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Perceived Effectiveness of Indigenous Technical Knowledge (ITK) in Modern Agriculture in Haryana State

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ABSTRACT

India is a country of many aboriginal communities, with unique traditional knowledge. These traditional knowledge and technologies have played a significant role in the development of the communities. To find out the perception of the modern farmers about the value and effectiveness of the ITKs in today's agriculture a study was carried out in two districts Haryana state namely, Karnal and Sirsa by interviewing 60 farmers from each district. It was observed that the use of compost, neem leaves, biogas slurry and ash were ranked at top as they were perceived to be very effective and popular methods of ITK. The use of egg shells bone meal, crop rotation, use of alcohol, growing pest repelling plants, dhatura, chilli, cowpathy, use of barriers and traps, growing only native plants, talex of aak, tobacco, kerosene oil and garlic followed in series. Other ITKs like use of canola oil, amritpani, castor oil, engine oil, soap, karanj seeds, buttermilk, garlic, limonene and vinegar were not known by the farmers. This indicates that the modern farmers didn't much rely on the ITKs due to the availability of chemical fertilizers and pesticides in market and also because there is lack of awareness among them about certain ITKs thus, there is an urgent need of documenting and preserving the Indigenous Technical Knowledge, many of which are at the edge of extinction. There is also lack of proper links between the practice of indigenous and modern knowledge and technologies which can be a reason for the losing faith of modern farmers in their traditional knowledge.

Keywords: ITK, Mass media exposure, Change proneness, Pesticides, Fertilizers

INTRODUCTION

Indigenous Technology Knowledge (ITK) refers to the unique traditional local knowledge existing within and developed around the specific conditions by women and men indigenous to a particular geographic area (Grenier, 1998). It put greater emphasis on minimizing risks rather than maximizing profit. The traditional knowledge focuses on preventative measures rather than curative, they are dependent on long-range planning. But in today's modern world the indigenous technical knowledge is losing its importance and farmers have started relying more on new scientific techniques and chemical ways of farming. Though many of the modern farming techniques are based on the centuries old traditional ways, the modern farmers find the conventional method to be more easy and effective to carry out. It is important to study the perception as this will enable us to understand why the modern farmers abandoned the indigenous technical knowledge and depend highly on conventional methods of agriculture. Thus a study on the perception of farmers about the effectiveness of ITK in today's agriculture was conducted.

METHODOLOGY

The study was conducted in Haryana state which is geographically located at 30.73° N and 76.78° E. Two

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districts namely Karnal and Sirsa, were selected purposively as they consumed highest amount of agrochemicals in entire state. From each districts six villages were selected. From Karnal; Pabana Hassanpur (Gharaunda), Padhana (Nilokhedi), shyamgardh (Nilokhedi), Gangar (Nilokhedi), Chapra Kheda Rasoolpur (Karnal) and Phoosgardh (Karnal) were selected. From Sirsa district; Rupana Khurd (Chopta), Bakriyawali (Chopta), Panihari (Sirsa), Kheja Kheda (Sirsa), Shahpur begu (Sirsa) and Farwain khurd (Sirsa) were selected. From each village ten farmers were selected randomly. Thus a total number of twelve villages and one hundred twenty farmers were selected for the study. The change proneness was measured by using the scale developed by Moulik (1965). The responses were checked by reading the statement of change proneness. In order to access the extent of use of mass media by the respondent, different mass media were listed and respondents were asked to how often they used these mass media. The scoring pattern was adopted as of Bhatti (1985).

RESULTS AND DISCUSSION

Majority (53.57%) of farmers belonged to middle age group, 30 per cent educated up to matriculation and 83.57 per cent of farmers were engaged only in farming. Table 1 highlights that majority of the respondents in both the districts i.e. 92.50 per cent in Karnal and 88 per cent in Sirsa had high level of the change proneness. It shows that most of the respondents had very high tendency to adopt any new technology introduced to them. It is apparent that they may use every new fertilizers or pesticides introduced in market, ignoring the traditional methods which require lot of efforts and show late results. High proneness to change may be one of the reasons why farmers has abandoned the ITK and adopted modern agricultural practices.

Table 1: Proneness to change in farmers

Category	Karnal (%)	Sirsa (%)
Low (<6)	00.00	00.00
Medium (6 to 12)	07.50	12.00
High (>12)	92.50	88.00

Mass media plays an important role in the transfer of technology from technocrats to farmers. Particularly when a farmer is not able to contact an extension agent frequently, media comes to rescue to some extent by bringing the required information to the farmers. The more the exposure of farmers to mass media, more would be the gain in knowledge and information. But it has been observed that the TV, radio, newspaper and other sources mostly promote the modern technologies and not the traditional ones. Hence, it is clear that the farmers were more aware of the modern technologies rather than the old ones, thus adopting them. Under the present study although the mass media exposure was low, the farmers used TV, radio and newspaper as a source of information. It could be illustrated from Table 2 that in Karnal district, from all the mass media, TV was ranked 1st with weighted mean score of 1.1, followed by newspaper (0.65), radio (0.55), internet (0.08), magazine (0.07) and KVK (0.03), whereas, in Sirsa district, TV (0.95) ranked 1st followed by radio (0.67), newspaper (0.53) and KVK (0.28). It was observed that the farmers in Sirsa district did not use magazine, internet and farmers of both the districts never attended any workshop.

Conventional agriculture involves use of chemical fertilizers, pesticides, insecticides, herbicides, fungicides and various other types of agrochemicals. The deliberate use of these agrochemicals can adversely affect human and environmental health. Thus there is urgent need of choosing a method which is preventive rather than curative. Our ancestors had immense knowledge that was evolved within the local (grassroots) community and is being passed on from one generation to another,

Table 2: Mass media exposure of farmers

S. No.	Mass media exposure	Karnal (WMS)	Karnal (Rank)	Sirsa (WMS)	Sirsa (Rank)
1.	Radio	0.55	3	0.67	2
2.	TV	1.10	1	0.95	1
3.	Newspaper	0.65	2	0.53	3
4.	Workshop	0.00	7	0.00	5
5.	Magazine	0.07	5	0.00	5
6.	KVK	0.03	6	0.28	4
7.	Internet	0.08	4	0.00	5

encompasses not only local or indigenous knowledge, but also scientific and other knowledge gained from outsiders. The implementation of those knowledge and practices can prevent the environmental degradation leading to sustainable development. Thus it was felt important to know what the modern farmers perceive about indigenous technical knowledge. A list of fertilizers (Table 3) that were used in traditional farming system was prepared and the farmers were asked about their effectiveness and their responses were arranged rank-wise. In Karnal district, green manuring (Fageria, 2007), poultry litter/ manure (Boateng *et al*., 2006), organic manure, compost/ vermicompost (Adhikari, 2012), spent compost, bio-gas slurry and ash were ranked 1st as all the farmers mentioned them to be most effective fertilizers. Use of egg shells (Nikose, 2015) was ranked 2nd with weighted mean score (3.9) followed by bone meal (3.7) (Kivela *et al.*, 2015) and organic fertilizers (3.6). In Sirsa district, use of compost/ vermicompost, spent compost, bio-gas slurry and ash were ranked 1st with weighted mean score of 4. Green manuring, poultry litter/manure, organic manure and egg shells were ranked 2nd with weighted mean score of 3.8. Organic fertilizers were ranked 3rd and bone meal was ranked 4th with weighted mean score of 3.6 and 3.4, respectively.

Among various pesticides used in ITK system, use of neem leaves (Lokanadhan *et al.,* 2012), was ranked 1st with weighted mean score as 4 followed by alcohol (Aristizabal *et al*., 2016) and growing pest repelling plants as 2nd with weighted mean score as 3.1. Dhatura (2.8) (Kuganathan *et al*., 2007) was ranked 3rd followed by cowpathy (Khan *et al., 2015)* & chilli (2.6) (Varghese and Mathew, 2012) and biological control (2.3). Using barriers and traps, growing only native plants, trees and grasses and using latex of *Aak* plant were ranked 6th. Use of tobacco (2.1) was ranked 7th, kerosene oil (1.9) was ranked 8th, physical control & use of garlic (1.7) was ranked 9th and use of butter milk (1.5) was ranked 10th. Use of hormones/ pheromones was ranked 11th. Use of limonene, castor oil, canola oil, engine oil, soap, karanj and apple cider/vinegar was felt non-effective by all the farmers. In Sirsa district, use of neem leaves ranked 1st with weighted mean score as 4 followed by growing pest repelling plants (3.1), alcohol & dhatura (2.8), cowpathy & chilli (2.6). Use of barriers and traps, growing only native plants, trees and grasses and latex of *Aak* plant were ranked 5th with weighted mean score of 2.2. Biological control, tobacco and kerosene oil were ranked 6th with weighted mean score of 1.9. Use of garlic was ranked 7th followed by physical control and use of butter milk with weighted mean scores of 1.7, 1.6 and 1.4. Hormones/pheromones with weighted mean (1.2) was ranked 10th followed by using soap. Use of limonene, castor oil, canola oil, engine oil, karanj and apple cider/ vinegar was felt non-effective by all the farmers (Table 4).

Table 3: Perception about the effectiveness of various fertilizers used in ITK system

S.No.	Fertilizers	Karnal		Sirsa		Extension functionaries	
		WMS	Rank	WMS	Rank	WMS	Rank
1.	Green manuring	4.00	1	3.80	2	4.00	1
2.	Poultry litter/ manure	4.00	1	3.80	2	4.00	1
3.	Organic manure	4.00	1	3.80	2	4.00	1
4.	Compost/vermicompost	4.00	1	4.00	1	4.00	1
5.	Spent compost	4.00	1	4.00	1	4.00	1
6.	Bio-gas slurry	4.00	1	4.00	1	4.00	1
7.	Ash	4.00	1	4.00	1	3.70	2
8.	Egg shell	3.90	2	3.80	2	1.70	4
9.	Bone meal	3.70	3	3.40	4	1.90	3
10.	Organic fertilizers	3.60	4	3.60	3	4.00	1

Table 4: Perception about effectiveness of pesticides used in ITK system

S.No.	Pesticides	Karnal		Sirsa	
		WMS	Rank	WMS	Rank
1	Neem leaves	4.00	1	4.00	1
2	Alcohol	3.10	2	2.80	3
3	Growing pest repelling plants	3.10	2	3.10	2
4	Dhatura	2.80	3	2.80	3
5	Cowpathy	2.60	4	2.60	4
6	Chilly	2.60	4	2.60	4
7	Biological control	2.30	5	1.90	6
8	Barriers and traps	2.20	6	2.20	5
9	Growing only native plants, trees and grasses	2.20	6	2.20	5
10	Latex of *Aak* plant (*Calotripis gigantea*)	2.20	6	2.20	5
11	Tobacco	2.10	7	1.90	6
12	Kerosene oil	1.90	8	1.90	6
13	Physical control	1.70	9	1.60	8
14	Garlic	1.70	9	1.70	7
15	Butter milk	1.50	10	1.40	9
16	Hormones/ pheromones	1.20	11	1.20	10
17	Limonene	1.00	13	1.00	12
18	Castor oil	1.00	13	1.00	12
19	Canola oil	1.00	13	1.00	12
20	Engine oil	1.00	13	1.00	12
21	Soap	1.00	13	1.10	11
22	(*Pongamia Pinnata*) Karanj	1.00	13	1.00	12
23	Apple cider/ vinegar	1.00	13	1.00	12

CONCLUSION

It can be concluded that farmers in both the districts had high proneness to change but had low level of mass media exposure. Perception about effectiveness of various fertilizers used in ITK system revealed that green manuring, poultry litter/manure, organic manure, compost/ vermicompost, spent compost, bio-gas slurry and ash were observed to be most effective. Pesticides used in ITK system like neem leaves, pest repelling plants, alcohol, dhatura, cowpathy & chilli were considered to be most effective. The farmers were not much aware about the indigenous technical knowledge and perceived to be not very effective method of practicing agriculture. Thus there is need of awareness creation and educating farmers that our traditional knowledge system has great potential of practicing agriculture without disturbing the ecological balance. There is an instant need of documenting and preserving the Indigenous Technical Knowledge, many of which are at the edge of extinction. There is also lack of proper links between the practice of indigenous and modern knowledge and technologies. By building a bridge between modern and traditional knowledge better agriculture can be performed along with clean, green and safe environment to live and flourish in.

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