Wetlands Environmental Management For Agriculture In Hungary

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ABSTRACT

Hungary is located at the central Basin of Danube River, which is surrounded by the Alps and the Carpathians mountain range. The 84% of the Hungary area lies below 200 mBm. The rate of the flooded area is significant in the country. The average runoff of surface water exceeds hundred billion cubic meters. Streams and rivers from the surrounding area flow together with the Danube River into the Black sea. The 96% of the mentioned water quantity come from abroad; three-quarters of this water quantity enter the country in the Danube's, Tisza's and Drava's riverbed. In my presentation, I would like to give an account about the status of wetlands in Hungary, its roles of agriculture and social life, difficulties encountered and future possibilities referring to literary sources.

Keywords : Financial Regionally Accounting Information System Characteristics, decision controlling policy, decision management policy, cost consciousness.

INTRODUCTION

Hungary is located in moderate climate zone, but it's under strong continental influence, that complicates the weather forecast. The average yearly precipitation is 550-600 mm, which is between 300 and 1200 mm in various regions of the country. The precipitation is sufficient in the west region of the Danube that is the reason Transdanubian area has great water supply.

In contrast, the catchment basin of Tisza is poorer in precipitation, because in long-term average the precipitation is less than 600 mm/year in 80% of the cases while it is more than 600mm/year in the 20% of the cases. Therefore, these low-lying areas are more vulnerable to the drought, inland waters and flood (Somlyódi, 2002).

RESULTS AND DISCUSSION

Before river regulation, the Tisza flooded large area of Great Plain; it had no got riverbed, practically. The slight sloping and slow river could be diverted easily by lower

barriers also. Due to these attributes, the Tisza's riverbed has permanent migration.

At the time of flooding, the water spread on vast floodplains. Permanent marshes were formed on the area of flooded plains. Tisza formed a considerable part of the Great Plain to wild wetland country.

The idea of Tisza regulation was incurred at the 18th and 19th century, which set the following objectives: (a) inshore property protection, (b) new agricultural production area (c) creating the conditions for the cheap shipping.

The main changes after the Tisza regulation were:

- The regulation has successfully passed the flood relief. We can continue the construction of the dams; broaden the floodplains- including the reservoirs, which would benefit from nature conservation aspects.
- 15500 km² area of Tisza Valley was flood relieved which is utilized for agricultural cultivation.
- Stronger evaporation can be observed, thus sodium salts were transported to

near to the surface layer by the upward water movement. The salinization processes were strengthened.

- The inland water can not flow directly into rivers because of the new dams. Inland water reservoirs were built, the collected water was pumped raised through to the rivers.
- A sharp decrease in fish stock can be observed, because of decreasing floodplain areas and accelerating water flow.
- Sources of dangerous diseases were disappeared because of the drainage of swamps. The agricultural carrying capacity made possible to the population growth.
- Currently, the Tisza shipping is negligible.

The current situation, water management of Great Plain could be pertained:

- The vast majority of surface water comes from the neighbouring countries.
- Regional and spatial distribution of water resources is uneven.
- There are significant differences between water resources and water needs in space and time.
- The water discharge of watercourses is uneven.
- The decrease in water volume of still water is becoming more severe.
- The water resources of usable surface and subsurface water are decreased quantitatively and became qualitatively worse.

Based on the above description, within one year of the drought, the inland waters, and the flood are real risks.

Flood and inland water

The incoming low water discharges of Danube and Tisza are 570 m³/s, 45 m³/s, however the largest flood discharge are: 10 300 m³/s, and 3350 m³/s. Large fluctuations could be observed in precipitation, the autumn

and spring often involves large amounts of water, which causes significant damages. Periodic flooding may occur in flat areas adjacent to surface waters. The quarter area of the country is threatened by floods. The other parts of these low-lying areas are compromised by inland water. The both type of mentioned area expose the 52% of the country that affect two-thirds of the cultivated lands.

Drought and irrigation

The number of sunny hours is about 2000 hours. Evapotranspiration can be 500-600 mm/year, more than the annual precipitation. This is especially true in the region of the Tisza. If low quantity of precipitation is realized in summer, the situation is even more dangerous. In this case, the moisture content of the soil is unable to meet the minimum water requirement of vegetation in the root zone. Drought affects mainly the eastern part of the country. The irrigation avoids the drought damages, and preserves the crop safety. The total irrigated area is about 300,000 ha, however, only 30-40% of this area is used currently (Somlyódy, 2002).

The wetlands are transition between terrestrial and aquatic habitats. Wetlands are all natural units which have proportional average depth – in case of medium water level – is no more than two meters, as well as, those parts of the deeper water bodies, which at least one-third of part is covered by macro-vegetation as seaweed, marsh or edging plant. The natural units are considered as wetlands which have hydromorph soils and their upper layers are saturated with water permanently or at least for a longer period. Mostly, plant populations with high water demands characterized these areas as reed, high-sedge, marshy meadows, marshy weed associations, mud and reef salt-loving vegetations, softwood and hardwood groves, alder groves (Dévai, 2000).

The Ramsar Convention (1971) was signed in Ramsar (Iran), initially focused on bird protection approach. Following this, the general protection of wetlands, wildlife was

the full account of the focus. In 1979, Hungary joined the Ramsar Convention, and in 1995, the Hungarian National Committee was formed.

The most serious ecological impact of water management interventions was the suppression of wetlands. Upper sections of the Danube river basin system were affected by such interventions as cross dams, reservoirs and penetrations. Changes of natural water regime contributed to (a) disappearance of many types of the habitats, (b) disappearance of wetlands in river borders, impediment to metabolic processes of the rivers, cessation of fish spawning grounds. In Hungary, the flood control and draining works disappeared nearly a million hectare of wetlands (Istvánovics – Somlyódy, 2002).

Types of non-watercourse wetlands:

Plain saline lakes- which are protected areas, specific manifestations of the Eastern European forest-steppe and steppe zones with special chemical properties and wildlife (Danube-Tisza-Ridge, Central Tisza region) (Dévai, 1996).

Bog soils, peat-bog with highly decomposed peaty substance in particular, the most southern lowland sites of occurrence in Nordic (mainly tundra, taiga belt, and the higher mountains typically) water bodies in Europe. These areas have special chemical potentials and characteristic flora and fauna (protected areas).

Marshes common type of wetlands in lowlands, formerly covered large areas of the Great Plains. They have key importance in drying areas. They have particular manifestation which is known in our country with specific chemical potentials, specific flora and fauna. Currently, their water catchment area is very small; their water recharge feed-through takes place from watercourse and foreign catchment - except in the floodplain wetlands.

River dead beds, characteristics of the Hungarian Great Plain wetland turn different types of dead beds along the river (part of the landscape). So-called green corridors are important saviours of the original water wildlife. They have special endowments and distinctive flora and fauna.

Floodplains are the areas between mean coastline of rivers and protection dikes, which expose the 6% of the original floodplains. The habitats of floodplains are markedly reduced the wetlands -which are the transition between the water and terrestrial habitats - are the most vulnerable. Those elements of the habitat chain which were close connection earlier with the rivers eliminated or transformed in the upland side of the rivers. During the flood relief, the extent of these areas reduced most notably.

The alluvial floodplains are preserving the traditional forms of farming; on the other hand these satisfy to new demands. The subsistence fishing has decreased however; the sport fishing has become popular. Only residues of oak, elm, walnut, floodplain orchards could be found. The reeds, cattail are no longer base materials for the building or user devices. Floodplain, meadows and pasture, and plant production are utilized for feed. The number and area of resorts are growing.

Coordination of flood protection, nature conservation and recovery demand is essential task.

The total area of floodplains is 127450 ha in Hungary. The larger part of this area is located at Tisza Valley (59%); the smaller part (41%) is located at Danube Valley.

The main cultivation branches of the Danube Valley are: forest, arable land, and grassland. The gardens, orchards, fish ponds and reeds appear in small quantities.

One-third of floodplains is covered by forest in the Tisza Valley. The arable land of Tisza Valley is two times larger than the Danube Valley's. The soil fertility is low on the floodplains. It falls far short of good

quality Hungarian soils (Gergely – Érdeiné Szekeres, 2002).

The future of wetlands

Today, agriculture sector - in addition to food production - means landscape management and nature management.

The floodplains and outside of the floodplains can be utilized for cultivation, hunting, fish farming, and ecotourism which provide living for provincial people (Glatz, 2002). In the target program of wetlands, the following procedures will get priority:

- Change of cultivation branches offers many advantages (Gergely – Érdeiné Szekeres, 2002).
- The elimination of summer fields and dams will help the cleanup of the floods.
- There will be possibility for renewal of floodplain forest and for afforestation.
- The extensive grazing of domestic animal species come to forefront (gray cattle, domestic sheep species, waterfowl), production of organic animal products.
- Floodplain orchards can be planted (walnuts, plums).
- The backwaters can serve the fish farming and fishing.
- Condition of the water and ecotourism can be improved.

It can be concluded that usage of ecological corridors with conversion changes of floodplains promotes the continuity of natural habitats. It plays an important role in the conservation of biodiversity.

CONCLUSIONS

- Wetlands in Hungary have gone through major changes. Subsequently, less water will be available because of the climate change.
- We have to manage better the water which comes from the neighbouring countries.

- Design and creation of periodic reservoirs are imperative.
- The life of the rural population is largely determined by the conditions of wetlands. We should strive to utilize it variously. The wetland tourism and recreational functions of wetlands are increasingly strengthened.

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