



# ASSESSING FARMERS RESPONSES ON THE EFFECTS OF AGROCHEMICALS SUBSTANCES IN KASTLA KASMABAD VILLAGE UTTAR PRADESH, INDIA

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## *Abstract*

**T**he study was conducted to assess the farmer's Responses on the effects of agro chemicals to the health and environment among farmers of Kastla Kasmabad village of Hapur District. Data were collected from one hundred (100) farmers selected randomly in the study area using structured questionnaire and interview. Questions were asked based on the way they handle agro chemicals, reading the labels contain on the pesticides containers, where do they get the knowledge of the application and whether they have ever got illness immediately or shortly after application of agro chemicals. The data obtained were analyzed separately using descriptive statistic and hypothesis are tested using chi-square method of data analysis at 0.05 level of significance and degree of freedom one (1) The result obtained showed that 89% of the respondents were males and were in the age range of 18- more than 50 years with only 11% being females. Eighty two percent (82%) of the farmers were partially educated between primary school, secondary and tertiary level and about 59% of the respondents attended between primary school to class eight (8). More than 70% of the respondents are full time farmers meaning that farming is their primary occupation. All the hypothesis tested were found to be accepted which indicated that farmers do not have adequate knowledge with regard to safe handling and application of agro chemicals, farmers are not getting enough information from extension workers, farmers are applying agrochemicals anyhow in respective of its type and quantity, and there are adverse impacts to the health and environment associated with the use of agro chemicals. It could therefore, recommended that government should



*train enough extension workers and distribute them to local areas to enable farmers have access to them, farmers should be encourage to join farmers association so that they can benefit more from the government and workshops should be organized to local farmers on safe handling, use and application of agro chemicals respectively.*

**Keywords:** Agro chemicals, Farmers, Health, and Environment.

## **INTRODUCTION**

Agro Chemicals mishandling constitute one of the most several farm operation hazards confronting farmers their produce and the environmental. Wrong application time and dosage, mishandling ignorance of safety precautions and the use of adulterated or expired agro chemicals in circulation have been shown to impact both aquatic and terrestrial eco system and degrade the quality of ground water destined for human consumption.

Ideally, a pesticide must be lethal to targeted pest, but not to non-target species including man. (David, 1999). Unfortunately. This is not the case, so the controversy of use and abuse of agro chemicals has surfaced. The rampant use of these chemicals in agriculture has played a lot of havock to human and other life forms in the environmental. Long term exposure to agro chemicals can increase the risk of development and reproductive disorders, immune system disruption endocrines disruption, impaired nervous system function and development of cancers. While the rate of application and use of agro chemicals in developed nation is reducing it is opposite in the developing nation where by the application and use of agro chemicals in agriculture is increasing annually. To reduce its application and it associated effects on human health and the environment, there is need for all stake holders to be aware of the impacts of these chemicals. Farmers equally need to understand that although agro chemicals are beneficial, their continuous application is also associated with long term effects to the health and environment.

The long range effect of agro chemicals is a threat to the health and environment. Death occurs due to agro chemicals in developing countries are estimated around 10,000 per year. About 1.5-2 million people are suffering from acute poisoning of agro chemicals (Chatwal and Harish 2005).

In many cases, people applying agro chemicals lack the technical knowhow and what precautions should be used in the application of the chemical. In many part of the world farmers may not be able to read caution labels on the package or do not have access to protective devices specified for use with the agro chemicals. Therefore, many incidences of acute poisoning and adverse health impacts occur every year.

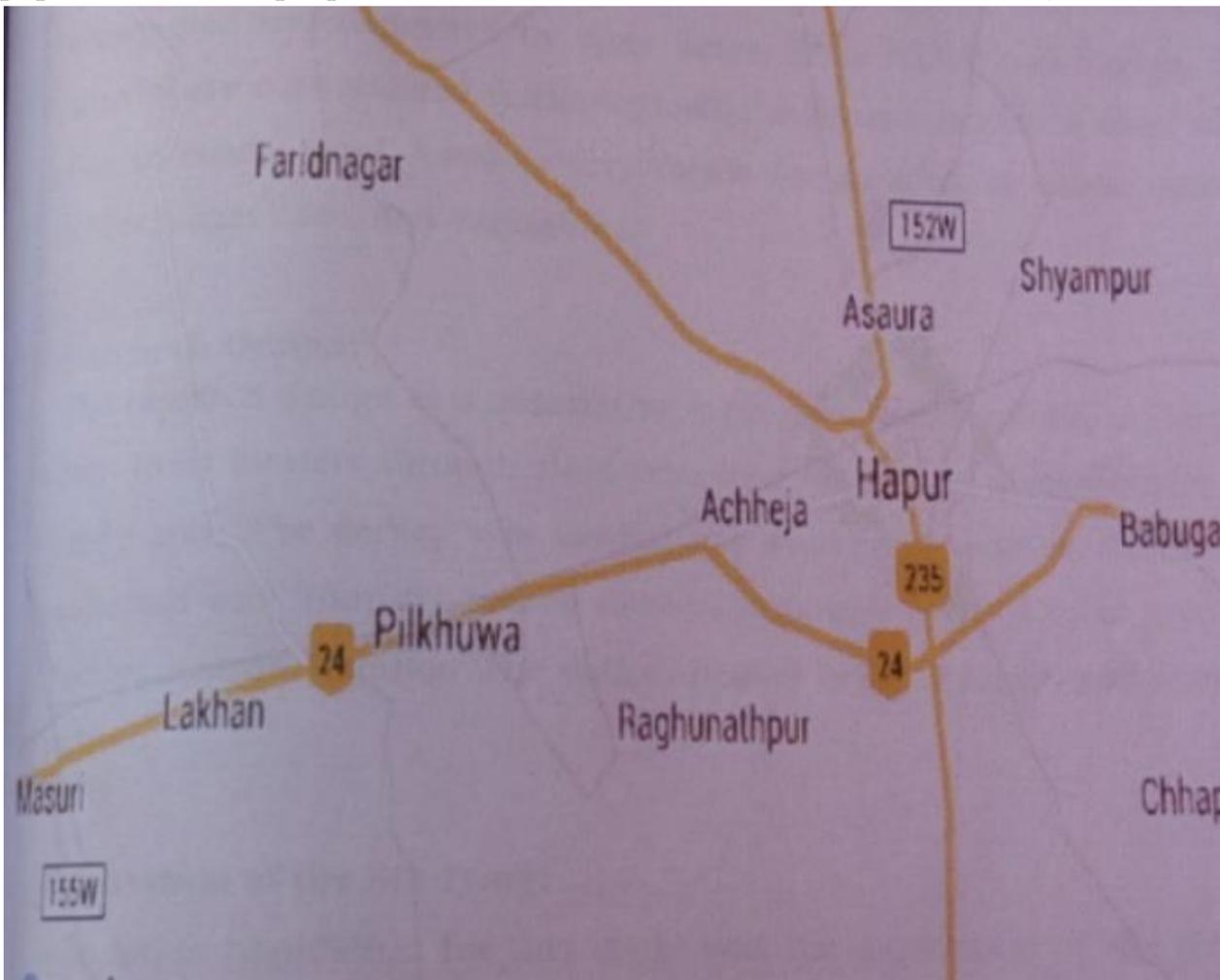
### **Purpose of the study**

The aim of the study was to assess the level of farmers knowledge with the regard to the effects of agrochemicals to human health and the environment. The objective is to determine farmers level of knowledge, and the way they handle agrochemicals during crop production.



**Description of the study area:**

Kastla Kasmabad is a village in Hapur Tehsil in Hapur District of Uttar Pradesh State, India. It belongs to Meerut division. It is located toward east from District headquarters Hapur, 446km from State capital Lucknow. Niampur, Kanvi, Pipla Bandur, Duhri are the nearby villages to Kastla Kasmabad. Pilkuwa, Hapur, and Modinagar are the nearby cities to Kastla Kasmabad. This place is in the boarder of the Ghaziabad district and Meerut district respectively. It has a total geographical area of 475.54 hectares. Kastla Kasmabad has a total population of 5,935 people, which consist of 3,115 males and 2,820 females.(Census,2011).



*Map of Kastla Kasmabad, Hapur district.*

**Soil and Vegetation:** the Soil composed of Pleistocene and more recent alluvial sediment transported and deposited by river action from Himalayan region. These alluvial are consolidated. Litho logically, sediment consists of clay, silt and fine coarse sand. Land is very fertile for growing of crops, especially wheat, sugarcane, and vegetables.



**Climate:** Kastla Kasmabad has a monsoon-influenced humid subtropical climate characterized by very hot summer and cold winters. Summer last from early April to late June and extremely hot, with temperature reaching 430c (1090F). The monsoon arrives in late June and continues until the middle of September, temperature drop slightly with rise again in October, and the village has a mild dry winter season from late October to the middle of March. The lowest temperature recorded is

0.50c(32.90F). Rainfall is about 80cm to 100cm per annum, which is suitable for growing crops. Most of the rainfall is received during the monsoon, humidity varies from 30 to 100%, the village receives no snow.

### **Methodology**

The researchers employed descriptive survey research design to carry out the study. The design was considered appropriate for this study because it helps to provide a wide base information and data collection to answer the research hypotheses.

**Target Population of the study:** The target population for this study comprised all farmers in Kastla Kasmabad village.

**Sample and Sampling Technique:** The sample size for this study comprised of 100 (one hundred) Farmers in Kastla Kasmabad village. The participant were selected using simple random sampling techniques i.e selection from different part of the village for equal participation.

**Instrument of Data Collection:** The instrument used for data collection for this research work was both the primary and the secondary sources. For the primary source, self structured and validated questionnaire and interview was used as an instrument for data collection, while for the secondary sources, both published and un published materials were used as well as internet services respectively.

**Validity and Reliability of the Instrument:** The research for this study was validated through face and content validity. The reliability of the instrument was ensured using test re test method.

**Data Collection:** The data for this study were collected through the use of validated questionnaire administered by the researchers.

**Data analysis:** To ensure successful analysis of the data collected and prove of the stated hypotheses. The data obtained from the questionnaires were collected and analyzed using inferential statistic of chi- square with formulae

$$X^2 = \frac{(ad-bc)^2M}{KLmn}$$



The formula was derived from chi square contingency table.

Gender	Yes	No	Total
Males	a	b	K
Females	c	d	L
Total	m	n	M

Source: Field survey

Where:-

a= No of males agreed with statement made on the questionnaire

b- No of males disagreed with statement made on the questionnaire

c= No of females agreed with the statement made on the questionnaire.

d= No of females disagreed with the statement made on the questionnaire.

m= total no of males and females agreed with the statement made on the questionnaire.

n= total no of males and females disagreed with the statement made on the questionnaire.

K= total no of males agreed and disagreed with the statement made on the questionnaire.

L= total no of females agreed and disagreed with statement made on the questionnaire.

M= total number of respondents.

## Results and Discussion

Table 1. Summary of the characteristics of farmers in the study area. (n=100).

Selected characteristics	Categories	Frequency %
Gender	Males	89
	Females	11
Age (years)	Young (18-30)	16
	Medium (31-50)	69
	Older (> 50)	15
Marital Status	Married	88
	Single	12
Employment status as farmers	Full time	76
	Temporary /Casual	24
Educational level	Illiterate	18
	Up to primary education	59
	Up to secondary education	13
	Up to tertiary education	10
Number of years in farming	≤10	22
	>10	78
Member of farmers association	Yes	25
	No	75

Source: field survey, 2016



Table 1. Summarizes the characteristics of farmers interviewed in the study area and from the result obtained so far it showed that majority of the farmers (89%) were males only (11%) being females.. Also nearly most of the farmers were within the young and middle age category ( $\leq 50$ ) while only (15%) were aged more than 50 years. Furthermore, most farmers were married with only 12% being single that are yet to be married, with no number of widow and divorce found during the study.

Majority of the farmers (24%) consider it is a part time occupation. Similarly, most of the farmers are literate, were (59%) undergo primary education, (13%) went up to secondary level, 10% up to tertiary level, with only 18% who are illiterate among the respondent during the study. Majority of the farmers about (78%) have spent more than ten years (10) in farming where only (22%) have at least ten years of farming experience among the respondent.

Moreover, about (75%) of the respondent did not belong to any farmers association, where by only (25%) were members of different farmers association among the respondents.

**Table 2. Farmers' responses to agro chemicals use:**

Selected characteristics	Responses (n=100)	Frequency (%)
Wearing of protective devices before application of agro chemicals	Yes	46
	No	54
Reading labels	Yes	37
	No	63
Trained in use of agro chemicals	Yes	24
	No	76
Washing hand and body with soap after application of agro chemicals	Yes	32
	No	68
Mixing two (2) or more agro chemicals	Yes	27
	No	63
Concern about expiry data.	Yes	33
	No	77
Most commonly use type of agro chemicals	Herbicides	48
	Insecticides	36
	Fungicides	6
	Rodenticides	10
Developing any illness immediately after using agro chemicals	Yes	42
	No	58

Source: field survey, 2016

**Table 2. Summarizes farmers' responses to agro chemical use in the study area:** Out of the 100 farmers interviewed 46% the framers are using protective device while handling and application of agro chemicals while 54% of them were not using protective devices while application of the agro chemicals. Also from the result obtained majority of the farmers 63%



were not reading the label of the containers containing agro chemicals substances only 37% were found to be reading the label of the container containing the agro chemicals.

It was equally found that only 24% of the farmers were trained on how to handle and apply agro chemicals substances, while 76% of the farmers responded were not trained on how to handle and apply agro chemicals. Similarly, majority of the farmers 67% were found washing their hands and body with soap after handling and application of agrochemicals substances in the study area with the remaining 33% who were not in the habit of washing their hand with soap immediately after application of agro chemicals substances. It was also discovered from the result obtained that fifty eight (58%) of the respondent were found to say that they have never developed any illness immediately after application of agro chemical, while (42%) of them said to be once affected with acute problem after application of the agro chemicals substances. Moreover, majority of the farmers 63% of them were not aware of alternative methods to agro chemicals use in the farm, while 27% of the respondent were knowledgeable about alternative methods to be use instead of agro chemicals. It was also found that (33%) of the farmers were in the habit of mixing two or more chemicals at the same time while (67%) were found to be using only one chemical at a time. Moreover, only (27%) of the farmers were concern with the expiration date of the agro chemical substances while (63%) of the respondent were not in the habit of reading the expiring date label in the containers. The result also showed that farmers in the study area were using more herbicides which constituted (48%), insecticides (36%) fungicides, (6%) and rodenticides only (10%).

### Table 3. Respondents to hypothesis 1

Farmers don't have adequate knowledge with regard to safe handling and application of agro chemicals.

Gender	Agreed	Disagreed	Total
Males	55	36	89
Females	7	4	11
Total	62	38	100

Source: field survey, 2016

Table: 3 above summarized the responses by the respondent to hypothesis 1. Which shows that out of the 100 respondent 89 were males and only 11 were females. Out of the 89 males respondent 55 of them agreed with started null hypothesis while 34 of them disagreed with it out of the 11 females responded to the hypothesis, 7 of them agreed with the statement while 4 of them dis agreed with the null hypothesis.



**Table 4 responded to hypothesis 2**

Farmers are not getting enough information from the extension workers on how to handle and use agro chemicals substances.

**Responses:**

Gender	Agreed	Disagreed	Total
Males	50	39	89
Females	3	8	11
Total	53	47	100

Source: field survey, 2016

Table 4 above gave the responses of the farmers with regard to the stated hypothesis. From the result we can see out of the 100 respondent to the stated null hypothesis 50 males agreed with the statement while 39 of them disagreed with stated null hypotheses. While out of the total 11 females responded only 3 of them agreed while the remaining 8 of them disagreed with the stated null hypothesis.

**Table 5.respondent to hypotheses 3**

Farmers are applying agro chemicals anyhow in respect of its type and quantity

**Responses**

Gender	Agreed	Disagreed	Total
Males	49	40	89
Gender	5	6	11
Total	54	46	100

Source: field survey, 2016

The table above summarizes the number of respondents to hypothesis 3 stated. From the table we can see out of the total number of 100 respondent 89 were males and the remaining 11 wee females. Out of the89 males 49 of them agreed with the stated null hypothesis while the remaining 40 disagreed with it. It also should that 5 farmers out of the total 11 were agreed with the hypothesis while the remaining 6 of them disagreed with the null hypothesis.

**Table 6. Respondents to hypothesis 4**

There are adverse effects to human health and the Environment associated with the use of agro chemicals substances.



### Responses

Gender	Agreed	Disagreed	Total
Males	40	49	89
Females	5	6	11
Total	45	55	100

Source: field survey, 2016

Table 5 above gave the responses of the farmers to the stated hypothesis. From the result obtained so far out of the total number of 89 males respondent 40 out of them agreed with the stated null hypothesis while the remaining 49 of them disagreed. Equally out of the 11 females respondent only 5 out of them agreed with stated null hypothesis while the remaining 6 disagreed with it.

### Discussion

The study aim to assess the knowledge of farmers on the effects of agro chemicals substances to human health and environment among farmers of Kastla Kasmabad, Hapur. Under the age categories of 18-above to 50 years. The data obtained concerning demographic and characteristics of the farmers were analysed separately using descriptive statistic and hypotheses are tested using chi-square method of data analysis at 0.05 level of significance and degree of freedom one (1).

Questionnaires were administered to both males who constituted 89% of the respondent while the remaining 11% were females. The idea behind this judgment was the fact that males were the fraction of the population who per take actively in farming. While the percentage of females were low because they stay most of their time at home doing domestic works. .

The level of education of the respondent was also investigated with a view of finding their level of awareness to the effects of agro chemicals to human health and the environment. 82% of the respondents were educated at various levels while 18% are un educated. It was also found out that most of the respondent takes farming as their full time occupation about 76% of them while the remaining 24% take farming as a casual or temporary occupation. The data obtained concerning demographic and characteristics of the farmers were analysed separately using descriptive statistic and hypotheses are tested using chi-square method of data analysis at 0.05 level of significance and degree of freedom one (1).

Similarly, the result shows that majority of the farmers are not belong to any farmers association about 75% of them although many have spent many years in the farming business. Many of the farmers are applying herbicides in their farm followed by insecticides then rodenticides and fungicides being minimal.



From the result obtained so far it is clearly showed that farmers did not have adequate knowledge with regard to the safe handling and application of agro chemicals. This is in line with the report of PAN (1995) which stated that many farmers do not have adequate knowledge with regard to safe handling and application of agro chemicals. According to the result obtained, it is clear that farmers in the study area are not getting enough information from the extension workers on how to handle and use agro chemicals substances. This agreed with the work of (Omari, 2004) which says the low access to extension and research programmes by farmers could be attributed to the inadequate number of skilled farmers who can handle and use agro chemicals substances effectively.

Furthermore, the results obtained clearly shows that farmers are applying agrochemicals substances anyhow in respective of its type and quantity. This is in line with the statement made by Enger and Smith (2006), who stated that in many cases people applying pesticides are unaware of how to work, handle and what precautions should be use in the application. Therefore, many incidence of acute poisoning occur each year.

Similarly, the result obtained clearly indicated that there are adverse impacts to human health and the environment associated with the use of agro chemicals substances. This also tally with the statement made by WHO (2008\_) which stated that spraying of agro chemicals substances in the farms is usually associated with adverse impact to human health and the environment. This study has revealed that most farmers have low level of awareness of the effects of agro chemicals to human health and environment, low accessibility to extension workers, and lack of observing proper precautionary measures are the major findings of this research work.

### **Conclusion**

Although agro chemical help improve productivity this study has disclosed that wrong application, dosage, mishandling, ignorance of safety precautions and use of expired agro chemicals have detrimental effect to human health and the environment.

### **Recommendations**

From the findings of this study, it is recommended that:

1. There is need for organizing work shop and training to local farmers on safe handling, use and application of agrochemical substances.
2. Farmers should be encouraged on observing safety precautions while handling and applying agrochemical substances.
3. Farmers should be encouraged to use alternative pest management systems in order to reduce dependency on agrochemical substances.
4. There is need for the training of more extension workers and distribute them to local areas to enable farmers have access to them.
5. Farmers should be encouraged to join farmers association so that they can benefit from government intervention programmes and other research findings.



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