

Research Article

Traditional knowledge adopted by the tribal farmers of the Nilgiris district, Tamil Nadu in animal husbandry

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Abstract

The study assessed the awareness and adoption behavior of the tribal respondents belonging to the Kotagiri and Udhagamandalam blocks of the Nilgiris district, Tamil Nadu with respect to indigenous practices in animal husbandry and assessed the rationality of the Indigenous Technical Knowledge (ITK). Three tribal communities viz. Todas, Kotas and Irulas were selected for the study thus comprising 180 as sample of the study. A multistage random sampling method was adopted for the study. The results revealed that the majority of the ITKs had rationality mean scores above 2.5, revealing their wider usage and application in the field of animal husbandry. Turmeric was used to cure 'bumblefoot' in chickens, followed by cinnamon which is widely used as a form of oral medicine with feed to poultry. The tribals cured FMD of animals by giving them spider eggs and the ragi flour viz. The rotten horn was cut away with a backstap leaving a 4cm stub. Traditional knowledge is built on everyday observation and transmitted from the older generation to the young generation through word of mouth. Although, this is more effective in their habitat, it is believed to be totally unscientific and unreliable because it is not recorded. This is recorded only in the minds of the people. The main novelty of this research work is to document and validate the indigenous practices of the tribal communities which are compatible with their traditions and culture. Thus such documented and meaningfully validated indigenous technologies could be promoted among other tribes and farmers of other localities.

Keywords: Indigenous Technical Knowledge, Animal husbandry, Rationality, Validity, Awareness, Adoption

INTRODUCTION

Indigenous knowledge refers to the understandings, skills and theories developed by societies with long histories of interaction with their natural surroundings. This knowledge is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, ritual and spirituality. Indigenous knowledge is defined as "A body of knowledge built up by a group of people through generations of living in close contact with nature. (Bisha and Teshome, 2020). Traditional knowledge and practices have their own importance as they have stood the test of time and have proved to be efficacious to the local people and form the basis for their link with nature, and the varied levels refinement depend on the

level at which the society finds itself in the social evolutionary basis (Nisha and Arunachalam, 2018).

In Tamil Nadu, the Nilgiris district is a hilly ecosystem enriched with luxuriant natural vegetation and hence it attracts lakhs and lakhs of tourists all over India and world every year. Apart from having rich natural vegetation, this district gives cover for various wild animals. Recent studies based on Nilgiris biosphere reveals that the natural resource potential of Nilgiris is degrading presently in an alarming way more than the past. On the other hand, the tribal communities, the native tribes are constantly adopting their every socio cultural practices in line with preserving the natural resource potential. Several studies, as reported earlier, also confirm that the native tribes of Nilgiris are following a good fund of indigenous practices suited to their system. A

thorough understanding of such knowledge would help in developing a knowledge base and providing them a crystallized knowledge with a blend of modern science. (Nisha and Arunachalam, 2018).

In the field of indigenous knowledge regarding agriculture and allied areas, a very meagre amount of work has been done in documentation and validation as agriculture is the main occupation and source of livelihood of tribal people. (Nisha and Arunachalam, 2018). Therefore, it is vital to identify and preserve these indigenous knowledge practices for sustainability as well as to conserve the ecosystem. With this background, the present study aimed to identify, document, and validate the traditional practices the tribals in the Nilgiris district and assess their awareness and adoption level in terms of the rationalized Indigenous Technical Knowledge (ITK) in Animal Husbandry.

MATERIALS AND METHODS

The study was carried out in the Nilgiris district of Tamil Nadu. Kotagiri and Udhagamandalam blocks were purposively selected because the percentage of the selected tribal population was high. Three villages from each block, viz., Pudu Kotagiri, Tiruchigedi and Kozhikkurai from Kotagiri block and Muthunadumund, Munjakalmund and Kodanad from Udhagamandalam block, were selected randomly for the study thus making a total of six villages (Fig.1). From each village, 60 respondents comprised three primitive tribal communities viz. Todas, Kotas and Irulas were selected, thus constituting 180 respondents as the sample size for the study using the multistage random sampling method. The ITKs in animal husbandry were pooled and documented through focused group discussions with the tribal inhabitants of the Nilgiris district. (Nisha and Arunachalam, 2018). Thus the validation of each ITK practice was calculated using the rationalization method with the help of scientists. The selected indigenous technologies that the tribal farmers were most concerned with were sent to 30 scientists belonging to both agriculture and horticulture disciplines for scrutiny. The rationality scale consisted of four-point continuum and the responses were scored 4 for Rational with Scientific evidence (RSC), 3 for Rational with Experience S (REX), 2 for Irrational with Scientific Evidence (IRSC) and 1 for Irrational with Experience (IREX). Thus, one ITK might get within the range of 4 to 1. Finally, the overall mean scores were calculated and the rationality was assessed.

To assess the adoption behavior of each of the ITK practices in animal husbandry, an individual farmer was asked to mention those practices in the checklist, which he/she was practicing during the last five years. The ITKs that were found to be adopted by less than 20%

and more than 80% of the tribal farmers were eliminated from the analysis.

RESULTS AND DISCUSSION

The rationalized ITKs and their rationality scores are indicated in Table 1.

It is essential to analyze the rationality of the selected ITK practices as it has been proposed to study the adoption and impact of those practices as perceived by the farmers for the study. In this study, 'rationality' refers to how the indigenous traditional knowledge practices can be explained or supported with scientific reasons or established based on long time experience. Likewise, 'irrationality' refers to how indigenous traditional knowledge practices cannot be explained or supported by scientific reasons or cannot be established based on long time experience (Nisha and Arunachalam, 2018).

It was observed from the table that a total of 23 indigenous practices were obtained with the validity values. The majority of the ITKs had a rational mean of above 2.5 which shows that the majority of the practices were adopted by the tribals. Moreover, the majority of the traditional practices belonged to the categories of 'Rational with Scientific Evidence' and 'Rational with Experience'.

From the above table, it could be inferred that all the ITKs in animal husbandry except a few ITKs, viz.,

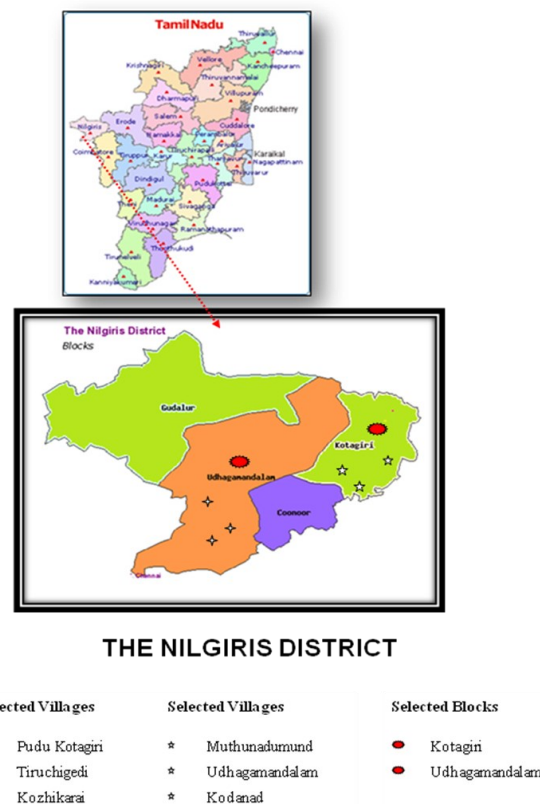


Fig. 1. Map showing the study area.

wheat flour or banana in a fermented form, were given to the anaemic buffaloes, Cucumber leaves mixed with salt in a fried form were fed to the buffaloes to create heat and to cure milk fever of buffaloes after calving and chalk powder was fed to the animal mixed with other feed that was found Irrational.

Indeed, ITKs with low mean scores should not be ignored because the tribal farmers in the Nilgiris district adopt these ITKs. ITK practices were further tested for their efficiency. Since the tribal respondents suffered from poor resource availability and improved costs of high tech veterinary practices paved the way for adapt-

Table 1. Rationality scores of ITK in Animal husbandry assigned by scientists (n=30)

S. No.	ITK practices	Rationality Mean Score	Rational (R) / Irrational (IR)
ANIMAL HUSBANDRY			
1	Wheat flour or Banana in a fermented form is fed to the weak Buffaloes to cure anaemia	2.20	IR
2	Pigeon droppings were given to the Buffaloes to hike the heat. The Pigeon droppings found to have estrogen which is required to hike heat in animals.	3.23	R
3	Cucumber leaves are mixed with salt in a fried form was fed to the Buffaloes to create heat.	2.17	IR
4	Applying Tobacco tar inside the nostrils to control leach infestation that occurs in Buffaloes.	3.37	R
5	Approximately 200g soil is collected from Termite burrows and made to boil in water. The suspension was given to Buffaloes. It is said to bring relief within 24 hours for the animals that suffered from udder swelling.	3.23	R
6	To cure milk fever of Buffaloes after calving, chalk powder was given to the animal with other feed.	2.23	IR
7	Rotten horn was cut away with a backstaw leaving 4 cm stub. Approximately 100 ml of Castor oil is applied on horn's cut surface. A mixture of 50 g of <i>Vernonia antheimintica</i> and 50 g urea is applied on it and tied tightly. It will cure after one week.	2.57	R
8	Turmeric is used to cure 'Bumblefoot' in chicken	3.47	R
9	Cinnamon is widely used as a form of oral medicine with a feed	3.57	R
10	Wheat straw is mixed with soaked oil cake in the ratio of 2:1 and fed to the animal.	2.77	R
11	Tulasi leaves (100 g) put in boiling water and essence is extracted when mixed with 1 teaspoon of honey and fed to the animal.	2.53	R
12	Neem leaves and Neem bark mixed with cucumber seeds (100 g) and given for 3 days in intestinal worms.	3.47	R
13	Ground fresh leaves of henna leaf (1 kg), add salt (100 g) and sour butter milk, mix it well and apply to the body of cattle	2.53	R
14	About ten leaves of betel and ten gram of pepper along with garlic were mixed together, diluted with boiled water and given to animal that suffers from indigestion or gastric issues.	3.10	R
15	Sheep droppings along with seeds soaked in Turmeric and soil taken from mounds of Termite were mixed and allowed to boil and allowed to cool. This was applied for healing of wounds and legs of Cattle.	3.03	R
16	FMD of cattle was prevented by providing the animals a mixture of Spider eggs and Ragi flour.	3.27	R
17	FMD in cattle can also be controlled by mixing 500 g turmeric powder and 500 g behada powder mixed with 2.5 litres water two times a day after allowing to boil.	3.43	R
18	Peach leaves extract are blended with fresh milk and applied thrice daily on the parts of the animals affected by FMD.	3.23	R
19	Babool bark and Jamun bark are mixed and made as paste is applied on the hooves of the animals affected by FMD three times to cure the disease.	3.53	R
20	Approximately 50 g of Drumstick seeds was powdered and blended with water and given to buffaloes to solve the urinary problems and stones will be removed.	3.60	R
21	Twigs are burnt and put inside the pit. Odd number of layers of Raddish and vegetables were put inside the pit and compressed. The pit was covered tightly. The vegetables will ferment for two and half weeks and made to dry. These were utilized to supplement the lean season.	3.37	R
22	Salt water was applied on the body parts of Buffaloes that suffered from tick infestation.	3.23	R
23	Coriander seeds along with water were fed to animals suffered from indigestion.	2.90	R

ing ITK practices in animal husbandry to modern animal husbandry practices. Nisha and Arunachalam (2018) Similar findings on the rationality mean scores for nine rational ITKs with relevance to animal husbandry in their study in Kotagiri and Gudalur blocks of the Nilgiris district were assessed with the help of the veterinary scientists of KVKs

Awareness and adoption of the ITKs in animal husbandry

From the above table, it could be inferred that turmeric was used to cure 'bumblefoot' in chickens. Bumblefoot, in poultry, is something that occurs more frequently in moist warm conditions. Turmeric, when mixed with the coconut oil mixture and added to their food, the wounds

Table 2. Awareness and adoption of the rationalized ITKs in animal husbandry (n=180)

S. No.	Rational Technologies	Awareness		Adoption	
		No	%	No	%
I Poultry					
1.	Turmeric is used to cure 'Bumblefoot' in chicken	174	96.67	166	92.22
2.	Cinnamon is widely used as a form of oral medicine with a feed	141	78.33	127	70.56
II Livestock					
1.	Feed the animal with 2:1 ratio of wheat straw and soaked oil cake	169	93.89	146	81.11
2.	Tulasi leaves (100 g) are allowed to boil in water and then the essence is blended with 1 teaspoon honey and given to the animal	125	69.44	107	59.44
3.	Neem bark and Neem leaves both are mixed with seeds of cucumber (100 g) are administered for three days in intestinal worms.	158	87.78	140	77.78
4.	Ground fresh leaves of henna leaf (1 kg), add salt (100 g) and sour butter milk, mix it well and apply to the body of cattle	125	69.44	112	62.22
5.	About ten leaves of betel and ten gram of pepper along with garlic were mixed together, diluted with boiled water and given to animal that suffers from indigestion or gastric issues.	172	95.56	155	86.11
6.	Ragi flour administration was believed to cure FMD of cattle.	133	73.89	119	66.11
7.	Approximately 50 g of Drumstick seeds was powdered and blended with water and provided to buffaloes to solve the urinary problems and remove the stones.	158	87.78	137	76.11
8.	Salt water to the affected parts of cattle will cure tick infestation.	144	80.00	134	74.44
9.	Ground coriander seeds with water are fed to animals for indigestion. Pigeon droppings were given to the Buffaloes to hike the heat.	161	89.44	140	77.78
10.	The Pigeon droppings found to have estrogen which is required to hike heat in animals.	132	73.33	119	66.11
11.	Applying Tobacco tar inside the nostrils to control leach infestation.	144	80.00	141	78.33
12.	Approximately 200 g soil is collected from Termite burrows and	156	86.67	147	81.67
13.	Rotten horn was cut away with a backstap leaving 4 cm stub. Approximately 100 ml of Castor oil is applied on horn's cut surface. A mixture of 50 g of <i>Vernonia antheimintica</i> and 50	170	94.44	164	91.11
14.	Wheat straw mix with soaked oil cake in the ratio of 2:1 and fed	158	87.78	148	82.22
15.	Sheep droppings along with seeds soaked in Turmeric and soil	144	80.00	137	76.11
16.	FMD of cattle was prevented by providing the animals a mixture of Spider eggs and Ragi flour.	173	96.11	169	93.89
17.	FMD in cattle can also be controlled by mixing 500 g turmeric	164	91.11	155	86.11
18.	Peach leaves extract are blended with fresh milk and applied	166	92.22	158	87.78
19.	Babool bark and Jamun bark are mixed and made as paste is applied on the hooves of the animals affected by FMD three	172	95.56	167	92.78
20.	Twigs are burnt and put inside the pit. Odd number of layers of Raddish and vegetables were put inside the pit and compressed. The pit was covered tightly. The vegetables will ferment for two and half weeks and made to dry. These were utilized to supple-	176	97.78	164	91.11

are believed to heal from the inside. Moreover, turmeric is well known for its antiseptic and anti-inflammatory properties. Similar indigenous practices using the combination of turmeric and black pepper were reported by Maneesha (2016) in Pingli village, Nissing block of Karnal district in Haryana, to reduce swelling and pain in affected udders of cattle.

Further, cinnamon is widely used as a form of oral medicine with feed to poultry. It is clearly found that cinnamon can be used as an effective alternative to antibiotics in the poultry industry, offering greater animal health, food safety, and economic aspects of poultry production. Besides, a compound in the spice cinnamon helps enhanced blood flow to the feet, wattles, and combs to ward off frostbite. It also helps in the prevention of coughing, infection and respiratory problems. These findings are in line with Rashid *et al.* (2020), who reported that the dietary supplementation of cinnamon in poultry feed as a natural feed additive has beneficial impacts on nutrient digestibility, immunity and particularly gut health to alleviate the impact of disease and heat distress by maintaining water and electrolytic balance and feed intake in a study conducted in Deori village, Tamar block of Ranchi (Jharkhand). Notably, the tribals cured the Foot and Mouth Disease (FMD) of cattle by providing the animals with a mixture of spider eggs and ragi flour. It was used as a prophylactic measure against FMD. The ragi flour served as an effective pain reliever in cattle having tongue lesions. Nisha and Arunachalam (2018) reported similar indigenous practice of applying honey and ragi flour on the lesions daily for three days to cure FMD in cattle in a study conducted in kozhikarai village, Kotagiri block of the Nilgiris. Babool bark and Jamun bark were mixed and made as paste was applied to the hooves of the animals affected by FMD three times to cure the disease. It showed good efficiency because the lesions healed rapidly without the development of maggot in FMD affected cattle and buffaloes. Mishra, (2020) reported similar indigenous practices in Baduan and Bareilly districts of Uttar Pradesh by applying leaf paste of Tobacco and Babool bark on the hooves of affected animals twice a day to cure FMD and its secondary infections.

Twigs were burnt and put inside the pit. An odd number of layers of radish and vegetables were placed inside the pit and compressed. The pit was covered tightly. The vegetables ferment for two and a half weeks and dry. These were utilized to supplement the lean season. The tribals adopted an ITK practice of preparing peach leaf extract blended with fresh milk and applied it thrice daily to the parts of the animals affected by FMD. Similar indigenous practice of blend-

ing peach leaf and tulsi leaf extract with fresh milk and administering orally to cure ulcers caused due to FMD in cattle was reported by Nisha and Arunachalam (2018) in Konavakarai village, Kotagiri block of the Nilgiris district.

Conclusion

The study results highlighted the important indigenous practices practiced by different proportions of tribal farmers for animal husbandry. The study concluded that proper identification, documentation and scientific analysis of the old age practices of tribal farmers would provide us with greater scope to think about eco-friendly practices in animal husbandry. Indigenous practices are thus excellent alternatives to costly chemicals in conjunction with other organic-based components. Rigorous efforts should be made to conserve these practices and ideas to pass to the future generation as well. A lack of proper and consistent efforts to document, validate, and lack of knowledge are major hindering factors for applying these valuable ITKs for field applications.

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Conflict of interest

The authors declare that they have no conflict of interest.

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