INTERNATIONAL JOURNAL OF ENVIRONMENT
Volume-3, Issue-3, Jun-Aug 2014 ISSN 2091-2854
Received:24 July *Revised:14 August* *Accepted:21 August*

ASSESSMENT OF PESTICIDE USE, PRACTICE AND RISK IN GEDEO AND BORENA ZONES; ETHIOPIA

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Abstract

This research attempts to assess pesticide use, practice and risk in Gedeo and Borena Zones. Three sample districts have been selected purposively from these zones and four sub districts from each district. Primary data was collected through in depth interview and group discussion. Results show that people in the sample area use pesticides for crop production and ectoparasites. Malathion, DDT, Karate and 2-4D are chemicals frequently used to control pests. Majority of the respondents used these pesticides by their own decision for the intended purpose and purchase pesticides from private shops, local market and government offices. Farmers mostly spray by themselves; however all of them spray pesticides without proper protection. Pesticide containers are usually thrown anywhere after use and in some cases used for home consumption. All of the respondents took no training about pesticide use, many do not read labels including expiry date when they buy or use pesticides and doesn't know recommended dose for application. There were pesticide poisoning incidents recorded such as poisoned-recovered, illness/injury and death incidents; mainly due to poor storage, careless disposal, unsafe application and suicidal behaviour. It can be concluded that there is a wrong pesticide use and practice in the sample area and risk is observed to be high. Universally prohibited pesticides like DDT were found in use for crop production and household pests. Therefore, proper training and awareness has to be created to the community. Moreover, government bodies should regularly educate as well as monitor, control and regulate pesticide trade, use and practice in the area.

Key words: DDT, Malathion, Pesticide, Risk, 2-4D

Introduction

In the agriculture sector the benefits that pesticides have played in increasing crop production at a reasonable cost are unquestioned, without pesticide applications, field crops would produce significantly lower yields due to insect damage, weed infestations and plant diseases (Ortelli et al., 2006). Pesticides such as DDT are also commonly used in the health sector as vector control for mosquito. However pesticides particularly organochlorines, can have adverse effects on human beings, animals, plants and the environment if the necessary precautions are not taken during storage, transportation, mixing, and application (FAO, 2003; Hussen, 2007). Pesticide residues in food are global problems (Abinash and Singh, 2009). Ethiopia has been considered as having the largest accumulations of obsolete pesticides in the whole of Africa. It was estimated that there were 402 stores at 250 sites containing 1, 500 tones of obsolete pesticides (MoRAD, 2007).

There is a scientific consensus that the effects of an inappropriate use of pesticides can seriously affect human health and the environment (Hayes and Laws, 1991; Hussen, 2007). In developing countries lack of awareness and proper management, trained man power, disposal facility has resulted in adverse impacts on human health and the environment (Ecobichon, 2001). Farmers use pesticides without full understanding of the impact on human health and the environment (Mathews, 2008). They also lack the appropriate knowledge on safe handling and use of pesticides (Ngowi et al., 2007). Misusing pesticides also harms the natural environment. Both harmful and beneficial organisms are killed and substances released from chemical reactions contaminate the environment, leading to climate change, pest resistance and biodegradation (Ajayi, 2005).

Good pesticide management practices could help prevent risks of pesticide poisoning and pollution of the environment. Some of the good management practices include to follow pesticide label directions, use protective devices, avoid spills, disposal of pesticide wastes and containers properly, elimination of unnecessary application and use of proper pesticide storage (Sweet et al., 1990). How many of the Ethiopian farmers are aware of the good pesticides management practices? Do they have awareness about the health effects of various pesticides being utilized? To answer such questions one has to research out or evaluate pesticide use and practice in the country. Very limited studies have been made to address this subject in the country. Amare and Abate (2008) studied pesticide use of 420 farmers selected from 23 villages

in Ziway and Arsi Negele districts. The study indicated 28.7% of the farmers use DDT for agriculture. The report revealed the protective equipment utilization in the area was almost none and hence 31% of the respondents claimed illness after spraying pesticides. The report added that about 50% of the respondents used empty containers as household utensils. One can see that the situation of farmers in the studied area is alarming and calls for an intensive work on assessing pesticide use and practice, educating the farmers on good pesticide management: sensitize the local community about consequences in misuse of pesticides. The objective of this study is to explore on pesticide use, practice and risk in Gedeo and Borena Zones hoping to get a wide picture of the situation in Ethiopia and followed by intervention programs to mitigate the risk.

Methods

Three environmental clubs were involved in the study from Dilla, Yirgachefe and Guangua High schools. Proper training on the research project and data collection was given to members of environmental club, for two supervisors and ten Data collectors from each sub district. Pilot test of the data collection tool was made for three days. Two districts (Yirgachefe and Dilla Zuria) from Gedeo zone and Abaya district from Borena zone, a total of three districts were selected; four sub districts (Kebeles) were selected from each district.

Field study was made during 2011/12 cropping season. A Total of 600 households were interviewed that is 50 from each sub-district (Kebele). Among all informants; 82.2 % were male, 91.1% head of family, all are farmers and 60.3 can read and write. They mainly grow Coffee (95.6%), Enset (89.4), Maize (89.2%), different fruits (60.9%) and vegetables (33.5%). Group discussion was made at the end of each week for data evaluation. Eighteen key personnel's and extension workers in agriculture and rural development offices, health offices were interviewed and basic information's on frequently used pesticides, methods of pesticide application, follow up of instructions, disposal, pesticide storage, safety measures, perception on pesticide use and associated risks were gathered. Three Focus group discussions of 8 individuals were also employed with emphasis on how farmers get and use DDT. Data analysis was made using SPSS Software.

Results and Discussion

Pesticide Use and Practice

All respondents growing coffee and Enset said that they don't use pesticides for production. However, cereal and vegetable growers said that they use pesticides at different level for production. Pesticides mainly used were DDT (55.2%), Malathion (44.8) and 2-4 D (21.6%). They use it for insect pests, rodent and broad leaf weed control. In Ethiopia, officially there is a restricted use of DDT for vector control only, which is in accordance with Stockholm convention. However, people in the sampled areas were found using DDT for crop production. Most likely farmers get access to this chemical through health workers spraying DDT for malaria control. Market assessment was not yet done, but it is most likely that the price of DDT is much lower compared to other insecticides for the obvious reason that the sprayers get it free of charge (Amare & Abate, 2008). Among those used pesticides, 75% of them indicated that using pesticide solved their pest problem, and 46.3% indicate it will increase crop production.

Among those using pesticides only 195 (32.6%) said they read labels on pesticide containers and only 41 (6.8%) can understand and follow instructions (figure 1). Some of them said that they even bought and used pesticides without labels. Regarding expiry date check-up and application dosage, all informants said they don't know anything about it; they use chemicals as received without checking those parameters. Only 17.7% of the users were buying pesticides form licensed vendors.

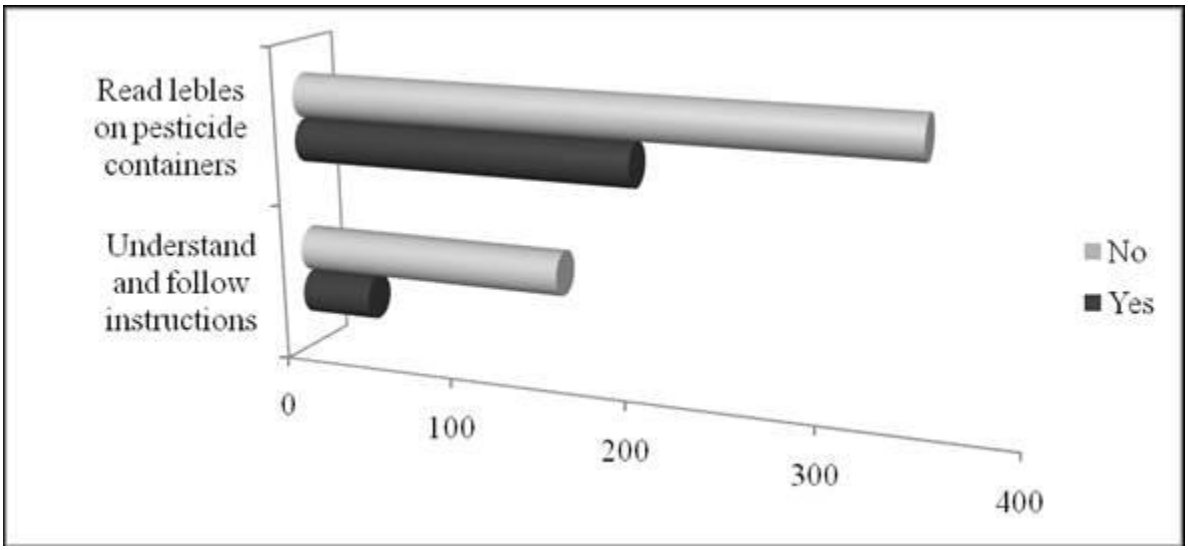

Fig 1: Number of farmers who read, understand and follow instructions in labels on pesticide containers in Abaya, Yirgacheffe and Dilla Zuria districts

Spraying duty is mainly done by farmers and family members; 67.8% of sprayers were fathers, 22% hired labour, sons or daughters (5%) and only 5.2 % by trained personnel. All said that they use no protective device during spray and 91% of all respondents said they never had any training about how to use pesticides. After spray, they dispose empty containers in the soil, throw it any place, sale, burn and few wash the container to use it for water and food storage (figure 2).

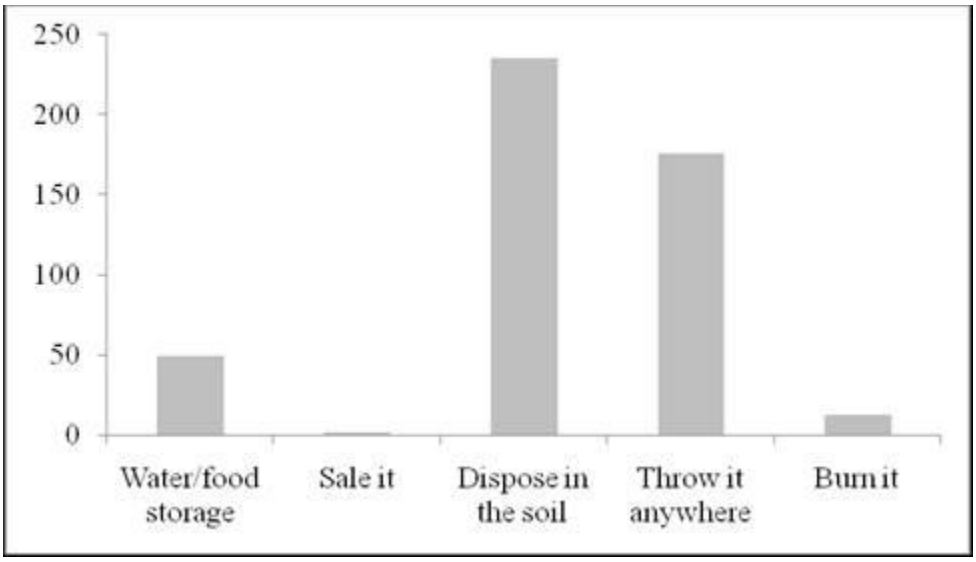

Fig 2: Use of empty pesticide containers after spray in Abaya, Yirgacheffe and Dilla Zuria districts

Pesticide Risk

There was pesticide related risks in the surveyed areas in the past two years such as death, illness, injury, poisoned and recovered. After the spraying, 77% of the sprayers always felt discomfort. Respondents described these discomforts as headache, vomiting, Skin irritation, Nausea and combination of two or all (figure 3). There were also incidents of family member's intoxication in 19.6% of the respondents. Most of them were poisoned and recovered, some faced long term injuries/ illness and 1% death was also observed. Pesticide poisoning incidents were mainly due to poor storage, irresponsible disposal, unsafe preparation and spraying , suicidal attempts and precarious way of transportation (figure 4).

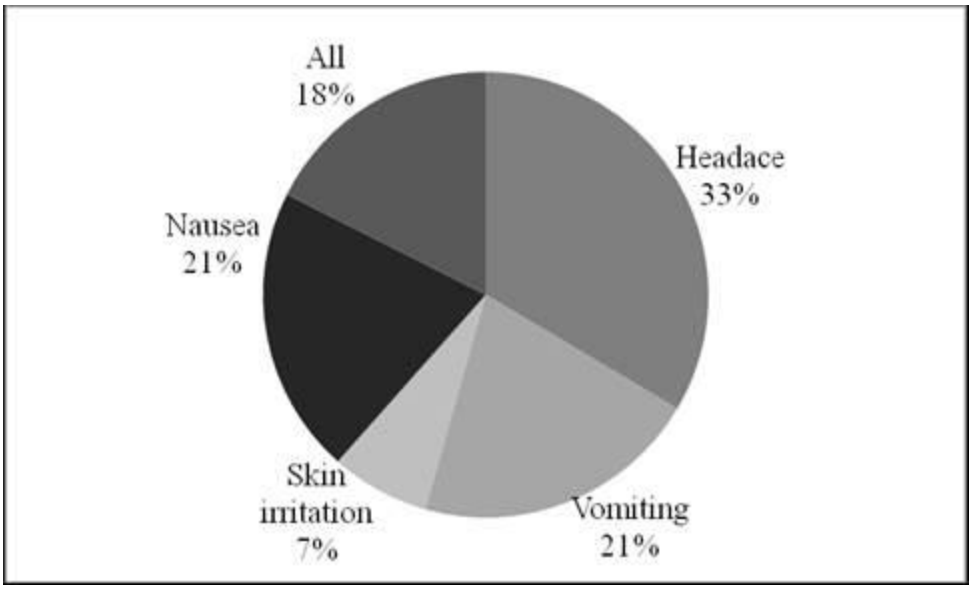

Fig 3: Impacts on farmers' health in Abaya, Yirgacheffe and Dilla Zuria districts

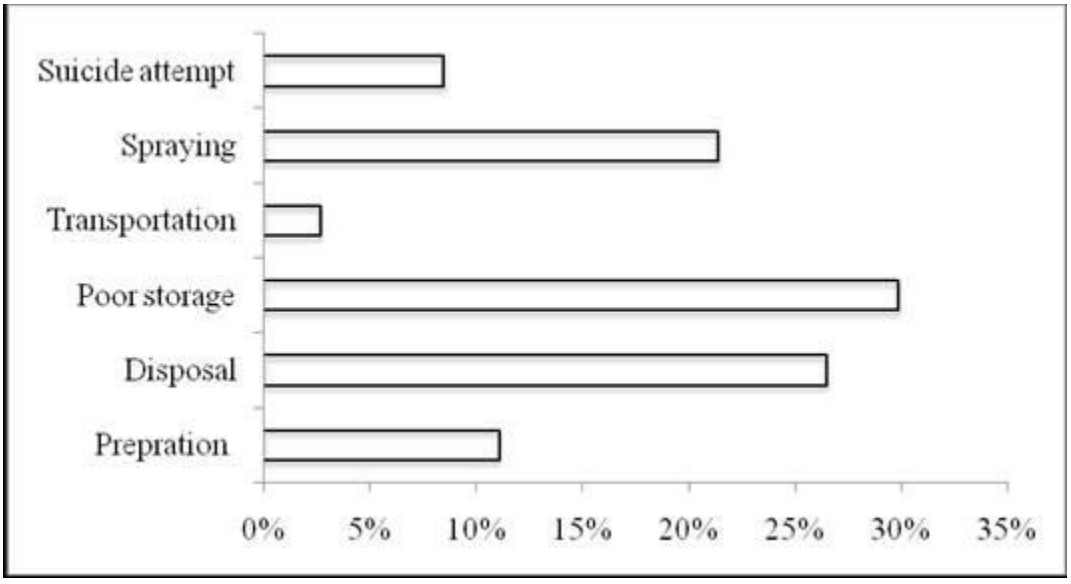

Fig 4: Sources of pesticide poisoning incidence in 117 of sampled families at Abaya, Yirgacheffe and Dilla Zuria districts

Majority of respondents say they never had or heard of pesticide poisoning incidents. However, among 117 respondents who witnessed different types of pesticide poisoning incidents only 25 % of them reported the case to Government officials both at bureau of agriculture or Health institutions. The majority of them were given local solutions or remain silent with their long term injury, illness and in some cases death without getting appropriate medical care (Figure 5).

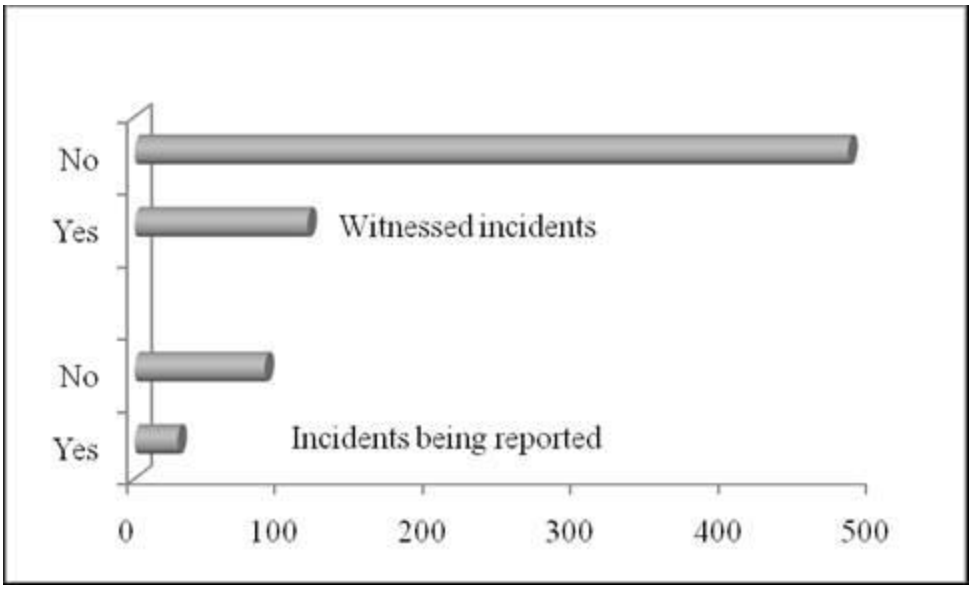

Fig 5: Reporting of environmental incidents due to pesticides in Abaya, Yirgacheffe and Dilla Zuria districts

Conclusion and recommendation

This assessment showed that there is ill pesticide use and practice in the sampled areas and risk observed to be high. Farmers without having proper knowledge, they are buying, storing, applying and disposing pesticides. Findings from this study strongly indicate that farmers lack appropriate knowledge on the safe handling and use of pesticides. This is attributed to the limited availability of extension services and training. Extension services should be improved and training programs on pest management and safe use of Chemical pesticides should be developed to boost farmers' productivity. Therefore, proper training and awareness creation has to be done for the community to mitigate risks of poisoning. Government bodies (mostly extension workers, agriculture experts) should regularly educate community as well as monitor, control and regulate pesticide trade, use and practice in the area. Alternative to chemical means of controlling pests, it is better to explore on indigenous pest control methods such as crop resistance, biological controls, and habitat management methods. Such methods should be advocated, disseminated, and reinforced through policy.

Acknowledgement

We would like to thank Dilla University for financial support and Dilla, Guangua and Yirgacheffe High schools environment club members who assisted us in the field work. We are also thankful to government officials of agricultural bureau of Dilla Zuria, Abaya and Yirgachefe districts who facilitated our study by making contact with farmers.

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