

Commentary

Redefining the Roles of Extension Scientists in KVKs: Innovative Experiments in KVK, Thiruvarur, Tamil Nadu during COVID Pandemic

Comment [A1]: What does this abbreviation refer to?

Abstract

Krishi Vigyan Kendras in India are playing a crucial role in disseminating the location specific technologies to farmers besides serving as a technology repository and bring the gap between Extension workers, researchers and farmers. (Sahoo *et al.*, 2021; Sunil *et al.*, 2020; ICAR,2020) Basically, KVKs are Extension Institutes mandated to reach the farmers through various Extension methods/tools which are essential to double the farmer's income which has been emphasized by Union Government of India.(IBEF, 2021; Acharya *et al.*, 2021; Singh *et al.*, 2019; Gupta & Nagar, 2017) Hence, KVKs are the bastion for Extension Scientists and can do wonders in experimenting various Extension models/methods/tools. Realizing the importance of Extension Scientists in KVK system, ICAR has issued guidelines, wherein the Programme Coordinator or Head of KVK should be either Extension Scientist or Agronomist. (ICAR, 2021) Similarly, one exclusive Extension Subject Matter Specialist is to be employed among six SMS. This is exclusive and cannot be substituted by scientists of any discipline. (Kale, 2017)

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1. Introduction

Though, initially the Extension Scientists could assert their role since the first KVK was started in 1974, there has been a depreciation in terms of the role of Extension Scientist in shaping the system. This is more evident in many KVKs. The following are some of the observations of the lack of clarity in the role of Extension scientists which needs to be reckoned with

- Neither the Extension Scientists in KVK System know their role nor the other scientists in the system know clearly the role of Extension Scientists
- The Extension Scientists have been forced to propose FLDs and OFTs in Extension Science without a basic understanding of the fact that the very FLD, OFT programmes are Extension Programmes
- Often, the Extension Scientists are given with Miscellaneous works
- The other scientists in KVK System still perceive Extension Scientists as custodians of age old Extension stuff
- There is a perception that Extension Scientist's role in KVK is only to arrange Exhibition and Exposure visits

The above observations may not hold good for all KVKs. There are some KVKs headed by Extension Scientists are exceedingly doing well under the creative guidance. Though, invariably the Extension Scientists in KVKs are having less clarity about their role and often they fail to recognize that the KVKs are their right place where they can bring in lot of changes or innovations. More importantly, the attitude of the Extension Scientists working in KVKs should change and they need to contemplate the following points to make themselves relevant for KVK system.

- The Extension Scientists should feel that KVK is their Home (System) and they need to lead the Home (system)
- The Extension Scientist should develop and hone Multidisciplinary thinking and working
- Rather than being in the periphery the Extension Scientists should come to the centre and get themselves noticed through noteworthy work
- The Extension scientists should feel that KVK is the best place where there are ample opportunities to prove the principles and philosophy of Extension through Social Laboratory
- The Extension scientists should develop an attitude that KVK is a wonderful place to experiment innovative ideas

Krishi Vigyan Kendras are more amenable for Extension Scientists to try new ideas or to spawn their innovations. Only requirement on the part of the Extension scientists is to have a bent of mind to innovate and to get along with the other SMS who are working in the KVK system. When compared to any

other systems like Agricultural Colleges, Agricultural Research stations, KVKs provide huge space for Extension Scientists to think and Innovate. Sky is the limit for the Extension Scientists to carry out whatever he/she thinks provided he or she should possess impeccable enthusiasm to work in the system and to go to field to learn from farmers and to intervene innovatively.

KVK, Thiruvarur is one of the prominent KVKs in Tamil Nadu in terms of its locality and the striking activities. Located in the heart of the Cauvery Delta, the farmers demand from the KVK is ever increasing and past few years has seen the KVK in cloud nine due to the plethora of Extension innovations that the scientists of KVK have introduced to reach out to farmers. During COVID pandemic KVK, Thiruvarur was on its feet to reach the unreached farmers. This article is an epitome of the innovative Extension activities that has been carried out by the scientists of KVK, Thiruvarur

2. Materials and methods:

2.1. Study area

I. “KVK on the Move” (Block Advisory Meet) as a platform to reach the unreached farmers during COVID 19 Pandemic

One important problem that the farmers have been facing during COVID 19 Pandemic is that they could not come to KVK to get their problems solved due to travel restrictions. In order to address this issue, the KVK scientists design an innovative model called "KVK on the Move" which has the following advantages.

- As of now, there is no unified platform for the meeting of Extension personnel, farmers and Scientists at block level due to which many of the relevant problems are not getting noticed
- Farmers from distant area are not getting served by KVK and they are crying for a platform to get their problems solved
- Only few agricultural problems of a particular block is getting visibilised. Meeting more number of farmers who could not visit KVK will result in diversity of issues coming to the fore

The block level line department officials were intimated about the event well in advance. The farmers were intimated through dept. officials, Karaikal FM, print media and whatsapp groups. The event was conducted on a stipulated date during which the team of KVK scientists visited Block Extension Centres wherein the farmers have given with solutions for the problems along with Line dept. officials

Through this innovative initiative, 558 Farmers in 10 blocks were given with 128 advisories which culminated in the addition of 5525 new farmers to the data base of the KVK

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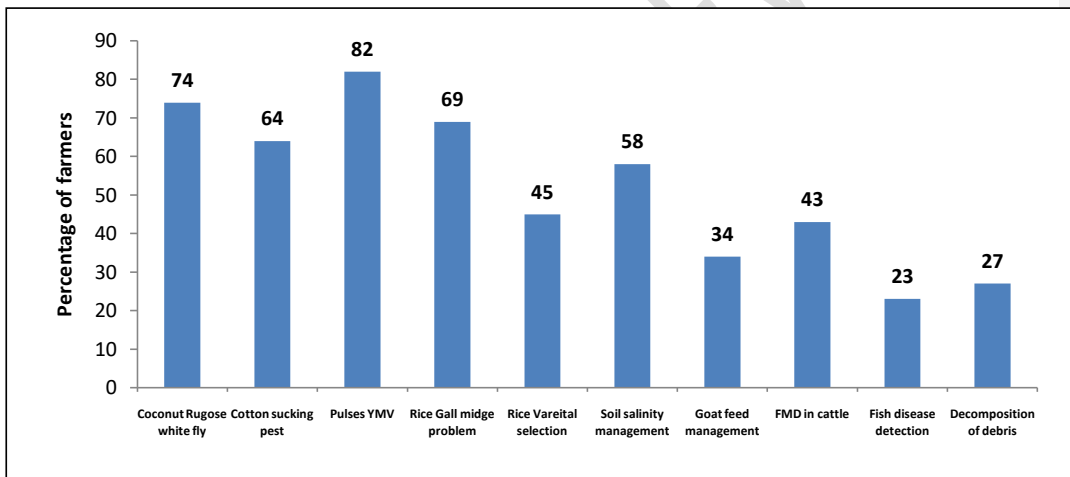
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Figure 1 :Hands on practice training



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Graph 1 : farmers for getting solutions in KVK on the Move programme

The above chart clearly depicts the issues brought by farmers for getting solutions in KVK on the Move programme. Coconut Rugose white fly, Pulses Yellow Mosaic virus, cotton sucking pests, soil salinity management are the major issues flagged by farmers. Another important observation is that besides agricultural issues, animal husbandry issues also were brought to the fore which is the sheer advantage of this programme. All advice in one roof with strong Extension workers-Researchers-Farmers linkage are the twin benefits that this innovative ideas has achieved. This model can be replicated in other KVKs also

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II.Utilising the School going Children of Farmers as Para-Extension Agents

There is serious discourse among Extension Scientists to find out right mix of medium for transfer of technologies. Rather than Extension worker from outside the society, an insider can deliver better which has been substantiated through several studies and in the recent past the input dealers have been trained for this. Though, there is a caveat that whether the input dealers/pesticide shop owners will deliver technologies without prejudice is a million dollar question. Hence, an innovative idea has been conceptualised wherein school going children of the farmers were trained to serve as para Extension agent and we have recorded positive results.

There are three reasons which can be quoted as rationale of such employing this initiative.

- Though pluralistic Extension is in place, adoption percentage is low
- Farmer: Extension worker ratio has been drastically reduced
- The children of the farmers can act as bridge between research system Extension workers and farmers

There are three Experimental treatments were taken up wherein the treatment 1 involved the sons/daughters of farmers pursuing 8th to 10th standard and the treatment 2 involved the sons/daughters of farmers pursuing 11th to 12th standard. In order to find out any significant change in terms of gender, we have included 60 male (Sons of farmers) and 60 female (Daughters of farmers) students and they were given with four sessions each and a control was kept to find out the effect of the treatment. The schools have been informed about the experiments and proper consent was obtained from school administration. The season coincided the pulses cultivation which has been taken up by farmers after Thaladi season is over. Some farmers used to go for Rice fallow pulses and some used to go for pure crop. Hence technologies related to pulses has been given to students during the four sessions

Table 1 :List of environmental treatments

Experimental Treatments	No. of Trials	Mean Knowledge Index (Number of practices-12)		Mean Adoption Index (Number of practices-12)		Mean Communication Effectiveness Index (Max.score:9.0)	
		Male (n=60)	Female (n=60)	Male (n=60)	Female (n=60)	Male (n=60)	Female (n=60)
T1: Sons/Daughters of farmers pursuing	4 sessions	75.22	83.21	43.42	49.74	6.2	7.1

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8 th class to 10 th class							
T2: Sons/Daughters of Farmers pursuing 11 th class to 12 th class	4 sessions	66.61	74.21	38.33	41.21	5.3	5.9
Check- Farmers who rely on regular mode of getting information	Not applicable	42.15		22.31		Not applicable	

The results given above indicated that the daughters of farmers rather than sons of farmers were better communicators and that too daughters of farmers pursuing 8th to 10th standard rather than Higher secondary class did possess the skill of convincing their father to adopt technologies. This experiment requires to be further validated and hence in the coming years this will be taken as a Front Line Demonstration by the scientists of KVK, Thiruvarur

Figure 2: Social Networking Tools for Technology Transfer

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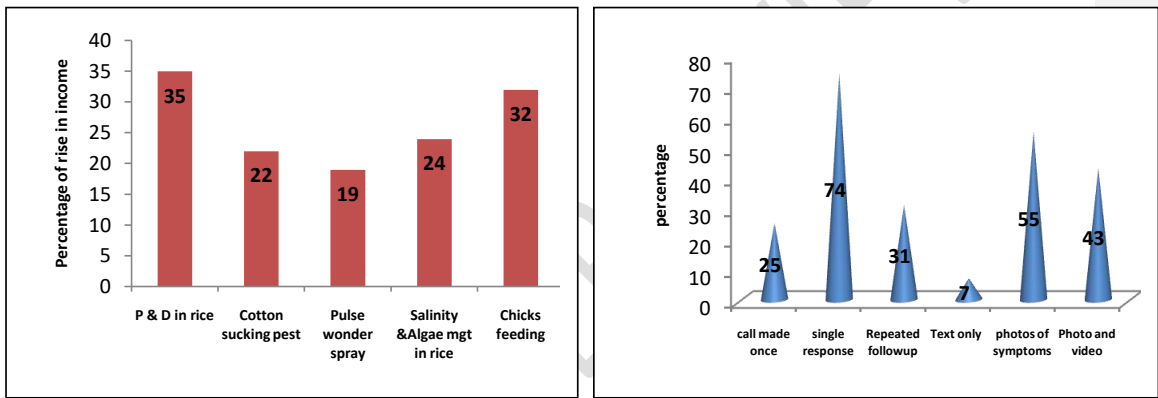


III. Augmenting the Potential of Social Networking Tools for Technology Transfer

The Information and Communication Technology tools have transformed the way the Agricultural Technologies are transmitted. Gone are the days, the Extension worker had to visit individual farmers households. Now within a mouse click or touch on the mobile phone, the farmers could get technologies with greater pace which has removed the spatial and temporal barriers of communication. The KVKs which are the custodian of technology transfer at District level has to fastly embrace the ICT enabled Extension. Already it is happening in many KVKs. KVK, Thiruvarur is not an exception and the

scientists have meticulously used the Whatsapp platform for technology transfer.

Besides having an exclusive whatsapp in the name 'Thiruvarur KVK', the scientists of KVK have been sending and receiving information from almost ten farmer's whatsapp group. The member of Thiruvarurwhatsapp group used to send the technical information to many farmer's whatsapp group and thus the reach of the KVK has been increased manifold. A survey was taken up to understand the impact of technology delivery whatsapp platform among 130 android mobile using farmers who have constantly been in touch with scientists of KVK through Whatsapp



Graph 2 :economic impact of whatsapp advisory

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The figure in the left side revealed the economic impact of whatsapp advisory. The farmers could realise 35 percentage of increased income from resorting to advice of KVK scientists on Pest and Disease management in rice through application of correct chemical and reducing cost of visiting KVK. This was followed by Chicks feeding in which 32 percent increased income was realised by farmers. The analysis of pattern of whatsapp advisory given in right side figure revealed that surprisingly 55 and 43 percentage or whatsapp users used to send photos of symptoms alone and video of the symptoms respectively. The encouraging trend is that farmers have been increasingly adept in sending photos, videos of symptoms and got their problems solved without visiting KVK. The following are the snapshots of whatsapp advisory given to farmers.

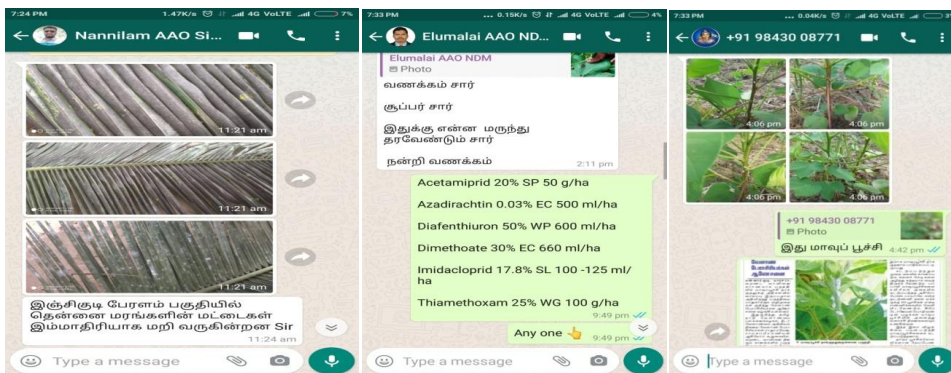


Figure 3 :Communication through social network

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IV. Spawning Multidisciplinary working culture in KVK

Though, KVK is a platform where SMS from different disciplines work together. In reality, there are working in water tight compartments and often one cannot see multidisciplinary work culture in addressing farmers problem. In order to stimulate this culture, in selected Front Line Demonstrations proposed by other scientists, the Extension scientist has been involved. For example, the in varietal demonstrations the role of Extension scientist is essential to find out the acceptance of the variety, its social and economic impact and attributes of the variety which determine the diffusion

Frontline Demonstrations			
FLD No:	3	Title :	Demonstration of Newly released medium duration fine grain Paddy variety VGD 1 with ICM in Thiruvavur District (2 nd Year)
Proposing Scientist			
Name:	Dr.Selvamurugan,M Dr.M.Ramasubramanian	Designation and discipline:	SMS Environmental Science Programme Coordinator and Associate Professor (Agri.Extension)
Replications/ Beneficiaries:	10	Location	Edamelayy village of Needamangalam block
		Season	Rabi 2022
OFT converted to FLD or Direct FLD:	Direct FLD		
Technology	Paddy Seed VGD 1 @ 60 kg / ha + Application of Fertilizers based on STCR + TNAU wetland Micronutrient mixture@ 25 / ha + Bio-fertilizers @ 2kg/ha		
Source and year	TNAU 2020		
Farmers Practice	Other varieties practicing in farmers field		
Parameter(s)	Growth parameters, yield and yield stability, soil fertility status (SMS Extension Science) Acceptance, Determinants of Adoption, possibilities of diffusion, Partial budgeting comparing previous variety and VGD 1 (Agricultural Extension)		
Critical input	Seed, biofertilizers and other inputs		
Cost per replication (Rs.)	2500		
Total Cost (Rs.)	25000 (Inputs) + Conducting Participatory workshops with farmers (3000) = 28000		

Figure 4: Frontline demonstration

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For example VGD 1 is a recently released briyani rice variety which has hogged the limelight. While designing the FLD, the Extension scientist was also involved as a co-scientist along with an Environmental Scientist who has originally proposed the FLD. Along with agronomic parameters, the parameters like acceptability, determinants of adoption, partial budgeting to find out the real economic impact of the variety juxtaposing the variety which they have planted before were also collected and analysed which gave the FLD a value addition.

V. Innovative designing of trainings in hybrid mode

The COVID 19 pandemic, though it has created havoc among people, it has brought to light unexplored dimensions of technology delivery. Online trainings/conferences/Consultations have become more popular. Though many KVKs have been hooked onto online mode of training farmers, the KVK, Thiruvarur have innovatively designed the online trainings in terms of subject and delivery. On contrary to regular topics given by KVKs, KVK, Thiruvarur has identified the following areas which were ignored but assumes lot of importance.

- Successful farmers discussion forum
- Training Agro Input Dealers on plant protection
- Online awareness on schemes of Devt.Depts.
- Invertebrate pest management
- Mites and nematode management

Some of the trainings warranted the physical presence of farmers. In such trainings hybrid mode of on and off line has been resorted to. For example a training on repair and maintenance of Farm implements was given through hybrid mode. Farmers not only in Thiruvarur District but from all over the state and nation took part in online trainings. This has given rise to a thought that in future online trainings may be recommended as a cost effective quick reach training methodology to be adopted by KVKs and other training institutions.

VI. Youtube videos to reach wider mass of farmers

Youtube has become an important mode of communication which can effectively disseminate skill part of a technology which triggers lot of discussion among farmers and ultimately one video has a huge effect than thousand pages of written text. Keeping in view the reach of Youtube videos, KVK, Thiruvarur has come up with a youtube channel called "Nerkalanjium" through which we

could reach thousands of farmers. These videos have been uploaded in KVK website also besides forwarded to various whatsapp groups as mentioned above. A forte of the videos is its shortness and authenticity. Three minute videos have been edited and posted. Certain videos like millets in Cauvery delta had abundant views. So far more than 30 videos have been uploaded and their URL is given below



Figure 5 :Technology videos uploaded in you tube

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VII. Innovative Diagnostic Advisory Sheet

Diagnosis of field problems of the farmers is one of the important function of KVKs. Either in the field or from the symptoms brought to the KVK by the farmers, the problems will be diagnosed and the solutions will be given. Though this has been happening continuously in all KVKs, a proper documentation is not there. Despite the fact that certain KVKs are adept in giving field diagnostic advisories to the farmers, they are not being documented properly for future reference. Hence an innovative Diagnostic Advisory Sheet has been designed by the KVK Scientists in Thiruvarur and it is given below

The uniqueness of the sheet is that it contains the date of diagnosis, photograph and full address and contact details of the farmer, the photograph of symptoms of the plants brought by him, the details of diagnosis, the scientist who diagnosed it and his/her signature. More importantly, the feed back of the farmers after some time has also find a place in the advisory sheet which will be useful to get to know the appropriateness of advisories given and

this is an indirect way of assessing the impact of field diagnostic advisories of KVK.

TAMIL NADU AGRICULTURAL UNIVERSITY
 ICAR-Krishi Vigyan Kendra
 Needamangalam - 614 404, Thiruvaur District.

FARM ADVISORY SHEET

Date: 30.07.2019

Sl. No.	Name & Address of the farmer along with photograph	Problem Diagnosed/Queries of farmers	Solutions/Advisory given	Photograph of the symptoms/specimen	Signature of the Scientist offering advisory
1	Th. S.Rajasekaran S/o Somu Kandiyan street Manalur 9171587507 	Ehendi Aphids	<ul style="list-style-type: none"> Monitoring the aphid population by setting up yellow sticky traps @ 12/acre Conservation of ladybird beetles, predatory wasps, green lacewing bug, spiders by growing 2 rows of maize to attract natural enemies. Spraying of neem oil 2% or Azadirachtin 0.03% EC 1 lit/acre or HDKE 5% along with detergent / wetting agent in 200 litres of water/acre. Spraying of chemical insecticides such as Imidacloprid 17.5 SL @ 50ml/acre or Acetamiprid 20% SP 25 g/lit or Dinethofos 30 EC 250ml/acre in 200 litres of water/acre using hand operated sprayer. 		

Follow up comments/Feedback of farmer

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Figure 6 :Innovative Diagnostic Advisory Sheet

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In the long run, such documentation will be very useful in the following ways.

- What are the major issues of the farmers
- Are the issues changed over years
- Are there any changes between different blocks in the district pertaining to a problem
- In which of the season a particular field problem raised often
- What are the suggestions offered by scientists
- Are the suggestions effective in tiding over the farmer's problem

VIII. Strengthening the bond with farmers and media personnel

Krishi Vigyan Kendras are district level Extension institutions which can reach the farmers in entire district which is not often possible with the available human resources. Only six SMS and a Programme Coordinator is there in a KVK who could not reach the entire district practically. Hence, the KVK scientists should make use of media personnel both print and electronic media to transfer technologies to wider mass of farmers.

KVK, Thiruvaurur has a strong linkage with vernacular media in the district, due to which the information given by scientists got published in one

or other newspaper everyday. This has created huge impact and the farmers used to get first hand information from newspaper and call the scientists to get their doubts clarified. In this way, the KVK, Thiruvavur reached the entire district. In order to exemplify the linkage of KVK Scientists with print media, the publications made in newspaper has been categorised into crop, animal husbandry, value addition, soil, Plant protection etc., and made into a bound volume of book entitled "Storehouse of Agricultural Information: Compilation of News items published by Scientists of KVK, Thiruvavur" and it was put in KVK website. This has become a readily available resource material for scientists, Extension workers and farmers. The second volume of such compilation has also been released recently.

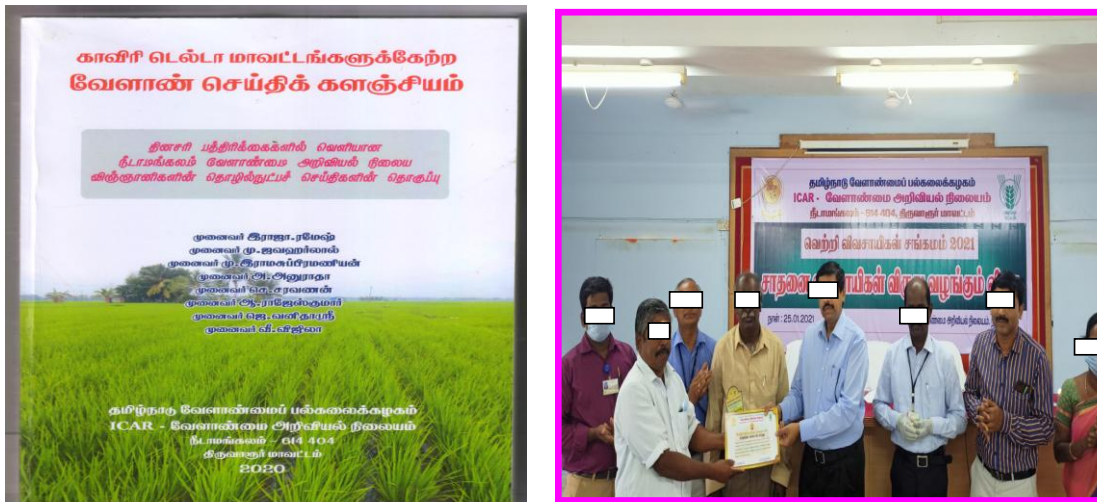


Figure 7 :Strengthening the bond with farmers and media personnel

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Yet another important role of KVK is to sustain the relationship with farmers. The maintenance of good relationship with farmers will go a long way in diffusion of technologies to farmers. As discussed already, with the limited manpower in KVK, the scientists cannot reach nook and corner of the districts. One important innovative idea implemented by KVK, Thiruvavur is to bestow awards and recognition to selected 25 farmers every year in order to motivate them and also this will indirectly influence them to transfer the technologies to other farmers as "KVK Ambassadors"

IX. Designing Exhibitions with Out of Box thinking

Exhibitions are the usual activity of KVK Scientists and the Extension scientists have often been entrusted with this task. Usual way of putting up charts would not interest the viewers. Hence, the Extension scientists in KVKs should improvise in arranging Exhibition. In KVK, Thiruvarur, instead of putting up a stall, the miniature rice field has been created in the threshing floor and various technologies like SRI method of cultivation, IPDM in rice, direct sowing of rice, water management technologies have been depicted which has attracted the visitors. Rather than showing in a chart or a model, this miniature fields have opened up a new way of designing Exhibitions



Figure 8 :Designing Exhibitions with Out of Box thinking

X. Participatory Training Evaluation to rid of mundane Evaluation

Training evaluation is an integral part of all trainings. This has become a mundane exercise and neither the scientist nor the trainee will be interested in evaluation. Hence, the scientists in KVK, Thiruvarur designed a participatory training evaluation. What we can do is to try collecting both qualitative and quantitative data to evaluate the effectiveness of any training.

One innovative idea is to display the materials related to the training and asked the participants to identify the displayed material before and after training- This qualitative analysis will aid the data collected through pre post training impact analysis. This was tried in a training on Composite fish culture where the fish species/ materials/inputs/medicines related to the training were displayed outside the training hall. The trainees were given with a paper and asked to identify the exhibits. The same paper was again given after the training was over and again they were allowed to see the exhibits. The change in learning was enumerated.

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Figure 9 :Participatory Training Evaluation to rid of mundane Evaluation

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XI. Extension Scientists can Innovatively publish and Prove in KVKs

Extension Scientists do a lot of work in KVK, but often they fail to publish. Basically, we do not have a conviction that the KVK work can be published. If we try to publish also, it used to be in low rated journals. This is because the of the fact, that our articles do not possess rigorous statistical analysis. There is ample scope for Extension Scientists to publish their work in quality journals than their counterpart in Research and Teaching. The following are the situations and statistical tools which could be used to publish the articles in high rated journals.

Table 2 :Extension Scientists can Innovatively publish and Prove in KVKs

Comment [A19]: Idem

Nature of Data	Statistical tools
Comparative data between farmers from two villages, male/female, small/big farmer Training Evaluation- before/after	Parametric -T test, ANOVA, Discriminant analysis Non parametric- Mann-Whitney U Kruskal Wallice
Ranked data emanated from PRA tools	Kendall's Concordance Spearman rank correlation
If you are working with Farmers in a village more than three years and	Repeated Measures ANOVA

implementing a particular intervention	
Impact indicators	Factor analysis
Studying varietal attributes	Cluster analysis, Multidimensional scaling
Adoption	Bivariate and Multivariate logistic, probit regressions

XII. Innovate in Mobilizing/Facilitating Farmers Groups/FPOs

The Extension Scientist can hone skill of building the capacity of FPO members, BODs and CEOs. In KVKs, the Extension Scientist's important role is to facilitate FPOs in terms of capacity building, evolve business plan for them and to link them with formal and informal institutions. Extension Scientists should feel that it is our arena for which we had been prepared during our PG and Ph D studies in Group dynamics and Team building. Similarly, Extension Scientist in KVKs can transform KVK into a nodal Capacity Building Centre for FPOs and come up with a comprehensive Training Manual

The following are the innovative ways in which the Scientists of KVK, Thiruvarur facilitated FPOs

1. Thaaiman FPC was facilitated to come up with a business plan on Traditional rice trading
2. Karikalan Pulse FPC was given guidance to erect a seed processing unit with the help of Govt.of Tamil Nadu
3. Linking Karikalan FPC with Dept.of Agriculture and Dept.ofAgrl.Engg to get mechneries related to Rice cultivation
4. During corona pandemic, Karikalan Pulse FPC was facilitated to come up with a marketing strategy of selling vegetables and due to this activity, this KVK has received Rs. 10 lakhs from State Government for best performing FPO

Documenting Farmers Innovations with zeal

The Extension scientists have a greater role in KVK to innovatively document farmers Innovations at grass root level. No other scientists can

creatively document farmers innovations other than Extension scientists as they have been trained during their Post Graduation.

Mr. Elangovan in Manaparavai village of Thiruvavarur District has come up with a innovation wherein he designed a drum seeder by modifying the existing one which suits the requirement of lands in Thiruvavarur District. The farmer has modified the seed felling drums by fabricating and welding cooker vessels and made holes in such a way it uniformly fell in the ground. Further, he kept the drums in such a way that spacing for intercultural operations using mechanical weeder could be possible. Besides, he has removed the corrugated wheel which may struck in the clay and modified it with a cycle tyre. Like this many Innovations have been documented.

While documenting this innovation, a idea was struck in our mind to establish a Innovation Incubation Cell, which the scientists in KVK, Thiruvavarur have been trying to establish in coming years. There are three dimensions namely, Innovation Exploration, Innovation Incubation and Innovation upscaling are there in the proposed model which is given below

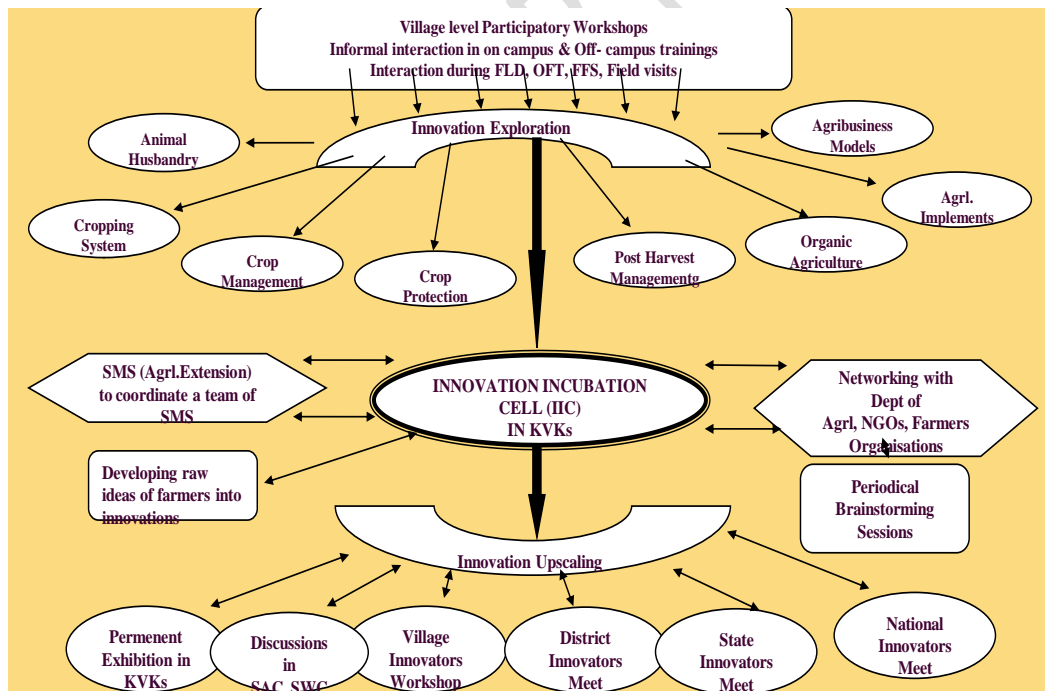


Figure 10 :Village level participatory workshop

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4. Conclusion

Krishi Vigyan Kendras are Wonderful Institutions where Extension Scientists can really implement practically whatever they learnt in their UG, PG and Ph.D courses. Union Government in coming years is all set to give enormous thrust to KVKs. This being the reality, Extension Scientists should occupy the KVKs and prove what we can do. There is enormous freedom in KVKs for the Extension Scientists to hone their skills and to innovate in their activities. The innovative small and big ideas which has been implemented in KVK, Thiruvavur by an Extension Scientist is very much possible in other KVKs also. Hence, this epitome of innovative activities in KVK, Thiruvavur is to set the stage for Extension Scientists to innovatively function in KVKs and hog the limelight.

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