CHAPTER 2 REGIONAL DEVELOPMENT AND LAND USE

2.1 Future Socioeconomic Frame

The LWC's socioeconomic frame is established here by estimating the future figures for the socioeconomic indicators available around LWC based on the national prediction for economic growth rates. The socioeconomic indicators and their 1998 levels, which are almost common with the national economic growth data, are selected from the set of multiple indicators on socioeconomic development as shown below.

Socioeconomic Levels of the Four Districts in 1998

Indicators	Rezekne	Balvi	Madona	Gulbene	Average in four	National median
a. Industrial output (LVL/person)	93	176	280	246	199	434
b. Capital investments (LVL/person)	62	91	227	257	159	196
c. Unemployment rate (%)	28	22	13	10	18	11
d. Monthly gross wage (LVL)	80	92	92	92	89	104

Source: Administrative Districts and Major Cities of Latvia : Statistical Yearbook, CSB, 1999

Considering the low level of economic activities within LWC, it is assumed that the present situation of LWC is the same as or worse than that of Rezekne district which is in the worst economic situation among the four districts concerned. Therefore, the future socioeconomic frame for LWC is set up based on the present figures of Rezekne district applying the national economic growth rates of the basic scenario, together with population and tourists prediction utilizing the past or assumed growth rates. The next table shows the calculated future socioeconomic frame for LWC up to 2010 as the target year of EMP.

Future Socioeconomic Frame for LWC

Socioeconomic Factor	Unit	1998/99	2000	2005	2010
a. Industrial output	LVL/person	93	103	134	164
b. Capital investment	LVL/person	62	66	82	102
c. Unemployment rate	%	28.0	15.7	14.3	10.8
d. Monthly gross wage	LVL/worker/month	80	87	110	140
e. Population	Persons	6,500	6,400	6,000	5,600
f. Potential tourists	Visitors	-	400	640	850

Note: 2005 figures of "Potential tourists" are averages between 2000 and 2010.

In order to realize the expected economic growth, local environmental resources should be actively utilized in a wise-use manner for sustainable development. Indeed, eco-tourism and fishery rehabilitation projects are proposed in EMP, and they will contribute to economic growth in LWC. However, the future economic growth figures for LWC as established above might not be fully achieved because EMP does not include development projects of more profitable industrial sectors, potential of which has been unforeseeable at present.

2.2 Guideline for Regional Development

2.2.1 Approach and Strategy

Fully considering the EU level and national and local development frameworks, development approaches are set out for LWC as follows:

a) Full and wise use of natural resources and environmental amenity in and around Lake Lubana as local heritages, to activate economic activities in LWC; and
b) Promotion of eco-tourism and rural tourism focusing on natural environment as well as rural landscapes in LWC.

The following 3 strategies are proposed for development in LWC, which are in compliance with the existing land use and these development approaches:

- Image of development is to be a small scale rural development, which should be mainly based on the existing agricultural, forestry and fishery activities;
- Multi-sector development should be directed by expanding or extending all the existing industries, not by focusing only on a certain sector; and
- Eco-tourism and rural tourism should be actively promoted by wisely using natural resources, wetland and rural landscapes, and products and facilities of the existing primary industries.

2.2.2 Overall Directions

Based on the development approaches and strategies proposed, the development in LWC can be envisaged to go in the directions of 1) indivisibility of the development sectors, 2) secured support from the local residents, 3) improvement of infrastructure and educational levels, and 4) strengthening of the local governments' capacity and mutual cooperation. In order to achieve the development objectives in LWC, it can be guided for the future development that the following actions should be taken for the existing or potential industries in LWC.

(1) Agriculture

As for the traditional production, effective rotations should be applied for the cultivation of cereal crops, peas and potatoes, aiming at sustainable soil fertility and mitigation of soil structure depletion. Application of humus content will also consolidate soil fertility of the agricultural lands in LWC. Traditional livestock farming is to be continuously a main economic activity taking advantage of vast area of meadows and pastures surrounding Lake Lubana, since it provides employment opportunities and basic food supply for local residents. Further promotion of the on-farm processing of dairy products is recommendable in addition to the usual livestock products. As non-traditional income sources, mushroom cultivation as well as apple wine/cider production can be considered. Prospective mushroom species are champignon de Paris (*Agaricus bisporus*), shiitake (*Lentinus edodes*), and oyster mushroom (*Pleurotus species*). Although apples are produced in the small-scale orchards around LWC, the farmers need to increase apple productivity and improve quality for promotion of wine/cider production.

Financial support is inevitable for the agricultural development, making a full use of and strengthening the existing financial systems for the public subsidies and saving-and-loan banks. Besides, technical and scientific backup is important to adopt the best cultivation and processing technologies from economical and environmental viewpoints so that quality of agricultural products and cultivation methods is in line with the EU requirements. It is therefore recommendable to establish pilot farms for demonstration of the non-traditional agriculture, which can be the base for training and testing of new technologies to adjust them to the local conditions. In order to effectively promote agricultural development in LWC together with these financial and technical supports, close cooperation among the local farmers by means of establishment of agricultural cooperatives or other types of collective organization is recommendable because such an organization can make use of scale merit and secure the local farmers with necessary seed material and market information.

(2) Forestry

Forestry is the most active sector in LWC at present, and should continue to be a key industry in the future as income sources for local residents. Additionally, afforestation on the abandoned or unutilized agricultural land can be proposed, as it is one of the major national forestry policies for creating additional income source in a long term. Planting of pine, spruce, birch and aspen is recommendable for the commercial purpose. If idle land is privately owned by local residents, they should be partially supported for afforestation through the existing financial systems such the state subsidy program. Guarantees of long-term credits must be elaborated for private owners to regenerate and plant their forests. Technical training and consultation system on the local level must be consolidated for such land owners to grow trees and rationally use wood resources, as well. This system should have functions to improve wooden and non-wooden forest products toward international and EU quality requirements.

For sustainable and effective development in the future, environmental consideration and wood waste usage are important. Monitoring on forests in LWC is required to obtain objective information on the conditions of newly planted forests and their impacts on the local ecosystem. Legislative and institutional system should be therefore improved for supervision and management of state and private forests in LWC. It will also prevent wood stealing cases. Wood working activities using the wood waste such as furniture and handicraft making should be considered, as they will create further marketing possibilities for the local residents and tourists and can be conducted even during winter season as an additional income source.

(3) Fishery

Considering the national fishery policies and potential markets as well as the present inland fishery conditions in Lake Lubana and the fishponds, an important species of fishery development in LWC has been identified by the current study to be pike, which might be regarded as symbolic fish species to be produced and conserved in the future.

Pike can be caught both commercially and recreationally for anglers, and is a target species of the National Board of Fishery (NBF) for artificial seed production aiming at restocking. This selection of pike as prospective fishery species is also based on the comparative analysis on marketable features between Lake Lubana where eco-tourism/rural tourism is proposed and Lake Razna already known nationwide as the center of eel production. Pikeperch is another target species due to its high market price and recreational demand, propagation of which should be done for fishery development in LWC.

Fish processing plants should be also promoted in order to add market values to fresh fish which does not have a market demand or gets spoiled fast. Such processed goods as smoked or dried fish can be marketed outside LWC and be sold to the tourists to Lake Lubana. Cooperatives such as a fishing club or union should be established to analyze potential markets, to improve fishing techniques, and to provide private fishermen and companies with other attractive supporting means. Rehabilitation of the old fishponds as well as market development including tourists can be also implemented effectively with mutual cooperation through such bodies.

For the fishery development in LWC, the fish hatchery development project" and the angling promotion project are proposed. The total cost for these facilities and equipment is estimated at about 414,000 LVL without any contingency.

(4) Tourism

For LWC with rich natural environment and rural atmosphere, eco-tourism and rural-tourism are prospective tourism forms. All the existing natural resources and products from agriculture, forestry and fishery can well serve tourists visiting LWC. In order to promote these two types of tourism, positive image of LWC with local interesting objects should be created by means of advertisement to potential tourists, developing tourism data base and information system, and printing the information brochure about possible recreational and environmental activities. Tourism cooperation with foreign countries such as Lithuania, Finland, Germany, Austria, Poland and Russia is recommendable, especially taking advantage of the LWC's location close to the international roads connecting Riga and Moscow as well as St. Petersburg and Warsaw. At the same time, training of the manpower involved in the tourism services including foreign languages training is of crucial importance. Especially for rural-tourism, service training and accommodation facilities should be arranged for local residents who can offer their farms for tourists' needs.

Proposed eco-tourism in LWC include various types of environmental and recreational activities, and rural tourism activities will additionally include farming and forestry experience. These activities necessitate building of the facilities specific to eco-tourism and rural tourism in addition to basic infrastructure for telecommunication and transportation. In particular, angling facilities at Lake Lubana and the fishponds are essential. Release of popular angling species such as pikeperch will contribute to increase the number of anglers visiting LWC. Financial and institutional support is needed for

tourism development including establishment of these facilities. Special financial backup must be provided to local residents and farmers who are involved in rural tourism, making use of the existing financial supporting system such as the Special Action for Pre-accession in Agriculture and Rural Development (SAPARD) Program, because they are supposed to manage landscape beauty of their pastures and old orchards in addition to provision of services and good-quality accommodation to tourists at their farm lands. Considering that important factors attracting rural tourism are waterfront siting and basic infrastructure, Nagli or Idena areas have a high potential to be bases for rural tourism in LWC.

2.3 Directions of Land Use Planning

2.3.1 Approach and Strategy

The land use plan should be prepared with basic directions of environmental policy of Latvia and it should not contradict the Directives of the European Union concerning spatial planning. Moreover, the plan should fit into a united planning system that specifies distribution of responsibility between the state and municipalities toward decentaralization. Duly observing the goal and basic directions on the national-level land use planning, the approaches of a) planning for local people's welfare, b) protection against adverse impacts of introduced technology, c) planning in an integrated manner, and d) planning based on land resource information are proposed for land use planning in LWC.

The national goals stress rational use of nature resources, and management and protection of nature, which are quite suitable to the land use in environmentally important lands like LWC. LWC has unique and important wetland ecosystems, but with different issues related to local economic activities and environmental protection that should be regarded as one whole problem. Therefore, the area deserves special attention within the frames of local land use. Taking into account these key factors for land use planning for LWC, the following five land use strategies with implication on its regional development and wetland conservation are established:

- restriction on change of the existing land use pattern,
- flexible and small scale conversion of the idle arable lands into forests,
- harmonization of productive and recreational usage of water bodies,
- building of small scale factories, facilities, and infrastructure, and
- application of land use technologies friendly to local environment.

2.3.2 Proposed Future Land Use of the Study Area

(1) Future land use map for LWC

Figure 2.3.1 presents a land use map proposed for the future land use in LWC. It is based on the present land use pattern, reflecting the land use strategies for LWC. The land use here is proposed based on the analytical results of development potentials in the future,

taking account of and harmonizing with proposals on land use appropriate for environmental conservation of LWC. In the course of planning the land use, the output of the environmental zoning has been also fed back. The depicted land use categories are classified into four areas, namely, forest land, agricultural land, urban area, and retardation basin, in addition to the Nature Protection Zone (NPZ) and the Active Management Zone (AMZ).

1) NPZ and AMZ

NPZ and AMZ are absolutely identical with those of the environmental zoning. Land use for development activities is strictly prohibited in NPZ, while the present land use will be maintained in AMZ with environmental consideration. AMZ includes Lake Lubana and fishponds because they provide not only fishery resources but also valuable aquatic ecosystem to be conserved for flora and fauna as well as eco-tourism activities.

2) Forest land

It includes the existing state and private forests, and its major part covers commercial cutting forests planned by the state-shared forestry company “Latvijas Valsts Mezi”. And all the identified idle arable land is also proposed for forestry development. But wet idle land along the northwestern shore of Lake Lubana necessitates large scale rehabilitation of the existing drainage system even for forestry rather than agriculture. Costly drainage rehabilitation works during the period up to 2010 are not recommendable since the economic effectiveness of forestry at present is very low under LWC’s and Latvian economic situation.

3) Agricultural land

This area mostly includes the existing agricultural land consisting of non-irrigated arable land, pastures, complex cultivation patterns, and land principally occupied by agriculture with natural vegetation. Within the area, kinds of agricultural products, cropping patterns and cultivation methods can be modified as long as neither NPZ nor AMZ are environmentally affected. A part of the farmland at Licagala is subject to the spring flood, needing expensive construction of 6-km dike along the Aiviekste river. It is proposed that such dike construction should be considered in a long term, taking into account actual economic merits to agricultural activities as well as hydrological impacts on the whole Aiviekste river basin.

4) Retardation Basin

This area in the biotope map is categorized as inundated grassland with little possibility of any development. Instead, it has played an important role to retain excessive water flow of the rivers, especially during the flooding season. Therefore, its land use is to continue this hydrological function. In the future, development activities can be established even located outside of NPZ or AMZ. However, it is essential to replace the hydrological

function lost by the development activities in other ways, in order to prevent adverse impacts downstream.

(2) Change between the present land use and the proposed land use

The next table shows areas in km^2 by the five land use categories for present land use based on the 1998 map as well as for the proposed land use toward 2010.

Area Comparison of the Proposed Land Use (2010) with the Present Land Use (1998)

Land Use Legend	Year	NPZ		AMZ		DZ		Total by Land Use	
		Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
Forest Land	1998	108	58	112	43	159	43	379	47
	2010	108	58	112	43	190	52	410	50
Agricultural Land	1998	0	0	27	10	204	55	231	28
	2010	0	0	27	10	164	44	191	24
Water Bodies	1998	1	1	93	36	0	0	94	12
	2010	1	1	93	36	0	0	94	12
Retardation Basin or Wetlands	1998	77	41	28	11	3	1	108	13
	2010	77	41	28	11	12	3	117	14
Urban Area	1998	0	0	0	0	2	1	2	0
	2010	0	0	0	0	2	1	2	0
Total by Zone		186	100	260	100	368	100	814	100

Notes: Forest Land includes broad-leaved forest, coniferous forest, mixed forest, natural grassland, transitional woodland & scrub, and sparsely vegetated area; Retardation Basin is inundated grassland, and Wetlands additionally include inland marshes and peat bogs; Water Bodies include lakes, and fish ponds; and Agricultural Land includes non-irrigated arable land, pastures, complex cultivation patterns, and land principally occupied by agriculture with natural vegetation.

Sources: Satellite "SPOT" data in 1998, and 1:50,000 Topographical Maps

Since NPZ is strictly preserved and the present land use pattern in AMZ will not be changed in principle, there will be no land use difference between the present and the future. On the other hand, the land use pattern within DZ is proposed to change in the future. A major change will be for forest land and agricultural land. The forest area in DZ will increase from 159 km^2 to 190 km^2 (20 % increase), while the agricultural area will decrease from 204 km^2 to 164 km^2 (20 % decrease). This is mainly because of conversion of idle agricultural land to forestry development area. In 2010, the land use ratio of DZ will be 52 % for forest land, 44 % for agricultural land, and the remaining 4 % for the other usage. Majority land use of agriculture in 1998 is switched with forestry in 2010.

Area Comparison of the Proposed Land Use (2010) with the Present Land Use (1998)

Land Use Legend	Year	NPZ		AMZ		DZ		Total by Land Use	
		Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
Forest Land	1998	108	58	112	43	159	43	379	47
	2010	108	58	112	43	190	52	410	50
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Retardation Basin or Wetlands	1998	77	41	28	11	3	1	108	13
	2010	77	41	28	11	12	3	117	14
Urban Area	1998	0	0	0	0	2	1	2	0
	2010	0	0	0	0	2	1	2	0
Total by Zone		186	100	260	100	368	100	814	100

Notes: Forest Land includes broad-leaved forest, coniferous forest, mixed forest, natural grassland, transitional woodland & scrub, and sparsely vegetated area; Retardation Basin is inundated grassland, and Wetlands additionally include inland marshes and peat bogs; Water Bodies include lakes, and fish ponds; and Agricultural Land includes non-irrigated arable land, pastures, complex cultivation patterns, and land principally occupied by agriculture with natural vegetation.

Sources: Satellite "SPOT" data in 1998, and 1:50,000 Topographical Maps

2.3.3 Implication with EMP

The strategies and future land use are based on the basic concept mentioned in the guideline on regional development. Therefore, they are to be altered when the development guideline is revised in the future.

(1) Democratic coordination of different landowners

Land in LWC is owned by different stakeholders such as private persons, private enterprises, the state and local municipalities. The ratio of private land is increasing also in the study area according to the national privatization policies. Especially, a major part of agricultural area is owned by individuals. It is a sensitive matter for private owners to alter the present land use pattern, since it directly affects their living conditions. In particular, due agreement and compensation should be required where private land is planned to be converted to the strict nature protection area and even to different productive land, for instance from potentially arable land to forest. Therefore, the different stakeholders' interests on land use must be coordinated democratically by providing local people with opportunities to participate in planning the concrete land use for LWC under the EMP framework.

(2) Maintenance of the existing land use pattern

The already established land use situation should not be changed as much as possible, also preventing additional construction of large-scale facilities and infrastructure. This is not only to prevent damages to the wetland ecosystem of LWC, but also to guarantee the productive land resource to the owners. It means that that spatial extension of conservation area except for the proposed strict protection quarters is not favorable from the land use's standpoint. Maintenance of the present land use pattern implies that a large part of LWC will continue to be utilized for agriculture, forestry, and fishery in the future. Instead of expansion of the land for such primary industries, production should be improved by intensively inputting production resources, although application of land use technologies friendly to environment is recommended as a land use direction.

(3) Flexible and multiple usage of the development land

In the spatial land use map, idle arable land is recommended to be flexibly converted between cultivated land and forest depending on economic profitability of both industries. The agricultural and forest lands will be used not only purely for agricultural and forestry activities but also for rural tourism development based on the existing natural resources. In addition, water bodies such as Lake Lubana and fishponds should be managed so that they contribute to both commercial fishery and waterfowl preservation as eco-tourism object.

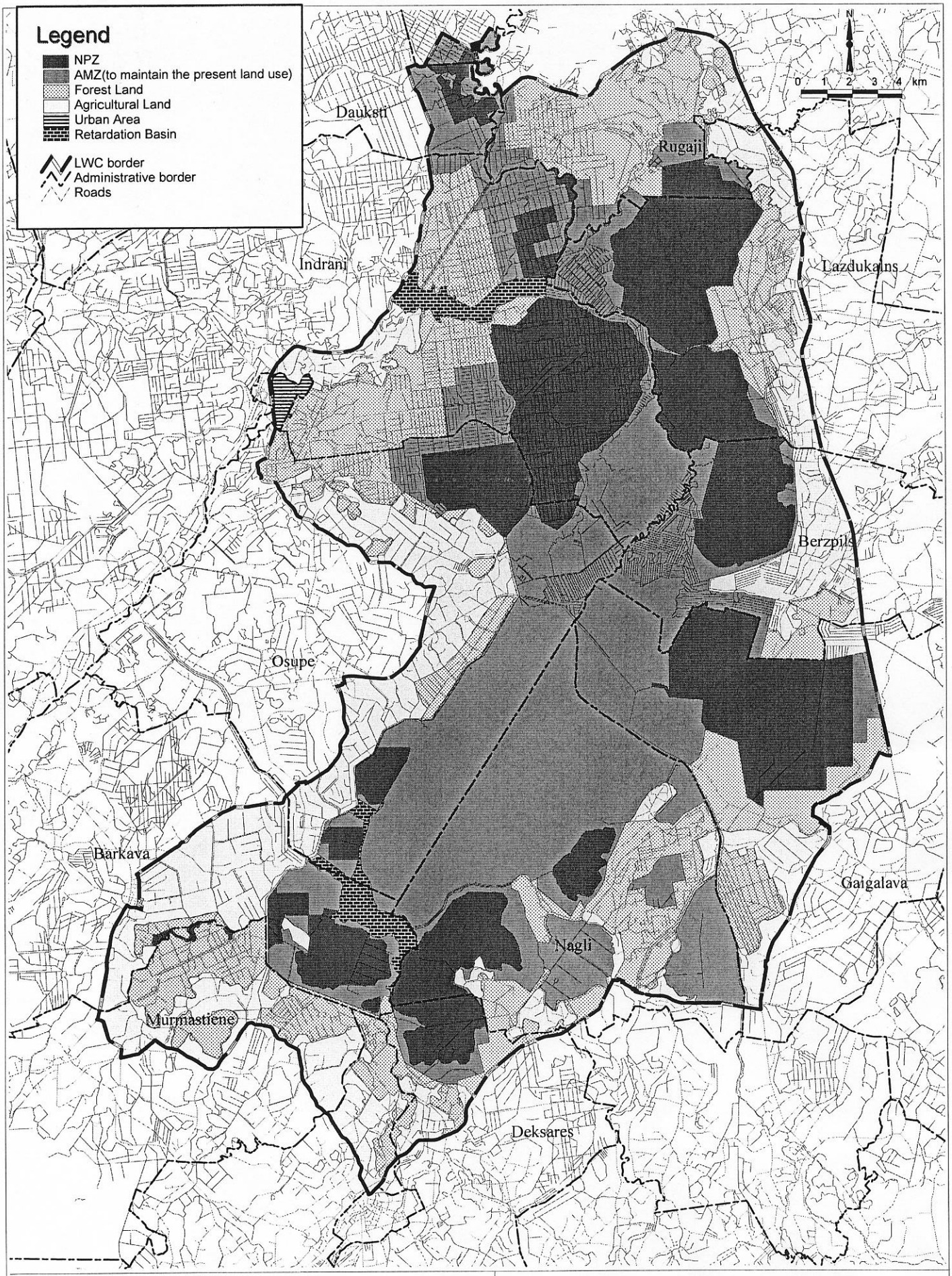


Figure 2.3.1 Proposed Land Use Map

The Study on Environmental Management Plan
for Lubana Wetland Complex in the Republic of Latvia

JAPAN INTERNATIONAL COOPERATION AGENCY

CHAPTER 3 FRAMEWORK OF THE ENVIRONMENTAL MANAGEMENT PLAN

3.1 Overall Concept

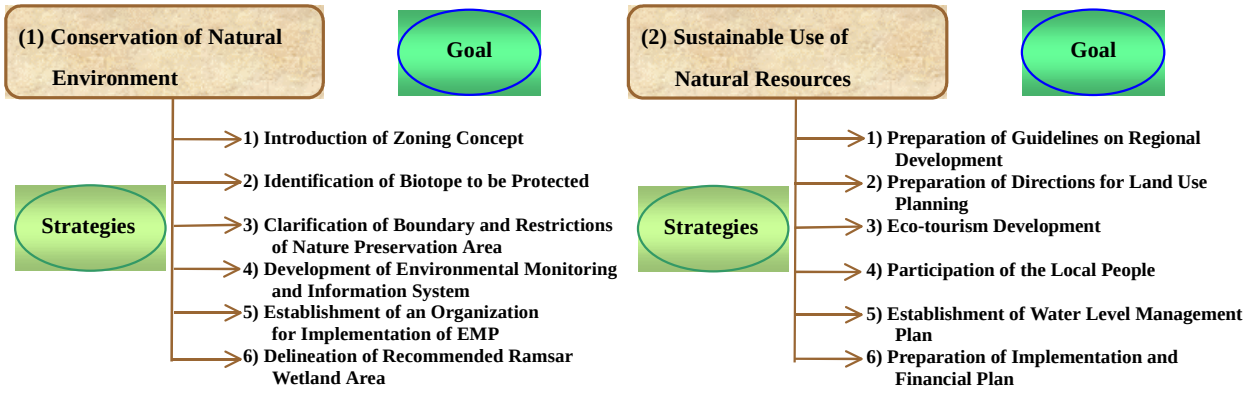
The fundamental vision of the EMP for LWC is set as:

" <u>Wise Use of the Lubana Wetland Complex</u>".

The goals to attain this vision are set 1) Conservation of Natural Environment and 2) Sustainable Use of Natural Resources. The general concept of vision, goals, and major strategies is shown in Figure 3.1.1.

The target area is the whole LWC (about 810 km^2) including Lake Lubana, and the target year is set at 2010.

In order to attain the vision and goals of EMP for LWC, the following 12 strategies are set for the respective goals:



3.2 Environmental Zoning

3.2.1 Environmental Zoning in LWC

(1) Zoning concept

The EMP area was once fully developed especially for agricultural production. Only the current sluggish economy allows LWC to keep its rich and valuable natural environment. This compound circumstance characterizes LWC because unregulated development would surely exhaust the natural resources and the vulnerable nature would be lost forever. Thus, the EMP area should be divided into three zones, namely Nature Preservation Zone (NPZ), Active Management Zone (AMZ), and Development Zone (DZ).

1) Nature Preservation Zone (NPZ)

NPZ is defined as a nature preservation oriented area in LWC. This zone should be delineated by priority evaluation of biotopes for preservation of wetland vegetation and important habitats of fauna. NPZ includes the most important natural environment from various viewpoints, so it corresponds to the strict protection quarters which representative

for unchanged and vulnerable nature, endangered wild species, and unique and beautiful landscapes, stipulated in the Latvian regulations under LEP.

2) Active Management Zone (AMZ)

A creation of AMZ is indispensable to attain the vision of EMP for sustainable use of natural resources of LWC. It is impossible to achieve sustainable protection of natural environment without any understanding and cooperation of the local people. Thus, the rich natural resources should be materialized for economic and educational activities with the wise-use manner as the Ramsar Convention explicitly stated. AMZ is not so strictly restricted as NPZ, but any socioeconomic activities must be developed without affecting natural environment in NPZ. In other words, AMZ should be a buffer area of NPZ. So, this zone could be a potential eco-tourism development area with wise use of natural resources in LWC.

3) Development Zone (DZ)

DZ is a development oriented area for industries such as agriculture, forestry, fishery, and tourism in LWC. This zone is rather free of development and land use unless affecting NPZ and AMZ, and violating national and regional regulations. It means that the ecologically friendly regional development and socioeconomic activities are recommended in this zone.

(2) Delineation of environmental zones

All the biotopes identified as the strict nature protection area are zoned as NPZ. AMZ is demarcated by selecting the regular and seasonal nature protection quarters which are the biotopes mostly for eco-tourism. All the fishery area proposed in the spatial land use map are included into AMZ. Rural tourism, agriculture, forestry and fishery are also allowed AMZ as far as these development activities hardly affect the existing natural environment which is essential to eco-tourism development.

The rest of LWC is naturally selected as DZ, where restriction on development is weak. But development activities and land use should be harmonious with and friendly to environment so that DZ can have a buffering function for NPZ and AMZ. Rural tourism, agriculture and forestry are to be implemented in DZ. Any inundated lands exclusively for agriculture and also for rural tourism in DZ should be protected with water control measures for stable agricultural products.

Eleven nature protection territories in LWC have been approved by the Cabinet Ministers in 1999. Detailed regulations are planned to be set by the Government in each protection territory. At present, the detailed regulations have been prepared only for three territories, namely the Lubana depressions (No.6), Parabaine (No.8), and Pededze river lower stretch (No.9). By adopting a functional zoning approach, these regulations clarify allowed and/or prohibited human activities. A strict protection quarter defined in these regulations is considered to correspond to NPZ, and regular and seasonal protection quarters are to AMZ

compared with the concept and definition of zoning categories of EMP. The environmental zoning procedure of LWC is summarized as Figure 3.2.1.

Figure 3.2.2 depicts the conclusion of environmental zones in LWC in accordance with the delineation approach mentioned above. NPZ surrounded by AMZ is spread in the center of LWC. DZ is scattered close to the study area's borderlines, surrounding AMZ. The areas of each zone are 186 km^2 (23% of the total LWC area) for NPZ, 261 km^2 (32%) for AMZ, and 367 km^2 (45%) for DZ, respectively.

3.2.2 Conservation Criteria by Environmental Zone

The conservation criteria set below should be achieved by the good combination of a facility plan and a regulatory plan described in the next section.

Conservation Criteria and Other Characteristics for Environmental Zone

Environmental Zone Type	Nature Preservation Zone (NPZ)	Active Management Zone (AMZ)	Development Zone (DZ)
Definition	Area for strict nature preservation	Area for restricted human activities	Area for further development
Present Features	- Unchanged and vulnerable nature - Endangered or important flora and fauna - Unique and beautiful landscapes	- Developed area for agriculture, forestry and fishery - Potential natural resources for eco-tourism - Less naturalness than NPZ	- Developed area for agriculture and forestry - Less biodiversity and ecological value than AMZ
Conservation Criteria	Preservation of the present levels of biodiversity, ecosystem functions and landscapes	No occurrence of negative impacts to natural environment in NPZ and to eco-tourism objects in AMZ	Maintenance of buffering function for NPZ and AMZ to prevent adverse impacts on wetland ecosystem from the outside
Allowable Development and Inundation Control	No development and no artificial inundation control	- Eco-tourism - Commercial fishery harmonized with eco-tourism - Restricted agriculture, rural tourism and forestry with environmental protection measures - No additional inundation control - Water level control of the lake and ponds	- Agriculture and rural tourism with inundation control - Forestry development and land use harmonious with and friendly to environment

3.2.3 Regulatory Plan

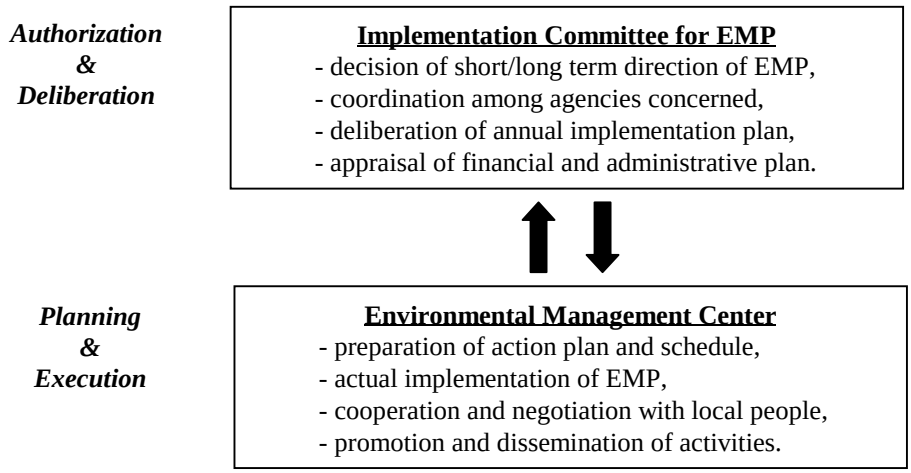
A regulatory plan must be simple and understandable both for decision makers and users. Too much as well as too weak regulations will lead a distortion of its effectiveness and efficiency. Effective environmental management can not be achieved only by the regulatory plan. Well harmonized application of the regulatory plan and the facility plan is crucial for implementation of EMP.

Since the regulatory plan for EMP needs to cover all types of proposed protection territories in LWC, it must be applicable for preparation of a site specific regulation of each protection territory. The major activities to be restricted in LWC are 1) Physical activities, 2) Pollution activities, 3) Ecological disturbance, and 4) Other activities.

Considering the characteristics of LWC mentioned above, a regulatory plan by environmental zone in LWC is proposed as shown in Table 3.2.1. This plan must be a base for preparation of a concrete plan for each protection territory. It should be noted that the contents and methods adopted in the regulatory plan needs to be revised and modified based on the monitoring data and information related to the effectiveness of regulatory and facility plan in order to prepare more workable plan for effective implementation of EMP.

3.3 Organization and Institution for EMP

The EMP needs to cope with rather broad and complicated functions as mentioned above. It will require an integration and well coordination among official agencies and the local people concerned. Therefore, an establishment of the Implementation Committee (IC) and the Environmental Management Center (EMC) is proposed for actual implementation of EMP for LWC. The IC is a management authority of EMP which deliberates, authorizes, and coordinates substantial matters related to EMP, and the EMC is a site specific organization for actual implementation of EMP as shown below. These two organizations should be established before implementation of EMP because they will be required a lot of preparatory works including application of available soft (low interest rate) loan.



Overall Organization Frame of EMP

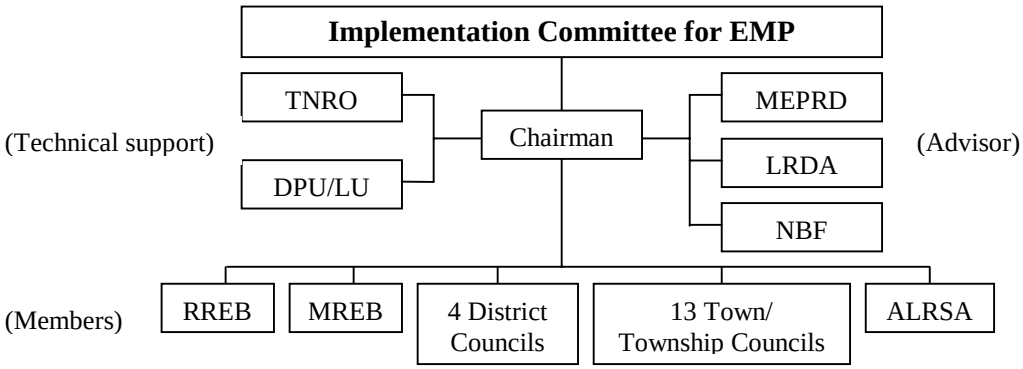
(1) Implementation Committee (IC)

Since a drastic institutional and organizational change might bring about some confusion in the current administrative system, the creation of an ad hoc Implementation Committee (IC) consisting of the agencies concerned can be practical for the time being. Its organization is proposed in the next figure. The IC should provide necessary physical, administrative, and financial resources to EMC as described below, and supervise its activities.

The IC consists of the regular committee members and the advisory group from MEPRD, National Board of Fishery (NBF), Latgale Regional Development Agency (LRDA), district councils, townships, Rezekne and Madona REBs. A committee chairman is to be

selected from among these members. IC requires scientific and technical supports from DPU, University of Latvia (LU), and TNRO.

MEPRD would require a strong initiative to establish IC and to make it on right orbit with leading key members such as district councils and REBs. It should be, however, noted that the establishment of a new management authority is recommendable for actual implementation of EMP in the long term.



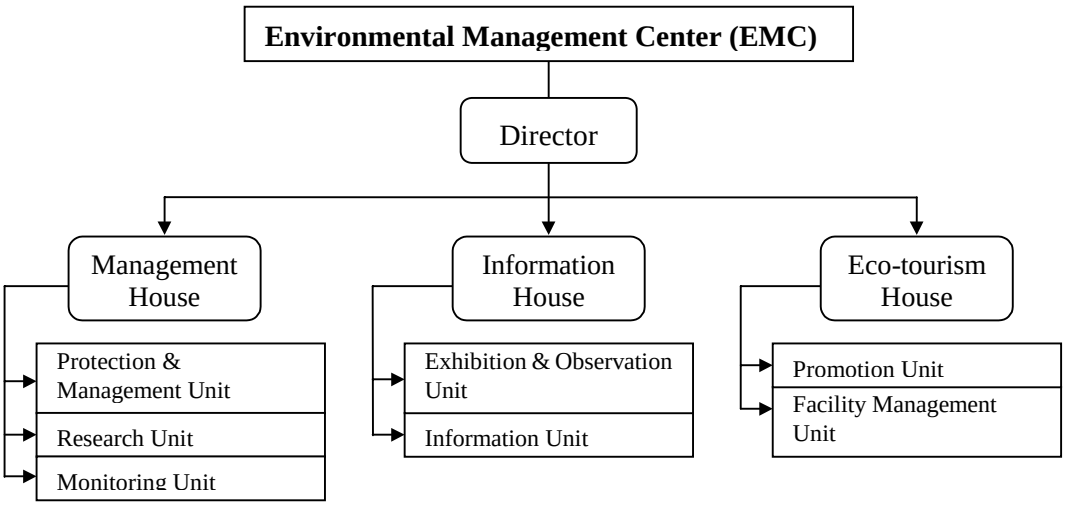
notes: RREB = Rezekne Regional Environmental Board
MREB = Madona Regional Environmental Board
LRDA = Latgale Regional Development Agency
NBF = National Board of Fishery
DPU = Daugavpils Pedagogical University, LU = University of Latvia
ALRSA = Aiviekste Land Reclamation System Administration of MOA
TNRO = Teici Nature Reserve Office

Organization Structure of EMP

(2) Environmental Management Center (EMC)

The EMC has a role of actual implementation of EMP under the supervision of IC. EMC consists of three sections (tentatively named “House” in this report) which correspond to the components of EMP, namely the Management House, the Information House, and the Eco-tourism House. Each house has several units for actual implementation of responsible activities as shown below. Since some difficulties could be expected to actualize necessary actions in line with decisions made by committee members at the beginning, IC would be required to support EMC’s concrete actions.

The Management House is responsible for a) biotope conservation including water level management, b) research of wetland ecosystem and its conservation, and c) monitoring and patrol. The Information House is responsible for preparation and dissemination of environmental information, and the Eco-tourism House is for promotion of eco-tourism and management of facilities to be used for eco-tourism. A building which has enough space and facilities should be provided for EMC, and its location would be the Idena area in Nagli township from strategic management viewpoint.



Organization Structure of EMC

(3) Institutional frame

In order to effectively and steadily implement the programs and projects proposed under EMP, the following five major institutional roles should be set up to realize wise and sustainable use of LWC and to manage the existing institutional difficulties.

- Initiative role for local people's participation,
- Coordination role between environmental side and development sector,
- Enforcement and technical role on implementation,
- Environmental monitoring role for LWC, and
- Environmental education role for residents and visitors.

Table 3.2.1 Regulatory Plan by Environmental Zone

Activities	Environmental Zone		
	NPZ	AMZ	DZ
I. Physical Activity			
1) Building & facility construction	●	○	X
2) Land development and topographical change	●	○	X
3) Mining & quarring	●	○	X
4) Reclamation	●	○	X
5) Road construction	●	○	X
6) Cultivation	●	○	X
7) Telecommunication and transmission line	●	○	X
8) Change of water level	●	○	X
9) Dredging & water drainage	●	○	X
10) Navigation	●	○	X
II. Pollution Activities			
1) Wastewater discharge	●	○	○
2) Solid waste dumping	●	○	○
3) Storage of pollutants and harmhul substances	●	○	○
4) Spraying agri-chemicals & harmful substances	●	○	○
III. Ecological Disturbance			
1) Capture & collection of fauna	○	○	-
2) Collection of trees and forest products	○	○	-
3) Research and monitoring	○	X	-
4) Educational use	○	X	-
6) Tree cutting and planting	○	X	-
7) Grass cutting and planting	○	X	-
8) Introducing & Stocking endemic species	○	○	-
9) Hunting	○	○	-
10) Angling & fishing	○	○	-
11) Commercial forestry	●	○	X
12) Commercial fishery	●	○	X
IV. Other Human Activities			
1) Land use change	●	○	-
2) Dwelling	●	○	-
3) Intruding on foot (exept for carnberry picking)	●	-	-
4) Intruding by car and motorbike	●	○	-
5) Intruding by motorboat	●	○	-
6) Burning	●	○	-
7) Camping & firing (except for designated place)	●	○	-
8) Other recreational use	●	○	-
9) Agriculture and Pasturing	●	○	-

note: ●：Strictly prohibited, ○：Permission required, X： Notification required, -：No restriction
NPZ: Nature Preservation Zone, AMZ: Active Management Zone, DZ: Development Zone

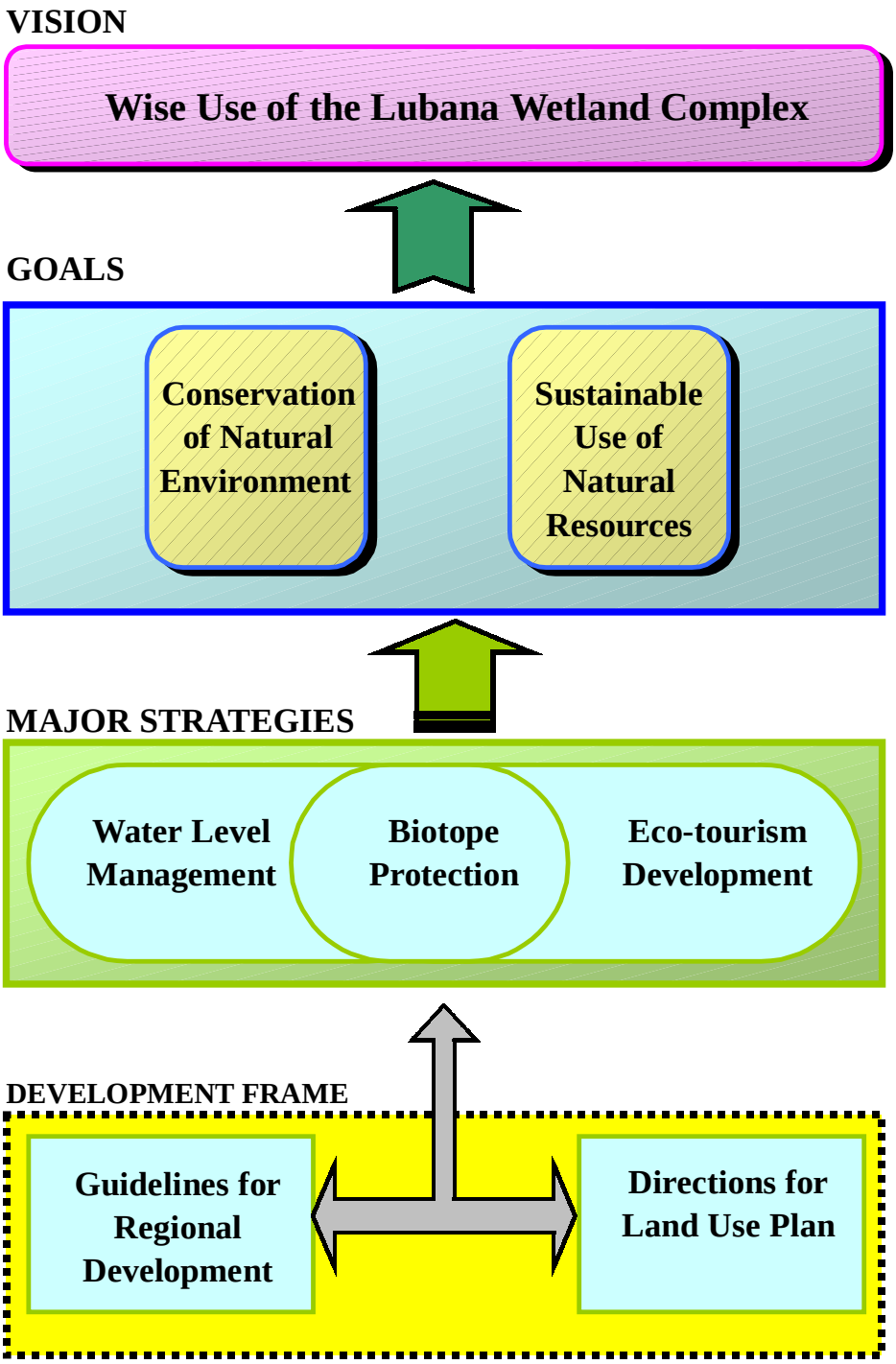


Figure 3.1.1 Concept of Vision and Goals of the Environmental Management Plan

The Study on Environmental Management for Lubana Wetland Complex in the Republic of Latvia

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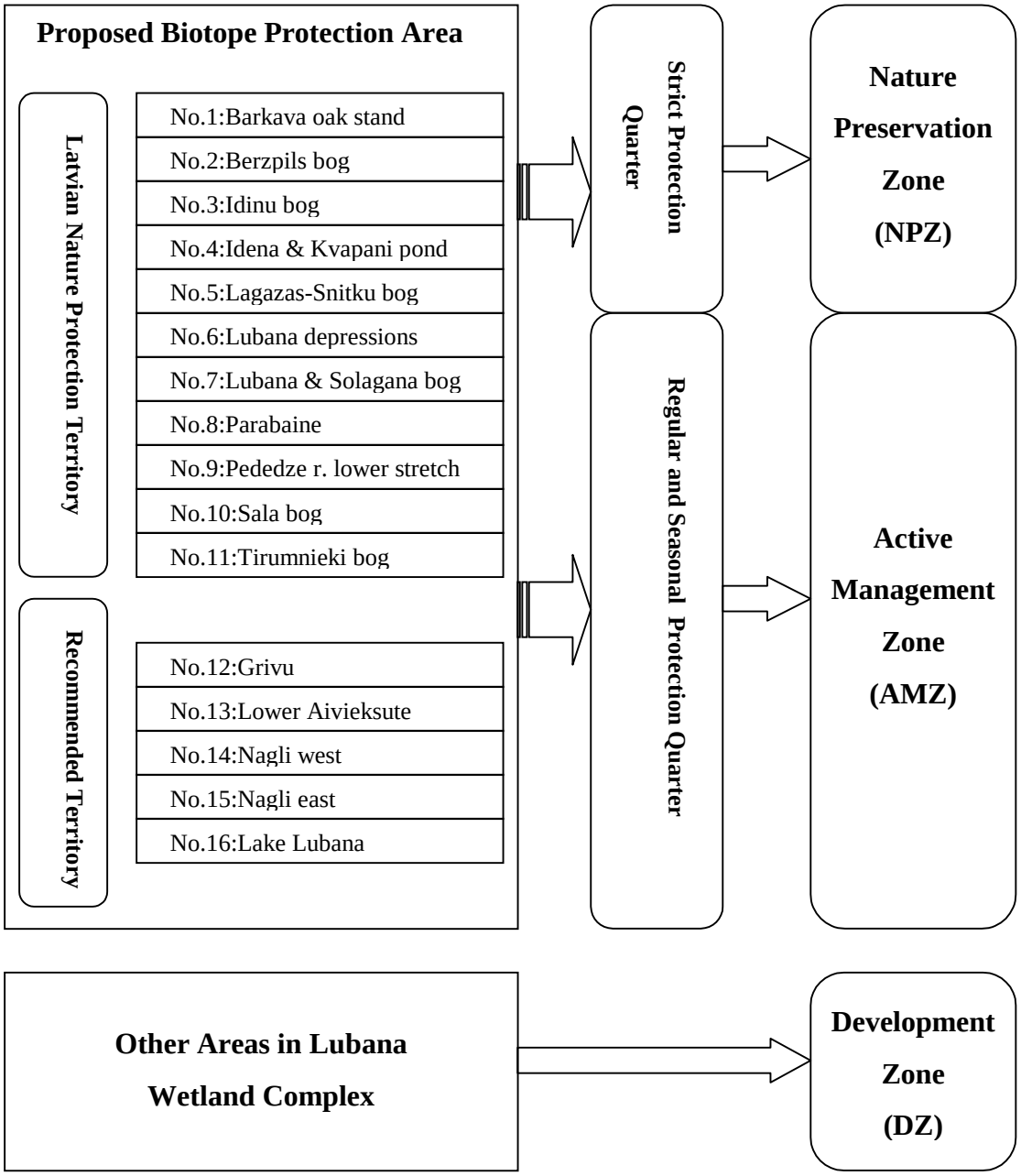

Figure 3.2.1 Environmental Zoning in LWC

The Study on Environmental Management
for Lubana Wetland Complex in the Republic of Latvia

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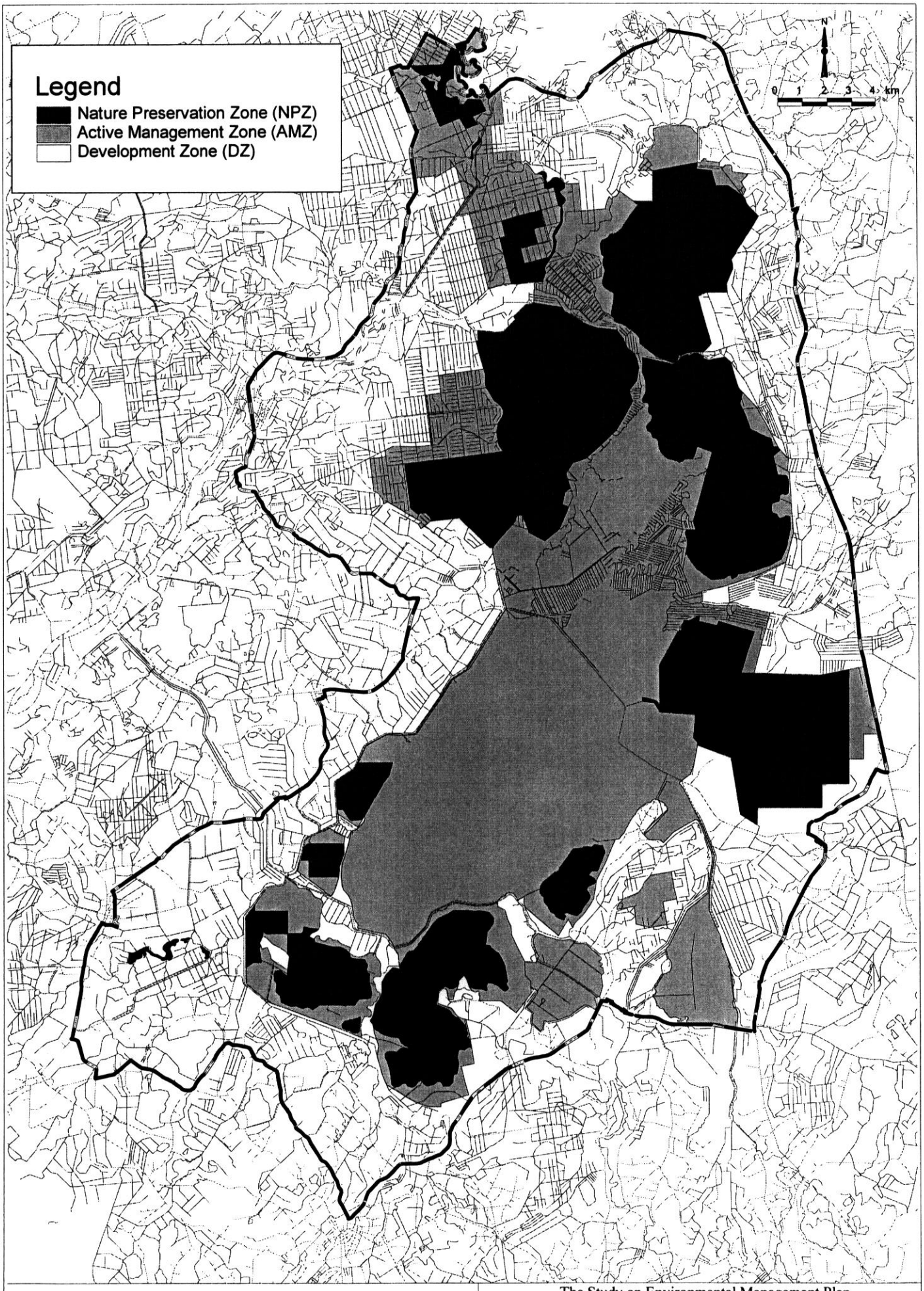

Figure 3.2.2 Environmental Zoning Map

The Study on Environmental Management Plan
for Lubana Wetland Complex in the Republic of Latvia

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