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ECOLOGICAL SCREENING OF SHATIYA WETLAND IN RELATION TO AGRICULTURAL PRODUCTIVITY

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ABSTRACT

Wetlands are such natural habitats that performing valuable ecosystem services such as flood protection, water quality enhancement, food chain support and carbon sequestration. The wetlands may be extensively used without resolving drastic conditions and without chemicals might results in crop production with other wetland services with intact biodiversity.

This paper related to ecological screening of Shatiya wetland with the scope of its perspective use and sustainability of crop production. It also provide insight about recent anthropogenic disturbances which will lead sequential pressure to reclaim and loss of natural existing crop fields and the increasing cultivation of energy crops.

Key words: Wetlands, sustainable agriculture, floodplains, rice fields, water use, irrigation.

INTRODUCTION

There is several human settlements primarily occurred in fertile areas along rivers as primary settlements have occurred near water resources. Such river-connected wetlands are recognized as valuable site for agricultural works from the primary human settlements worldwide, because they have fertile soils resulted through regular sediment

deposition during flood events (Chew, 2003). The wetlands are reclaimed for agriculture in many parts of the universe with ever simple drainage and land amelioration measures within the course of civilization. The natural wetland ecosystems with agricultural activities leading to reduced biodiversity (Hassan et al., 2005; Mitsch and

Gosselink, 2007). It is certain that substantial wetland areas affected by drainage and development are only available for different regions mostly through agriculture (Millennium Ecosystem Assessment, 2005).

The expected growth of the universe population within the next 25 years, the necessity for food products will increase 50% by 2030 (Hassan et al., 2005). Additionally, there's a growing trend to grow energy crops to be utilized in bio-fuel production (Smeets et al., 2007). Also, some measures to boost neutral climate will lead to a greater pressure to natural areas for agriculture. This might mean that wetlands run an increasingly higher risk of being drained and destroyed. Another consequence is that the active exploration of more flood-tolerant and salt-tolerant crop varieties which will grow successfully under limited periods of water logging or drought-associated salt stress. This might lead to agricultural activities in wetlands that leave the water regime of the wetland intact but still disturb the wetland ecosystem by adding fertilizer or pesticides.

The aim of this review is to measure the impacts of the agricultural use of wetlands from different perspectives, with special attention to the results of past and current developments of land-use dynamics and new agricultural approaches for wetland functions and their benefits worldwide.

Agriculture in Wetlands

Floodplains in river basins in many parts of the universe are used for agriculture with their natural fertility. Floodplain sediments are regularly deposited by flooding with river water in very wide, flat areas, with subtle height gradients from natural levels with their relatively coarse sediments. The most important areas of those floodplains are highly suitable for growing crops, while the lower parts are wetter but are often suitable for grazing. These large 'land amelioration' works in floodplains have particularly deprived them of their wetland character in many parts of the planet (Nienhuis, 2008). In semi-irrigated regions, the appliance of freshwater for irrigating crops has also created major problems for wetland conservation.

The river floodplains also provide a big

benefit to river fisheries. Many river-dwelling fish species spawn in aquatic vegetation on floodplains and also the fish larvae take advantage of the floodplains (Welcomme et al., 2006). There are many initiatives to restore natural flooding and to order environmental flows to boost floodplain fertility and river fisheries and similarly protect river floodplain biodiversity (Coops et al., 2006; Welcomme et al., 2006).

Current Trends in Agriculture

The global food production has doubled within the past 40 years are enough to increased human population (Hassan et al., 2005) at the expense of major losses in biodiversity, disruption of worldwide element cycles, problematic eutrophication and toxification of our freshwater resources, and loss of regulating ecosystem functions. The challenge for the next 25 years to food production (FAO, 2003) also have another trend is able to create additional demands for agricultural land and increasing production is that the increasing use of first generation bio-fuels as another energy source to fossil fuels (Smeets et al., 2007). The latest, more flood-tolerant crop varieties may help to sustainable solutions within the context of agriculture, wetland ecosystem services and biodiversity.

Flood-Tolerant crop varieties and their use in Agriculture

It remains questionable whether major crop species may be made suitable for growth in wetland environments. Research in crop science has shown a spread of crop varieties that have better water logging tolerance than the regular cultivars. It provides an outline of the range of flood tolerances of cultivars of wheat, barley, oats, triticale, maize and rice, at the vegetative stage, within the sector or in flood-prone soils from target environments.

The timing, duration and intensity of the flood events clearly affected plant responses in these preliminary experiments. It should be stressed here that the circumstances investigated are very brink on this commercially used agricultural environments and means representative for wetlands. The well-drained wetland soils and also the flood periods were very short as compared with those of natural wetland environments. There some crop varieties have some

extent of flood tolerance. It is essential to search flood tolerant strains which could provide scope in wetland productivity.

There is no systematic research whether new variety of crop species apart from rice will be grown in wetland environments. Plant breeding and genetic modification is ongoing to develop cultivars that are more flood-tolerant and salt-tolerant. It would be worthwhile to live success and part of these developments and specifically seek for opportunities where such new cultivars could be utilized in selected wetland environments.

In view of the importance of wetland ecosystem services, it would be preferable to practice agriculture in wetland environments without the requirement of forced drainage measures that basically transform wetlands to dry soils. River floodplain systems are more suitable for experimental use of flood-tolerant crops.

Wetlands for Agriculture alongwith other wetland services

Many wetlands are currently subject to extensive land uses, during which food production is typically combined with other functions like water quality enhancement, flood detention or biodiversity. This sort of land uses are traditional crop cultivation methods without chemical fertilizers or pesticides, grazing schemes involving livestock, or traditional water management schemes to boost fish catches. At the current, such extensive land uses are often found in regions with subsistence agriculture where local communities produce food on a short scale, mainly for personal or community level (Waters, 2007). Combinations of local crop growing, fish production and grazing are being practiced during a semi-natural setting.

These systems could be optimized to supply more food per unit of wetland area while conserving the wetland, leaving its hydrology intact the utmost amount as possible and protecting its functions, including its biodiversity. It is important to agronomists, environmental scientists and local stakeholder groups cooperate to strive for the most effective combinations of land uses and other measures and for its actual implementation.

CONCLUSION

It is crucial to guard our remaining natural ecosystems from anthropogenic disturbances as cater demand of over-population in regions under process of development within the present universe. The floodplains and rice fields has proven to be sustainable through past periods with minimal requirement of chemical fertilizers and pesticides. The wetland systems could be considered for growing flood-tolerant crop varieties. These are just the conditions often found in wetlands connected partially to rivers. Such agricultural activities in wetlands could also be tested in floodplain restoration projects.

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