 (70)	6 (60)	4 (40)	1 (5)	19 (95)	7 (35)	13 (65)	**17 (28)**	**43 (78)**
3c	Involved in preparation of block action plan	2 (20)	8 (80)	2 (20)	8 (80)	0 (0)	20 (100)	1 (5)	19 (95)	**5 (8)**	**55 (92)**
3d.	Involved in preparation of district action plan	0 (0)	10 (100)	1 (10)	9(90)	1(5)	19 (95)	0(0)	20 (100)	**2 (3)**	**58 (97)**

Sl	Extension reforms approach	Sericulture officers(n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (N=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
3e	Prepared the action plan, by taking the Farmer's advice	1 (10)	9 (90)	3 (30)	7 (70)	1 (5)	19 (95)	1 (5)	19 (95)	**6 (10)**	**54 (90)**
3f	Refer the Strategic Research Extension Plan (SREP) prepared for the district to prepare the action plans	1 (10)	9 (90)	2 (20)	8 (80)	1 (5)	19 (95)	0 (0)	20 (100)	**4 (7)**	**56 (93)**
3g.	Feel extra burden working in ATMA or convergent mode	0 (0)	10 (100)	2 (20)	8 (80)	0 (0)	20 (100)	1 (5)	19 (95)	**3 (5)**	**57 (95)**
3h.	Get the funds as proposed in the BAP/DAP from ATMA	3 (30)	7 (70)	1 (10)	9 (90)	0 (0)	20 (100)	0 (0)	20 (100)	**4 (7)**	**56 (93)**
3i	Face problem in adjustment of the expenditure bills with BTT convener/ P.D. ATMA	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	Total average of agri-allied department (%)									**21**	**79**

*Figures in parenthesis indicate percentage to the total

From table 4, it is revealed that 30 per cent of the sericulture and fisheries officers, 15 per cent of animal husbandry officers and 10 per cent of horticulture officers were not aware of ATMA. As much as 70 per cent of the sericulture officers, 50 per cent of the fisheries, 65 per cent of both animal husbandry and horticulture officers had no knowledge about the key functions of ATMA.Around 70 per cent of the sericulture officers, 40 per cent of the fisheries, 65 per cent of the animal husbandry and 80 per cent of the horticulture officers had not attended ATMA meetings. Those who attended ATMA meetings stated that other line department officers also take part in the meetings.Only 20 per cent of the sericulture and fisheries officers and 5 per cent of the horticulture officers were involved in preparation of block action plan. Similarly, only 5 per cent of the animal husbandry and 10 per cent of the fisheries officers were involved in the preparation of district action plan.Around 20 per cent of the fisheries and only 5 per cent of the horticulture officers stated that there exists an extra burden working in convergent mode with 30 per cent of the sericulture and 10 per cent of the fisheries officers stating that they received less funds compared to the proposed and not even a single officer had faced problems in adjusting the expenditure bills. It can be concluded that not even half of the department staff knew about the functions of ATMA and only a few officers were involved in preparation of action plans. This approach mainly involves allocation of funds from the Government to the allied sectors to carry out trainings, exposure visits and other extension activities in allied sector. In the State of Karnataka, no fund was allotted to the allied sectors for the year 2014-2015 and no convergence meeting was conducted for the said year. Hence, this approach mainly works when separate fund was granted for the allied sector, therefore this particular approach was not fully adopted by the allied sector departments.

C. Farming Systems Approach (FSA): This approach is a holistic approach, complex in nature, with interrelated components, matrix of soils, plants, animals, power, implements, labour, capital and other inputs, influenced by political, economic, institutional and social forces. The approach requires the integration of extension activities across the different line departments.

Table 5. Farming systems approach (FSA) followed by the agri-allied department officers in Karnataka

Sl No	Farming systems approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (n=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Aware of Farming Systems Approach or Broad Based Extension	5 (50)	5 (50)	8 (80)	2 (20)	13 (65)	7 (35)	16 (80)	4 (20)	**42 (70)**	**18 (30)**
2	Key features of FSA	4 (40)	6 (60)	8 (80)	2 (20)	12 (60)	8 (40)	14 (70)	6 (30)	**38 (63)**	**22 (37)**
3	Recommended to the farmers to take combination of two/three enterprises	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
4	Work out the economic viability of the individual enterprises and total system	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
5	Recommended intensification or diversification of enterprises	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
6	Extension services are system based, converged with the other line departments	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
7	Recommended farming systems	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	Total average of agri-allied department (%)									**19**	**81**

*Figures in parenthesis indicate percentage to the total

Results from the above Table 5 indicate that 50 per cent of the sericulture, 20 per cent of the fisheries, 35 per cent of the animal husbandry and 20 per cent of the horticulture officers were not aware of farming systems approach.Around 60 per cent of the sericulture, 20 per cent of the fisheries, 40 per cent of the animal husbandry and 30 per cent of the horticulture officers had no knowledge about farming systems.Cent per cent of the allied department officers had not recommended the farmers to take up a combination of enterprises, had no idea of economic viability and had not recommended intensification or diversification of the enterprises.Cent per cent of all the department officers stated that extension services were not system based and not converged with the other line departments. Similarly, none of the officers recommended any farming systems to the farmers.It clearly indicates that though some of the officers knew about the FSA, they didn't recommend any farming systems. It indicates that the department staff were not adopting this approach.

D. Participatory Approach: This extension approach is designed to strengthen the delivery of more responsive and relevant services to farmers and rural communities. It is a process that fully engages farmers and communities in partnership with external extension service providers. The fundamental principle in participatory approaches is to listen and learn from farmers and to promote sustainable development based on the priorities of farmers as determined by them. It is a process that enhances community capacity to help them and to utilize their resources and those of external providers more effectively to improve their livelihood.

Table 6. Participatory approach followed by the agri-allied department officers in Karnataka

Sl No	Participatory approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (n=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Awareness about PRA	3 (30)	7 (70)	0 (0)	10 (100)	20 (100)	0 (0)	3 (15)	17 (85)	**26 (43)**	**34 (57)**
2	Knowledge about PRA tools	2 (20)	8 (80)	0 (0)	10 (100)	20 (100)	0 (0)	3 (15)	17 (85)	**25 (42)**	**35 (58)**
3	Use of participatory tools	0 (0)	10 (100)	0 (0)	10 (100)	20 (100)	0 (0)	0 (0)	20 (100)	**20 (33)**	**40 (67)**
4	Participatory tools useful for micro level planning	0 (0)	10 (100)	0 (0)	10 (100)	20 (100)	0 (0)	2 (10)	18 (90)	**22 (37)**	**38 (63)**

Sl No	Participatory approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (n=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
5	Conducted focused group discussion with the farmers	2 (20)	8 (80)	0 (0)	10 (100)	2 (10)	18 (90)	2 (10)	18 (90)	**6 (10)**	**54 (90)**
6	Merit in use of PRA tools	1 (10)	9 (90)	0 (0)	10 (100)	20 (100)	0 (0)	2 (10)	18 (90)	**23 (38)**	**37 (61)**
7	Awareness about Village map	5 (50)	5 (50)	2 (20)	8 (80)	20 (100)	0 (0)	6 (30)	14 (70)	**33 (55)**	**27 (45)**
8	Awareness about social map	3 (30)	7 (70)	0 (0)	10 (100)	7 (35)	13 (65)	2 (10)	18 (90)	**12 (20)**	**48 (80)**
9	Awareness about resource map	4 (40)	6 (60)	2 (20)	8 (80)	11 (55)	9 (45)	5 (25)	15 (75)	**22 (37)**	**38 (63)**
10	Involved in the preparation of above maps	0 (0)	10 (100)	0 (0)	10 (100)	20 (100)	0 (0)	0 (0)	20 (100)	**20 (33)**	**40 (67)**
11	Awareness about Transect Walk	0 (0)	10 (100)	1 (10)	9 (90)	17 (85)	3 (15)	2 (10)	18 (90)	**20 (33)**	**40 (67)**
12	Performed Transect walk	0 (0)	10 (100)	0 (0)	10 (100)	16 (20)	4 (20)	0 (0)	20 (100)	**16 (27)**	**44 (73)**
13	Awareness about Seasonality ranking	0 (0)	10 (100)	0 (0)	10 (100)	2 (10)	18 (90)	0 (0)	20 (100)	**2 (3)**	**58 (97)**
14	Awareness about Matrix ranking	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**

Sl No	Participatory approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (n=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
15	Awareness about Venn diagram	0 (0)	10 (100)	0 (0)	10 (100)	1 (5)	19 (95)	0 (0)	20 (100)	**1 (2)**	**59 (98)**
16	Developed a village plan based on participatory tools	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	Total average of agri-allied department (%)									**25.8**	**74.2**

*Figures in parenthesis indicate percentage to the total

Cent per cent of the fisheries officers, 70 per cent of sericulture and 85 per cent of horticulture officers were not aware of PRA technique. Similarly, cent per cent of the fisheries, 80 per cent of sericulture and 85 per cent of horticulture officers had no knowledge of PRA techniques. Around 20 per cent of sericulture officers, 10 per cent of both animal husbandry and horticulture officers were involved in conducting focused group discussion.Around 50 per cent of the sericulture, 80 per cent of the fisheries and 70 per cent of the horticulture officers were not aware of village map. Though few of the officers in the department of sericulture, fisheries and horticulture were aware of social and resource maps, they were not involved in the preparation of the above maps.It is clear from the above table that cent per cent of the animal husbandry officers were involved in the preparation of village maps. This is because of the fact that the State Government of Animal Husbandry has notified in the official memorandum that the veterinary officers working at the village level must and should prepare village maps in order to better tackle the vaccination of livestock, thereby veterinary officers were involved in the preparation of these maps. Using these maps the department is planning to prepare village plans in the near future.From the above table it is clear that the allied department officers were not adopting PRA approach. Though the officers in animal husbandry knew about PRA techniques and its usage they are yet to prepare village plans.

E. ICT Approach: This extension approach encourages the use of Information and Communication Technology in extension services.(Axinn, 1988).

Table 7. ICT approach followed by the agri-allied department officers in Karnataka

Sl No	Extension approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (n=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Awareness about ICT tools	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	0 (0)	**60 (100)**	**0 (0)**
2	ICT tools used:										
	a. Telephonic/ mobile calls	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	0 (0)	**60 (100)**	**0 (0)**
	b. Mobile messages	0 (0)	10 (100)	10 (100)	0 (0)	0 (0)	20 (100)	0 (0)	20 (100)	**10 (17)**	**50 (83)**
	c. Internet (Email)/use of tablets	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	4 (20)	16 (80)	**4 (7)**	**56 (93)**
	d. Video calling	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	e. Radio	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	f. Television shows	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	g. Kisan call center	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	h. Community Radio										
	a. Awareness about community radio	1 (10)	9 (90)	3 (30)	7 (70)	4 (20)	16 (80)	6 (30)	14 (70)	**14 (23)**	**46 (77)**
	b. Participated in community radio talk shows	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	Total average of agri-allied department (%)									**23**	**50**

*Figures in parenthesis indicate percentage to the total

Results from the above Table 7 revealed that all the four allied department officers were aware of ICT tools and used telephone calls to contact the farmers. Cent per cent of the animal husbandry officers used telephonic calls on a daily basis. Around 50 per cent of horticulture officers used telephone calls on a weekly basis, 40 per cent of the fisheries officers used it at irregular intervals and sericulture officers used it on weekly (30 %) and fortnightly (30 %) basis.As much as 90 per cent of the sericulture officers, 80 per cent of animal husbandry, 70 per cent of the horticulture and fisheries officers were not aware of community radio and none of the officers from the above four departments had participated in community radio talks.Except telephone calls none of the officers used any other mode of ICT viz., mobile message service (except fisheries department, wherein the State Government of Karnataka provides mobile based advisory services to the registered fisherman regarding new schemes in fish farming and fish related activities), use of internet/tablets (only 20 per cent of horticulture officers use tablets to diagnose the pest infestation and provide suitable solutions using the power of internet. This initiative of providing tablets to the horticulture officers was undertaken recently by the Karnataka State department of horticulture on a trial basis) in horticulture crops etc. Hence, more importance must be given to usage of these tools by the officers as these tools will not only ensure timely availability of information to the farmers but also provide quality messages to the end users.It can be concluded that the usage of ICT tools is restricted to mobile calls only, therefore the department staff should be provided with necessary ICT knowledge along with the technology components.

F. Commodity Specialized Approach: This approach tends to focus on one export crop, such as coffee, sugar, tobacco, cotton, or rubber.The commodity specialized approach groups all the functions for increased production, such as extension services, research, input supply, marketing and prices - under one administration. Extension is fairly centralized and is oriented towards one commodity or crop and the agent has many functions.(Axinn,1988).

It is revealed from Table 8 that cent per cent of the animal husbandry officers, 95 per cent of the horticulture officers, 90 per cent of the fisheries officers and 80 per cent of the sericulture officers were not aware of the commodity approach as well as they had no knowledge of commodity approach.All officers of the four departments stated that there was no commodity based departmental programme and that they had not linked any commodity groups to markets. Hence, it can be concluded that this approach was not adopted by the allied sector departments in the state of Karnataka.

Table 8. Commodity Specialized Approach followed by the agri-allied department officers in Karnataka

Sl No.	Commodity approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry Officers (n=20)		Horticulture officers (n=20)		Total (n=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Awareness about commodity approach	2 (20)	8 (80)	1 (10)	9 (90)	0 (0)	20 (100)	1 (5)	19 (95)	**4 (7)**	**56 (93)**
2	Knowledge about commodity approach	2 (20)	8 (80)	1 (10)	9 (90)	0 (0)	20 (100)	1 (5)	19 (95)	**4 (7)**	**56 (93)**
3	Commodity based programmes	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
4	Link of commodity groups to markets	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	Total average of agri-allied department (%)									**3**	**97**

*Figures in parenthesis indicate percentage to the total

G. Project Approach: This approach assumes that the large government bureaucracy featured in some other approaches is not likely to have a significant impact upon either agricultural production or rural people, and that better results can be achieved in a particular location, during a specified time period, with large infusions of outside resources. The approach focuses on concentrated efforts on a particular location, for a specific time period, often with outside resources and sustained after the project period. Change in the short term is often a measure of success. (Axinn,1988).

Results from Table 9 revealed that cent per cent of the fisheries, animal husbandry and horticulture officers were not aware of the project approach and had no knowledge about it, whereas in case of sericulture it was 80 per cent. Not even a single officer in the study area had undertaken project approach in the allied sector. Hence, it can be concluded that this approach was not adopted by the allied sector department in the state of Karnataka.

Table 9.Project approach followed by the agri-allied department officers in Karnataka

Sl No.	Project approach	Sericulture officers (n=10)		Fisheries officers (n=10)		Animal Husbandry officers (n=20)		Horticulture officers (n=20)		Total (n=60)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Awareness about project approach	2 (20)	8 (80)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**2 (3)**	**58 (97)**
2	Knowledge about project approach	2 (20)	8 (80)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**2 (3)**	**58 (97)**
3	Undertaken project approach	0 (0)	10 (100)	0 (0)	10 (100)	0 (0)	20 (100)	0 (0)	20 (100)	**0 (0)**	**60 (100)**
	Total average of agri-allied department (%)									**2**	**98**

*Figures in parenthesis indicate percentage to the total

Conclusion

The extension approaches followed by different extension departments have resulted into wider spread of modern technologies and increase in agricultural production, but with time, rate of agricultural production has slowed down due to several reasons. Moreover, there is increasing inability of line departments in carrying out extension activities (Sulaiman and Van den Ban, 2003). The present study was conducted to explore extension approaches adopted by the agri-allied sector departments of Karnataka State. The study focused on the General Extension Approach, Extension Reforms Approach, Farming System Approach, Participatory Approach, Commodity Specialised Approach and Project Approach. It was observed that, except General Extension Approach all other extension approaches are almost unknown to the officers of agri-allied sector in Karnataka. General Extension Approach is being used by the agri-allied department since its establishment in order to stimulate development of sectors and this particular approach is the most popular extension approach because it involves subsidy to the beneficiary under various central and state level schemes. It can be concluded from the present research that, to promote adoption of other approaches among the officers of agri-allied departments - recruitment of the officers having specialization in the relevant subject i.e. post-graduation, capacity building through induction training and refresher training program on extension management aspects and a well-defined job chart inclusive of frequent field visits is the need of the hour for development of agri-allied sector in Karnataka.

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