

Water pollution effects and impact analysis

[Environment](#), [Pollution](#)



Water is considered to be a vital resource for production growth, industrial development, have led to structured measures to ensure sustainable management of this important resource. Water scarcity and pollution rank equal to climate change as the most complicated environmental problems for the 21st century[1].

Today, water pollution is one of the most important environmental problems in the world. The current rise in mortality is caused by the recent evaluation of drug-resistant, inaccessibility to effective healthcare facilities and the introduction of industrial by-products to the environment. One of such industrial by-products threatening the environment worldwide today is pesticides residues. Reports have shown that presence of pesticide in the environment and the threat they pose to wild life and mankind have generated great concern in the past 20 years[2].

The on-growing and uncontrolled use of pesticides to fight pest and improve agricultural production constitutes a risk for water quality. Thus, pesticides have been detected in water by monitoring surface and underground waters. The most frequently found types of pesticides in water bodies are derivatives of urea, pyridazinone, phenoxy acetic acid, tryazin and the group of chlorinated pesticides[3].

Pesticides are broadly classified into two groups as chemical pesticides and biopesticides. Chemical pesticides are conventionally synthetic materials that directly kill or inactivate the pest. Pesticides are also classified according to the type of organism they act against as insecticides, herbicides, fungicides, rodenticides and Nematicides[4].

Herbicides are used to destroy other weeds that interfere with production of the desired crop. Based on their structure they are grouped into chlorophenoxy compounds (eg 2, 4-D, 2, 4, 5,-T), dinitrophenols (2- methyl-4, 6- dinitro phenol), bipyridy compounds (paraquat, carbamate herbicides, substituted urea, triazines) and amide herbicides (alanine derivatives) [5].

Phenoxy herbicides (PHs) are among compounds among currently the most frequently used pesticides worldwide. They have been used on large scale in agriculture to control the growth of broad -leaved weeds on rice, maize and wheat and in post emergence application in most developing countries[6, 7]. Among them, 2, 4- dichlorophenoxy aceticacid (2, 4-D) is a common important PHs (Figure 1) that is selective herbicide extensively used throughout the world including Ethiopia for the past 50 years. These types of herbicidesfamilyare popular among the farmers because of their low cost, effectiveness even in low doses and good water solubility.

Figure 1: Structural formula of 2, 4- dichlorophenoxy acetic acid

However, there is information gap in our farmer about the toxicity level of herbicides [8].

Herbicides are commonly formulated into two forms including sprayed liquid and dry solids. Herbicides are widely used all over the world. figure 2 shows the statistic of pesticide usage worldwide, according to its categories for the year of 2011.. As shown in Figure 2, the total usage of herbicides in worldwide accounted as (36 %) followed by insecticides (25 %), fungicides

(10%) and other pesticides including nematicides, rodenticides, fumigants, birds, fish and aquatic fish (29 %)[9].