Chapter 4
Status of Indian Wetlands With Special Reference to Pesticides and Their Impact

Javid Manzoor
Jiwaji University Gwalior, India

Manoj Sharma
Jiwaji University Gwalior, India

Irfan Rashid Sofi
Jiwaji University Gwalior, India

Mufida Fayaz
Jiwaji University Gwalior, India

Musadiq Hussain Bhat
Jiwaji University Gwalior, India

ABSTRACT

Wetlands are home to numerous species of fish, birds, and reptiles. The enormous roots of the mangrove trees act as shelter to small fish, reptiles, and amphibians. Pesticides and agro-chemical fertilizers have been playing a very pivotal role in the degradation of the land and the water bodies. The different herbicides that are present in wetlands are Dicamba, Endothall, MCPA, Triallate, Trifluralin, 2, 4-D, and insecticides Carbaryl, Carbofuran, Fenvalerate, Malathion, Parathion, and Terbufos. These pesticides have been provided with the aim of catering to the security of the crops which are highly vulnerable to the pests. However, harmful effects of pesticides on wetland species have been a concern for long time. Wetlands constitute one such habitat threatened by the pesticides. But there has been a lack of comprehensive research in this direction. The chapter will identify the gaps in the current research and will review the status of Indian wetlands with special reference to pesticides and their impact.

DOI: 10.4018/978-1-5225-6111-8.ch004

INTRODUCTION

Wetlands are the precious life-sustaining water resources in India. Besides playing a vital role in the hydrological cycle, wetlands are the most productive ecosystems of the world and a potential source of carbon sequestration, although they covers about 4% of the earth's ice-free land surface (Prigent *et al*., 2001). Ramsar Convention on Wetlands, which is an international treaty signed in 1971 for national action and international cooperation for the conservation and wise use of wetlands and their resources, defines wetlands as "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres".

Globally, the areal extent of wetland ecosystems ranges from 917 million hectares (Lehner and Doll, 2004) to more than 1275 m ha (Finlayson and Spiers, 1999). One of the first widely used wetland classifications systems (devised by Cowardin et al., 1979) categorized wetlands into marine (coastal wetlands), estuarine (including deltas, tidal marshes, and mangrove swamps), lacustarine (lakes), riverine (along rivers and streams), and palustarine ('marshy'– marshes, swamps and bogs) based on their hydrological, ecological and geological characteristics.

The Ramsar Classification is exhaustive, given under three broad groups as Marine/Coastal wetlands, Inland wetlands and Human-made wetlands. There are twelve categories under Marine/Coastal wetlands, twenty categories under Inland wetlands and ten categories under Human-made wetlands, as given below:

- Marine/Coastal wetlands
- Inland wetlands
- Human-made wetlands

Wetlands are ecologically sensitive and adaptive systems (Turner *et al*., 2000). Wetlands exhibit enormous diversity according to their genesis, geographical location, water regime and chemistry, dominant species, and soil and sediment characteristics (Space Applications Centre, 2011). However, many wetlands which perform potentially valuable functions are continued to be ignored in the policy process. As a result many freshwater wetland ecosystems are threatened and many are already degraded and lost due to urbanization, population growth, and increased economic activities (Central Pollution Control Board, 2008) (Figure 1). Wetlands being dynamic and influenced by both natural and man-made activities, need frequent monitoring. Regular updation of the status of the wetlands is all the more significant in view of the accelerating pressure on the very existence of these resources due to developmental activities and population pressure being witnessed currently.

STATUS OF WETLANDS IN INDIA

India with its annual rainfall of over 1,300 mm, varying topography and climatic regimes, supports diverse and unique wetland habitats (Prasad *et al*., 2002). The available estimates about the area extent of wetlands in India vary widely from a lowest of 1% to a highest of 5% of geographical area (Space Applications Centre, 2011).