Mimosa pigra infestations and the current threat to wetlands and floodplains in Cambodia

Chin Samouth[1]

Abstract

The wetlands in Cambodia play a vital socio-economic role. They provide food, basic household commodities, arable land, water for agriculture, fishing and a range of habitats for aquatic life, birds and wildlife. These wetlands are under serious threat. Fish catch is declining, flooded forest is rapidly disappearing, and lakes and channels are getting shallow. Mimosa, *Mimosa pigra* L., has infested rice fields and wetlands, replacing native vegetation. This weed is considered to be one of the serious threats to wetlands in Cambodia, in particular around the Tonle Sap Great Lake, and wetlands along the Mekong River and its floodplain. This paper provides information on mimosa and its impact in Cambodia near Boeung Thom, Kompong Cham, a pilot site of the Cambodian Wetlands Project.

Keywords: Mekong River, weed invasion, impacts, spread.

Introduction

About 20% (3.65 million hectares) of Cambodian territory consists of permanent wetlands and lakes and large, annually inundated areas. This includes 5% of Asian wetlands of international importance. These are naturally productive and have important ecological and socio-economic functions involving flood buffering, soil fertilisation by annual deposit of flood-borne silt, recharging of groundwater and spawning and rearing habitats for fish and other aquatic organisms.

There are four major wetland resources in the country:

- the Mekong River and its floodplain
- the Great Lake and Tonle Sap floodplain, which covers 250,000 to 300,000 ha in the dry season and 1,300,000 ha in the wet season
- the Stung Sen floodplain of more than 400,000 ha, north of the Great Lake
- the middle floodplain.

Exotic plants and animals are common at Tonle Sap, but while locally troublesome, they form only a minor underlying threat to indigenous biodiversity. However, there is sufficient evidence to suggest that certain species have potential to outcomplete indigenous species and become major pests. Potentially troublesome species thrive under local conditions, propagate naturally, and threaten biodiversity through competition with, and displacement, predation, and parasitisation, of indigenous and endemic species.

Mimosa

Of the many exotic plant species recorded at Tonle Sap, the only potentially problematic weed at present is mimosa, *Mimosa pigra* L. This aggressive, invasive weed, forms large, mono-species stands, to the detriment of indigenous biota, and

[1] Program Officer, Environment Division, Mekong River Commission Secretariat.

causes significant economic damage, primarily to livestock and fisheries.

Originally from South America, it is capable of surviving in various ecological environments. According to the local people it was first seen in the Great Lake in early 1990. The change in land use in the region, in particular an increase in rice cropping, has been a significant factor in the spread of mimosa, with neglected or abandoned fields being particularly susceptible to invasion (Figure 1a). By April 1997 the mimosa infestation had spread to wetland sites along the Tonle Sap River and areas close to Kompong Chhan Town and the northern part of Tonle Sap Lake. In addition, mimosa has been found at the following locations; Stung Treng, Kratie, Kompong Cham, Kandal, Kompong Chhnang, Kompong Thom, Posat, Batdombang, Siem Reap, Prey Veng, Svay Rieng, Takeo, and some parts of Kompong Speu (Figure 2).

Figure 1a. Mimosa plants growing in rice fields at Kompong Cham

Figure 1b. Mimosa plants growing on the Tonle Sap floodplain.

Recent surveys by the Mekong River Commission Water Utilization Program show that mimosa is widely distributed from low-level lake banks, 1.5 m in depth, to abandoned fields under up to 7 m in depth. Areas with dense existing vegetation are practically free of mimosa; for example, the northern part of Tonle Sap floodplain (Figure 1b). Large and almost impermeable mimosa thickets were found in the areas where abundant fields border the southern part of the lake. The most abundant mimosa plants were observed in the Pursat region (Figure 2), in areas of flooded grasslands and abandoned fields. Other dense mimosa infestations occur in the delta area of Tonle Sap. There are also extensive mimosa infestations around Siem Reap, north of Tonle Sap (Figure 2). The potential area of the mimosa infestation is at least 2,100 km^2, or 20% of the maximum flooding zone. It can be clearly stated that mimosa is a major problem.

Pilot project in Kompong Cham

During phase I of the Inventory and Management of Cambodian Wetlands Project, the team selected Boeung Thom wetland as a pilot project site. It is one of the most important wetland systems in Kompong Cham Province and is comprised of 10 sub-lakes, most of which connect Boeung Thom to the Mekong. Boeung Thom is located in three districts: Prey Chhor, Kompong Siam and Kang Meas District, Kompong Cham, around 125 km south-east of Phnom Penh.

The wetland's spatial diversity and large area of flooded forest provides sanctuary and habitat for wildlife such as crocodiles, and a range of fish and large water birds.

Impacts of mimosa

The system is also socio-economically important for local people living around the wetland. Local people obtain food, basic household commodities, arable land, water and fuel wood from Boeung Thom wetland.

Every year farmers spend a lot of money on mimosa clearance and they get less income from the agricultural product. It is difficult for farmers to find food and pasture for their animals and also difficult to access the wetlands for food and wetland product collection. Some farmers have left their land to find other jobs in the province or cities, as building workers, garment factory workers, moto-taxi drivers, cyclo-drivers, and so on.

The results of discussions with stakeholders during the project show that the major threats of an infestation of mimosa to wetlands are the formation of mono-species stands that cause severe impact on aquatic resources, agricultural, and family economics. The impacts issues raised by stakeholders include the following:

- several white fish species have disappeared from Boeung Thom
- fish catch has declined

- loss of money and time for agricultural land preparation
- displacement of local plant species
- difficult to access wetlands for fishing and food collection
- degraded fish, wildlife and bird habitats
- disturbance of aquatic life
- trapping sediment.

Developing a management plan

The above results of the Boeung Thom survey were presented to the stakeholders at 10 locations. These results and the knowledge of local landowners were then used to prepare a management plan for the region. The process used was as follows:

- a discussion of threats to the lake's resources, and determination of the threats that related most to people's livelihoods
- identification of the impact of those threats to occupations and livelihoods
- summarise proposed solutions to the causes of the selected threats to the lake system
- take the issues and requests to institutional and other stakeholders to seek resources to address these problems in Boeung Thom.

Lesson learnt of local community

The three local communities report that mimosa was first seen in Boeung Thom around 1985. By 2000, the whole area was infested, especially where the flooded forest had been cleared. Results of the communities' experience with mimosa management showed that stem cutting, fire and combined cutting and fire were not effective in managing the weed. Mimosa plants were difficult to burn/kill. The cut stems grew quickly after the first rain. Local communities noticed that fire triggered the germination of mimosa seed. Although significant increases in mimosa invasions were noticed in Boeung Thom in late 1999, no weed management or control practice was applied until eradication had become complicated and costly. The Boeung Thom communities requested continued funding support to manage this invasive weed. Unfortunately, the project terminated in December 2000.

Figure 2. Locations were mimosa has invaded Cambodia.

Recommendations from the study

- Replanting of local flooded forest species with support from government organisations, non-government organisations and other organisations.
- Rehabilitate habitats for fish and birds.
- Management plans for firewood collection.
- Training on mimosa management and control at local level.
- Research/study on the impact of mimosa on fish and other aquatic life.

Acknowledgements

I thank the Australian International Seminar Support Scheme (ISSS) for sponsoring me to attend this symposium.