



Scientific Rationality and Adoption of Indigenous Field Bean (*Lablab purpureus* (L.) Sweet) Cultivated by Tribal Farmers of Tamil Nadu

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Abstract: The tribes of the Kolli hills of Namakkal district in Tamil Nadu possessed rich tradition, heritage and experience in agriculture. Their rich wisdom in, Indigenous Tribal Agricultural Practices (ITAPs) of field bean (*Lablab purpureus* (L.) Sweet) can effectively be utilized for sustainable agricultural development of tribal areas. Ten ITAPs on field bean, in different clusters of villages of Kolli hills were documented. For assessing the rationality, the selected ITAPs were sent to 50 horticulturists and 50 plant protection scientists. Out of 10 selected ITAPs, 8 ITAPs were rational and 2 ITAPs were irrational. Overall extent of adoption of ITAPs was found to be more than 75 per cent as they were practiced for quite long time. The rational and effective ITAPs should be blended into the technology package for transfer of technology for sustainable agricultural development.

Key Words: Indigenous Tribal Agricultural Practices, Field beans, Tribal farmers, Rationality, Adoption

Tamil Nadu State in India is a treasure land of indigenous tribal technical knowledge in agriculture and allied activities. The *Malayali* tribal groups in Tamil Nadu, mostly found in Kolli Hills, have rich cultural and agricultural heritage which is situated in the Namakkal district of Tamil Nadu, South India, spread over an area of 441 sq.km at the tail end of the Eastern Ghats in the state of Tamil Nadu. The tribes in Kolli Hills were more traditional in nature having faith in the practices of the local communities. They managed their livelihood through agriculture and maintained a traditional life style through their indigenous knowledge system. They cultivated indigenous field beans (*Lablab purpureus* (L.) Sweet). The contribution of indigenous communities to the conservation and sustainable use of biological diversity goes far beyond their role as natural resource managers, their skills and techniques provide valuable information to the global community and a useful model for biodiversity policies. As on-site communities with extensive knowledge of local environments, indigenous and local communities are most directly involved with conservation and sustainable use, their rigid social structure with lesser social mobility had kept them away from scientific and technological progress. The ongoing practice of using such indigenous knowledge on field beans (*Lablab purpureus*) cultivation by ethnic communities established the belief that traditional knowledge used was fruitful for the people. Hence, studying Indigenous Tribal Agricultural Practices (ITAPs) of tribes on Field beans cultivation in Kolli Hills will be helpful for proposing an action paradigm for preservation and diffusion of desirable cultivation aspects for the benefit of the tribal farming

community. Keeping this in view, a study on scientific rationality and adoption of Indigenous Tribal Agricultural Practices on Field beans was carried out. This paper discusses about the indigenous Field beans adopted by tribal farmers in Kolli hills of Tamil Nadu.

MATERIALS AND METHODS

Kolli Hills is situated in the Namakkal district of Tamil Nadu, South India (78° 17' 05" E to 78° 27' 45" E and 11° 55' 05" N to 11° 21' 10" N) are a low ranging hills of Eastern Ghats spread over an area of 441 sq.km. Kolli Hill has an area of 282.92 sq.km. It stretches 29 kms from north to south and 19 km from east to west. The Mean annual temperature ranges from 14°C to 28°C. The area receives an average of 1440 mm of annual rainfall distributed fairly over the two seasons. The elevation ranges between 1000 and 1350 meters MSL. The soils are deep to very deep, non-calcareous and developed from weathered genesis. Each village of the settlement is called 'oor'. A group of ten to fifteen 'oor' constitutes a 'nadu', clusters of villages. For this study seven clusters of villages were selected from the total 14 clusters of villages (Nadu), in Kolli hills of Namakkal district. Seven cluster villages viz., *Ariyur Nadu, Bail Nadu, Gudini Nadu, Gundur Nadu, Selur Nadu, Thinnanur Nadu and Valappur Nadu* were selected based on the geographical area covered in agriculture under the farming systems.

In each of the selected villages, 20 aged and experienced farmers were contacted through informal interview method for collecting indigenous practices associated with field beans cultivation there. Thus, a total of

140 farmers were contacted. ITAPs were also collected from secondary sources viz., M.S. Swaminathan Research Foundation, State Department of Agriculture and previous studies, apart from the above mentioned farmers. Thus, a total of 10 Indigenous Tribal Agricultural Practices on field beans were collected. The collected ITAPs were then classified systematically based on the four cropping systems and eight technological dimensions.

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). In this study, rationality refers to the degree to which Indigenous Tribal Agricultural Practices can be explained or supported with scientific reasons, or established based on long time experience. Similarly, irrationality refers to the degree to which Indigenous Tribal Agricultural Practices cannot be explained or supported with scientific reasons, or cannot be established based on long time experience. Testing the rationality of the indigenous knowledge items is essential, as it has been envisaged to test the adoption of such knowledge by the farmers. For assessing the rationality, the selected 10 indigenous field beans cultivation practices were referred to the 50 horticulturists and 50 plant protection scientists, by rating them on a four point continuum ranging from 4 to 1.

The rationality of indigenous technologies was assessed by using the scoring procedure adopted by Sakeer Husain (2010) i.e., indigenous technologies which were rational based on scientific evidence, rational based on experience, irrational based on experience and irrational based on scientific evidence was given the score of 4,3,2 and 1 respectively.

To find out the rationality of an Indigenous Tribal Agricultural Practices (ITAPs), the total score given by all the scientists to individual ITAP was calculated and based on the mean score, the indigenous technologies were classified into two categories viz., rational and irrational. If an ITAP scored a mean score of 2.5 and above, it was considered as a "rational" and The ITAPs with a mean score of less than 2.5 were considered as "irrational".

Having identified and selected the list of ITAPs with their rationality scores, further analysis was undertaken to test verify their extent of adoption. Thirty farmers were selected using proportionate random sampling from the above clusters of villages; proportionate to the area. The selected ITAPs were narrated to thirty respondents one by one, each time enquiring whether they had adopted the practice, in the previous years. If the answer was 'Yes', a score of one was assigned and if the answer was 'No', zero score was given. The scores obtained for all the practices were summed up for each respondent and adoption score

Table 1. Rationality and adoption of ITAPs on field beans cultivation

ITAP	ITAPs on field beans cultivation	Rationality score	Adoption	
			No.	%
A.	Crop production			
1.	Local land races of field beans, such as Karuppu mochai (black beans) and Sem mochai (red beans) are generally grown.	1.80 IR	30	100.00
2.	Field beans (Karupu mochai and Sem mochai) is suited only for rain fed or upland cultivation.	1.90 IR	27	90.00
3.	Field beans can be raised thrice a year during May-June (Vaikasi) September-October (Purattasi) and (Thai-Masi) January-February provided if good rainfall has occurred, otherwise it is raised for two times only.	3.20 R	26	86.67
4.	Black field beans (Karuppu mochai) as well as red field beans (Sem mochai) comes to bearing on 3 rd month onwards with a total duration of is 4 months with an average yields about 2-3 kg.	3.70 R	27	90.00
5.	Field bean is sown behind to the country plough and covered by the return plough (marusaal).	3.20 R	27	90.00
6.	Field bean is mixed cropped with mustard, finger millet, italian millet, kodo millet, common millet and castor.	2.70 R	29	96.67
7.	Dry pods are harvested for grain purpose when they turn straw yellow in colour.	3.90 R	28	93.33
8.	Unopened field bean pods as such are stored for longer time.	2.68 R	24	80.00
B.	Crop protection			
9.	Mixing 2.5 kg. of red earth slurry with 50kg. of field bean seeds and drying them before storage. Seeds coated with red earth acts as pest repellent.	3.34 R	23	76.67
10.	A mixture of extracts of nochi (<i>Vitex negundo L.</i>) leaves and neem cake is sprayed to control the shedding of flowers and pre mature fall of pods in field bean.	2.98 R	24	80.00

was arrived at. Then the adoption quotient for each individual was worked out by using the following formula (Sundaramari *et al.*, 2003).

$$\text{Adoption Quotient} = \frac{\text{Number of indigenous tribal agricultural practices adopted}}{\text{Number of indigenous tribal agricultural practices applicable}} \times 100$$

RESULT AND DISCUSSION

The selected 10 ITAPs (by 1,2,3,4,5,6,7,8,9 and 10) on field bean (*Lablab purpureus* (L.) Sweet) cultivation were adopted by more than 75 per cent of the farmers, of which 8 ITAPs were rational and 2 ITAPs were (1 and 2) irrational. Local land races of field beans, such as *Karuppu mochai* (Black beans) and *Sem mochai* (Red beans) are generally grown (Fig.1). The major difference between black bean and white bean is the taste and energy which is comparatively high in the earlier than the later. Same is the case with red beans. Though this ITAP was irrational, it was followed and adopted by cent percent of the respondents, since these indigenous field beans are locale specific found only in Kolli hills and were much suitable for upland cultivation.

Field bean is mixed cropped with mustard (*Brassica juncea* (L.) *Vassilii Matveievitch Czernajew*), finger millet (*Eleusine coracana* Gaertn.), italian millet (*Setaria italica* (L.) P.Beauvois), kodo millet (*Paspalum scrobiculatum* L.), common millet (*Panicum miliaceum* L.) and castor (*Ricinus*

communis L.) and was adopted by 96.67 per cent of the respondents (Fig.1), to get maximum utilization of the land holding with maximum profit. Moreover, if one crop fails, other crop may fetch income to the farmers. Dry pods are harvested for grain purpose when they turn straw yellow in colour. This practice was adopted by 93.33% of the tribal farmers, since this traditional variety of field beans has been the oldest crop of the study area by which this ITAP would have been test verified for its harvest quality over generations.

Three ITAPs (2,4 and 5) were adopted by 90% of the respondents. Though the ITAP 2 (Field beans (*Karuppu mochai* and *Sem mochai*) is suited only for rain fed or upland cultivation) was rated as irrational, it had higher adoption since a vast majority of the cultivated area is under rainfed condition. *ITAP 4, black field beans (Karuppu mochai)* as well as red field beans (*Sem mochai*) comes to bearing on 3rd month onwards with a total duration of is 4 months with an average yields about 2-3 kg) was rationale with higher adoption, as the indigenous locale variety is well known to them. ITAP 5 (field bean is sown behind to the country plough and covered by the return plough (marusaal) possessed higher adoption as it is the most common practice in the rainfed dry lands and also it is traditionally practiced by the farmers and accepted by the scientists. About 86.67 per cent



Fig.1. ITAPs on field beans cultivation

of adoption was noted towards raising field beans thrice a year during May-June (Vaikasi) September-October (Purattasi) and (Thai-Masi) January-February because these months coincide with the onset of monsoons and the rainfed crop has to necessarily depend on the monsoon. The ITAP 8, unopened field bean pods are stored as such for longer time (Fig.1) also had higher adoption because it helps in retaining the moisture content of the seeds. The two crop protection aspects selected were rational with the adoption of more than 75 per cent each.

A mixture of extracts of nochi (*Vitex negundo*.L.) leaves and neem cake is sprayed to control the shedding of flowers and pre mature fall of pods in field bean was with 80 per cent adoption, since *Vitex negundo* leaves have polyalcohol and IAA which acts as growth regulator and as neem cake induces cell division and proliferation, with inhibition over biotic senescence. Mixing 2.5 kg of red earth slurry with 50kg of field bean seeds and drying them before storage was adopted by the 76.67% of the farmers, as coating of field beans seeds with red soil prevents the seeds from storage insect pest attack and facilitates in easy sowing. All the 10 ITAPs on field bean cultivation aspects were adopted by more than 75% of the respondents.

The studies of Esther *et al.* (2012) and Sakeer Husain (2010) support the above finding.

More than 75 per cent of tribal farmers adopted all

the 10 ITAPs on field beans. The tribes of the Kolli hills possessed rich tradition, heritage and experience in indigenous field beans cultivation. Their rich wisdom in ITAPs in indigenous field beans cultivation can be effectively utilized for sustainable agricultural development of tribal areas. It could also be concluded that the farmers have experiential wisdom which they use to conserve and select location specific indigenous varieties of field beans for obtaining sustainable yield. Such stabilizing qualities of traditional practices must be supported and complemented by agro-ecological practices that enhance the soil, water and germ plasm conservation potential of traditional technologies.

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