Health Hazards among Tribal Farm Women in Agricultural Operations

S.K. Badodiya[1], Anamika Tiwari[2] and O.P. Daipuria[3]

1. Asstt. Prof., 2. P.G. Student 3. Professor, College of Agriculture, RVSKVV, Gwalior (M.P.)

Corresponding author e-mail: sbadodiya@gmail.com

ABSTRACT

Farmwomen play very important role in home as housewives in managing the domestic affairs and they work as co-partners in the farming profession. No field operation is beyond the reach of women. 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. 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 negative and significant relationship with health hazards and only age was found positive and significant relationship with health hazards while family background and size of family were not 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;*

Farmwomen are the backbone of Indian agriculture. Growing food has been an interminable saga of her life. Like other rural women, tribal farmwomen also play an important role in agriculture. Farmwomen play vital role within home as housewives in managing the domestic affairs and they work as co-partners in the farming profession. No field operation is beyond the reach of women. They are at them best in agriculture and animal husbandry. Besides this they are the manager to the household activities. They take important decisions in the home and outside the home. Scientific achievements and modernization are yet to make an impact on them.

The current population of India 1,220,200,000 and the tribal comprises 8.14% 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 constipate over 20.3% of the state Population and are mainly concentrated in southern part of state. The lifestyle culture and customs of this community mostly resemble the Hindu religion though they still strongly believe in orthodox traditions.

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. It is ranked as one of the three most hazardous industries together with mining and construction. 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 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.

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 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 objects:

i. To study the extent of health hazards among the tribal farm women in different agricultural activities.
ii. To explore the relationship between extent of health hazards among the tribal farm women in operation different agricultural activities and their selected attributes.
iii. To suggest the strategies for reducing the health hazards among the tribal farm women in operation different agricultural activities.

METHODOLOGY

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

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 that (Table 1) majority of the farmers opined that skin irritation and allergies were frequenty occurring during seed treatment (50.83%), manual threshing and cleaning grains (48..33%) and 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%) operations.

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 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

Table 1 : Farm women's opinion about occurrence of health hazards in different operationsn of agricultural activities

Types of Health Hazards and Operations	Extent of Occurrence		
	Frequent	Some-times	Rarely
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)
Poisoning			
Pesticide Application.	64(53.33)	36(30.00)	20(16.67)
Storage	27(22.50)	72(60.00)	21(17.50)
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)
Congestion & Breathing			
Threshing & Winnowing	65(54.17)	28(23.33)	27(22.50)
Cleaning of grains			
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)
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)
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)
Biting			
Weeding, irrigation, & harvesting	60(50.00)	35(29.17)	25(20.83)

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 that (Table 2) most of the tribal farm women (44.17%) were frequently occurring in 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 in rarely. Similar findings were also reported by *Cordes and Foster(1988)* and *Aktar et al (2009).*

Table 2: Overall occurrence about Health Hazards in operation of agricultural activities among the tribal farm women

Category	No.	%
Frequently	53	44.17
Sometimes	41	34.17
Rarely	26	21.66
Total	120	100

Correlation analysis of independent variables 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 3.

The results reveals 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) where 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 variables were also negatively and significant correlation with health hazards in operations of different agricultural activities at one per cent level of significance.

Table 3: Coefficient of correlation between independent variables and health hazards-

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

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

Multiple regression analysis of independent variables health hazards : A multiple regression analysis was done to find out the extent of the effect of independent variables on health hazards in operations of different agricultural activities.

The perusal of data in Table 5 shows that the "b" value of each independent variables along with their "f" values of significance related with the health hazards in operations of different agricultural activities as shown in the Table 4, reveals that the Age (X_1), family background (X_2), Education (X_3), Social participation (X_5), irrigation availability (X_8), Credit availability (X_9), source of information (X_{12}), and knowledge (X_{14}) had significant contribution to the health hazards in operations of different agricultural activities at the one per cent level of significance. While family size (X_4) had significant contribution to the health hazards in operations of different agricultural activities at the five per cent level of significance.

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

Table 4: Multiple regression analysis of independent variables with health hazards

Independent variables	"b" Value	"f" Value
X_1 Age	1.154	72.86**
X_2 Family background	0.587	8.53**
X_3 Education	-2.494	230.53**
X_4 Size of family	-1.150	5.39*
X_5 Social participation	-1.847	37.62**
X_6 size of land holding	2.394	0.01^{NS}
X_7 annual income	-0.804	0.67^{NS}
X_8 irrigation availability	-2.925	40.15**
X_9 Credit availability	-1.282	8.05**
X_{10} Innovativeness	-0.261	2.59^{NS}
X_{11} Agricultural belief	-0.261	3.70^{NS}
X_{12} source of information	-3.646	21.62**
X_{13} Extension contact	-1.016	1.47^{NS}
X_{14} Knowledge	-9.855	21.00**

** Significant at 1 % level *Significant at 5% level
NS Non-significant $R^2 = 0.812$
"F" calculated = 32.471 ** (1,120-14-1 = 105 d. f.)

Table 5: Multiple effects of independent variables on health hazards-

Model	Variable included in 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	$X_1X_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}X_{12}X_{13}$	0.8062	33.9283**
III	$X_1X_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}X_{12}$	0.8057	36.9849**
IV	$X_1X_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}$	0.8054	40.6498**
V	$X_1X_2X_3X_4X_5X_6X_7X_8X_9X_{10}$	0.8053	45.1283**
VI	$X_1X_2X_3X_4X_5X_6X_7X_8X_9$	0.8052	50.5731**
VII	$X_1X_2X_3X_4X_5X_6X_7X_8$	0.8040	56.9206**
VIII	$X_1X_2X_3X_4X_5X_6X_7$	0.8014	64.6010**
IX	$X_1X_2X_3X_4X_5X_6$	0.7993	75.0489**
X	$X_1X_2X_3X_4X_5$	0.7500	68.4174**
XI	$X_1X_2X_3X_4$	0.6935	65.0572**
XII	$X_1X_2X_3$	0.6704	78.6790**
XIII	X_1X_2	0.5565	73.4148**
XIV	X_1	0.5486	143.4257**

(Based on step down multiple regression analysis)

significant variables in the model. This was the shorting process of variables in the model. This shorting 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 R^2 value with 5 non significant and 9 significant independent variables.

The second model had 13 variables, this set of independent variables had 0.8062 R^2 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 R^2 value respectively.

Strategies for reducing the health hazards among the tribal farm women in operation of different agricultural activities : The data shows in Table 6, majority (72.00%) of tribal farm women needed medical facilities for better treatment of health hazards at village level. Out of 120 tribal farm women, 66.66 per cent respondents suggested that credit should be timely available. Majority (54.16%) tribal farm women needed demonstration and training on improved agriculture technologies followed half of the total 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 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

Strategies for Reducing the health hazards	%	Rank
Credit should be available on time	66.66%	II
Literature related to health hazards and their solution should be available in villages	27.50%	V
Awareness came should be organized on health hazards	50.00%	IV
Medical facilities should be available at village level	72.00%	I
Demonstration and training should be organized on improved agricultural technologies	54.16%	III

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 occurring in health hazards in operation of agricultural activities. Out of fourteen independent variables eleven variables were found negative and significant relationship with health hazards and only age was found positive and significant relationship with health hazards while family background and size of family were not significant relationship with health hazards.

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