



## Innovative Extension Methodologies for Diffusion and Wider Dissemination of Agricultural Technologies under ICAR-KVK, Imphal West

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Agricultural technologies are the carrier of rural growth and development. So, scientific technologies interventions dully supported by institutional mechanisms for technologies dissemination with the follow-up activities often leads to sustainability of the particular farming community. While empowering such technologies, ensuring profitability to provide food, nutrition and livelihood security to farmers along with ecosystem maintenance becomes the need of the hour. According to the concept laid by the Technical Advisory Committee (TAC) of the Consultative Group on International Agricultural Research (CGIAR)—*Sustainable agriculture is the successful management of resources for agriculture to satisfy the changing human needs, while maintaining or enhancing the quality of environment, and conserving natural resources.*

Again, Sustainable agricultural systems must be resource-conserving, socially supportive, commercially competitive, and environmentally sound. Hence, the agriculture research system must place emphasis on generation of required technology along with strong linkage between research-extension system and vice versa. It involves design and management procedures that work with natural processes to conserve all resources, promote agro ecosystem resilience and self-regulation, minimize waste and environmental damage, while maintaining or improving farm productivity and profitability (MacRae et al., 1990).

In present scenario, the extension system envisages a transformation from technology driven to market driven extension where farmers would give emphasis on commercialization of high value products, maintenance of quality control, fulfilling market demands, cost effectiveness etc. There is an urgent need to reform agriculture in holistic, scientific and systems approach to meet the present day challenges in agriculture due to climate change and global competitiveness so as to achieve sustainable agriculture production and growth under different agro-climatic conditions. Thus certain strategies or methodologies which will strengthen extension system and empowered small and marginal groups of farmer become the need of the modern extension approach in our KVK extension system.

### Concept of Innovative Extension Methodology

Earlier, the extension specialists were involved in diffusion of farm technologies generated by public research organizations, mostly disseminated through appropriate mechanism, viz., On Farm Trials (OFT), front line demonstrations (FLD), field visits, farmers,, meetings, media use, etc. This process had the conceptual backup from the diffusion of innovation

model. But in the last two decades, the paradigm shifts in development pivots to the enhanced concern for future generations to meet their basic needs. In India, different models for transfer of farm technology have been tested and also robust extension education approaches have been validated. Furthermore, the frontline extension system of the country has been sharpened through more farmer-centric approaches for technology adaptation and dissemination. The extension system in India has been designed to move beyond technology and beyond commodity through ensured reciprocal farmer-research-extension linkages. Farm producers located at far-off and those unreached still suffer from lack of access to appropriate services like credit, inputs, market, extension, technologies etc. Specific innovative extension approaches originating from multiple sources have been adopted on to make agriculture more profitable to provide food, nutrition and livelihood security to the farmers of our country.

Thus, the general or the conventional system of technology transfer through individual mechanisms are still applicable however, the rate of technologies diffusion towards the farming community is unsatisfactory as we are to compete for both the food and nutritional security. Thus, the clusters, SHGs, FPOs, FIGs and community based approaches have been implemented in the technology transfer by the ICAR-KVK-Imphal West. Hence, the following innovative extension methodologies are in operation under ICAR-KVK, Imphal west so as to achieve or attain the higher adoption, wider dissemination and diffusion of our technologies towards the farming community of the district. This very issue of bulletin is the outcome of the various extension activities and other social concepts applied in the transfer of technologies and expected to gain much momentum as the forerunner of the innovative extension methodologies application farm science centre.

- ✓ PARTICIPATORY SEED PRODUCTION
- ✓ NATURAL RESOURCE MANAGEMENT WITH INEGRATED FARMING SYSTEM AS MODEL VILLAGE
- ✓ CLUSTERING OF SMALL, MARGINAL AND LANDLESS FARMERS THROUGH FARMER PRODUCER ORGANIZATION
- ✓ COMMUNITY BASED DEVELOPMENT THROUGH SHGs MOVEMENT
- ✓ SELF SUFFICIENCY IN OILSEED PRODUCTION THROUGH VALUE CHAIN DEVELOPMENT APPROACH

### **I. PARTICIPATORY SEED PRODUCTION**

The involvement of individual, groups, community and the users group in the process of planning and its implementation of the developmental project or the transfer of technology in agriculture and allied activities so as to develop their socio-economic-cultural status with equity is the need of the present agricultural extension mechanism and cumulates in the participatory goal.

- Manipur is a tiny state in the north eastern part of India and is the home for 30 lakhs peoples. In Manipur, rice is considered to be the major dominant crop and it occupies 90% of the total Gross Cropped Area (GCA). Agriculture or farming in their dwelling lands accounts for 80% of the state economy.
- Rice cultivation in both the pre-kharif and kharif seasons have been the major source of livelihood of their farm families. Next to Assam, Manipur ranks second in the lists of rice production amongst the North-eastern states of India. However, the production and productivity of the local cultivars including the rice crop could not meet the demand of the 30 lakhs population. The average productivity of rice in the valley districts is 3.2t/ha.
- Again, the prevailing farmers' system of using inferior own saved seed, traditional methods of sowing/transplanting, lack of seed entrepreneurs, and burgeoning issue of global warming are some of the major problems & constraints faced by the farmers and is also considered to be a big challenge for the experts and policy makers.

- In the real context, the average annual net return per hectare accrues from the cultivation of rice could not bear the farm families of small, marginal and tenant farmers of the state and hence simply production of rice is becoming an out-dated enterprise. However, with the implementation of the ICAR PARTICIPATORY SEED PRODUCTION during 2012-13, the real scenario of quality seed production of rice has been changing specially in the Imphal valley district of Manipur.
- The seed replacement rate (SRR) which was hardly 2% in the year 2000 been increased to 35% in rice during 2020 with the adoption and implementation of Participatory Seed Production (PSP).

**Extension Methodology Implemented:** Under ICAR Participatory Seed Production of rice, 2 blocks (Wangoi and Haorangsabal) under Imphal west district have been selected and implemented for diffusion of seed production dissemination. Of which 20 participating villages are identified and lastly 5 farmers from each village are selected based on the progressiveness, exposure to scientific cultivation and production, feasibility and access to irrigation and cluster-based.

#### **Extension outreach imparted**

- Training on scientific cultivation and production technology(FS, CS and TFL)
- Participatory demonstration, roquing
- Supply of critical inputs such as seeds, fertilizers, cono-weeder, Custom Hiring of water pumpsets, sprayers and PPCs
- Schedule monitoring, seed certification inspection and
- Buy back policy of certified seed under KVK-Revolving Fund mechanism.

#### **a. Convergence/Linkage Programmes achieved during 205-2020**

- ✓ Joint monitoring of seed certification with State Agriculture Department Sanjenthong
- ✓ Supply of quality seeds to the various State Agriculture Departments and KVKs of NE States.
- ✓ Chakhao Poireiton organic Producers Company Ltd, Sagoltongba, Imphal West
- ✓ Integrated Farmers Organic Mission Manipur, Ngairangbam, Imphal West
- ✓ Kaorel Agro Farmers Producer Company Ltd., Khumbong, Imphal West
- ✓ Yumbi Agro Farmers Producer Company Ltd., Sekmai, Imphal West
- ✓ Mangjil Agro Farmers Producer Company Ltd., Lamshang, Imphal West
- ✓ Langei Producer company, Keishampat, Imphal West
- ✓ NABARD for financial support

#### **a. Constraints encountered**

- ✓ Lack of sufficient revolving fund for timely payment for buyback of seeds from farmers for larger volume size.
- ✓ High transportation charges
- ✓ Lack of manpower and storage /Godown

#### **b. Most significant achievements**

- ✓ Increase of seed producers and FPOs have enhanced crop production in Manipur and Tripura states.
- ✓ Rice variety RC Maniphou-12 is a short duration variety which replaces all the indigenous or local varieties
- ✓ Rice varieties like RC Maniphou-7, RC Maniphou-10 and RC Maniphou-13 have largely replaced the Farmers'' varieties.
- ✓ RC Seed bin (Storage-bin developed by ICAR) is more demanded by the small and marginal farmers in hill and valley regions.
- ✓ Line transplanting with Cono-weeder and use of Leaf colour chart reduce the cost of cultivation and reduce Urea application.

- ✓ The VRR and SRR for the major crops in the adopted areas have attained 70 % and 35 % respectively

## II. NATURAL RESOURCE MANAGEMENT THROUGH INTEGRATED FARMING SYSTEM AS MODEL VILLAGE

Thuijang village in Imphal West district is a small tribal village having 51 numbers of household. The village has a good scope for cultivation of various food crops and rearing of livestock. The major general problems associated in the cultivation of food crops have been identified as:

- Mono-cropping (rice as the major stable crop)
- Use of inferior and improved varieties of crops
- Low scientific interventions
- Low irrigation infrastructures
- Poor soil health conditions and
- Resource poor small and marginal farmers

With a view to uplift the socio-economic status of the farm households of Thuijang village, ICAR-KVK, Imphal west have been adopting this village under Schedule Tribe Component (STC) through integrated crop's-livestock's interventions in a holistic manner.

### Interventions

- (i) IFS Model-Village Development
- (ii) Natural resource management (land development, water management, soil health management, irrigation, INM etc.)
- (iii) Agricultural/horticultural crops
- (iv) Livestock and Fisheries
- (v) Agroforestry

**Impact:** As usual, farmers of the Sangaitel Thuijang village have been practising paddy based mono-cropping system of farming since their ancestor's time. With the adoption and implementation of IFS by the clustering farmers group, some farmers have increased their income after KVK technology intervention during the last 6 months from before. Not only are these, farmers now utilizing their farm resources in a sustainable manner with the integration of crop-livestock and other enterprises too.

**Table 1. Economics with cost benefit ratio**

Crop	Yield (Q/ha)	Gross Cost(Rs)	Gross Income (Rs.)	BC Ratio
Rapeseed (M-27)	8.56	27000.00	59920.00	2.21:1
Cabbage	180.00	80000.00	180000.00	2.25:1
Paddy	52.12	72000.00	104240.00	1.44:1
Maize	39.75	58250.00	186000.00	2.78:1
Fish cum Duck (100 ducks: 1500 fishes)		30000.00	79250.00	2.64:1

The results of the various crops demonstration has improved the households food security and nutrient supplement thereby farm families expenditure have been drastically reduced during the short period. Thus, ICAR-KVK-Imphal west intervention in the Sangaitel village with the various improved and HYVs has motivated the farm families and started to take new venture in crop productions by the farmers. Training on Scientific crop-livestock intervention and demonstration on IFS has resulted in the increased of income, employment and knowledge gain from before the implementation of the TSP project. Mustard oilseeds produced from the rabi crops are now marketed to the whole-seller @Rs.2500/bag (40kg). Farmers are now getting an additional net income of Rs.20000/ha from crop-livestock components.

**1. Natural resource management in model village:** Prior to the implementation of Integrated Farming System (IFS) in the Sangaitel Thuziang village, the villagers were simply depended on the natural vegetations and other resources available in an around the village. Dwelling in the forests and hill areas during the pre and post kharif remains as the only viable sources of livelihood. However, with the adoption of the village under Tribal Sub-Plan (TSP) by the ICAR-KVK-Imphal west has resulted in development of many resource conservation activities such as the on-farm water harvesting structures (Jalkund), vermicomposting units and embankment of many natural springs etc.

**Impact:** Earlier, farmers could grow crops only in the monsoon season. The development and installation of various water harvesting structures have resulted in the crop-water use efficiency during the lean period and as such resources could supplement in the live saving irrigation of different crops grown in the cluster areas during Dec-March, 2022. An additional net income of Rs.16000/ha were benefitted from such intervention.

**Table 2. Economic benefits of Jalkund technology in Imphal West district of Manipur**

Types of crops/ activities	Numbers of plant/ livestock	Cropping Area (m <sup>2</sup> )	Water requirements	Total water requirement (litres)	Crop/ livestock Production	Gross return (₹)	Net profit (₹)	Benefit cost ratio
Coriander	--	62	250 litres per irrigation	7500	750 bunches of coriander	3750	2500	3.00
Cabbage	430	128.5	516 litres per irrigation	13269	430 kg	8600	4600	2.15
Tomato	150	50	300 litres per irrigation	7800	130 kg	5200	3500	3.10
<b>Total</b>		<b>240.5</b>		<b>28569</b>		<b>17550</b>	<b>10600</b>	<b>2.53</b>

### III. CLUSTERING OF SMALL, MARGINAL AND LANDLESS FARMERS THROUGH FARMER PRODUCER ORGANIZATION

A Farmer Producer Organization represents the power of aggregation; many small farmers come together and form an organization that collectively purchases inputs required by them and/or sell their produce. Initially, only small informal groups of farmers are formed and gradually such farmer interest groups or FIGs are, then registered under the *Company Act or Cooperative Societies* and which ultimately turn or form into FPOs.

**Status of Farmer Producer Organizations in Imphal West district of Manipur:** ICAR-KVK, Imphal west being one of the oldest and renowned organization for uplifting the socio-economic status of the farming community of Manipur have promoted 3 (Three) Farmers Producer Companies as POPI (Producer Organization Promoting Institute) under the strict guidelines of NABARD and start functioning after attaining key statutory compliances.

**Table 3. Composition and Growth pattern of FPOs in Imphal West District of Manipur**

Sekmai Cluster			Lamshang Cluster			Khumbong Cluster		
Promoters	Numbers	Pooled Members	Categories	Numbers	Pooled Members	Categories	Numbers	Pooled Members
SHGs	51	163	SHGs	333	212	SHGs	48	132
FCs	12	192	FCs	14	193	FCs	16	193
JLGs	9	158	JLGs	6	155	JLGs	7	147
<b>Total</b>	<b>72</b>	<b>513</b>		<b>62</b>	<b>560</b>		<b>61</b>	<b>472</b>

Table 4. Details of FPOs promoted by ICAR-KVK, Imphal West

Name & Address	Sponsored	Year of Registration	Lead Commodities Handled/Deal
Yumbi Agro-Farmer Producer Company Ltd. Awang-Sekmai-IW	NABARD	2020	<i>Piggery</i> , Veggies., Fishery, Poultry, Mushroom, Paddy, Processed Foods, Pulses, Oilseeds etc..
Mangjil Agro-Farmer Producer Company Ltd. Khumbong-IW	NABARD	2020	<i>Poultry</i> , Piggery, Veggies. Fishery, Mushroom, Paddy, Processed Foods, Pulses, Oilseeds etc.
Kaorel Agro-Farmer Producer Company Ltd. Lamshang-IW	NABARD	2020	<i>Dairy</i> , Poultry, Piggery, Veggies. Fishery, Mushroom, Paddy, Processed Foods, Pulses, Oilseeds etc

Fig. 1 Composition and Growth pattern of FPOs

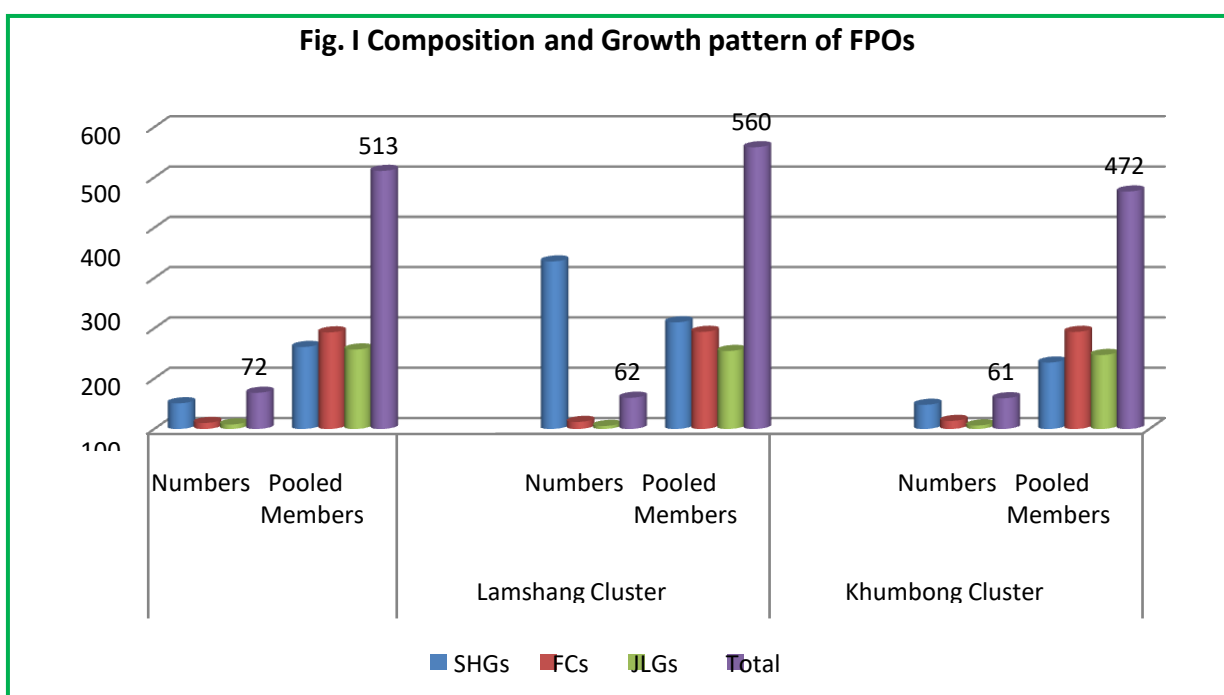


Table 5. Status of FPO under Producer Organization Promoting Institute (POPI)

Number Sanctioned	3 nos.	Status of legal compliances (Mention the number of FPOs completed following returns)
Number Registered (Feb-May, 2020)	3 nos. under COMPANY ACT 2013	Audit of Accounts (2020-21) & uploaded in RoC 3 FPOs
Average number of Shareholders/ FPO	650 Shareholders	AoC-4 (financial statements) 3 FPOs
No. of FPOs under A & B category	All the promoting FPOs are in G-A category	MGT-7 (Shareholders details) 3 FPOs
		DIR (Directors report) 3 FPOs
		% of FPOs whose data is captured completely on nabfpo portal 100 %

#### IV. COMMUNITY-BASED DEVELOPMENT APPROACH THROUGH SHGs MOVEMENT IN IMPHAL WEST DISTRICT OF MANIPUR

**Challenges:** Khurkhul village is listed in the Schedule caste category under the Haorang Sabal block of Imphal West district of Manipur. Women in the village are the majority of household bread earner. Unfortunately, it is also recorded that 12 % percent of the women population in the village are widow. It is said that the women are the half part of their male counterpart; however, majority of the farm women living standard were very pathetic. For the day to day subsistence living, women use to go in the river basin for quarrying of sand, stone, forest dwelling and weaving. In doing so, they hardly earned a monthly income of Rs 5000 10000 and could not bear the family expenses. Few women were practicing kitchen garden, piggery and seasonal wage earner during kharif season paddy cultivation.

**Initiatives:** During the year 2017, ICAR-KVK Imphal West, NABARD, Manipur Region, Manipur State Co-operative Bank and NCUI had a joint venture for the formation of SHGs, JLGs, FIGs and farmer's Club at the Khurkhul village. During the meeting, many women attended the meeting programme and they were asked to form a group of women having some economic activities. Thereafter, ICAR-KVK, Imphal West selected Khurkhul village for the implementation of ICAR SC-Sub Plan Project during the 2018-19 so as to uplift the socio- economic status of the Schedule Caste-women in the Imphal West district of Manipur.

**Key results/insight/interesting fact:** Under some women key leaders of Khurkhul village, clustering women formed 21 SHGs with 10 members per SHGs. A total of 100 women farmers comprising of 30% socially discriminated widows were selected from her 21 SHGs as the beneficiaries of the project.

**Impact:** Heikham Chanbi Devi manages to facilitate 350 farmers card from State Agricultural department. She could manage to own one Tractor, Power Tiller in the name of SHG during 2020 from the state subsidy scheme under SMAM. From 21 SHG 4 numbers of women farmers were benefited with piggery unit from Manipur State cooperative Bank Limited amounting 1 lakh with Subsidy during the year 2019. From 21 SHG 12 numbers of women farmers were benefited with diary unit from Manipur State cooperative Bank Limited amounting 1.18 lakh/ member with Subsidy. From 21 SHG 4 numbers of women farmers were benefited with piggery unit from Manipur State cooperative Bank Limited amounting 1 lakh/ member with Subsidy during the year 2020. 12 women farmers got Kisan credit card from Manipur State cooperative Bank Limited. 21 farmers got loan amounting to Rs.50000 during the year 2018 but now the amount is increased to R. 400000 by the year 2021 and is expected to increase more in the near future. She is the regular resource person for trainings on rules and regulation on Record/ Book keeping, cash book and resolution writing in respect of SHGs in the entire Imphal West district of Manipur. Every month within the date of 20- 22 the SHG farmers will give money to her, after collecting the money she will deposit the money for them to the bank for repayment of their loan amounts and depositing to their saving account.

**Learning Experienced:** A mere widow who went for stone quarrying , knocking others door for weaving in search of her livelihood can significantly change the status of the socially discriminated schedule caste women of Khurkhul village after forming 21 Women self-help group under her leadership and by becoming a group leader of this 21 SHGs. She joins the farmer Producer Organization (YUMBI AGRO FARMERS PRODUCER COMPANY LIMITED) promoted by ICAR-KVK, Imphal West. Under her leadership, 28 women farmers got Bank subsidy amounting rupees 1 lakh/ member on piggery farming and 1.18 lakh/member on Diary Farming and 12 women farmers had avail Kisan Credit card from Manipur State cooperative Bank Limited.

## Conclusion

This very issue of bulletin is the outcome of the various extension activities and other social concepts applied in the transfer of technologies by the ICAR-KVK, Imphal West and these innovative extension methodologies & social concepts which will strengthen extension system and empowered small and marginal groups of farmer in our KVK extension system in terms of technology transfer, adoption and wider dissemination at a faster rate than the conventional system of extension.

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