

# **Agricultural Extension Services Provided by Cooperatives**

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## Introduction

Scientists do research on different aspects of agriculture under structured and controlled conditions. Experiments are conducted by using different varieties of crop in different locations in the country taking into account the weather conditions and soil and water quality and quantity. Experimentation in agriculture is a slow process because the results of experiments are tested and verified over and over again. Each step is recorded and scientifically analysed with a view to ensure that the results are sound and profitable to the end users – the farmers.

The results, which have been carefully verified, need to be released for general application. The process of transfer of research findings to farmers is agricultural extension.

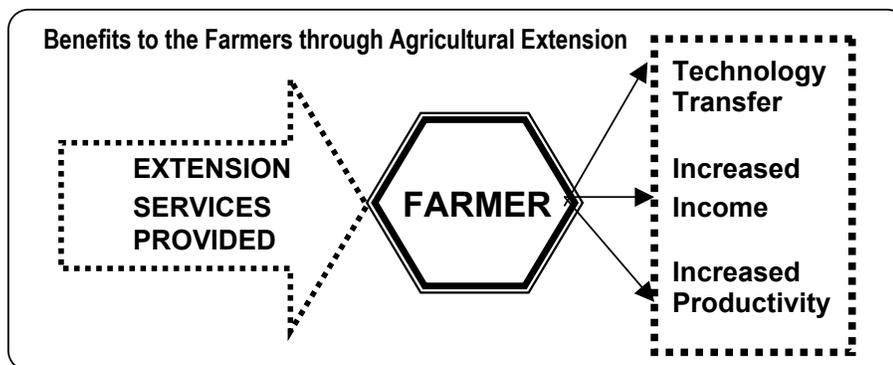
There are a number of methods used in transmittal of information. The extension workers closely monitor the process of application. The following methods are generally used in agricultural extension:

- Seeing is Believing - Laying of Front Line Demonstrations [FLD];
- Farmers' active involvement – is the best method;
- Use of audio-visual aids, films, seminars, meetings, printed material etc.;
- Exchange visits of farmers;
- Visits to specialised and research institutions;
- Discussions with scientists, technologists

Agricultural extension is a 'sharing of experiences'. It is a Two-Way process. Directions from the top or scientists are not enough. It is a highly participatory exercise and must be handled systematically. There has to be an active and continuous interaction between the scientists and the farmers. The extension agent is the media, who promotes such an interaction.

The laying of Front Line Demonstration for any crop is the most ideal method of agricultural extension. It is a well-considered package of practices. The strength of the American, Japanese and Indian agriculture lies in the application of this method of extension.

The benefits of agricultural extension to the farmers are many. Advisory services given result into: transfer of technology to the farmers; increase in their income from farming operations, and increase in the productivity. By make use of extension services not only the national production of foodgrains and horticulture products can go up, but also create additional wealth for the farmers. Higher agricultural income can bring about prosperity to the nation as a whole.



There has been a lot of discussion on various practices used in agriculture. Chemical fertilisers and farm chemicals are said to damage soils and destroy friendly insects. There are also talks of contamination of water due to excessive use of farm chemical and fertilisers. Also there have been discussions on 'safe agriculture', 'human-friendly agriculture', 'environment-friendly agriculture', and 'organic agriculture'. Excessive use of chemicals to increase productivity is now being gradually replaced by 'organic farming'.

## Organic Farming

Although the term, 'Organic Farming' is getting popularity in recent times, but it was initiated 10,000 years back when ancient farmers started cultivation depending on natural sources only. There is a brief mention of several organic inputs in the ancient literature of India like Rigveda, Ramayana, Mahabharata, Kautilya Arthashastra etc. In fact, organic agriculture has its roots in traditional agricultural practices that evolved in countless villages and farming communities over the millennium.

<b>Historical Perspective of Organic Farming</b>	
<b>Ancient Literature</b>	<b>Descriptions given</b>
[01] Oldest Practices	10,000 years old, dating back to Neolithic age, practiced by ancient civilization like Mesopotamia, Hwang Ho basin etc.
[02] Ramayana	All dead things – rotting corpse or stinking garbage returned to earth are transformed into wholesome things that nourish life. Such is the alchemy of mother earth – as interpreted by C. Rajagopalachari.
[03] Mahabharata [3300 BC]	Mention of Kamadhenu, the celestial cow and its role on human life and soil fertility.
[04] Kautilya Arthashastra [300 BC]	Mentioned several manures like oil cake, excreta of animals.
[05] Brihad-Sanhita [by Varamihir]	Described how to choose manures for different crops and the methods of manuring.
[06] Rigveda [2500-1500 BC]	Mention of organic manure in Rigveda, Atharva Veda and in Shukra it is stated that to cause healthy growth the plant should be nourished by dung of goat, sheep, cow, water as well as meat. Surpala also makes a reference of manure in Vrksayurveda.
[07] Holy Quran [590 AD]	At least one-third of what you take out from soils must be returned to it implying recycling or post-harvest residue.

Source: Indian Journal of Fertilisers, New Delhi. December 2005

The world foodgrain production is to the extent of 2100 million tonnes roughly which is generally based on farming where adequate use of fertilisers and pesticides are in practice.

There is a tremendous scope for improvement in farm incomes by using scientific practices and use of agro-inputs like fertilisers appropriate to the local conditions. If the farmers are convinced that change in the farming techniques would generate higher returns, they would be more than willing to adopt modern farm practices.

## System of Agricultural Extension

Whatever be the type of economy, agriculture always plays a prominent role in generating food and employment and sustaining national economy. All countries, especially in the Asia-Pacific countries whether it is Japan, Republic of Korea or India or Bangladesh, all governments have ensured that farming continues to progress. Significant budgetary allocations are made to promote agriculture [foodgrains or horticulture] and protect the interests of farmers.

## Agricultural Extension in India

From a nation dependent on food imports to feed its population, India today is not only self-sufficient in grain production but also has a substantial reserve. The progress made by agriculture has been one of the biggest success stories of free India. Agriculture and allied activities constitute the single largest contributor to the Gross Domestic Product, almost 33% of it. This increase in agricultural production has been brought about by bringing additional area under cultivation, extension of irrigation facilities, the use of improved high yielding varieties of seeds, better techniques evolved through agricultural research, water management, plant protection through judicious use of fertilisers, pesticides, cropping practices and extensive extension programmes.

Extensive and elaborate network of agriculture universities, research stations and institutions of higher learning have been established in almost all countries of the Asia-Pacific Region. In the Region, India has created an extensive research and development infrastructure. It is perhaps world's largest agricultural R&D set up. The following illustration explains the range of institutions, which are engaged in research work in all sectors of agriculture.

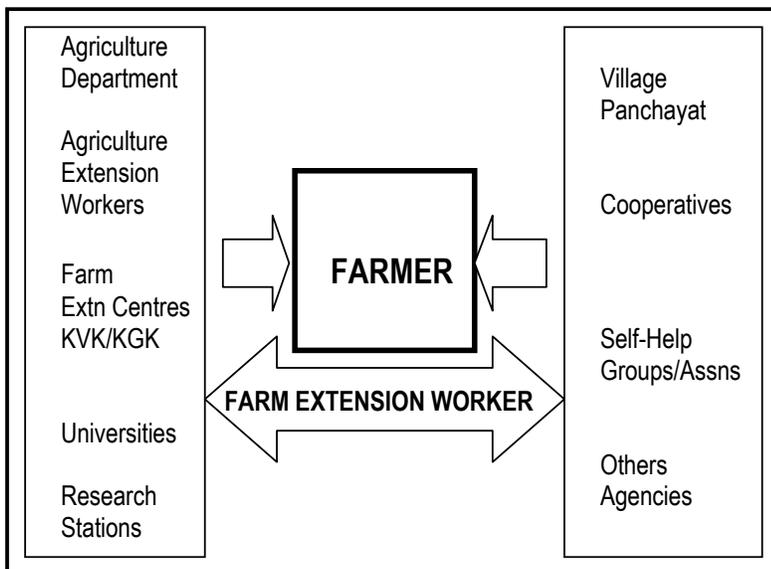
### Functions of Agriculture Universities and Institutions of Higher Learning

Agriculture Universities [State Universities]	Specialised Institutions [Research]	Indian Council of Agricultural Research [ICAR] [Estd. 1929]
Research	Research	Research
Teaching		Teaching
Extension		Extension
Krishi Gyan Kendras/KGK		Krishi Vigyan Kendras/KVK
Indian Agricultural Research Institute [IARI]; <i>Deemed Universities:</i> National Dairy Research Institute; Indian Veterinary Research Institute; Central Institute of Fisheries Education; Central Potato Research Institute.		
45 Central Research Institutes; 30 National Research Centres; 04 National Bureaux; 10 Project Directorates; 90 All-India Coordinated Research Projects; 261 Krishi Vigyan Kendras [soon to cover all districts]; 08 Training Centres.		
<b>The ICAR is world's largest research and development agency in agriculture sector</b>		

The apex body for education, research and extension education in the field of agriculture is the Indian Council of Agricultural Research [ICAR] established in 1929. India's transformation from a food deficit to a food surplus country is largely due to ICAR's smooth

and rapid transfer of farm technology from the 'laboratory to the land'. The Council has been a major player in the 'Green Revolution' drama.

In order to provide the farmers with authentic information and services agricultural universities have established Agricultural Technology Information Centres [ATIC] from where all types of services including farm inputs are provided. Such Centres are generally located at the very entrance of the University. It is a kind of Single Window System for service to farmers. In addition, more than 270 Krishi Vigyan Kendras [Agriculture Science Centres] have been established in selected districts. It is now planned to establish such centres in all the districts [nearly 550 districts] of the country. Some of the agricultural universities have established their own Krishi Gyan Kendras [Agriculture Knowledge Centres].



Arrangements have been made by the Central as well as by the State Governments to provide extension services in all agricultural and allied fields. A network of soil and water testing laboratories has been established. Specialised institutions like the Seed Corporation of India, Horticulture Development Board and several specialised Technology Missions have been constituted to improve productivity. The illustration explains how elaborate has been the extension activity at various administrative levels in India.

**An Example of Agricultural Extension Services Structure [India]**

Location	Agriculture	Horticulture	Development
National	-	-	Ministry of Agriculture
State	Director [Agriculture]	Director [Horticulture]	-
Region	Joint Director/Deputy Director	Joint Director/Deputy Director	-
District	District Agriculture Officer	District Horticulture Officer	District Collector/DDC
Block	Block Development Officer	Block Development Officer	Block Development Officer
Village	Village Level Worker	Village Level Worker	Village Level Worker
Target	Farmer	Farmer	Farmer

India has 42 million ha of land under rice; 28 million ha under wheat, and just 6.5 million ha under maize cultivation. In terms of acreage India is number one in all these crops except maize but on productivity front the country is far below the world average. It is the irony of fate, or perhaps lack of resources and agricultural extension that inspite of the large tracts of agricultural land, the productivity remains low. Specialised institutions of higher learning engaged in research and development in agriculture sector, institutions established by

cooperatives and farmers' groups along with progressive farmers are continuously engaged in experimentation. Institutions like the National Horticulture Research and Development Foundation [NHRDF] are engaged in seed preparation and extending advisory services to the farmers.

Biotechnology is one new technology that has proven itself and converted many skeptics to die-hard proponents. Biotechnology is enabling farmers to grow more food, helping keep pace with a burgeoning global population. It is also enhancing sustainability by correcting some of the problems inherent in the earlier technologies. Biotechnology research is being conducted on 57 crops in 63 countries to improve yield, resistance to pest and drought and nutrient value. Used responsibly, biotechnology can advance India's agriculture to address the challenge of feeding its increasing population, with its limited economic, land and water resources. It would not be surprising if biotechnology proves to become the most important agricultural advancement since the first farmer put a seed in the soil, because of its beneficial and sustainable impact on the basic elements of farming.

Given proper and scientific agricultural extension, farmers in India can overcome problems of seed, crop management and irrigation and become a 'food factory' of the world.

## **Agricultural Extension in Japan**

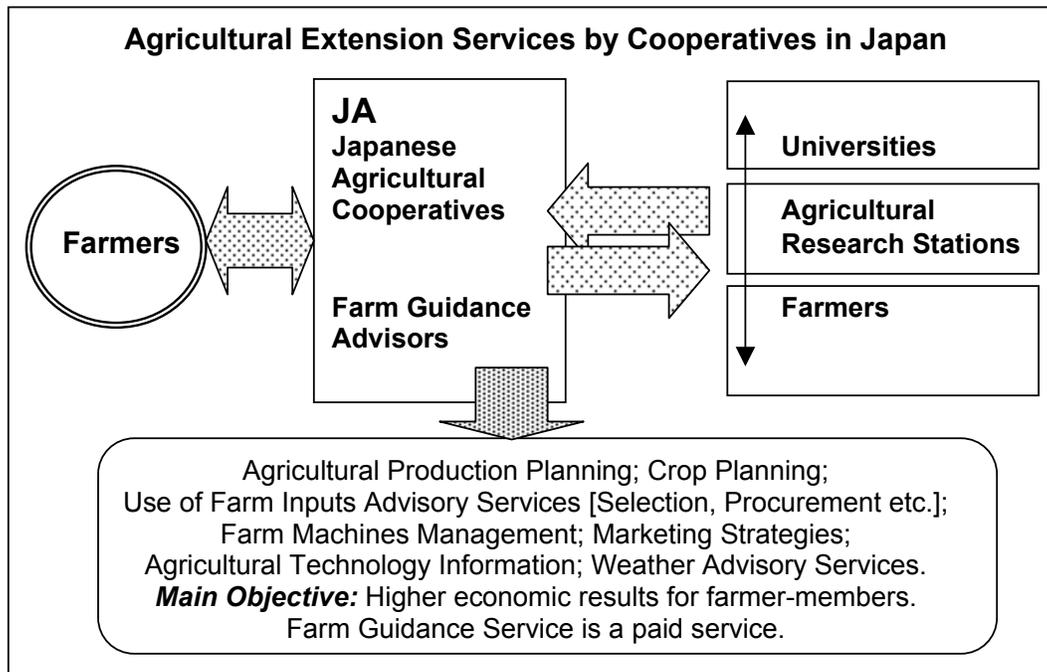
Japan is world's strongest Industrialised economy. It also boasts of hosting world's strongest agricultural cooperative structure. The Japanese consider it a matter of pride to be connected with agriculture. The government has made significant contributions to agricultural research programmes through a network of agricultural universities, agricultural research stations and agricultural cooperatives. Contributions are made to agriculture-related infrastructure e.g., country elevators, grading and packaging centres etc.

All farmers in the country are the members of agricultural cooperatives. The composition of membership is regular members, associate members including 'Saturday-Sunday farmers'. There are more than 900 agricultural cooperatives [multipurpose in character] with a membership of 9.1 million farmers. Primary level cooperatives are large and their activities cover all the social and economic needs of the farmers. The agricultural cooperative system has a two-tier system, primary cooperatives are directly linked to the national cooperative federations and unions.

Farm guidance is one of the most important activities of the Japanese Agricultural Cooperatives [JAs] which provides member farmers with guidance to improve their farm management and production technologies. Farm advisors of JAs offer such guidance particularly through producers' groups who are organised on commodity-wise basis. With a view to contributing to better farming of member-farmers, these advisors promote many activities of farmers such as joint marketing of their agricultural products and joint purchases of production materials. Field technical guidance services are also offered to farmers by those advisors.

The Central Union of Agricultural Cooperatives of Japan [JA-Zenchu], a national apex of agricultural cooperatives, operates a full-fledged department of Farm Guidance. Its responsibilities, among others, are: preparation of information material for Farm Guidance Advisors; training and orientation of Farm Guidance Advisors and progressive farmers on preparation of agricultural production plans; and coordination with the prefectural unions and business federations of agricultural cooperatives. The JA-Zenchu also offers training and orientation programmes at its central agricultural cooperative college for officials and

members of agricultural cooperatives in order to strengthen agricultural production vis-à-vis relationship with the consumers.

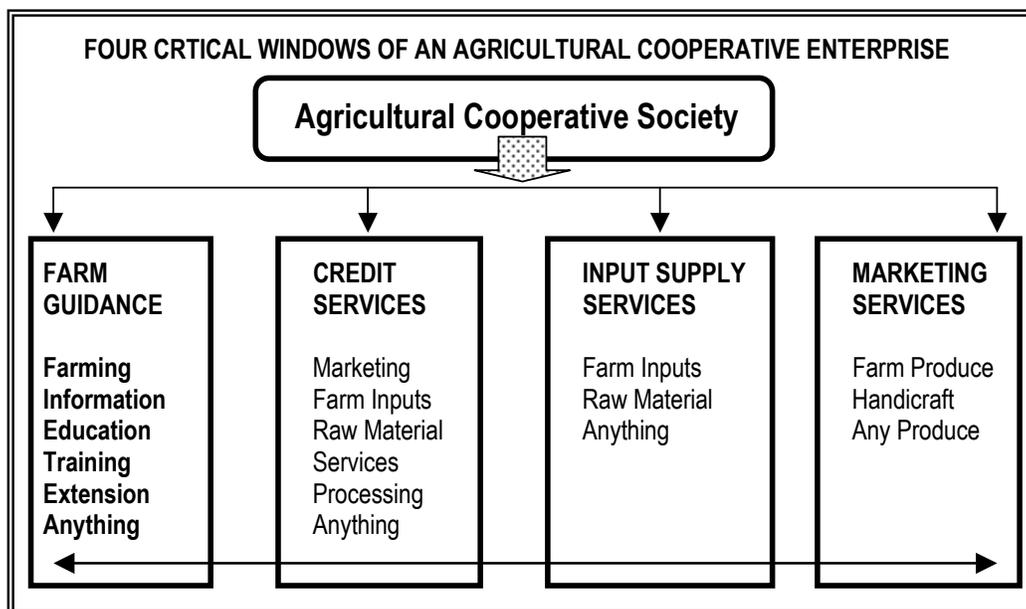


They are qualified people who have graduated from Agriculture Colleges and Universities. They keep themselves abreast with latest agricultural research results. They transfer their technical knowledge to the farmers and also pass on the reactions of farmers to the agriculture universities and research stations. They also remain in touch with latest market trends so that they are able to give proper advice to the farmers as to grading, packaging and marketing activities. Their main aim is to increase the income of farmer-members of JAs. They are the employees of cooperatives and remain in constant touch with the members.

The national business federation of agricultural cooperatives in Japan [Zen-Noh] is responsible for supply and marketing functions. In order to enable JAs to produce quality products and to educate and provided the needed information to the farmers, a network of demonstration farms and research laboratories have been established. The federation makes available its own findings to the farm guidance workers so that they are able to perform their extension functions properly and in the best interests of the farmers and their cooperatives.

## Agricultural Cooperatives

Nearly 70% of world's cooperatives are engaged in agriculture and allied sectors. Almost 68% of world's agricultural cooperatives are in Asia-Pacific. Two-thirds of world's farmers live in Asia-Pacific. In India alone there are 550,000 cooperatives – 70% of them being agricultural cooperatives [credit or non-credit] with a membership of nearly 151 million farmers. Agricultural cooperatives, in general, are multipurpose. Through their services they enable the farmers to produce agricultural products. A cooperative is an autonomous institution the aim of which is to support production activities of their members. Agricultural cooperatives perform a variety of services. Their principal services are four: Guidance, Credit, Supply and Marketing, as explained in the illustration below:



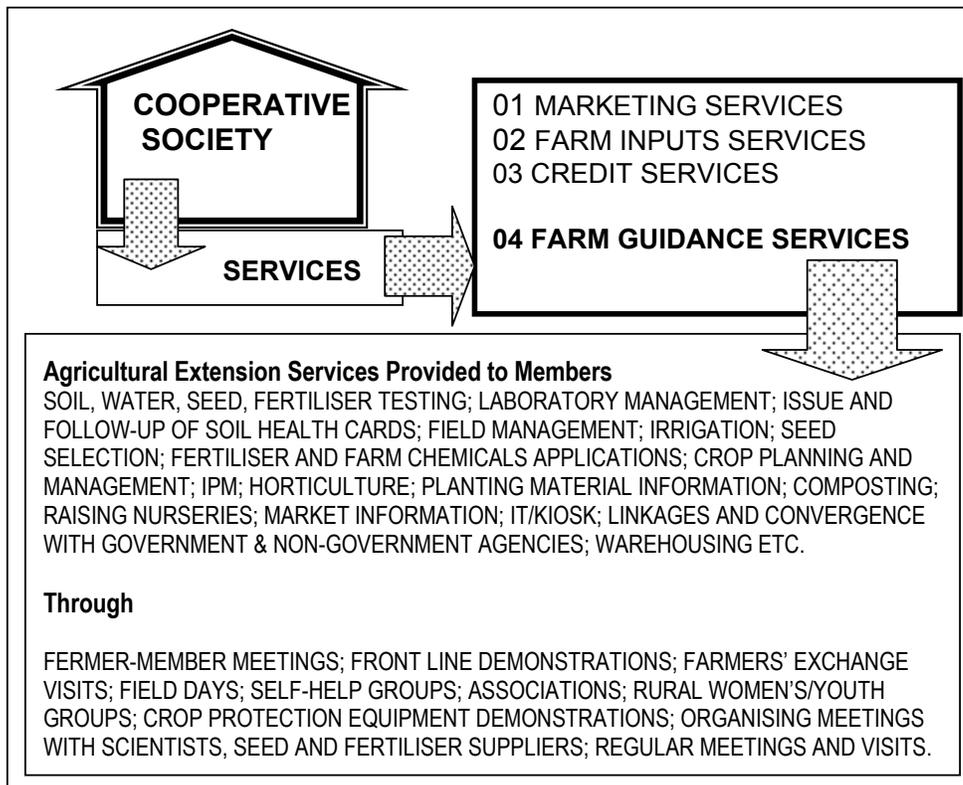
Of the **four essential services** which an agricultural cooperative is expected to provide to its members, Farm Guidance Services are crucial to the development of the other three services.

*Guidance and Advisory services [these are essentially agricultural extension services] are provided as a composite and development service. Services provided under this window, among others, can be: Advising the members on what to grow, when to grow and how to grow with the consideration that members earn more and more from their production; advising the members on appropriate application of fertilisers, farm chemicals including soil and water testing; advising the members on preparing a comprehensive local farm production plan or a Business Development Plan [BDP] so that the members and their cooperative know when and what is needed and in what quantities; Advising the members on simple agro-processing [later on becoming complex and large agro-processing activities], identification, cultivation and use of local herbs, flowers and other wild vegetables; Advising members on how to develop their own family budgets, take care of risks, animal husbandry, maintenance of farm machines etc.*

As the work of the cooperative expands this activities can be further elaborated and divided into various service units. In some of the countries of the region, the services and guidance provided by the cooperative covers the full human live cycle.

In order to make these service windows effective and attractive, people manning them need education and training and orientation on the product/service range handled and managing them. Training, education, extension and guidance thus become a composite cornerstone for strengthening the business of an agricultural cooperative. In the preparation of extension workers, there is a need for a closer collaboration between the agricultural scientists and farmers. Cooperatives can enlist the support of its farmers in laying Front Line Demonstrations and trial of various technologies including seeds and irrigation methods. In many cases farmers do not come forward due to obvious fear of losses, but if the cooperative explains the purpose and method in consultation with the scientists, many would like to offer their participation.

The illustration below explains how an agricultural cooperative operates its extension activities for its member-farmers:



## Illustrations of Agricultural Extension

Given hereunder are some instances of agricultural extension [Events]. Illustrations relate to provision of extension services on individual basis, as well as through institutional arrangements. It has also been explained what benefits can be obtained if proper extension advice has been given and followed, and what losses can be suffered where extension advice was either not given or not followed. Illustrations have also been given of the extension services rendered by the IFFCO Foundation and the IFFCO. The IPM [Integrated Pest Management] is, of course, world largest agricultural extension programme.

### Event-01 Extension Services Not Provided

The farmer owned 2 ha of farmland in the neighbourhood of Capital City. Grows grains, vegetables and some flowers. Also has placed 50 beehives. He wanted to establish a specialised mother nursery and plant some citrus. He allocated a piece of 9 sq mt of and prepared three beds for a citrus nursery. High quality seeds of citrus were obtained. Procured the services of an advisor and asked him to plant citrus. Accordingly, on the assumption that the land was suitable, the sowing was done.

#### 01 Functions Performed

- Sowing was done on three beds of 9 sq mt;
- Well-rotten compost was applied;
- Beds covered with sugarcane leaves thatch to accelerate germination;
- Proper irrigation was applied;
- The following investment was made:

-Cost of Seed and other Inputs	...	...	...	Rs 20,000
-Compost and thatching	...	...	...	Rs 4,000
-Irrigation expenses	...	...	...	Rs 1,000
-Labour and transportation expenses	...	...	...	Rs 3,000
-Cost of Expert	...	...	...	Rs 5,000
<b>Total Investment</b>	...	...	...	<b>Rs 33,000</b>

## 02 Anticipated Benefits

- Transplanting will be done in an area of 1 ha;
- Although fruiting will be after two years, but normal harvesting in 3rd year;
- Additional investments on labour, land preparation, manure and advisory services;
- Approximate total investment after transplantation until harvest: Rs 50,000
- Anticipated earning from sale of mother plants and harvest: Rs 30,000/year

## 03 Observations after 15 days of Sowing

- Germination had taken place alright [almost 100%];
- After removal of thatch the germination started withering away;
- Within 5 days after removal of thatch all plants died of alkalinity in the soil;
- Salt formation noticed on the top of beds after germination;
- Financial losses, shock and disappointment.

## 04 What was 'sadly' Missed?

- Proper extension advice;
- Soil-testing step was missed;
- Soil could have been tested before sowing; or
- Beds would have been moved elsewhere.

## Event-02

### Extension Services Adequately Provided

The farmer owned 2.5 ha of well-levelled and easily accessible farmland. A high-tech mother nursery has been laid with the following varieties: Mangoes – 1,000 saplings; Guava – 10 mother plants [each plant can produce 100 more plants]; Citrus – 3 beds of 9 sq mt.

## 01 Steps Taken at the time of Plantation

- Soil and water testing done;
- Soil found to be alkaline – treated with gypsum as per guidelines;
- Well-rotten manure applied;
- Sugarcane leave thatch used to cover beds;
- Investment made: Approximately Rs 45,000.

## 02 Anticipated Benefits

- Mango sapling survival – 750/500 saplings;
- If saplings sold [normally not done] @ Rs 50x750= Rs 37,500;
- Reproduction of saplings after harvesting – multiplication of saplings;
- Each Guava plant will produce at least 50 plants: 10x50=500 plants;
- Each plant sold @ Rs 50 per plant: 500 plantsxRs 50= Rs 25,000.

## 03 What was not missed

- Proper testing of soil and water;
- As per procedure, adequate treatment done;
- Expert advice to field workers;
- Well-rotten manure used.

## **Event-03**

### **Extension Services in Vegetable [Cauliflower] Cultivation – Recommended Procedure**

#### **01 Soil Selection and Care**

- Select the site and inspect the land;
- Get the soil and water tested;
- Observe the results and follow the recommendations made;
- Undertake treatment, as per advice given.

#### **02 Variety Selection, Sowing and Nursery Beds Preparation**

- Selection of quality seeds;
- Procure the recommended variety and in correct quantity;
- There are at least 4 groups of cauliflower e.g., early/mid-season & late variety etc.
- Raising of nursery – preparation of beds [Use proper methods and technology];
- Obtain proper manure;
- Treat seeds and nursery soil with fungicides etc. before sowing;
- Cover the beds with proper thatch or covering;
- Drenching of nursery beds with fungicides;
- Observe the frequency and quantity of irrigation.

#### **03 Transplantation and Field Care**

- Preparation of main field, check soil, drainage;
- Undertake weeding and hoeing before transplantation of saplings;
- Transplantation according to recommended distance;
- Use of weedicides, and top-dressing with fertiliser;
- Undertake 'blanching' to ensure white colour and quality.

#### **04 Harvesting and Marketing**

- Staggered harvesting to fetch better income;
- Check market supply position;
- Ensure 'Freshness from Harvest to Consumer Table'.

## **Event-04**

### **Integrated Pest Management [IPM] -An Elaborate Agricultural Extension Activity**

There are various types of pests, including the man himself. Integrated Pest Management [IPM] is an approach to controlling pests in safer, more effective, longer-lasting ways. In this unique and most elaborate agricultural management practice, one should:

- Understand a pest's identity and habits so non-toxic, preventative measures can be used first;
- Use a combination of different tactics for better effectiveness;
- Use least toxic chemicals, if any.

Under IPM there is a combination of three main components:

- It is a package of low cost techniques with the intention of obtaining a higher, safe, and healthy yield;

[b] Minimum use of farm chemicals e.g., insecticides, pesticides, weedicides etc.; and

[c] Use of improved variety of seeds.

Of course, any control practice chosen must be used at the right time and place to be effective. Keeping track of pest populations before they get out of hand is also important to avoid 'emergency' situations, which may require pesticide use. The use of IPM in an agricultural environment is a more complex strategy. Much research has been done on the use of IPM and its benefits to agriculture, such as saving farmers' money, reducing use of pesticides in consideration for environment and human beings.

### **Benefits of IPM**

- Promotes sound structures and healthy plants which can withstand all types of damages;
- Reduces the need for pesticides by using several pest management methods;
- Reduces excessive or unnecessary pesticide applications which can negatively affect health and the environment;
- Promotes clean water. If water leaving the house contains pesticides these can pollute streams, ground water, or coastal regions, and ultimately the crops;
- Typically provides long-term control of pests, as opposed to more conventional short-term treatments;
- Usually costs less to use IPM control methods.

### **Components of IPM**

- Social organisations e.g., farmers' groups, cooperatives;
- Awareness campaigns e.g., Farmers' Field Days;
- Use of less farm chemicals and raise higher production;
- Identification of pests and their destruction through friendly pests;
- Understanding quality seeds, irrigation application, soil health etc.

IPM is essential to modern agriculture. It improves profitability while reducing the adverse impact of pest management on environment and human health.

### **Event-05**

#### **Front Line Demonstration**

Based on the research and experimentation done by the agricultural scientists under structured situations, the results are communicated to the farmers. The process of demonstration of experiments for replication is termed as 'Front Line Demonstration'.

#### **Characteristics of Maize Front Line Demonstration Programme**

- Dissemination of latest technologies for maximum yield;
- Supply of essential farm inputs and on-the-spot guidance;
- Monitoring performance of crop at critical stages;
- Encouraging quality and disease-free seed exchange in the same village;
- Obtaining feedback from participating farmers;

- Transmittal of technology through Field Days;
- Director interaction between the farmers and scientific community;
- Evaluation of harvest and analysis of results.

#### **Directorate of Maize Research [DMR] and IFFCO Foundation Collaboration**

- DMR allocated 300 FLDs to IFFCO Foundation;
- IFFCO Foundation implemented the programme through its CDRC Units; [Aligarh-50, Deoria-100, Ghazipur-50, Lalitpur-50, Unnao-50];
- One Preliminary Workshop and one mid-term training course organised;
- 350 willing farmers from 71 villages in five districts identified;
- Land plots and seed suppliers and irrigation potential identified;
- Required seeds and IFFCO fertiliser quantified and procured;
- Supervised line-sowing, application of irrigation, and weeding operations;
- Enlisted technical assistance from Agricultural Department/KVK/Universities;
- Farmers provided with "Observation Note Books";
- Harvesting operations supervised;
- Prescribed reporting procedures followed and complied;
- 340 FLDs were successfully harvested; 10 plots failed due to drought conditions.

IFFCO Foundation provided training to extension agents and farmers on new cultivars innovative methods of maize cultivation and agronomical practices and crop protection techniques.

The IFFCO Foundation, established in March 2003 as a public trust, has been promoted by the Indian Farmers' Fertiliser Cooperative Limited [IFFCO]. It uses the structure of cooperatives/non-governmental organisations e.g., Self-Help Groups and their associations, for carrying the latest technology in agriculture to their members. It is in this context that the Foundation agreed to implement the FLD Programme in the State of Uttar Pradesh through its Cooperative Development Resource Centres [CDRC] in five districts.

#### **Potential to Double Agricultural Production is Real and Possible**

**Table-I** describes the FLD yield kg/ha in comparison with district yield and percentage increase in yield. The yields achieved ranges from 3,101 kg/ha in Lalitpur to 5,125 kg/ha in Deoria. Percentage increase in yield from the district average varies from 66% in Aligarh to 155% in Unnao. In the overall FLD Programme, 116% increase has been achieved as compared to the district average.

**Table-I: Average Yield and Percentage Increase in Five Districts of Uttar Pradesh**

District	No. of Successful FLDs Laid	Average FLD Yield kg/ha	Average Dist Yield kg/ha	Percentage Increase
01 Aligarh	50	3,375	2,031	66
02 Deoria	116	5,125	2,500	105
03 Ghazipur	62	4,375	2,091	109
04 Lalitpur	41	3,101	1,275	143
05 Unnao	71	3,571	1,399	155
<b>TOTAL</b>	<b>340</b>	<b>3,909</b>	<b>1,859</b>	<b>116</b>

The experiment has created awareness among the farmers about cost-benefit analysis of the maize production. It also enlightened the extension agents in refining approach to extension methodology. The cooperatives have also gained by a higher demand for quality inputs like seed, fertiliser and other crop protection products.

Depending upon the field level the net profit for maize production ranged from Rs 8,763/ha in Unnao to Rs 17,031/ha in Deoria district [Table-II]. The average profit earned by the FLD participating-farmers has been Rs 12,521/ha.

**Table-II: Average Expenditure Incurred and Average Profit Earned by Farmers**

District Name	Average Sales Realisation Rs/ha	Average Expenditure Rs/ha	Average Profit Rs/ha
01 Aligarh	17,719	7,807	9,912
02 Deoria	26,906	9,875	17,031
03 Ghazipur	22,969	8,325	14,644
04 Lalitpur	16,280	4,025	12,255
05 Unnao	18,748	9,985	8,763
<b>Average</b>	<b>20,524</b>	<b>8,003</b>	<b>12,521</b>

It is clearly established that the country has the necessary technical and other capabilities to double its food production, but it requires proper extension and monitoring systems. The productivity has gone up from a district average of 1,860 MT/ha to 3.9 MT/ha indicating an increase of 116%. In the case of the best performing farmers the average productivity achieved is 4.92 MT/ha indicating an increase of 165%. Even the average of the minimum yield is 3.08 MT/ha which is higher by 66% of the average yield in the district.

Integrated Pest Management [IPM] is a composite programme designed to minimize use of pesticides by employing all possible methods of plant protection. Under the IPM the farmers are advised, guided and assisted in the selection of resistant varieties, preparation of fields, balanced application of soil nutrients, weed control, plant protection, field sanitation, biopesticides, water management, and post-harvest techniques etc. Identification of useful and harmful insects was also done. Participants were given illustrative posters in this regard. Under the Frontline Demonstration Programme, the IPM technique is geared specially to the cultivation of quality maize with minimum use of pesticides.

If the increase in maize yield can be achieved by applying known technology, methods and inputs, it is quite possible to do the same with other foodgrains and other crops and achieve a 100% growth. All that is needed by the farmer is a proper supply of quality seeds, fertiliser, crop protection measures and technical guidance in the form of extension.

## **Event-06**

### **Provision of Agricultural Services by IFFCO**

The Indian Farmers' Fertiliser Cooperative Limited [IFFCO] is presently world's largest chemical fertiliser producing and distributing cooperative. It has a membership base of 37,000 agricultural cooperatives. It is a specialised cooperative registered under the Multi-State Cooperative Societies Act-2002.

IFFCO has strengthened its linkages with cooperatives and farmers through its promotional and educational programmes. The emphasis was to communicate the message of balanced use of nutrients to farmers and cooperatives. The targeted activities selected were demonstrations, farmers meetings, field days, crop seminars, district cooperative conferences, soil test and bio-fertiliser campaigns etc.

Collaborative programmes with specialised government agencies were implemented through ON FARM demonstration. These programmes provided a platform for interaction between IFFCO, farmers and cooperatives, scientists from agricultural universities and officials from government departments etc. on the aspect of increasing crop productivity and nutrient use.

IFFCO has made use of information technology in promoting fertiliser use through various programmes. Location specific special projects were implemented to enhance crop productivity and nutrient use through adoption of improved technology. IFFCO two mobile soil-testing vans analysed soil samples and educated farmers on soil fertility and need for balanced use of nutrients. Intensive training programmes for the salesmen and helpers of IFFCO's Farmers' Service Centres were organised to equip them with the agricultural technology so that they can extend better services to the farmers.

Support from print and electronic media was also sought to disseminate the technology at farmers' level. Professors on IFFCO Chair [15] in the disciplines of agronomy, soil sciences, extension and cooperation, agricultural economics and fertiliser technology at agricultural universities/national institutes.

The IFFCO promoted Cooperative and Rural Development Trust [CORDET] [at Kalol in Gujarat and Phulpur in Uttar Pradesh] undertakes training activities for farmers on the aspects of crop production, animal husbandry, farm mechanisation etc.

## **Event-07**

### **Farm Guidance in Indian Cooperatives**

The National Cooperative Union of India [NCUI], a national apex of the Indian Cooperative Movement, implements world's largest cooperative education and training programme for 550,000 cooperatives with a membership of nearly 225 million. members. A special programme for cooperative education and development is carried out through 50 field projects which are located in cooperatively-under-developed states. Besides imparting education and training on cooperative issues, the field projects provide farm guidance services to farmer-members. The Farm Guidance Instructors [FGI] of the NCUI Field Projects guide the members on all agricultural related issues e.g., seed selection, soil testing, plant protection, post-harvest techniques. They remain in constant touch with the local agricultural research centres and transmit the information to the farmers through member education classes and field visits. They also inform the farmers on various agricultural schemes available at the district level. In the cooperative sector, the Farm Guidance Instructors serve as important agricultural extension agents.

## **Conclusion**

Agricultural extension is a sharing of experiences. It is a Two-Way process. Directions from the top or scientists are not enough. It is a highly participatory exercise and must be handled systematically. There has to be an active and continuous interaction between the scientists and the farmers. The extension agent is the media, which promotes such an interaction. The benefits of agricultural extension to the farmers are many. Advisory services given result into: transfer of technology to the farmers; increase in their income from farming operations, and increase in the productivity. By making use of extension services not only the national production of foodgrains and horticulture products can go up, but also create additional wealth for the farmers. Higher agricultural income can bring about prosperity.

Whatever be the type of economy, agriculture always plays a prominent role in generating food and employment and sustaining national economy. All countries, especially in the Asia-Pacific countries whether it is Japan, Republic of Korea or India or Bangladesh, all governments have ensured that farming continues to progress. Significant budgetary allocations are made to promote agriculture [foodgrains or horticulture] and protect the interests of farmers.

Extensive and elaborate network of agriculture universities, research stations and institutions of higher learning have been established in almost all countries of the Asia-Pacific Region. In the Region, India has created an extensive research and development infrastructure. It is perhaps world's largest agricultural R&D set up.

Japan is world's strongest Industrialised economy. It also boasts of hosting world's strongest agricultural cooperative structure. The Japanese consider it a matter of pride to be connected with agriculture. The government has made significant contributions to agricultural research programmes through a network of agricultural universities, agricultural research stations and agricultural cooperatives. Contributions are made to agriculture-related infrastructure e.g., country elevators, grading and packaging centres etc.

Farm guidance is one of the most important activities of the Japanese Agricultural Cooperatives [**JAs**] which provides member farmers with guidance to improve their farm management and production technologies. Farm advisors of JAs offer such guidance particularly through producers' groups who are organised on commodity-wise basis. With a view to contributing to better farming of member-farmers, these advisors promote many activities of farmers such as joint marketing of their agricultural products and joint purchases of production materials. Field technical guidance services are also offered to farmers by those advisors.

From the six events explained, it is clear that farmers need specialised assistance and advice in order to reap fruitful harvest. There are cases where the farmers had suffered because they were not advised properly and the required extension steps were overlooked. In several cases farmers have been found to be disinterested in adopting new farm technologies just because they do not wish to suffer economic losses. The role of cooperatives is to encourage farmer-members to interact with the scientists and adopt new methods and techniques to enhance productivity and individual income. Agricultural cooperatives, therefore, can offer extension services.

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#### ***About the Author....***

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