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## A study on perceived effectiveness of farmer innovations and re-inventions in Andhra Pradesh and Telangana

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### Abstract

Farmer innovations and re-inventions is a subject that is increasingly making people sit up and think. At the very least it underpins a refreshing new approach to indigenous environmental knowledge that goes further than just passive admiration. At the most it is a potentially important new direction for research and extension wherever else the conventional approaches have failed to deliver. To highlight the value of this rich resource and to develop mechanisms for local innovations and re-inventions to find their way into the formal research and development system, documentation of farmer innovations and re-inventions is necessary to give the real picture of its wealth. Majority of the farmer innovations/re-inventions 155 (94.51%) has shown high perceived effectiveness followed by medium 7(4.27%) and low 2 (1.22%) perceived with regard to the different attributes i.e., inexpensiveness, availability of inputs, high relative advantage, compatibility, low complexity, trialability, observability, predictability and profitability.

**Keywords:** Farmer innovations, re-inventions, perceived effectiveness, compatibility, trialability, predictability, profitability

### Introduction

Farmer innovations and re-inventions are the products of farmers informal experimentation. Such innovative technologies and methodologies are largely confined to some locations. Benefits accrued from such innovative ideas need to be widely shared across the country. And the scientific talents behind such grass root level innovations and re-inventions need to be encouraged and recognized. Valuable ideas and techniques generated by them largely go unnoticed owing to lack of proper documentation and opportunities for wider dissemination. Unfortunately, the farm scientists and extension personnel are still struck up in the concept of “empty vessel fallacy” with regard to farmers and undermining the role of farmers in Innovation Development Process (IDP) in research as well as in transfer of technology. The innovative farmers are strategically important to design, develop and implement any research and development programme of Indian Agricultural Research (Ayyappan, 2010) <sup>[1]</sup>. In marginal agro-ecosystems, farmers continuously look for technologies that best fit their bio-physical, economic and socio-cultural conditions. Formal research and development efforts still too often result in technologies requiring inputs that are not locally available. Out of necessity, and based on their cultural background, inherited knowledge and daily observations, farmers have generated solutions (even though sometimes partially) to their own problems. Finding out the various constraints and analysis of the Innovation Development process will fetch a base which can be utilized by scientists, extensionists and user system.

### Methodology

In this study 164 farmer innovations and re-inventions were identified and documented in different farming situations of Andhra Pradesh and Telangana regions through informal interview with innovative farmers who were identified for the purpose of giving information on farmer innovations and re-inventions in the selected 3 districts i.e., East Godavari, Khammam and Kadapa of sample area. An exploratory research design was followed to unearth farmers knowledge in the form of farmers innovations and re-inventions with an objective to unearth and document as many farmer innovations and re-inventions as possible in different farming situations and to study the rationality and perceived effectiveness of them.

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## Results and Discussion

### Perceived Effectiveness of Farmer Innovation and Re-Inventions

Any new technology should be perceived as better than existing one in relation to attributes of farmers innovations/re-inventions i.e., cost, availability, relative advantage, compatibility, complexity, trialability, observability, predicatability and profitability. An attempt was made in this section to find out the perceived effectiveness of farmer innovations and re-inventions and the same presented in table.

**Cost effectiveness:** From the table it was observed that on perceived attribute i.e. cost, out of 164 farmer innovations/re-inventions, 142(86.60%) were perceived as less expensive than the farmers normal practices, followed by low 13 (7.92%) and medium 9(5.48%) cost effectiveness. Most of the innovations/re-inventions generated by the farmers were cost effective in nature, so that it could be concluded that mostly farmers will go for informal experimentation with the available inputs to reduce their cost of cultivation in different farming practices. All (86.60%) documented innovations and re-inventions were found to have high cost effectiveness. Thus it could be concluded from the study that majority of farmers innovations and re-inventions were relatively inexpensive and are effective farming practices generated by the farmers. Therefore a better understanding of the link between innovation/re-invention and cost effectiveness is particularly important for the promotion of farmer innovations and re-inventions. Thus this attribute of cost effectiveness also helps the scientists and extension personnels to derive the inconsistency of the farmers in technology adoption. Therefore it is suggested that research stations and extension units to work closely with the farmer innovators for up-scaling relevant and cost effective farmer innovations and re-inventions.

**Availability:** As seen from the table on perceived attribute of availability, it was observed that out of 164 farmer innovations and re-inventions 150 (91.47%) were perceived high availability of raw material followed by low 11(6.71%) and medium 3(1.82%) perceived availability of raw material for the generation of innovation/re-invention. Some of the constraints faced by the farmers for the procurement of raw material were transport cost due to poor infrastructure, lack of market information, lack of storage facilities, and limited skill and knowledge judging in the quality of raw material. The poor domestic infrastructure will definitely effect the availability of the agricultural inputs. Whereas remaining all (91.47%) documented innovations and re-inventions were found to have high availability. Therefore it was revealed from the results that farmers will prefer to conduct experiment to generate a innovation/re-invention when there was timely availability of the raw materials/inputs, technical support and credit availability to them. Hence, timely availability of farm inputs and services is the need of hour for better agricultural growth as well as development of farming community. Thus there is a need to critically look at how can we get the oppurtunities and how can we alleviate the constraints or problems faced by the farming community for the generation of innovations and re-inventions. Therefore both research stations and extension units of the concerned district need to develop alliances that mobilize the capacities and resources to support farmer innovators.

**Relative advantage:** It was clear from the table that out of 164 farmer innovations and re-inventions 158 (96.34%) perceived as higher relative advantage followed by medium 5 (3.05%) and low 1(0.61%) relative advantage. Relative advantage is an important attribute which can be perceived in terms of advantage to soil and crop, eco-friendly, ease in operation, usefulness etc., any one or more of them might be influenced by the farmer innovators to carry out experiment for the generation of innovation/re-invention

Whereas remaining all (96.34%) generated innovations and re-inventions were showing high relative advantage in different aspects. So it could be concluded from the study that farmers will show interest to generate innovations/re-inventions which gives relative advantage in many aspects. Hence to increase the capacity of farmers to conduct informal experimentation in the generation of innovations and re-inventions and to make relative advantage more effective, incentives in kind or cash by the SAU's, Research stations and extension units may be provided to support the successful farmer innovators to create more interest in the generation of innovations and re-inventions

**Compatibility:** It could be concluded from the table on perceived effectiveness of compatibility, it was observed that out of 164 innovations and re-inventions 157 (95.73%) has higher compatibility followed by medium 4(2.44%) and low 3(1.83%) compatibility of the generated farmer innovations and re-inventions. Even though, cost effectiveness and relative advantage is high with generated innovation/re-invention, there is no guarantee in diffusion and adoption of these innovations/re-inventions. This might be due to one of the major reasons is that generated innovation/re-invention may not be compatible with cultures, values, beliefs exists with the farming community. As the generated innovations and re-inventions were tested and developed in the existing specific local agro ecological conditions and farming situations, hence possessing the high compatibility with the local conditions and farming community where they have generated. Hence scientists and extension personnels must be conscious while promoting the farmer innovations and re-inventions by considering the compatibility of innovations and re-inventions.

Therefore it is suggested for the scientific and extension agencies to check the compatibility of the innovations and re-inventions with social norm, previously introduced ideas and client need for innovation. If an innovation is incompatible with the growers social values and beliefs it will not be adopted as rapidly as an innovation that is compatible. Hence, if an innovation is compatible with an individual needs, than uncertainty will decrease and the awareness and adoption of the innovation will increase.

**Complexity:** It could be concluded from the table on perceived effectiveness of complexity, it was observed that out of 164 farmer innovations and re-inventions 145 (88.41%) perceived as low complexity followed by high 12 (7.32%) and medium 7 (4.27%) complexity of the generated farmer innovations and re-inventions. In fact the generated farmer innovations and reinventions are the simple practices which involves the locally available material and the diffusion and adoption of these innovation/re-invention is smooth without any problem.

Some of the innovations were found to be complex because to understand the procedure for adoption and the complex procedure is involved in the storage of these innovations as they need security always because of their higher cost.

It could be concluded from the results that farmer innovations and re-inventions which are simple to understand by the members of a social system will be adopted more rapidly than innovations that require to develop new skills and understanding of the adopters. Therefore no or low complexity lead to higher adoption rate, if complexity increased the rate of rejection also high (Rogers 2003) [2]. Hence research stations and extension units should scout and document the low complex farmer innovations and re-inventions for extrapolating the same in similar conditions.

**Trialability:** It was observed from the table 4.26 that out of 164 farmer innovations and re-inventions 157 (95.73%) were perceived as trialable followed by medium 6 (3.66%) and low 1(0.61%) trialability. Majority of the generated innovations and re-inventions are simple and can be taken up in small scale in the field and need not necessary for any help from others. This is an appropriate attribute which helps in mass scale adoption of the innovations/re-inventions by the farming community.

95.73 per cent of innovations and re-inventions were found to be trialable because they involve less risk and more opportunity to try out innovation/re-invention. Hence this could be concluded that farmers will opt for the easily trialable experimentation in the fields for the generation of innovations and re-inventions. Farmers who are invited to experiment an innovation for trials would feel more comfortable to adopt innovations. Some times trialability provides farmers the ability to evaluate innovation benefits. Consequently, if farmers are given the opportunity to try the innovation certain fears of the unknown and inability to use can be reduced. Therefore scientists and extension personnels should focus on this attribute for the promotion of local farmer innovations and re-inventions

**Observability:** From the table on perceived effectiveness of observability, it was observed that out of 164 farmer innovations and re-inventions 161 (98.17%) were perceived as high observability followed by medium 3(1.83%) observability. A visible observation of the results of the farmer experiments will make them to diffuse and adopt quickly in a large scale. All the documented innovations were found to have high observability of the results whereas some of the innovations and re-inventions such as were possessing medium observability because these innovations and re-inventions were difficult to observe the final output to the farming community. One can learn or observe these innovations through experience or they can learn about it from others. Where as remaining 161(98.17%) innovations and re-inventions were possessing high observability hence it could be concluded that farmers are more likely to generate the innovations and re-inventions which were found to be more observable in nature.

The results of some ideas are easily observed and communicated to other, whereas some innovations are difficult to observe or to describe with others. Therefore observability of the result is the key motivational factor to the farmers for informal experimentation. Thus this attribute of perceived effectiveness will determine the successful adoption of an innovation or re-invention by the farmers

**Predictability:** From the results of the table on perceived effectiveness of predictability, it was observed that out of 164 farmer innovations and re-inventions 159 (96.95%) had high predictability followed by medium 5(3.05%) predictability. Most of the innovations and re-inventions belongs to high predictability group because the results of the experiments were anticipated by the farmers from the beginning itself. And some of the innovation/re-inventions show less predictability as experiments of the farmers got succeeded accidentally without anticipating the results by the farmers.

All the 96.95 per cent of the documented innovations and re-inventions were found to have high predictability except some of the innovations and re-inventions were belonged to medium predictability category because the results of these innovations and re-inventions was not expected in the beginning stage of innovation generation but the success of these innovations and re-inventions was observed after the implementation of the farmers innovative idea.

It was concluded from the results that farmer innovators were very cautious in taking experimentation decision because failure or substantial reduction in the output (in case of generated new farm technology) could cause a greater loss resulting in starvation of the whole family. Hence, before introducing any innovative idea by the farmer innovators, it must be evaluated thoroughly by the scientific and the advisory committee. If the problems /constraints (if any) faced by the farmers during the informal experimentation they should be brought to the attention of the concerned scientist / authority for their solution. A proper feedback from the farmers will certainly provide an insight to the scientists for further research or modification of the farmer innovations and re-inventions

**Profitability:** It was clear from the table that out of 164 farmer innovations and re-inventions 155(94.51%) has high profitability followed by medium 7(4.27%) and low 2 (1.22%) profitability. Most of the innovations/reinventions generated by the farmers were more profitable than the existing technologies available to them. And some of them were belonged to medium profitability category. Some of the experiments by the farmers on organic farming methods in paddy, Direct seeded aerobic rice cultivation, Saline soil reclamation fall under the medium profitability category because through these though there are many non-monetary benefits of natural resource conservation but were found to be low profitable in obtaining the monetary benefits like increased yields and income. Followed by some were belonged to low profitability category as there was no additional profit obtained by the farmer innovator by the adoption of these innovations. Whereas 155(94.51%) farmer innovations and re-inventions were found to be profitable technologies developed by the farmers as the benefit to investment ratio of the innovation/re-invention was high when compared to the existing technologies. Therefore it could be concluded that farmers will prefer to informal experimentation when their choice of getting profits are high. Hence technological package of farmers experimentation was not only meant to suit a wide diversity of agro-ecological, need based and location specific farm technology but also it should be income generating and remunerative. Because it has been observed that besides meeting subsistence basic requirements of farmers for effective farming practices, an innovation or re-invention should also be an economic incentive was one of the strong motivating factors for the

farmers to generating new ideas and practices.

**Table 1:** Distribution of Farmers innovations and re-invention according to their perceived effectiveness of farmer innovators

S. No.	Perceived Attribute	Category & score	Frequency	Percentage
1	Cost effectiveness	Low (6-10)	13	7.92
		Medium (11-15)	9	5.48
		High (16-20)	142	86.60
2	Availability of raw materials	Low (6-10)	11	6.71
		Medium (11-15)	3	1.82
		High (16-20)	150	91.47
3	Relative advantage	Low (33-38)	5	3.05
		Medium (39-44)	1	0.61
		High (45-50)	158	96.34
4	Compatibility	Low (21-25)	3	1.83
		Medium (26-30)	4	2.44
		High (31-35)	157	95.73
5	Complexity	High (6-10)	12	7.32
		Medium (11-15)	7	4.27
		Low (16-20)	145	88.41
6	Triability	Low (4-7)	1	0.61
		Medium (8-11)	6	3.66
		High (12-15)	157	95.73
7	Observability	Low (6-10)	0	0
		Medium (11-15)	3	1.83
		High (16-20)	161	98.17
8	Predictability	Low (6-10)	0	0
		Medium (11-15)	5	3.05
		High (16-20)	159	96.95
9	Profitability	Low (6-10)	2	1.22
		Medium (11-15)	7	4.27
		High (16-20)	155	94.51
10	Total perceived effectiveness score	Low (136-156)	2	1.22
		Medium (157-177)	7	4.27
		High (178-198)	155	94.51

## Conclusions

From the table it was concluded that majority of the farmer innovations/re-inventions 155 (94.51%) has shown high perceived effectiveness followed by medium 7(4.27%) and low 2 (1.22%) perceived effectiveness respectively. Some of the innovations and re-inventions has shown medium perceived effectiveness as these were perceived as effective to some extent.

Hence from the study it was revealed that majority of the generated innovations/re-inventions were belonged to the high to medium perceived effectiveness with regard to the different attributes i.e., inexpensiveness, availability of inputs, high relative advantage, compatibility, low complexity, trialability, observability, predictability and profitability. Thus there was a strong correlation between the perceived effectiveness of the farmers and the stated decision making considerations of leverage to carry out experiments in their farms. Of course, there is no guarantee that perceived effectiveness will reflect objective economic, environmental, and social outcomes of these practices, which in most cases are still subject to considerable knowledge gaps and require further agro ecological and social science research.

Innovation/re-invention practices of the farmers are amenable to more outreach methods, whereby extension personnels, research and the scientific experts should deliver information about the existence of the innovative practices to farmers, should provide technical assistance during implementation, and discussions of the benefits of the generated innovations and re-inventions to the farming community. However, the outreach farming community should prioritize those innovation practices with the largest environmental benefits to

enhance the overall sustainability of the innovation/re-invention. These practices which were having high perceived effectiveness should be promoted using more community-based and participatory strategies, in which farmer innovators come together as multi stakeholder partnership. In this case, the generated innovation and re-invention practices were diffused and adopted out of a sense of civic responsibility, social norms of reciprocity, and the desire to create a regional reputation for sustainability. Thus it is important to focus research, outreach, and education on generated innovation and re-invention practices. Furthermore, these results suggest that knowledge gaps are greatest regarding environmental benefits, in particular for this category of innovative practices such as disease and pest management that have long been studied with respect to agricultural productivity. Such research can speed up farmer innovations and re-inventions by focusing on how to most efficiently implement these practices while maximizing economic returns and environmental benefits.

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