



# Innovations Developed by Farmers in Erode District of Tamil Nadu

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## ABSTRACT

The study was conducted in Erode district of Tamil Nadu in order to identify the grass root level farmer led innovations by using personal interview method and observations in order to know location specificity of the innovations. A total of nine innovations were selected for this study namely land preparation, cultivation aspects, harvesting technology and varietal development in acid lime, organic liquid manure preparation and pest management. All the innovators were personally interviewed to know the uniqueness and its special features. This study revealed that, two innovations on land preparation machineries having the potential of covering 2 ha in a day, other two innovations in relation to cultivation aspects reduced the cultivation cost on an average of Rs. 2,800/- and Rs. 5,000/- per ha. Two more innovations on harvesting technology were used for timely harvesting and saved Rs. 6,250/- and Rs. 18,750/-ha. The average yield potential of acid lime variety was up to 2000 fruits /tree / season. By adopting liquid manure preparation technique and pest management technique, a farmer saved Rs. 12,000/- and Rs. 2,500/- against the purchase of fertilizers and pesticides, respectively.

**Key Words:** Innovation, Indigenous knowledge, Liquid manure, Machinery.

## INTRODUCTION

Development of agricultural sector is driven by innovations at all levels. In the ancient times when there was no formal system of research and documentation, even then the people used to devise some modes in order to preserve such things, such peoples who developed these technologies passed away like “unsung heroes” but their innovations are still being practiced under the domain of Indigenous Technical Knowledge (ITK). Indigenous knowledge requires very low external inputs and are suitable for local conditions and sustainable in nature, moreover, these are environment friendly than the modern technologies. Therefore, it is necessary to focus on documenting and validating the various innovations developed by the local people or farmers at the grass root level (Ramdatt *et al*, 2014).

Until recently, little attention was given to the farmer led innovations, including technological, management and institutional. It is now realized that there are numerous innovations, which yielded

higher return and made farming more economical and sustainable. Local innovation refers to dynamics of indigenous knowledge i.e., knowledge that grows within a social group, incorporating learning from own experiences over generations but also external knowledge internalized within the local ways of thinking and doing (Brigidletty *et al*, 2012).

Farmer innovations are also a way of life for the resource poor farmers who are being challenged by ever changing environmental, policy and market situations. Farmer led innovations in developing countries would lead to increase in production, thereby reducing the poverty among the rural people (Spielman, 2009 and Mariam *et al*, 2011). Farm innovation has always been happening but quite slowly and has seldom been recognized by communities and scientist also. The innovation process at farmers could be speed up giving opportunity to bring in their ideas and skills. Krishi Vigyan Kendra - MYRADA, Erode district is in the process of identifying and documenting

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such innovations in collaboration with farming community in order to properly validate and popularize the innovations among the farming communities through various extension methods.

## MATERIALS AND METHODS

The case study method was employed to undertake this study. These cases were selected purposively on the basis of the data base compiled by the Krishi Vigyan Kendra. Out of various innovations documented by Kendra, a total of nine cases namely clod breaker, pebble stone remover, acid lime variety, tapioca sett cutter, rotary power weeder cum ridger, fermented castor solution trap, organic liquid manure preparation technique, turmeric harvester and groundnut pod stripper were selected for the study. All nine innovators were personally interviewed vis a vis attributes of selected grass root innovations. In addition to the personal interview method, the observation method was also used for recording of attributed of the selected innovations. Data were collected twice with a gap of six months.

## RESULTS AND DISCUSSION

### Clod Breaker

Mr. G RSakthivel hailed in Talavadi block of Erode district doing farming for the past 30 years. Ragi was the major crop cultivated in this region for that fine field preparation is required. Normally the crops are sown immediately after receiving the monsoon. Due to the improper field preparation, the farmers couldn't get the optimum plant population. Clod formation was the common problem faced by the farmer at the time of field preparation. To tackle this problem, he developed animal drawn clod breaker which was made up of wooden log with 10 mm iron pokes. The equipment needs to be driven two times in an acre field for breaking clods and the time consumption for the operation was five hours for a hectare area. Many farmers in this region are effectively using this equipment for the fine field

preparation. The cost of innovation is Rs.3,000/- per equipment. Attributes of the equipments are given in Table 1.

### Pebble stone remover

In hilly regions and rainfed areas, the fields are dotted with a number of pebbles and stones hindering the farm activities such as land preparation and inter-cultivation practices. Generally women labourers are engaged for removing the stones before starting of the season. Now a day's labour shortage was the crucial problem faced by the farmers to carry out the farming operations in time. Mr K Viswanathan from Gobichettipalayam taluk of Erode District developed a tractor drawn stone remover. It consist of a conveyor chain driven gear box, shaft connected to the digger and a tipper. The machine has the potential of picking of both small and big stones from a depth of 25 cm in the field. In a day it can be used to clear two hectare area. It can also be modified for harvesting of tuber crops. This innovation helps the farmer to remove the pebbles and harvest the crop without additional involvement of labour.

The special features of pebble stone remover revealed that there are number of benefits like removal of pebbles, stones, leads to fine tilth preparation and harvesting of tuber crops like potato, ginger, turmeric etc. .This innovation was very useful to the hilly and rainfed region farmers who are facing the acute labour shortage.

### Acid lime variety

Acid lime is a major crop cultivated in Puliampatti region of Erode district. Die back and canker are the major diseases causing yield loss and quality of the harvested produce. Mr. A Devaraj from Erode district developed an acid lime variety by using the selection technique from the wild species. The special features of this particular variety were enlisted in Table 1. Now the innovation is in the process of multiplication of seedlings by using air layering technique.

## Innovations Developed by Farmers

### **Tapioca sett cutter**

Tapioca is the major crop cultivated in the hilly regions of Erode district. Setts are the planting material used for cultivation. Non availability of skilled labour in time forces the farmer to go for planting the whole setts in to the field which leads to the huge requirement of planting materials. Mr.V Viswanathan from Gobichettipalayam taluk of Erode district developed a sett cutter which requires 0.5 HP power. By using the cutter, a farmer can cut 750 setts per hour and it reduces the wastages of setts. By adopting this technology the cost of cultivation was drastically reduced from Rs. 4,000/- to Rs. 1,200/-ha.

### **Rotary power weeder cum ridger**

The major cost involved in tapioca cultivation are weeding and earthing up operation. This operation alone consumes Rs.7,000/-ha area. Mr. V Viswanathan of Erode district invented the rotary weeder cum ridger exclusively for hilly regions. By using this machine the farmer can reduce the cost of cultivation drastically from Rs. 7,000/- to Rs.2,000/-ha. This is the gender friendly, self starter machine requires 7.5 HP power and by using this machine the farmers can do the weeding and earthing up operation simultaneously in one hectare area in a day. The study revealed that tapioca sett cutter and rotary power weeder cum ridger developed by Mr.V Viswanathan was having the better performance in the hilly regions. Both the equipments were gender friendly, easy to handle and operate by the farmers themselves. This finding was in line with Soedjana *et al* (2015).

### **Fermented castor solution trap**

Root grub, the major pests in the crops like sugarcane, cotton, groundnut, coconut and areca nut. The serious infestation of the pest leads to heavy yield reduction. Mr.G R Sakthivel farmer from Talavadi region of Erode district invented the fermented castor solution trap to attract the grubs. Use 5 kg of castor seeds and pulverize it thoroughly. Add 5 l of water and keep this solution undisturbed 10 d for fermentation process. In the

mean time place the 5 mud pots with the capacity of 5 l each where placed in 1 acre field. Add 2 l of fermented solution to each pot and fill the remaining portion with water. Fermented castor solution trap was effectively used for controlling the pests like white grub, stem weevil and Rhinoceros beetle. It also caused the non-entry / re-infestation of rats into the field. The cost of entire process comes to Rs. 500/- only per year and it is eco-friendly too. The feasibility and sustainability of this trap were enlisted in Table 1. It has been reported that fermented castor solution trap was a technology having higher utility among all type of farmers for controlling rhinoceros beetle and other coleopteron pests (Saravana and Alagesan 2015).

### **Organic liquid manure preparation technique**

In the modern farming system, farmers heavily rely on external inputs such as synthetic fertilizers, pesticides, fungicides, etc., for the crop cultivation process. Continuous usage of these inputs leads to poor soil fertility and returns from the crop. This will trigger the interest of the farmers to find the alternate solution. Mr. G R Sakthivel from Talavadi region of Erode District developed a filtering system consists of four compartments. The first section was meant for collection of cow dung and urine mixing. After thorough mixing, the solution was being sent to second compartment for first filtration. In this compartment the sedimented solid matter called slurry was used for biogas production and the supernatant solution was then allowed for next compartment where jaggery was added for fermentation. In the fourth compartment the clear enriched filtrated medium was collected and used for field through drip system. By adopting this technology the farmer can save Rs.15,000/-ha by reduction of labour and fertilizers through application of recycled cow dung and urine solution by filtration techniques. Field application with drip irrigation instead of manual operation also adds advantage to the innovation. By adoption of this technology water holding capacity of the soil is increased, the earth worm multiplied well in the field.

### **Turmeric harvester**

Mr. P Ramaraj from Anthiyur taluk of Erode district was involved in farming practices since 1980. He cultivates crops like Turmeric, Vegetable, Banana and Sugarcane. Turmeric is one of the major crops in his field. This crop is annual and remunerative but highly labour oriented crop. Due to the scarcity of labourer in agriculture activities, farming work could not be carried out in time especially during harvesting season. If it was not harvested in time, crops can be infected with fungal diseases, which results in yield loss. Turmeric which can be easily operated with the support of power tiller. Though it was small, adaptability and transportation of the machine is easy. During machine operation, less consumption of fuel was observed. By using the harvester for harvesting turmeric rhizome, we can reduce the female labour for harvesting. By using of harvester, approximately Rs.18,000/-ha.can be saved in terms of labour. It can also be used for harvesting the tuber crops like potato, ginger in nearby districts.

### **Groundnut Pod Stripper**

Portable groundnut pod stripper in affordable process for the small and medium farmers was developed by the innovative farmer Mr. K Mohanasundaram, Nasiyanur of Erode district. The stripper was run with a help of electrical motor with 0.5 HP power. The cylindrical type machine was closed in all the sides with three openings. One for feeding channel, the other one for pod collection delivery point and the remaining one was dust removing or blowing point. The machine was designed in such a way that two men can work simultaneously.

By using this machine, a farmer can strip the pods from an acre area of groundnut in two or three days by engaging the family labourers alone. 99 percent stripping efficiency was found and the harvested pods are clean and it was notified that there were no broken pods. Winnowing operations can also be done at a time of harvest with the support of special attachment in this machine called

blower. It also reduces the drudgery of the women labourers and can easily transport even with the help of bicycle. The cost saving for stripping operation is Rs.2,500/-acre.

It was found that the groundnut pod stripper was more effective in stripping of pods since it saves labour and time. The cost for designing the machine is only Rs.25000/-. This is also a cost effective one, which can be easily operated and gender friendly in nature. The findings were in conformity with Olga and Ustyuzhantseva (2015).

### **CONCLUSION**

The study revealed that the innovations developed by the innovators were mostly in response to the field level problem faced by the farming community. The in-depth study reveals that five innovations namely clod breaker, organic liquid manure preparation, fermented castor solution trap, turmeric harvester and groundnut pod stripper have been commercialized. While the other innovations are popularized within the district level by the Krishi Vigyan Kendra.

Two innovations namely organic liquid manure preparation and turmeric harvester was notified by ICAR as a best innovation and the famers were awarded during the national level farmer innovators meet. The other innovations like acid lime variety, tapioca sett cutter, rotary power weeder cum ridger was notified by National Innovation Foundation as the best innovation. It was also found that all the farmer led innovations were having cost effective, greater utility and more sustainable rather than the available technology.

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**Table 1: Farmer led innovation and its attributes.**

Attributes	FARM INNOVATIONS								
	Clod breaker	Pebble stone remover	Acid lime variety	Tapioca sett cutter	Rotary power weeder cum ridger	Fermented castor solution trap	Organic liquid manure	Turmeric harvester	Groundnut pod stripper
Utility	Animal drawn. Covers 1.5 ha/day.	Tractor drawn. Remove pebbles up to 25 cm depth. Covers 2 ha/day	It produces 2000 fruits /season/ tree.	0.5 HP power is required to operate. Cut 750 setts/hr	Power tiller drawn. 7.5 HP power is required. Covers 1 ha/day	Managing root grub in sugarcane, groundnut and cotton.	Contains rich of nutrients. sediments used for bio gas production	Power tiller drawn. Covers 1.2 ha/day	Requires 0.5 HP power. Covers. 0.5 ha / day
Cost	Rs. 3,000/-	Rs.2.0 lakh	Rs. 50 / seedling	Rs. 8,000/-	Rs. 35,000/-	Rs. 500/-	Rs. 30,000/-	Rs. 35,000/-	Rs. 25,000/-
Advantages	Gender friendly. Cost of operation: Rs.1500/ha Ensures fine tilth	Cost of operation: Rs. 2000/ha. also used for harvesting tuber crops like potato, onion, garlic, etc.,	Resistant to citrus canker and die-back. Useful for value addition	labour saving. Cost of operation for cutting setts: Rs. 1200/ha	Time and labour saving. Cost of operation Rs.2000/ha.	Eco friendly. Reduces chemical application costs up to Rs.1500/ha	Increases the microbial population in the soil, water holding capacity and suitable for drip irrigation	Easy to transport. Time and labour saving. Cost of operation: Rs. 6250/ha.	Stripping and winnowing done on a single time. Cost of operation: Rs. 2500/ha
Demonstrability	No specific skills required for operation.	This is designed for reducing the labour dependency. The farmers can save Rs. 12000/ha towards labour cost.	Developed this variety by using selection process. Produces more fruits / tree over a long period of time.	Gender friendly and easy to operate. This can be detachable and move to any place.	Designed according to the need of rainfed farmers. Weeding and earthing up can be done at single operation	There is no specific skill required for preparation.	Organic and eco friendly. Non harmful to the soil and plants.	Easy to operate. Single man labour is enough to harvest 1.2 ha against the 110 male labour in manual harvest.	Easy to transport. Gender friendly.

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Sustainability	Easy to multiply. Rainfed millet cultivators are using this for long time.	This is the cost effective labour saving equipment.	This can be multiplied by using air layering technique.	This is the cost effective machine. Chance to go for trans-planting techniques in Tapioca.	Cost effective labour saving equipment. Dual operations carried out in a single mode	Cost effective. Eco friendly in nature. It also controls the rhinoceros beetle	Cost effective. Farmers can save Rs. 25000 in annual crops and Rs.15000 / acre in short duration crop.	Cost effective, gender friendly. It can also be used for harvesting potato, ginger and garlic.	easy to multiply and cost effective one. Labour saving equipment. 99 per cent efficiency was noticed
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