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DOES CHEMICALS IN USE WARRANT URGENCY?

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The area of natural resource management problems persistently becomes self evident as we gear up with revolutionary ideals of science in the field of agriculture and the environment. While considering food production and biodiversity conservation in Nepal, the series of problems could inauspiciously emerge as we continue to make use of modern agronomic practices combined with improved varieties of seed and wider use of pesticides. Though the Nepalese farmers opted to reap even more post harvest crop yield from the same amount of land available, the potential impacts of toxic organic chemicals are of particular concern for its infamous public health safety issues. Moreover, the increasing uses of these toxic chemicals are undeniably unsafe when its residues attains spill over effects into the natural ecosystem. In the present context, quantifying the spill over in the wildlife population would be one of most difficult task to assess; nevertheless once the toxic residual intensity accumulates enough its gravity, it will in no time sweeps the very foundation of ecological integrity which we enjoy today.

In this issue I have discussed the current status of pesticides use in Nepal so as to portray some of the unknown and never questioned facts, to suggest the situation be examined in future in a piece meal approach for long term conservation and development planning in Nepal.

INFAMOUS TOXIC CHEMICALS USE PROFILE

Though Klarman (1987) have already warned the increasing use of pesticides in food production in Nepal, most of the health hazard threats he have mentioned were from the persistent organic pollutants which were ban these days. Despite of the 12 pesticides including persistent organic pollutants were ban for use in Nepal, according to the data availed by Plant Protection Directorate, Pesticide Registration and Management Division of Agriculture department (PRMD, 2004), since 1997 there has been dramatic rise in gross pesticide import and consumption in Nepal (Figure 1). In between 1997 and 2003 the total import and consumption of pesticides is recorded to be 1005.2 m tons and 835.39 m tons, with an annual average import of 143.61 and consumption 139.23 m tons respectively. On an average 152.73 metric tons/yr are being consumed in agriculture and public health sector alone.

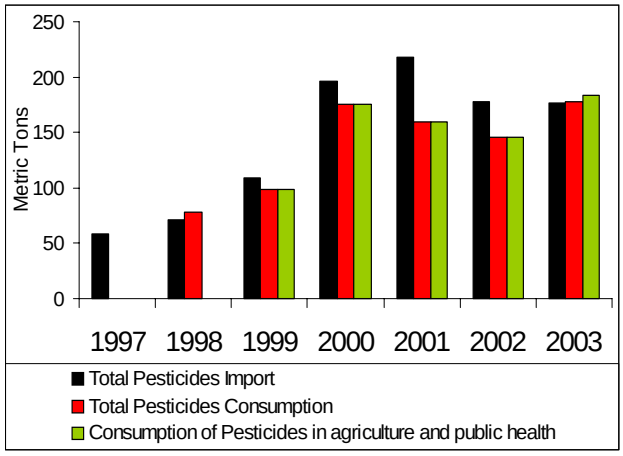

Figure 1: Pesticides import and consumption (1997-2003) in Nepal (PRMD,2004)

To date, about 319 types of pesticides have been registered for use under Pesticides Act and Rules of Nepal. Pesticides are sold in a Nepalese market emblazoned with different trade name (Insecticides-213, Fungicides-71, Herbicides-23, Rodenticides-8, Acaricides-2 and others-2). Pesticides in Nepal are imported from 8 countries and distributed through 67 national and foreign pesticide producing companies. There are in total 3450 trained resellers and of them 2543 were licensed (Palikhe, 2005). The import and consumption data of major pesticides such as insecticides, fungicides, bactericides, acaricides, seed treatment, herbicides and rodenticides shows that the demand and supply balance of pesticides has remained in steady equilibrium since 1999 in Nepal (Figure 2 and Figure 3). However insecticides consumption trend show increase in each successive years. Plant growth regulators, bio-pesticides and others types of pesticides also shares same equilibrium in import and consumption.

The toxicity level of pesticides that are sold in Nepalese market has been categorized according to WHO hazard

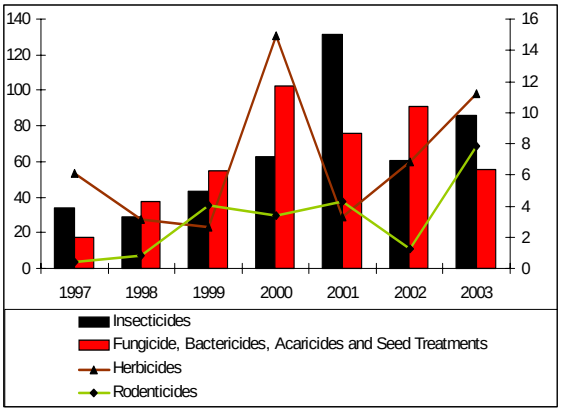

Figure 2: Pesticides import in tons in Nepal (PRMD,2004)

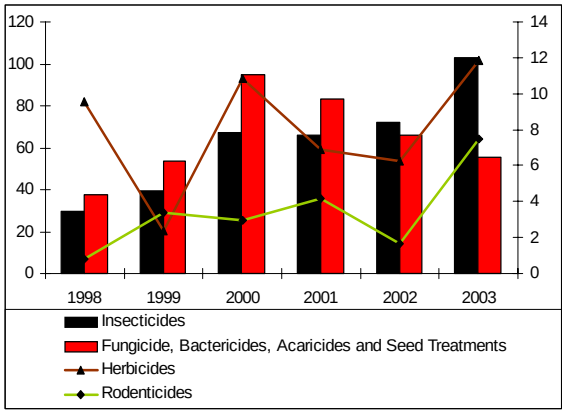

Figure 3: Pesticides consumption in tons in Nepal (PRMD,2004)

level. Insecticides are widely used organic chemicals, one in five insecticides which are in use in Nepal are categorized highly hazardous which have high oral or dermal lethal effect. A moderately hazardous insecticides group falls slightly less than half in total (Figure 4). Organochlorines, organophosphates, synthetic pyrethoids, carbamates and mixed forms are popular used insecticides in Nepal. Among them well under 85 % of organochlorines and organophosphates are consumed. The common forms are endosulfan, acephate, chlorpyriphos, quinalphos, dichlorovos, phorates etc. Almost all fungicides, herbicides, bactericides, acaricides and seed treatment pesticides fall under WHO non hazardous category and 75 % of all rodenticides fall under WHO highly hazardous category.

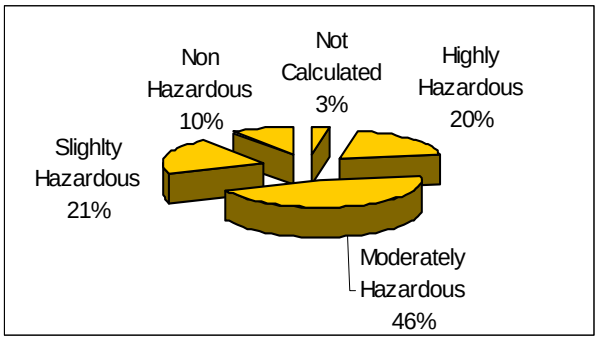

Figure 4: Hazard level for registered Insecticides in Nepal (PRMD, 2004)

THE UNKNOWNS

Does this trend of pesticides consumption have potential to degrade the integrity of the natural system in addition to human health threats? Agriculture land comprises 20 % of total land area of Nepal. If we assume linear pesticide application by ignoring over application, unbalanced application and under application in the available agricultre fields, the present average rate of pesticides use continue to add pesticides in a rate of 3 Kg/Km^2/yr in Nepal. Whether this rate forecast immediacy of urgency is left with questions, nonetheless protected areas covering other 19 % of total land of Nepal are island in a mix of settlements, agricultural lands, villages, wetlands and other land use forms. There is strong reason to believe that the low land Terai belt potentially act as a sink for pesticides residue more partly because of its large percentage share in agriculture land compare to mid hills and mountain region and partly because of plain topography and easy access to Indian market. Too little is known about the gross effects of pesticides consumption in Nepal to pertinently defense the potential loss of the natural resources.

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