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Farmers' knowledge, perception, and practices on agrochemical usage in upper Uma Oya and Kumbukkan Oya watersheds in Sri Lanka

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Pesticides are widely used to reduce pre- and post-harvest losses in cultivations due to the pest infestations. A semi-structured questionnaire survey and key informant interviews were carried out to compare the patterns of pesticide usage, perception and knowledge of farmers in one of the main vegetables growing areas of upper Uma Oya and main field crop cultivated areas of upper Kumbukkan Oya watershed in Sri Lanka. The primary data were collected covering two main seasons (*Yala and Maha* of 2019/2020) in Uma Oya (n = 61) and Kumbukkan Oya (n = 65) watersheds. The cultivated major crops in Uma Oya watershed area are potato, bean, tomato and cabbage whereas rice, cowpea, and maize are grown in Kumbukkan Oya watershed. According to the results, active ingredients of 26 insecticides, 21 fungicides, 17 herbicides were used by farmers for their cultivations in both sampling areas. The most frequently used pesticides were insecticides (51.2%) followed by fungicides (45.8%) and herbicides (3.0%) in Uma Oya watershed while in Kumbukkan Oya watershed herbicides usage (44.4%) was followed by insecticides (36.0%) and fungicides (19.6%). More than 50% of farmers in Uma Oya watershed mainly used five insecticides namely Abamectin, Carbosulfan, Chlorantraniliprole 20% + Thiamethoxam 20%, Profenofos, three fungicides of Chlorothalonil, Mancozeb, Propineb and only three types of herbicides. More than 80% of the farmers in the Kumbukkan Oya watershed used to utilize herbicides of MCPA 600 g/l and MCPA 400 g/l as major pesticides. Most of these active ingredients used in this study were belong to the World Health Organization hazard classification class "U" which is unlikely to present an acute hazard. Highly used insecticides Abamectin, Carbosulfan, Profenofos MCPA 600 g/l and MCPA belongs to WHO hazard class II (moderately hazardous) chemicals while fungicide Chlorothalonil belongs to hazard class III (slightly hazardous) chemicals. There is no significant difference observed in mixing ($\chi2 = 2.567$, $\alpha = 0.05$) and selecting the pesticides ($\chi2 = 0.403$, $\alpha = 0.05$) in both regions. Nearly 67.5% of the respondents applied a mixture of different chemicals because they believe such mixtures save their time (20.6%) and unsure about the pesticide strength of controlling pests and diseases (34.2%). Farmers selected pesticides mainly based on the information provided by the pesticide retail shop owners or dealers (72.2%). Meanwhile, only 7.1% of farmers seek advice from agricultural instructors/extension officers on pest management decisions. Only 31.0% of respondents had training on the correct use of pesticides and such training were conducted by private sector organizations involved in pesticide marketing. Most of the farmers washed their pesticide sprayers in their field (62%) while 23% washed in the irrigation canal and 13% washed in nearby waterways. Eight percent of farmers carelessly disposed of the pesticide leftovers and containers in the open fields. The findings indicated pesticide application in the study areas represents a potential risk for the environment and farmers.

Keywords: *Environment pollution, Farmers' perceptions, Kumbukkan Oya watershed, Pesticides, Uma Oya Watershed*