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Rationality of Farmers' Innovations in Southern Karnataka, India

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ABSTRACT

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Farmers' innovations are developed as new or modified earlier practices by farmers themselves to overcome their existing problems using available resources and Indigenous Knowledge which are location specific, cost effective. Farmers' innovations play a vital role in recent years, which will supplement formal research because these innovations are easy to adopt. Hence, documentation of farmers' innovations and checking their rationality is important. The study was conducted in the year 2016-17 in seven districts of southern Karnataka. From these districts, 36 farm innovators were selected and 50 farmers' innovations were documented. Among these innovations, 34 farmers' innovations were found to be rational and remaining 16 were found not rational as per farmer's opinion, whereas 22 farmers' innovations were found to be rational and remaining 28 farmers' innovations were found to be not rational as per opinion of scientists.

Introduction

Agriculture is one of the oldest professions over 5000 years. Agriculture plays an important role in Indian economy and continues to be one of the most vibrant sectors in ensuring food security of the country. Around 56.60 per cent of the population still depends on agriculture and allied activities for their livelihood.

Further, agriculture contributes 17.40 per cent to national GDP and accounts for 9.2 per cent share in the country's export. Development of this important sector, several critical factors like inputs, resources, services, education, research, and innovations will decide the success of this sector (Anonymous, 2014 and 2015).

Agriculture being primitive occupation of the country changing its face in recent past due to technological advancement and farmer's participation. Further there is a need to enhance the pace of innovations to accelerate the growth.

In the meantime farmers have taken lead in inventing new methods/practices to overcome their problems and enhancing their productivity. Innovation is defined as an idea, practice, or object that is perceived as new to an individual or another unit of adoption. The innovation development process consists of all the decisions and activities and their impacts that occur from recognition of a need or a problem, through research, development and commercialization of an innovation by users, to its consequences (Rogers 1983).

Farmers' innovations are also a way of life for the farmers who are being challenged by the ever-changing, technical, environmental, policy and market situations in the country. For them, innovation is not academic work or an extracurricular activity. Rather, it is an inherent characteristic of those who are striving to make a living out of the difficult situation they are in. Almost every single farmer who is living in such challenging circumstances has to innovate in order to adapt and survive. Farmers especially resource-poor ones, continuously experiment, adopt and innovate (Chambers *et al.*, 1989).

The seven districts selected from southern Karnataka having diversified cropping pattern and other occupations. Farmer's of this region having wider experience in the field of Agriculture especially different crop practices, natural resource management, mechanization, post harvest activities, animal husbandry etc., which are of more benefitting and leads to higher returns and made farming more economical and sustainable. No doubt farmers innovations are inexpensive, easily accessible, locally appropriate and tested most of these innovations are higher economical returns, higher feasibility and socially acceptable in their own situation so as to rapidly accept by other farmer's. Documenting these innovations will provide platform for selection and make way for identifying its rationality by farmers as well as scientists in terms of its importance in farming and identify the ways to commercialize them.

Rational means explainable with scientific reasons or established facts based on long time experience; irrational means something/practice that cannot be scientifically explained or supported with long time experience (Sastikannan 2002). Even then most of the farmers' innovations are not noticed and recognised. Limited attempts have been made to find out the rationality of these

innovations. With this background the study was conducted to assess the rationality of the identified farmers' innovations by farmers and experts, which also includes the comparison of the farmers and experts opinion to know the significance of the identified farmers' innovations.

Materials and Methods

An Ex-post facto research design was followed to assess the rationality of the identified farmers' innovations by farmers and experts. Seven districts of southern Karnataka viz., Mysore, Mandya, Ramanagara, Chamarajnar, Bengaluru rural, Tumkur and Hassan were selected for the study. The data was collected from the farmers regarding their innovations through personal interview method using pre-tested interview schedule.

Rationality of documented farmers' innovations

Farmers' innovations were collected and documented from the farmers. The collected farmers' innovations were transformed into statements so as to construct a questionnaire for further investigation at stage II level. In the constructed schedule, against each statement / farmer's innovations a three point continuum was given viz., rational, somewhat rational and not rational. For rationality analysis a sample of 30 scientists were referred from the agriculture colleges, KVK's, research stations of UAS Bengaluru and experts/ scientists from veterinary college and 30 progressive farmers from different area were selected. All scientists and farmers were administered with the questionnaire and were asked to give their response against each statement as the extent they feel that the modern science would explain the rationality behind each practice or statement. Scores allotted for the responses were 3 for Rational, 2for somewhat rational and 1 for not-rational.

After tabulating the responses of the all the 30 scientists and farmers, weighted means for all the practices was calculated along with the means of each practice to arrive at final rationality score of the each individual practice. The individual practices mean is compared with weighted mean. The practices whose mean score is 2.0 and more were regarded as rational and mean score less than 2.0 were regarded as not-rational. Statistical tools like Frequency, Mean, Correlation coefficient were used for analysis of data.

Results and Discussion

With respect to rationality of the documented farmers' innovations by the farmers, It could be observed from the table 1 that out of 50 farmers' innovations 34 (68.00 %) were judged as rational by the farmers and 16 (32.00 %) were judged as not rational or irrational by the Farmers. Nearly 34 innovations were found rational and 16 were found not rational as per farmers' judgment.

The probable reason for the kind of response may be due to their assessment of innovations keeping their existing situation in mind and few may have these problems in their farming situation also. Further they judged these most of the innovations as rational. Probably this might be due to the appropriateness and utility of these innovations in farmers' field. The results are in concurrent with (Shireesha 2015).

Among 34 rational innovations Four in One structure found highly rational as per the farmers opinion followed by developing improved variety in paddy, modified traditional grind stone etc., Among 16 not rational innovations, manual threshing of paddy got less mean score followed by processing of black gram, Natural protecting of rearing birds through china birds, Natural habitats for rearing birds etc.,

Four in one structure found highly rational as per farmers opinion because it has the benefit of minimizing space utilization for storing coconuts and also this structure has the facility of harvesting solar power at the top and growing shade loving vegetable crops at the bottom of the structure. Followed by improved paddy variety has the highest mean score because it had the location specific characters and high yielding characteristics. Followed by modified traditional grind stone has third highest mean score in the list because it has advantage of getting flours at home easily by using solar energy thereby minimizing the cost.

Manual threshing of paddy found not rational because it consumes more time to thresh paddy, it was not suitable for larger volume of paddy and also it requires more labour and cost of threshing will be more.

Followed by Processing of black gram was found not rational because it also had same problem as above innovation like it was not suitable to do processing large quantity of black gram easily and requires more time through this method and next to these two innovations natural protecting of rearing birds through china birds, natural habitats for rearing birds were found not rational because these two innovations were costly and not possible to build natural environment conditions.

With respect to rationality of the documented farmers' innovations by the Experts, It could be observed from the table 2 that out of 50 farmers' innovations 22 (44.00 %) were judged as rational by the experts and 28 (56.00 %) were judged as not rational.

Most of the scientist/expert opined that 22 number of farmers' innovations are rational which was quite less in number compared to farmers opinion.

Table.1 Rationality of the documented farmers' innovations by the farmers

(n=30)

Sl.no	Title of the innovation	Farmers	
		Mean score	Rationality
1.	Developing improved variety in paddy	2.90	R
2.	Shade net effect by harvested crop	1.97	NR
3.	Seed treatment with Cowdung	2.60	R
4.	Creating natural habitat in trees	2.33	R
5.	Hanging Vegetables seeds	1.90	NR
6.	Wider spacing in Sugar-cane	2.20	R
7.	Protecting Coconut seedlings from animal menace	2.73	R
8.	Cloth fencing for kitchen garden	1.87	NR
9.	Use of Radio to avoid animal menace	2.50	R
10.	Tying of umbrella to protect sunflower crop	1.80	NR
11.	Light trap in farm land	2.27	R
12.	Use of coconut water as nutrient spray	2.10	R
13.	Protecting Banana crop with digging pit	1.93	NR
14.	Growing of Poppy as a trap crop	2.07	R
15.	Tying of bottles to overcome birds problem	2.73	R
16.	Growing plants in rubber tire	2.13	R
17.	Use of Cow urine as pesticide	2.40	R
18.	Overcoming birds problem through buntings	2.07	R
19.	Modified traditional Grinding stone	2.80	R
20.	Modified multipurpose thresher	2.63	R
21.	Modified tractor driven spray	2.20	R
22.	Cocoon deflesor at rearing unit	2.37	R
23.	Modified ridger for Sugar-cane crop	2.33	R
24.	4 in 1 structure	2.97	R
25.	Manual threshing of Paddy	1.30	NR
26.	Labour saving using conventional Wheel for lifting	1.77	NR
27.	Underground storage structure	1.80	NR
28.	Fodder storage cum cool / refrigeration to animals	2.17	R
29.	Protecting trash stack	1.63	NR
30.	Storage of grains in bamboo baskets	1.93	NR
31.	Storing of seeds in metal container	2.63	R
32.	Production of Goaraka as medicine	2.53	R
33.	Processing of black gram	1.37	NR
34.	Drinking water supply in Rabbit rearing	2.40	R
35.	Avoiding food wastage in Rabbit rearing.	2.37	R
36.	Unique Rabbit rearing cages	2.03	R
37.	Cow dung path to Bio-gas plant	2.67	R
38.	Fortification of animal fodder	2.40	R
39.	News paper as rearing trays	2.53	R
40.	Coir waste as animal bed	2.10	R
41.	Protecting Honey box from ants	1.97	NR
42.	Natural habitat for poultry birds using rubber basket	2.30	R
43.	Rubber tire fixed basins	2.23	R
44.	Cooling effect by agricultural waste	2.17	R
45.	Natural protecting of rearing birds through china birds	1.57	NR
46.	Natural food supply in rearing house	1.73	NR
47.	Animal mouth protector	1.67	NR
48.	Convenient feeding trays for sheep's	2.00	R
49.	Natural habitats for rearing birds	1.57	NR
50.	Wet gunny bag for cooling effect	2.40	R

R – Rational; NR - Not Rational

Table.2 Rationality of the documented farmers' innovations by the experts

(n=30)

Sl.no	Title of the innovation	Experts	
		Mean score	Rationality
1.	Developing improved variety in paddy	2.77	R
2.	Shade net effect by harvested crop	1.60	NR
3.	Seed treatment with Cowdung	1.53	NR
4.	Creating natural habitat in trees	2.47	R
5.	Hanging Vegetables seeds	1.63	NR
6.	Wider spacing in Sugar-cane	2.03	R
7.	Protecting Coconut seedlings from animal menace	2.60	R
8.	Cloth fencing for kitchen garden	1.40	NR
9.	Use of Radio to avoid animal menace	2.57	R
10.	Tying of umbrella to protect sunflower crop	1.50	NR
11.	Light trap in farm land	2.30	R
12.	Use of coconut water as nutrient spray	2.07	R
13.	Protecting Banana crop with digging pit	1.97	NR
14.	Growing of Poppy as a trap crop	2.13	R
15.	Tying of bottles to overcome birds problem	2.63	R
16.	Growing plants in rubber tire	2.17	R
17.	Use of Cow urine as pesticide	2.37	R
18.	Overcoming birds problem through buntings	1.57	NR
19.	Modified traditional Grinding stone	2.40	R
20.	Modified multipurpose thresher	2.30	R
21.	Modified tractor driven spray	1.43	NR
22.	Cocoon deflesor at rearing unit	2.43	R
23.	Modified ridger for Sugar-cane crop	2.23	R
24.	4 in 1 structure	1.63	NR
25.	Manual threshing of Paddy	1.20	NR
26.	Labour saving using conventional Wheel for lifting	1.43	NR
27.	Underground storage structure	1.73	NR
28.	Fodder storage cum cool / refrigeration to animals	1.80	NR
29.	Protecting trash stack	1.60	NR
30.	Storage of grains in bamboo baskets	1.77	NR
31.	Storing of seeds in metal container	2.50	R
32.	Production of Goaraka as medicine	1.90	NR
33.	Processing of black gram	1.17	NR
34.	Drinking water supply in Rabbit rearing	2.17	R
35.	Avoiding food wastage in Rabbit rearing.	2.20	R
36.	Unique Rabbit rearing cages	1.57	NR
37.	Cow dung path to Bio-gas plant	1.67	NR
38.	Fortification of animal fodder	1.70	NR
39.	News paper as rearing trays	2.10	R
40.	Coir waste as animal bed	2.07	R
41.	Protecting Honey box from ants	1.70	NR
42.	Natural habitat for poultry birds using rubber basket	2.13	R
43.	Rubber tire fixed basins	2.17	R
44.	Cooling effect by agricultural waste	1.83	NR
45.	Natural protecting of rearing birds through china birds	1.70	NR
46.	Natural food supply in rearing house	1.77	NR
47.	Animal mouth protector	1.47	NR
48.	Convenient feeding trays for sheep's	1.97	NR
49.	Natural habitats for rearing birds	1.27	NR
50.	Wet gunny bag for cooling effect	1.93	NR

R- Rational; NR-Not Rational

Since scientists are judged the rationality based on their expertise in that field and analyzes the pros and cons of these innovations in real situation. Besides analyses the cost and benefit ratio as a result only few which are replicable may suggested as rational and these results are in concurrent with (Shireesha 2015).

Among 22 rational innovations developing improved variety in paddy found to be highly rational as per the scientist opinion followed by tying of bottles to overcome birds problem, Use of Radio to avoid animal menace etc., Among 28 not rational innovations, processing of black gram found least mean score followed by manual threshing of paddy, natural habitats for rearing birds etc.,

Developing improved variety in paddy was found highly rational as per the scientist opinion because this was locally developed variety which adopts well to the local environment and climate and also this variety is less susceptible to pest and disease since it is developed from the local race selection there by it minimizes the cost of cultivation to the farmers. Followed by tying of bottles to overcome birds problem, Use of Radio to avoid animal menace are found rational because these two innovations were very effective in controlling the damage caused to the crops by the birds and animals in less cost, so these two found more useful to the scientists than other innovations.

Processing of black gram found was found not rational because it was very old and traditional method of processing as per scientist opinion and also from this method it is not possible to get good quality of flour with in less time and energy requirement for processing is higher. Followed by manual threshing of paddy was found not rational as per scientist opinion since this innovation is

not suitable for large quantity of paddy threshing and for this method cost of threshing would be higher. Followed by natural habitats for rearing birds was found not rational because this innovation requires natural habitat of rearing but due to this there was the possibility of spreading disease from one bird to another bird was higher and also for rearing of larger quantity of birds require more space and cost requirement would be higher and not possible to get good weight of the bird.

Based on the result of the study 50 farmer innovations were documented in different farming situations in different area. These documented innovations which are found rational may be tested, verified, standardized, validated, include in package of practice and find out the possibility of blending with modern technologies and also study suggests the validation of the documented rational farmers' innovations may be undertaken to fine tune these farmer's innovations and recommend for larger adoption.

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