International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

Abuse of Pesticides and Environmental Impacts in Vietnam

Kieu Thi Thu Chung

Abstract--- *Pesticides have the main purpose of preventing insect pests. Therefore, the abuse of pesticides to preserve food seriously affects human health. The elimination of highly toxic pesticides in agricultural production will contribute to ensuring the quality of agricultural products as well as the health of users. However, in some places in Vietnam, businesses still surreptitiously produce fake pesticides, which are on the banned list for sale in the market, especially in remote areas. Vietnam is one of the countries using to much pesticides and it is difficult to control. This abuse will be harmful to producers, communities and environment, this also reduces product competition and causes land degradation. Meanwhile, the effectiveness from encouraging research, production, trading and application of biological measures and biological pesticides to fight harmful organisms in Vietnam is not high. The paper focuses on the current status of pesticide use in Vietnam. This abuse will have great consequences and we need appropriate solutions to create a healthier and cleaner living environment.*

Keywords--- *Environment, Human Health, Pesticides.*

I. INTRODUCTION

Drought, flood, unseasonal rain, warm winters and natural disasters strongly impact on crop production, and this not only adversely affects the growth of plants but also causes many new pests to flare up or changing their harmful rules. On the other hand, when the economic life is increasing, the demand for safe food use of domestic consumers also increases. In order to satisfy this demand of society, the organization of agricultural production must be more scientific, in which, focusing on the balanced use of inorganic and organic fertilizers and limiting the use of real protection drugs. However, in reality, there is still a large part of farmers who only care about productivity and profit without paying attention to the quality of agricultural products. Therefore, the abuse of chemical pesticides and inorganic fertilizers is still happening in many localities [1].

II. CURRENT SITUATION OF DEEP-USED DRUGS IN VIETNAM

The use of pesticides in the world over the past half century has always increased, especially in the 1970s and 1990s. In 6 Asian countries that have grown a lot of rice, over the years, the use of fertilizers has increased by 100 %, pesticide use increases by "200 - 300%" but productivity is almost unchanged, the number of pesticide sprays is not correlated or even inversely proportional to the yield.

Due to the consequences and adverse effects of the abuse of pesticides, many countries around the world have been implementing the strategy of using chemical pesticides. From effective and safe chemical use strategy to reduction and harm reduction strategy of chemical pesticides. The structure of insecticide chemicals has changed a lot towards increasing bio-friendly and environmentally friendly medicines.

In Vietnam, according to the data of Plant Protection Department, in the period of 1981-1986 the amount of

Kieu Thi Thu Chung, Department of Politics, FPT University, Vietnam.

DOI: 10.37200/IJPR/V24I4/PR2020392
Received: 10 Mar 2020 | Revised: 25 Mar 2020 | Accepted: 10 Apr 2020

chemicals used was from 6.5 to 9 thousand tons. In the 1991-2000 periods, this number increased to 20-30 thousand tons. Import value of pesticides also increased from 472 million USD (2008) to 482 million USD (2009), 537 million USD (2010). More than 80% of agricultural chemicals are imported into Vietnam from the Chinese market. In addition, there is a large amount of uncontrolled smuggled chemicals.

The number of chemicals registered for use in agriculture has also increased rapidly. Before 2000, the number of active substances was 77, but now that number increases by 10 times. Meanwhile, the countries in the region have only about 400 to 600active ingredients (630 types in China, 400-600 types in Thai and Malaysia). The above figures have partly shown the high level of pesticide use in our country in the recent period. That is not only to mention the improper use of chemicals in a large part of farmers but also the lack of technical knowledge usingwithout complying with quarantine time, or protection regulations [2].

III. CURRENT SITUATION OF IMPORT OF PESTICIDES IN VIETNAM

According to the Ministry of Agriculture and Rural Development's statistics, Vietnam annually spends about 500-700 million USD to import raw materials and pesticides from China every year. Herbicide is used on all types of plants, of which rice is the most used. The volume of active ingredients of plant protection drugs per hectare of plant / year in Vietnam is much higher than some countries in the region. Specifically, this figure in Vietnam is 2kg / ha, while in Thailand it is 1.8kg / ha, Bangladesh is 1.1kg / ha and Senegal is only 0.2kg / ha. Vietnam is one of the countries that uses plant protection drugs much and is difficult to control.

Herbicide still plays an important role in agricultural production, helping to improve labour for farmers. However, the overuse of herbicides has led to many harmful effects on production, the environment, public health, threatening the sustainable development of agriculture. Therefore, strengthening the management of production, sales and use of herbicides is a particularly urgent requirement. Agriculture that does not use chemical herbicides costs more 20 times to control weeds than conventional production. Herbicides are not only used in fields but also on non-farm land [3].

In recent years, the amount of herbicides used in production tends to increase. Laws on herbicide management were quite complete, synchronized and harmonized with other countries in the region and around the world. In addition, the technology for analysing and verifying quality of plant protection drugs has been gradually improved [3].

However, Vietnam's production is still small; drug users' knowledge is limited. Farmers are still using habit-based drugs. Meanwhile, the number of shops and drug dealers is too much, the business conditions are still loose, and the inspection force is not strong enough. “In addition, the role of local authorities in propagating, guiding, inspecting and supervising pesticides use in the area has not been given due much attention [2].

IV. HARMFUL EFFECTS OF CHEMICALS ON THE HEALTH

Children are particularly vulnerable to the dangers associated with the use of pesticides because the immune system, nervous system or detoxification mechanism has not been fully developed, making them less likely to fight back when toxic pesticides enter the body system. Farmers, consumers and children in Vietnam also face health

DOI: 10.37200/IJPR/V24I4/PR2020392
Received: 10 Mar 2020 | Revised: 25 Mar 2020 | Accepted: 10 Apr 2020

impacts from the consumption of unhealthy food [4].

More than 260 studies around the world have investigated the serious effects of agrochemicals. The results show that they are related to some types of cancer such as breast cancer, prostate, brain, bone, thyroid, colon, liver, lung, etc. The chemicals methyl bromide andcaptan are capable of causing and develop prostate cancer. In addition, women who are pregnant may increase the risk of brain cancer in the fetus.Children who are regularly exposed to the amount of phosphorus-containing pesticides found in fruits and vegetables, are at a higher risk of hyperactivity disorder than less exposed children. It also affects the behavior and ability to learn and cognitive in children. The pesticides found in celery, peaches, strawberries, apples, peppers, greens, grapes and potatoes can affect the human nervous system. Signs of poisoning include foaming at the mouth, stomach pain, vomiting, constipation or diarrhea (Figure 1).

Figure 1: Pesticide Abuse in Vietnam

In addition, pesticides alter the immune system in animals and they are more susceptible to infection due to poor resistance. Pesticides enter the body to reduce the number of white blood cells and lymphocytes that help in disease prevention. They also make it resistant to viruses and bacteria that cause disease. Chlorpyrifos in insecticides and herbicides reduces testosterone in men, causing infertility and miscarriage in women. This chemical is often found in fruits like strawberries, apples or peaches. Pesticides also harm pregnant women when chemicals cause various birth defect problems in the fetus [5].

Increased suspicions about diabetes in Vietnam are related to the fact that the whole population is exposed to toxic chemicals, particularly pesticides [6] Vietnam is among the top 10 countries with the highest rate of diabetes increase in the world. According to a survey of the Ministry of Health, the prevalence of diabetes in Vietnam in 2013 is at 5.7% (Vietnam has over 5 million diabetes patients) and the number of patients currently having diabetes. The trend is expected to double by 2030. The percentage of patients with diabetes is estimated to be different by

DOI: 10.37200/IJPR/V24I4/PR2020392
Received: 10 Mar 2020 | Revised: 25 Mar 2020 | Accepted: 10 Apr 2020

2030 in Vietnam and some regional countries. So far, people have not found the exact cause of type 2 diabetes but only know the disease occurs due to a combination of factors including fast food, little or inactivity, stress, smoking, etc. [7].

V. HARMFUL EFFECTS OF CHEMICALS ON THE ENVIRONMENT

When spraying pesticides to kill pests in the field, only 5-7% of the drugs are directly involved in the pest eradication process, while 93-95% is washed away into the water source, penetrating into the soil and causes groundwater pollution [5]. The amount of pesticide remaining on the packaging after using averagely accounted for 1.85% of the packaging. Thus, based on the amount of pesticide used annually, Vietnam's agricultural environment has about 150-200 tons of chemicals from packaging discharged into fields causing environmental pollution (Figure 2).

Figure 2: The Status of Discarding Pesticide Bottles after Use

The World Health Organization estimates that more than 220,000 people die each year from pesticides, with an average of 547 men, women, and children dying each day from pesticides. According to the Department of Preventive Medicine and Environment of Vietnam in 2010, around 39 million people in the world are estimated to be chronically poisoned by the use of pesticides in agriculture. About 3 million of them suffer from acute acute poisoning and 220,000 die each year. According to data of the National Cancer Center, Vietnam has the 3rd highest cancer incidence rate in Southeast Asia. This figure is 7 times higher than traffic accident deaths. The cause of this disease is 80% due to food and environment [4]. In Vietnam, preliminary statistics in 38 provinces and cities shows that there were nearly 4,700 cases, with 5,207 cases of pesticide poisoning and 106 deathsin 2007. In 2009, there were 4,372 cases of poisoning with 4,515 cases and 138 deaths accounted for 3.05%.

DOI: 10.37200/IJPR/V24I4/PR2020392
Received: 10 Mar 2020 | Revised: 25 Mar 2020 | Accepted: 10 Apr 2020

VI. THE NECESSITYOF PROGRAMS IN ORDER TO REDUCE PLANT PROTECTION DRUGS IN THE FUTURE

Abuse of herbicides, use of drugs in excess of recommended dosage, use for wrong purposes, especially awareness, understanding and social responsibility of herbicide users in Vietnam is limited and that is the main causes of some undesirable impacts on public health and the environment in recent times. We need to soon develop a strategy to use plant protection drugs in Vietnam in the next 10-15 years to reduce risks and minimize use. Based on the Law, we need specific regulations on the formulation, promulgation and use of plant protection drugs list.

The restriction on the number of active ingredients in the list must be clearer, that is, we need tofocus on import restrictions of pesticides. Manufacturers that importpesticides must have certain certificates. Besides, we should increase import tax for pesticides and these should be discouraged from using in order to protect less toxic environment. We need to periodically review the products, eliminate any unused chemicals on the market [7].

One of the first challengesis to have a list of plant protection drugs that are really effective, safe and environmentally friendly. To do this, the immediate task is to strictly manage the testing inputs and eliminate poor quality drugs, toxic to humans and the environment. However, databases and scientific grounds related to this issue are still lacking. Therefore, removing pesticides from the list faces many difficulties.Moreover, the number of pesticides in the current list is imbalanced, mainly pesticides on rice and other crops have not been focused on development.

Secondly, the number of manufacturing plants (735 factories) as well as fertilizer products (nearly 20,000 products) is very large and unbalanced, mainly inorganic fertilizers. In addition, there are currently more than 200 quality criteria including microbiology and physiology published in fertilizer products but no domestic approved testing method has created pressure.

Thirdly, although there have been many positive changes in the use of plant protection drugs recently, the abuse of plant protection drugs by people is still very alarming. This has led to risks of food safety, environmental pollution and soil degradation.Therefore, linking production and consumption chains is an indispensable trend in commodity production and marketization of agricultural production to ensure good management of the use of pesticides and fertilizers. Applying fertilizer to ensure food safety requirements for domestic products as well as meet export requirements.

We need to link production is also an important factor to organize the collection of pesticides after use, not to pollute the environment. At the same time, the link chains are also an important premise to apply 4.0 technologies to production practice.We need to continue reviewing and strictly managing agricultural materials at all stages from testing, resolutely complete all scientific bases to eliminate poor quality agricultural materials, harmful to human health and the environment from the list.

Regarding the management of plant protection chemicals, we need to shorten the number of trade names in the list of plant protection drugs permitted for use in Vietnam; that is, we should increase registered and used biological pesticides.We also need to continue encouraging research, transfer, production, sales and application of biological measures, organic fertilizers, and biological plant protection drugs [7].

DOI: 10.37200/IJPR/V24I4/PR2020392
Received: 10 Mar 2020 | Revised: 25 Mar 2020 | Accepted: 10 Apr 2020

In addition, the Plant Protection Department will complete the system of standards and technical regulations, and review and tighten the system of testing laboratories and conformity certification organizations to ensure good quality management of materials. We need to inspect and comply with regulations on fertilizer management in all stages from testing, production, trading and use of fertilizers and plant protection drugs.

We also need to strengthen coordination with functional forces such as Police, Market Management, etc. to prevent the manufacture and trading of fake fertilizers and plant protection drugs, and the quality is not guaranteed. It is important to strengthen the responsibility of local authorities in the work of inspection [8]. We also guide and urge the system of plant protection branches and local administrations, especially district and commune levels, to perform the task of managing agricultural materials in their respective localities [9].Finally, producers have to participate in chain production and form production areas with crop objects, there will be engineers instructing cultivation methods and the farmers only spray at the right disease, the right time, the dose, etc.

VII. CONCLUSION

Vietnam's agricultural environment is seriously polluted due to the overuse of pesticides and the health of farmers and consumers of agricultural productsis also seriously affected. Facing the trend and demand for clean and sustainable production associated with environmental protection, environmental management is facing many challenges. We must have assertive policies and effective implementation to develop the socio-economy in a sustainable manner.

ACKNOWLEDGMENTS

I would like to show my thanks to the support of FPT University

CONFLICT OF INTEREST

Noconflict of interest

REFERENCES

[1] Dasgupta, S., Meisner, C., Wheeler, D., Xuyen, K. and Lam, N.T 2007 Pesticide poisoning of farm workers–implications of blood test results from Vietnam. *International journal of hygiene and environmental health*. **210**121-132

[2] Houbraken, M., Bauweraerts, I., Fevery, D., Van Labeke, M.C. and Spanoghe, P 2016 Pesticide knowledge and practice among horticultural workers in the LâmĐồng region, Vietnam: A case study of chrysanthemum and strawberries. *Science of the Total Environment*. **550** 1001-1009

[3] Poonam Pathak, "An Insight Into the Changing Scenario of Agricuture in Punjab", BEST: *International Journal of Humanities, Arts, Medicine and Sciences (BEST: IJHAMS)*, Vol. 4, Issue 1, pp.5-8

[4] Ecobichon, D.J 2001 Pesticide use in developing countries. *Toxicology*. **160**27-33

[5] Dey, N.C., 2010. Use of pesticides in vegetable farms and its impact on health of farmers and environment. *Environ. Sci. Technol*. **11**134-40

[6] Santanu Debnath & A.K. Panigrahi, "Effects of Chlorpyriphos (20% EC), an Organophosphate Pesticide on Gill and Liver of a Catfish Heteropneustes Fossilis, (Bloch, 1794)", IMPACT: *International Journal of Research in Applied, Natural and Social Sciences (IMPACT: IJRANSS)*, Vol. 4, Issue 11, pp. 59-64

[7] Sattler, C., Schrader, J., Farkas, V.M., Settele, J. and Franzén, M 2018 Pesticide diversity in rice growing areas of Northern Vietnam. *Paddy and Water Environment*. **16**339-352

[8] Tatiana Montaño-Soto, Evarista Arellano-García, Lourdes Camarena-Ojinaga, Christine Vonglascoe & Balam Ruiz-Ruiz, "Genotoxic Biomonitoring and Exposure to Pesticides in Women Laborers at

Maneadero Valley in Baja California, Mexico", *International Journal of Applied and Natural Sciences (IJANS),* Vol. 3, Issue 2, pp. 89-96

[9] Swaminathan, K. 2013 Pesticides and human diabetes: a link worth exploring?. *Diabetic Medicine* **30** 1268-1271

[10] Muneeb U Rehman, Manzoor Ur Rahman Mir, Sheikh Bilal Ahmad, Sheeba Shakeel, Mohammed Yaseen Shah & Showkat Ahmad Bhat, "Endosulfan, A Global Pesticide: A Review of its Toxicity on Various Aspects of Fish Biology", *International Journal of General Medicine and Pharmacy (IJGMP),* Vol. 5, Issue 6, pp. 17-26

[11] Landrigan, P.J., Suk, W.A. and Amler, R.W 1999 Chemical wastes, children's health, and the Superfund Basic Research Program. *Environmental health perspectives*. **107**423-427.

[12] Adnan Amin & S. T. Indulkar, "Chronic Effect of Imidacloprid Pesticide, on Carcass Composition of Common Carp Fingerlings", *International Journal of Agricultural Science and Research (IJASR),* Vol. 7, Issue 2, pp. 343-348

[13] Peterson, J.M., Boisvert, R.N. and De Gorter, H 2002 Environmental policies for a multifunctional agricultural sector in open economies. *European Review of Agricultural Economics*. **29**423-443

[14] Shibajee Debbarma, Ankita Bajpai, Rahul Singh, Jigyasa Passey & Seema Nigam, "A Study on Poisoning Cases Admitted in LLR Hospital, Kanpur", *International Journal of Medicine and Pharmaceutical Science (IJMPS)* Vol. 6, Issue 1, pp. 103-108

[15] Hoi, H. T. 2020. Current Situation of Water pollution in Vietnam and Some Recommendations. *IOP Conf. Series: Earth and Environmental Science 442.*

DOI: 10.37200/IJPR/V24I4/PR2020392
Received: 10 Mar 2020 | Revised: 25 Mar 2020 | Accepted: 10 Apr 2020