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INTERACTION AMONGST THE CHEMICAL PESTICIDES, AGRICULTURE AND HUMAN HEALTH: AN ENVIRONMENTAL CASE STUDY IN NADIA DISTRICT, WEST BENGAL, INDIA

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Abstract–Chemical pesticides and fertilizers are well known in today's farming system and played a significant role in boosting the crop yield during the last four to five decades worldwide. But on the other hand, excessive use of these chemicals has been degrading natural resources (soil, water, air) globally and leads to increase environmental pollution. With this background, the broader objective has been set as 'assessing the impact of chemical pesticides and fertilizers on the soil, water, air vis-à-vis human beings and local biodiversity, a study was carried out in two different villages (Ghoragachha and Bhabanipur) of Nadia district, West Bengal, India with 200 number of respondents. The majority of the farmers belongs to marginal and small classes and is mainly vegetable growers. They also cultivate fruits and a few cultivate agronomic crops with a cropping intensity of greater than 200 percent. Most of the respondents don't take precautionary measures during pesticide storage, handling, and storing due to illiteracy among the respondents. Excess use of pesticides just increases the face value of the produce. They have no such awareness about crop-pest resistance and soil contamination. Indiscriminate use and application of improper doses of pesticides may cause their symptoms as well as the environment.

INTRODUCTION

Agricultural practices have been changing over a period throughout the world. This remarkable achievement in agriculture came with intensified farming through high-yielding crop varieties along with the use of chemical fertilizers, pesticides, proper irrigation scheduling, and mechanization. The production of food grains in India experienced a quantum jump during the seventies (55 million tonnes to 115 million tonnes), rural electrification networks of market link roads, diversification of crops along with a change in cropping intensity, creation of huge irrigation network, generation of millions of livelihoods, a humongous shift from begging nations to export nation in global food market have certainly been remarkable changes. In developing countries like India, this intensification was initiated in the 1960s with many more schemes, which began to transfer and disseminate high-yielding seeds termed as "Green Revolution". The green revolution is a milestone associated with the development of independent India in terms of food grain production. This self-sufficiency in food grain production was achieved through using high-yielding crop varieties. These high-yielding varieties are highly responsive to chemical fertilizers and some extent amenable to pests and diseases. This in turn demanded increased use of fertilizer and plant protection chemicals. Keeping view in this regards the objective of the study is to assess the level of adoption of modernized agricultural technologies with special reference to chemical fertilizers and pesticides; to evaluate the impacts of these modern agricultural inputs on the environment as a whole; to study the effects of these inputs on the health of human being, domestic animals and birds and to accumulate the impacts of these inputs on the bio-

diversity of the villages under study.

METHODOLOGY

The study was conducted in two villages i.e. Ghoragacha and Bhabanipur of Nadia district, in West Bengal, India. The data has been collected through the personal interview method with a structured schedule that has been prepared as per the objectives of the study. The background information of the selected 200 respondents is collected based on identified discriminating variables such as age, education, landholding, family size, family type, etc. In the second part of the study, some open-ended questions were also asked the same respondents to collect some relevant information to meet as well as satisfy the needs of the objectives.

RESULT AND DISCUSSION

From the results, it was found that in both the villages majority of the farmers are in the middle age group (36-45 yrs), based on caste are schedule caste; the pattern of occupation is cultivation; educational qualification is middle to high school. Cultivators have marginal landholding (<1 ha) and have two rooms for their house type; maximum has no farm animal. The majority have a TV, cycle, motorcycle, radio, and wristwatch. The majority of them have a reading habit of the newspaper. Respondents of both the villages are vegetable cultivar followed by agronomic (paddy, jute, and potato) and fruit cultivar. They have used an excessive amount of nitrogenous fertilizers above the recommended dose. The highest N_2O emission was mostly from the banana, followed by papaya. On the other hand, amongst the agronomics and vegetable crops, the highest amount of N_2O emission was recorded from Potato followed by Cabbage, Brinjal, and Maize. A substantial influence is seen in respondents of the villages by Agri-input distributors in case of timely application of pesticides. Most of the farmers in both Ghoragacha and Bhabanipur are seemed to be quite conscious about the protection of their crops; are sincere in using proper Plant Protection Chemicals (PPC), but most of them use indiscriminately and the application of improper doses is mainly due to wrong advice gathered from unauthorized sources. They get advice from the PPC dealer/retail shop for their quick remedy. In case of taking general precautions at the time of pesticide application the respondents in both of the villages do not wear a protective hat or goggles; not change their clothes if they become contaminated, the villagers of both the villages are habituated to eating, drinking, and smoke at the time of spraying. They do not wash their hands and face with soap, they don't take a shower or bath after spraying and also the villagers are not changing their clothes immediately if they become contaminated with insecticides.

CONCLUSION

Precautions should be taken in the following manner.

Transporting pesticides: Most of the respondents carried pesticides with their daily consumer goods and no such above-mentioned precautions have been taken by them in case of pesticide transportation. This is caused due to their illiteracy or low level of education. It is caused due to unawareness about pesticides among the respondents of both the villages.

Pesticide storing: Most of the respondents do not follow the precautionary rules during storing pesticides. It is revealed from the results most of the respondents keep the sprayers, pesticide containers, and other similar apparatus within their houses due to insufficient place for living and sometimes driven by unawareness among the farmers have compelled them not to take these precautions.

Handling of pesticides: A large number of sample respondents articulated their view that they do not bother with the precautionary measures but they follow the traditional practices which they learned from their predecessors. Illiteracy along with traditional belief is the most important feature of their irresponsible behavior towards pesticide spraying.

Applying pesticides: All the respondents are unable to read the instructions mentioned in the pesticide containers. They also do not wash the equipment after spraying pesticides. The respondents of both the villages are reluctant of taking protection during spraying. This is very unfortunate that they are unaware of the hazardous effects of these insecticides and do not use proper protection techniques. Due to unawareness, the forthcoming generations of them also lack the knowledge of this situation and go on with the unhealthy practices. This is a result of illiteracy and negligence.

Pesticide wastes and safe disposal: It is also found that most of the respondents use waste containers of pesticides in their daily household activities and they are habituated to reusing the pesticides jerry cans for keeping water for domestic use. A dump of useless containers of pesticides in front of their fields causes harm to other organisms (birds, arthropods, soil microorganisms, etc.) in the environment. All these practices are detrimental to the environment, human beings, and domestic animals.

Excess pesticides and safe disposal: The respondent's reluctance regarding general precaution, storage, or disposal of pesticides is an important factor in helping to determine the relationship between their unscientific and improper application of pesticides-associated health hazards. This is also associated with the sharp decline of the earthworm population in the soil and its detrimental effect on soil health and crop productivity.

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