International J. of Exten. Edu. Vol. 10: 115-119, 2014 ISSN : 2319-7188

Analytical Study on Occupational Health Hazards among Tribal Farm Women in Operations of Different Agricultural Activities

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ABSTRACT

The entry of women into the workforce as paid labour has been a gradual process extending over several centuries with a substantive increase following industrialization and World War -II. Tribal women constitute half of the work force among tribals in India. Tribal women face problems and challenges in getting a sustainable livelihood and a decent life due to environment degradation and the interference of outsiders. No field operation is beyond the reach of women. The study was conducted purposively in Betul district of Madhya Pradesh. The sample size for the study was 120 tribal farm women. Most of the tribal farm women (44.17%) were frequently occurring in health hazards in operation of agricultural activities. Out of fourteen independent variables eleven variables were found having negative and significant relationship with health hazards and only age was found to have positive and significant relationship with health hazards while family background and size of family were not having significant relationship with health hazards. Majority (72.00%) tribal farm women suggested that medical facilities should be available at village level.

Key words : *Health hazards, Agricultural activities, Tribal farm women, Multivariate effect*

Farm women are the key of Indian agriculture. Global entry of women into economic employment, particularly focusing on agriculture, and the occupational hazards and related adverse health outcomes that they encounter in agriculture. Growing food has been an interminable saga of her life. Like other rural women, tribal farmwomen also play an important role in agriculture. No field operation is beyond the reach of women. They are at their best in agriculture and animal husbandry. Besides this they are the manager of the household activities. They take important decisions in the home and outside the home. The current population of India 1,220,200,000 and the tribal comprises 8.14 per cent of total population of country. Madhya Pradesh is one of the largest states of India inhibited by the bulk of tribal population. The current population of Madhya Pradesh is 72,597,565 (Census, 2011) and the tribes of Madhya Pradesh population constitute over 20.3 per cent of the state population and are mainly concentrated in southern part of state. The lifestyle culture and customs of this community mostly resemble to the Hindu religion though they still strongly believe in orthodox traditions. Gondis the best known tribe and forms the largest group in Madhya Pradesh. They mainly in habitat area on both side of Narmada in the Mandla, Hoshangabad, Khandwa, Chhindwara, Betul and Seoni regions and the hilly terrains of the Vindhya and the Satpura region.

Tribal women constitute half of the work force among tribals in India. Tribal women face problems and challenges in getting a sustainable livelihood and a decent life due to environment degradation and the interference of outsiders. Tribal women are discriminated, though they make enormous contribution to the agriculture and allied sectors. They have very little access to the knowledge and skills of modern farm technologies and related resources. The tribal women work for about 12 to 15 hours per day involving in agriculture and allied activities. The tribal women collect minor forest produce like Mahua, Achaar, Amla, Soapnuts, Shikakai, Tendu patta, Firewood, Bamboo, Gumkaraya (Kovela gum), and sell these products in the nearby *shandy* and exchange the produce for their daily requirements through barter system.

When we refer to hazards in relation to occupational safety and health the most commonly used definition is 'A Hazard is a potential source of harm or adverse health effect on a person or persons'. The terms Hazard and Risk are often used interchangeably but this simple example explains the difference between the two. Agriculture is one of the most hazardous sectors in both the developing and industrialized countries. According to ILO estimates for 1997, out of a total of 330,000 fatal workplace accidents worldwide, there were some 170,000 casualties among agricultural workers. The increasing use of machinery and of pesticides and other agrochemicals has aggravated the risks. In several countries, the fatal accident rate in agriculture is double the average for all other industries. Machinery such as tractors and harvesters cause the highest frequency and fatality rates of injury. Exposure to pesticides and other agrochemicals constitute major occupational hazards which may result in poisoning and death and, in certain cases, work-related cancer and reproductive impairments. Engberg (1993) and Van der Hoek & Konradsen (2005).

One of the difficulties in dealing with agriculture is that it is a very complex and heterogeneous sector. Agriculture covers not only farming but also many

other associated activities such as crop processing and packaging, irrigation, pest management, grain storage, animal husbandry, construction and domestic tasks (carrying water or fuel-wood, etc.). As agricultural work is carried out in the countryside, it is subject to the health hazards of a rural environment as well as those inherent in the specific work processes involved. Most agricultural work is carried out in the open air and consequently agricultural workers are dependent on weather changes to perform their tasks. This factor not only undermines the efficiency of the operations, but also influences working conditions, making them difficult and dangerous (e.g. a rainstorm while harvesting, gusts of wind when pesticides are being applied, etc. In its strict sense, a hazard is simply something which could potentially be harmful to a person's life or well-being. However, hazards are sometimes classified by the combination of the likelihood of the hazard turning into a (health) effect and by the seriousness of that effect. Therefore, the study was conducted with the following objectives.

- To study the profile of tribal farm women.
- To determine the extent of health hazards among the tribal farm women in operation different agricultural activities.
- To analyze the relationship between health hazards among the tribal farm women in operation different agricultural activities and their profile.
- To seek the suggestions for reducing the health hazards among the tribal farm women in operation different agricultural activities.

METHDOLOGY

In order to fulfill the objectives, the study was conducted in Betul district of (M.P). There are ten blocks in the district namely –Betul, Shahapur, Ghora Dongri, Chicholi, Bhimpur, Bhainsdehi, Athnar, Amla, Multai and Prabhat Pattan. Out of these, Shahpur and Bhimpur block were selected purposively due to maximum population of tribals. From each selected block 5 villages were selected purposively due to maximum population of tribal farm women. After the selection of the villages, a village wise list of tribal farm women was prepared and 12 farm women from each village were randomly selected. Thus, the total sample was consisted of 120 tribal farm women. The data were collected through a well structured and pre-tested interview schedule. The statistical tests and procedures were used for analyzing the data, included percentage, mean, Karl Pearson's coefficient of correlation and multiple regressions.

RESULTS AND DISCUSSION

Profile of tribal farm women

It was observed from the Table 1 that higher percentage (43.33%) respondents were from middle aged. maximum (36.66%) of the tribal farm women found in Illiterate to functionary literate category. Majority of the beneficiary respondents (69.33%) had moderate family background. Maximum of the respondents (37.50%) had large size of family (above 8 members). Majority of respondents 51.66 percent had medium size of land holding. Most of the respondents (38.33%) belonged to low category of social participation. Majority of the tribal farm women (58.33%) had low annual income. A higher percentage of the respondents (46.66%) had medium irrigation availability followed by 27.50 percent in low category

Table-1
Profile of the tribal farm women
(N=120)

S. No.	Attributes	Categories	Frequency	Mean	S.D.
1.	**Age**	Young	45 (37.50)	45	37.50
		Middle	52 (43.33)		
		Old	23 (19.16)		
2.	**Education**	Illiterate	44 (36.66)	1.03	1.05
		Primary school	43 (35.83)		
		Middle school	22 (18.33)		
		High school	06 (05.00)		
		Above high school	05 (04.16)		
3.	**Family background**	Poor	36 (30.00)	2.05	0.76
		Moderate	56 (46.60)		
		Good	28 (23.40)		
4.	**Size of family**	Small	38 (31.66)	2.03	0.84
		Medium	37 (30.83)		
		Large	45 (37.50)		
5.	**Size of land holding**	Small	31 (25.83)	1.40	1.10
		Medium	62 (51.66)		
		Large	27 (22.50)		
6.	**Social participation**	Low	46 (38.33)	1.39	1.25
		Medium	41 (34.16)		
		High	33 (27.50)		
7.	**Annual Income**	Low	70 (58.33)	1.55	0.69
		Medium	40 (33.33)		
		High	10 (08.33)		
8.	**Irrigation availability**	Low	33 (27.50)	1.98	0.73
		Medium	56 (46.66)		
		High	31 (25.83)		
9.	**Credit availability**	Low	26 (21.66)	3.81	2.56
		Medium	75 (62.50)		
		High	19 (15.83)		
10.	**Innovativeness**	Low	31 (25.83)	2.80	1.12
		Medium	68 (56.66)		
		High	21 (17.50)		
11.	**Agricultural belief**	Low	31 (25.83)	1.40	1.10
		Medium	62 (51.66)		
		High	27 (22.50)		
12.	**Source of information**	Low	32 (26.66)	6.78	3.77
		Medium	66 (55.00)		
		High	22 (18.33)		
13.	**Extension contact**	Low	15 (12.50)	4.18	2.25
		Medium	80 (66.43)		
		High	25 (20.83)		
14.	**Knowledge**	Low	12 (10.00)	7.60	2.44
		Medium	97 (80.83)		
		High	11 (09.16)		

Figures in parentheses are percentages

of irrigation availability. Out of the total 120 respondents 62.50 per cent respondents were in the medium category of credit availability. Majority of respondents 56.66 percent had medium innovativeness. Majority of the tribal farm women (51.66%) had medium agricultural belief. Higher percentage of tribal farm women 55.00 per cent were having medium sources of information. Majority 66.43 percent of tribal farm women were having medium contact with extension personnel. Majority 80.83 per cent of tribal farm women were having medium level of knowledge about health hazards in operations of different agricultural activities.

Opinion of the respondents regarding occurrence of health hazards

In order to explore the extent of health hazards, opinion of the respondents regarding their occurrence in different operations has been taken in terms of frequently, sometimes and rarely. Results clearly indicated in Table 2 that, majority of the farmers opined that skin irritation and allergies were frequently occurring during seed treatment (50.83%), manual threshing and cleaning grains (48.33%) loading and unloading of straw (51.67%), poisoning (53.33%) mostly occurred during pesticide application; cuts, wounds and injuries occurred frequently during weeding & harvesting (57.50%), threshing (26.67%) and chaffing (23.33%). The fourth health problem identified were chest congestion and breathing problem which occurred frequently during threshing, winnowing & cleaning grains (54.17%).

Majority of the respondents confirmed frequent occurrence of swollen and sore hands and feet during irrigation (25.83%), digging, weeding & harvesting (52.50%), operations. Body ache was another common problem found to occur frequently after performing hard operations like digging, sowing & weeding (51.17%), harvesting& post harvesting

Table 2
Farm women's opinion about occurrence of health hazards in different operations of agricultural activities

S. N.	Type of Health hazards	Operations	Extent of occurrence		
			Frequently Freq. / %	**Sometimes** Freq. / %	**Rarely** Freq. / %
1	**Skin irritation & allergy**	Seed treatment	61 (50.83)	34 (28.33)	25 (20.84)
		Threshing & Cleaning grains	58 (48.33)	30 (25.00)	32 (26.67)
		Loading unloading of straw	62 (51.67)	28 (23.33)	30 (25.00)
2	**Poisoning**	Pesticide application.	64 (53.33)	36 (30.00)	20 (16.67)
		Storage	27 (22.50)	72 (60.00)	21 (17.50)
3	**Cut, wounds& injuries**	Land preparation	30 (25.00)	64 (53.33)	26 (21.67)
		Weeding & harvesting	69 (57.50)	27 (22.50)	24 (20.00)
		Threshing (mech.)	32 (26.67)	65 (54.17)	23 (19.17)
		Chaffing (manual)	28 (23.33)	59 (49.17)	33 (27.50)
4	**Congestion & breathing**	Threshing & winnowing cleaning of grains	65 (54.17)	28 (23.33)	27 (22.50)
5	**Swollen & sore hands & feets**	Irrigation	31 (25.83)	63 (52.50)	26 (21.67)
		Digging, weeding & harvesting	63 (52.50)	34 (28.33)	23 (19.17)
6	**Body ache & physical tiredness**	Household work	31 (25.83)	58 (48.33)	31 (25.83)
		Digging, sowing, weeding	62 (51.17)	28 (23.33)	30 (25.00)
		Harvesting & post harvest work	63 (52.50)	37 (30.83)	20 (16.67)
		cleaning shed & making dung	71 (59.17)	28 (23.33)	21 (17.50)
		Marketing of milk & milk product	65 (54.17)	29 (24.17)	26 (21.67)
7	**Eye irritation**	Cooking	70 (58.33)	27 (22.50)	23 (19.17)
		Harvesting	32 (26.67)	64 (53.33)	24 (20.00)
		Threshing & winnowing	59 (49.17)	26 (21.67)	35 (29.17)
8	**Biting**	Weeding, irrigation, & harvesting	60 (50.00)	35 (29.17)	25 (20.83)

Freq. - Frequency, % - Percentage

work (52.50%), cleaning shed & making dung cake (59.17%) and marketing of milk & Milk product (54.17%). eye irritation was found to be frequently occurring due to the smoke of traditional chullha during cooking times (58.33%). The last and highly prevalent problem was identified as bite of insects and poisonous animals frequently in various cases of weeding, irrigation & harvesting (50.00%). The findings of Pandey et al (2010) and Arthur et al (2004) were in the same line of the present finding.

Overall occurrence about health hazards in operation of agricultural activities among the tribal farm women

In order to explore Overall occurrence of health hazards, opinion of the respondents regarding their occurrence in different operations has been taken in terms of frequently, sometimes and rarely. Results clearly indicated in Table 3 most of the tribal farm

Table 3
Overall occurrence about Health hazards in operation of agricultural activities among the tribal farm women

S.N.	Category	No. of respondents	Percentage
1	Frequently	53	44.17
2	Sometimes	41	34.17
3	Rarely	26	21.66
	Total	**120**	**100.00**

women (44.17%) were frequently occured the health hazards in operation of agricultural activities and 34.17 per cent of the respondents were in sometimes occurred in health hazards in operation of agricultural activities followed by 21.66 per cent of the respondents were rarely observed the health hazards. Similar findings were also reported by Cordes and Foster(1988) and Aktar et al (2009).

Correlation analysis of independent variables with health hazards in operations of different agricultural activities

To determine the relationship of selected independent variables with health hazards in operations of different agricultural activities, the correlation analysis was worked out and results are present Table 4.

The results reveal that the variables age (X_1) was found positively and significant correlated with health hazards in operations of different agricultural activities at one per cent level of significant, while family background (X_2) and family size (X_4) were found non-significant relationship with health hazards in operations of different agricultural activities. However, the education (X_3) was found significant and negatively correlated with the health hazards in operations of different agricultural activities at one per cent level of significance and rest of ten independent

Table 4
Coefficient of correlation between independent variables and health hazards

SN	Independent variables	'r' value	't' value
1	X_1 Age	0.361**	4.21
2	X_2 Family background	-0.108^{NS}	-1.18
3	X_3 Education	-0.741**	-11.99
4	X_4 Size of family	-0.064^{NS}	-0.069
5	X_5 Social participation	-0.673**	-9.88
6	X_6 Size of land holding	-0.370**	-4.33
7	X_7 Annual income	-0.507**	-6.39
8	X_8 Irrigation availability	-0.636**	-8.98
9	X_9 Credit availability	-0.542**	-7.01
10	X_{10} Innovativeness	-0.573**	-7.58
11	X_{11} Agricultural belief	-0.647**	-9.22
12	X_{12} Source of information	-0.730**	-11.60
13	X_{13} Extension contact	-0.741**	-11.99
14	X_{14} Knowledge	-0.839**	-16.75

***Significant at 0.01 per cent level, NS-Non significant*

variables were also negatively significant correlation with health hazards in operations of different agricultural activities at one per cent level of significance.

This finding clearly indicates that most of the selected independent variables had significant relationship with health hazards in operations of different agricultural activities.

Multivariate effect of independent variables on health hazards

A backward multiple regression analysis was worked-out to find the best set of the independent variables of health hazards in operations of different agricultural activities, from this analysis it was found that fourteen models, in which the first model contained all the 14 independent variables second had 13, third had 12 and so on till the remaining most significant variables in the model. This was the sorting process of variables in the model. This sorting of variables from each model were done on the basis of their predication ability to health hazards in operations of different agricultural activities, from each model one least important variable was deleted. The entire fourteen models are explained in the Table 5 Model – I consisted all the 14 independent variables which had 0.8123 R2 value with 5 non significant and 9 significant independent variables.

The second model had 13 variables, this set of independent variables had 0.8062 R2 value at 106 degree of freedom similarly the succeeding IIIrd to XIVth model had 0.8057, 0.8054, 0.8053, 0.8052, 0.8040, 0.8014, 0.7993, 0.7500, 0.6935, 0.6704, 0.5565, and 0.5486 R2 value respectively. The result confirms with the findings of Badodiya et al. (2013)

Table-5

Multiple effects of independent variables on health hazards

Model	Variable included in the model	R^2 value	"F" value
I	$X_1X_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}X_{12}X_{13}X_{14}$	0.8123	32.4712**
II	$X_1X_2X_3X_4X_5\ X_7X_8X_9X_{10}X_{11}\ X_{12}X_{13}X_{14}$	0.8062	33.9283**
III	$X_1X_2X_3X_4X_5\ X_8X_9X_{10}X_{11}\ X_{12}X_{13}X_{14}$	0.8057	36.9849**
IV	$X_1X_2X_3X_4X_5X_8X_9X_{10}X_{11}\ X_{12}X_{14}$	0.8054	40.6498**
V	$X_1\ X_2X_3\ X_4X_5X_8\ X_9\ X_{11}X_{12}X_{14}$	0.8053	45.1283**
VI	$X_1\ X_2X_3\ X_4X_5X_8\ X_9X_{12}X_{14}$	0.8052	50.5731**
VII	$X_1\ X_2X_3X_5X_8\ X_9X_{12}X_{14}$	0.8040	56.9206**
VIII	$X_1\ X_2X_3X_5X_8X_{12}X_{14}$	0.8014	64.6010**
IX	$X_1X_3X_5X_8X_{12}X_{14}$	0.7993	75.0489**
X	$X_1X_3X_5X_8X_{12}$	0.7500	68.4174**
XI	$X_1X_3X_5X_8$	0.6935	65.0572**
XII	$X_1X_3X_8$	0.6704	78.6790**
XIII	X_1X_3	0.5565	73.4148**
XIV	X_3	0.5486	143.4257**

Based on step down multiple regression analysis

Suggestions for reducing the health hazards among the tribal farm women in operation of different agricultural activities

The data shows in Table 6, majority 74.00 percent of the respondents suggested that whole year guaranteed employment should be provided by Government followed by 72.00 per cent tribal farm women needed medical facilities for better treatment of health hazards at village level. Out of 120 tribal farm women, 66.66 per cents of respondents suggested that financial facilities should be timely available. Majority (54.16%) of tribal farm women needed demonstration and training on improved agriculture technologies, followed by half of the tribal women suggested awareness camp should be organized on health hazards in operation of different agricultural activities and only 27.50 per cent of tribal farm women suggested to provide the literature related to health hazards and their solution should be available in villages.

Table 6

Strategies for reducing the health hazards among the tribal farm women in operation of different agricultural activities

S. N.	Strategies for reducing the health hazards	Percentage (%)	Rank
1.	Financial facilities should be available on time	66.66	IIIrd
2.	Information related to health hazards and their solution should be available in villages	27.50	VIth
3.	Awareness camp should be organized on health hazards	50.00	Vth
4.	Medical facilities should be available at village level	72.00	IInd
5.	Demonstration and training should be organized on improved agricultural technologies	54.16	IVth
6	Whole year guaranteed employment should be provided by Government	74.00	Ist

CONCLUSION

This study concluded that the various health hazards involved in different operations were viz., skin irritation and allergies, poisoning, cuts, wounds, injuries, congestion, breathing problems, swollen and sore hands and feet, sun stroke, body ache, physical tiredness, eye irritation and bites of various poisonous animals and insects. Most of the operations having many of these health hazards were found to be mainly performed by women farmers. Most of the tribal farm women (44.17%) were frequently occurred the health hazards in operation of agricultural activities. Out of fourteen independent variables eleven variables were found negative significant relationship with health hazards and only age was found positive significant relationship with health hazards while family background and size of family were not significant corelationship with health hazards.

Paper received on : August 19, 2014
Accepted on : November 24, 2014

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