KORGALZHYN STATE NATURE RESERVE'S RESOURCE MANAGEMENT SUBSYSTEM

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Alden (1973) stated that the resource management subsystem consists of two phases – resource input and the resource management programs aimed at managing those input (see Figure 1). Preserving resource excellence is important and is should be achieved by monitoring the effects of present custodial programs on the resource base at some established stage. In other words, maintaining impact in some acceptable level or getting better the resource's capability to uphold an upper level of use within acceptable limits. Monitoring should be conducted at the line between the resource and human use. It indicates how good the existing programs are, and provides information about the way the stakeholders should conduct the programs within acceptable limits. In all resource management programs, preserving the resource might not be the only final objective, accomplishing some needed outcome, such as providing specified recreational opportunity, should be put into consideration.

Resource management programs consist of:

1. *Site Management.* This is an intense program to protect the site from any risk of overuse by the visitors and to provide pleasant and aesthetic surroundings for the activities.
2. *Overstory Vegetation Management.* This included silvicultural performance related to the management of the intensively used areas.
3. *Ecosystems Management.* It concentrates on particular disputable areas of management business related to the fragments of existing endangered ecosystems.
4. *Visual Resource Management.* It is a process where distinctive landscapes are listed, analyzed, classified and organized based on their availability to any low-visual-impact development.

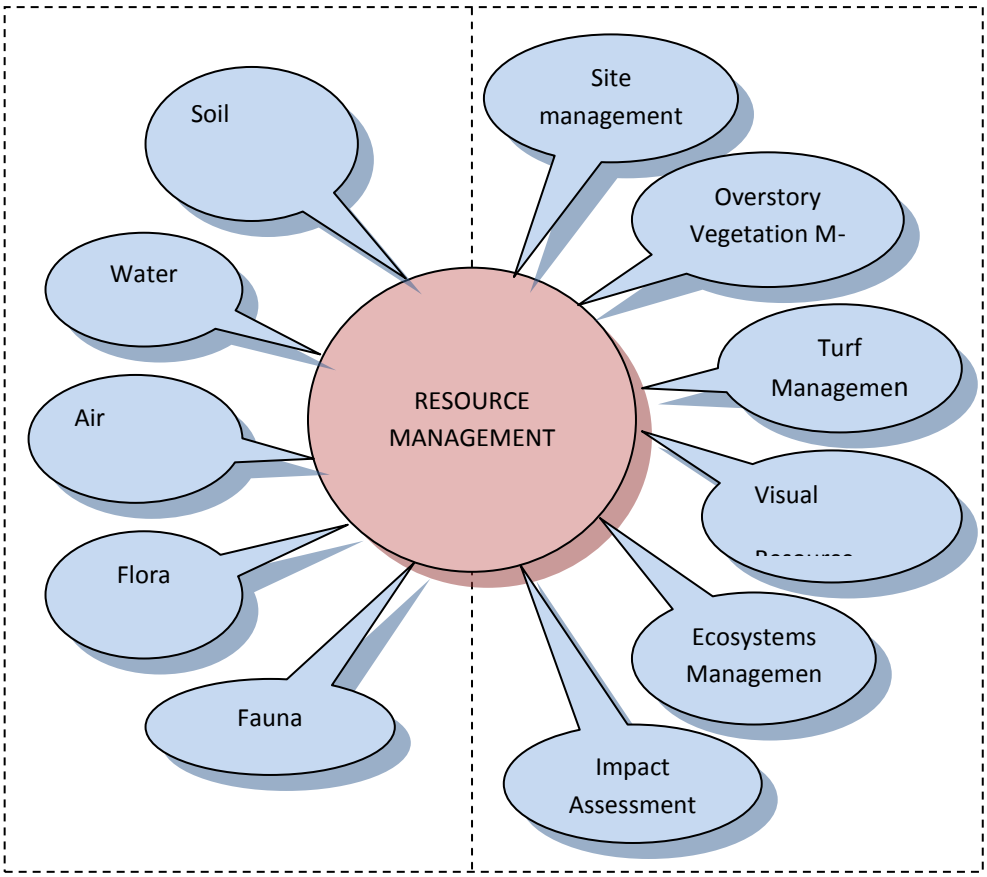

Figure 1. Resource management subsystem.
Source: Adopted from Jubenville et al, 1993

1. Korgalzhyn State Nature Reserve's (KSNR) resource management section analysis

Based on the interview and documentary researches, several problems with the resource management subsystem were identified.

Table 1: KSNR's resource management subsystem findings

Resource Management			
Theory	**KSNR**	**Problems**	**Implication**
Resource Monitoring:			
➢ Soil			Carried out in order with KSNR Development Program, and KSNR Annual Management Plan
➢ Water			Carried out in order with KSNR Development Program, and KSNR Annual Management Plan

➢ Air			Carried out in order with KSNR Development Program, and KSNR Annual Management Plan
➢ Flora			Carried out in order with KSNR Development Program, and KSNR Annual Management Plan
➢ Fauna			Carried out in order with KSNR Development Program, and KSNR Annual Management Plan
Resource Management Programs:			
➢ Site Management			Due to Kazakhstani Specially Protected Areas regulations site management is prohibited
➢ Overstory Vegetation			Due to Kazakhstani Specially Protected Areas regulations overstory vegetation is prohibited
➢ Turf Management			Due to Kazakhstani Specially Protected Areas regulations turf management is prohibited
➢ Visual Resource Management			Due to Kazakhstani Specially Protected Areas regulations visual resource management is prohibited
➢ Ecosystems (set of organisms and environment of their dwelling) Management			Hazard, anthropogenous pollution of rivers' basins, overuse of biological resources, facilities and infrastructural problems, weakness of water level control systems causes a big lost of biological species (animals, fishes, birds)
➢ Impact Assessment			Basin of river Nura is experiencing a critical situation due to pollution of its waters by heavy metals, mineral oil and other chemical products. Sewage waters throughout tens of kilometres along the river annually carry out the pollutants. The polluted water might have reached the lakes of KSNR and presented potential threat for their inhabitants.

Note: ✓ available input
● presence of problem
○ absence of problem

The first column of the table above displays inputs which are considered in management process. These inputs are inhesion for management of all protected areas categories and outdoor recreational places. Therefore, KSNR belongs to Ia category "Strict Nature Reserve", inputs such as, concession management, area planning, and site planning not considered in KSNR's management. Second

column shows what KSNR has. Third column shows the presence or absence of the problems in listed inputs, which are described bellow in detail. The fourth column provides implication.

Water Control Problems

Periodic changes of water levels in the river, both by natural climate and artificial causes (e.g., manipulation of channels of the river and water detention in artificial water basins), repeats the phenomenon of overflowing and droughty lakes system that negatively influences conditions of the major places of dwelling natatorial and water birds.

Artificial dams were built to maintain optimum water level in the lake, however, due to some technical and financial limitation, quality was not prioritized and the dams often break. Due to this situation, lakes in KSNR experience difficult conditions such as significant drop of the water level in reservoirs that suffocated fishes, and floods that deteriorated colonial birds' nests.

Deteriorations of the reserved fauna were mainly caused by high tide on springs. During winter, water in the lake basins upstream (e.g., lake Samarkand) froze and gained volume. At the end of the winter, the ice melted and produced higher amount of water. To avoid overflowing, people drained the lake by opening dams to the rivers. This action brought negative influence for the river and lakes at the downstream. Overflowed downstream lakes deteriorated thousands of endangered birds' nests.

It is necessary to apply modern engineering system to regulate water levels on the lakes in KSNR. It was noticed that downstream flows during the winter led to significant reduction of oxygen in the water, which deteriorates the fisheries. Another problem is the preservation of water mineralization in the lakes. Various water biotas essentially depend on the level of water mineralization. Stable and consistent water mineralization probably can be supported by periodic exchange of water in the lakes. Adjustable water waste constructions are required in this situation.

Meanwhile, the question about preservation of water quality is the general problem on all river basins and can be solved by working out of complex measures on all basins.

Anthropogenous pollution of reservoirs

Currently, basin of river Nura is experiencing a critical situation due to pollution of its waters by heavy metals, mineral oil and other chemical products. Sewage waters throughout tens of kilometres along the river annually carry out the pollutants. The polluted water might have reached the lakes of KSNR and presented potential threat for their inhabitants.

Some hydro chemical researches needs to be done in order to get the knowledge to predict the future ecological condition of the lakes. Despite the researchers might lead to re-planting or re-introducing new species of plants or animals, such activities were considered prohibited by local law. The management

perceived that altering according to the law about Special Protected Nature Territories, introduction (installation or other kinds of plants and animals) in protected area is strictly forbidden. For this reason, planting or re-planting in reserve should not take place, even though it was in order to maintain the ecosystems.

Irresponsible Uses of Biological Resources

Extensiveness and remoteness of many sites of reserve (e.g., coastal lines of lake Tengiz) makes it almost impossible for the management to enforce the rule of their protection to the right degree. For example, hunting for birds in lake Tengiz plaits, and fishing in the lake Korgalzhyn are both illegal and it takes co-operations from the visitors not to be involved in such unlawful activities. Since there is no efficient control for the activities of hunting and fishing at local level, this situation led to the deprivation of the local communities that are supposed to have special rights to utilize the resource to some degrees. Often, trespassers with high-performance equipment committed illegal hunting and fishing at KSNR and leave nothing valuable for the local communities.

To some degree, it seemed to be necessary to offer special rights to local communities to utilize the resource around KSNR. Despite the need to enhance the security system, local communities should be involved in maintaining KSNR with the controlled special rights as rewards.

2. Conclusions

Resource management includes two phases – resource input and the resource management programs. These resource management programs aimed at managing those input. Resource management has problems as follows:

1. Infrastructural problems

   Periodic changes of water levels in the river repeats the phenomenon of overflowing and droughty lakes system that negatively influences conditions of the major places of dwelling natatorium and water birds. Water regulation system of rivers needed to be improved.
2. Environmental control problems

   Sewage waters throughout tens of kilometres along the river annually carry out the pollutants. The polluted water might have reached the lakes of KSNR and presented potential threat for their inhabitants.
3. Problems in controlling of the recreational facilities
4. Hunting for birds in lake Tengiz plaits, and fishing in the Lake Kulanotpes are both illegal and it takes co-operations from the visitors not to be involved in such unlawful activities. Since there is no efficient control for the activities of hunting and fishing at local level, this situation led to the deprivation of the local communities that are supposed to have special rights to utilize the resource to some degrees.

3. Recommendations

Reserve protection can be organized as follows:

- First, it should be meant to increase number of cordons on perimeter of reserve with a view on strict control penetrations on its territory of poachers and other extraneous persons.
- Second, it is necessary to supply these cordons with modern monitoring facilities and protection. So, installation of chambers of supervision, and not only on cordons, but also in places most often visited by people, animal and where there are the most valuable kinds of flora and fauna is supposed.
- Third, it is also necessary to provide inspectors of protection with more modern communication facility, lanterns, transport. Therefore, in the western countries, protection is carried out by special employees and technicians equipped with high-tech instruments. From transport they use during wintertime snowmobile, snowmobiles, and in summer – quadracycle and small off-road cars. Such transport considerably facilitates work of inspectors of protection on investigation of territory of reserve. For water transports, it is possible to use modern boats supplied with a special communication facility and other stock for rendering assistance by the wounded animal and other actions. The same transport can be used for scientific researches and carrying out of excursions.

References:

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2. *Jubenville, A.* (1993). "Recreational Use of Public Lands: The Role of the Manager". Journal of Park and Recreational Administration, 3(4): 53-60