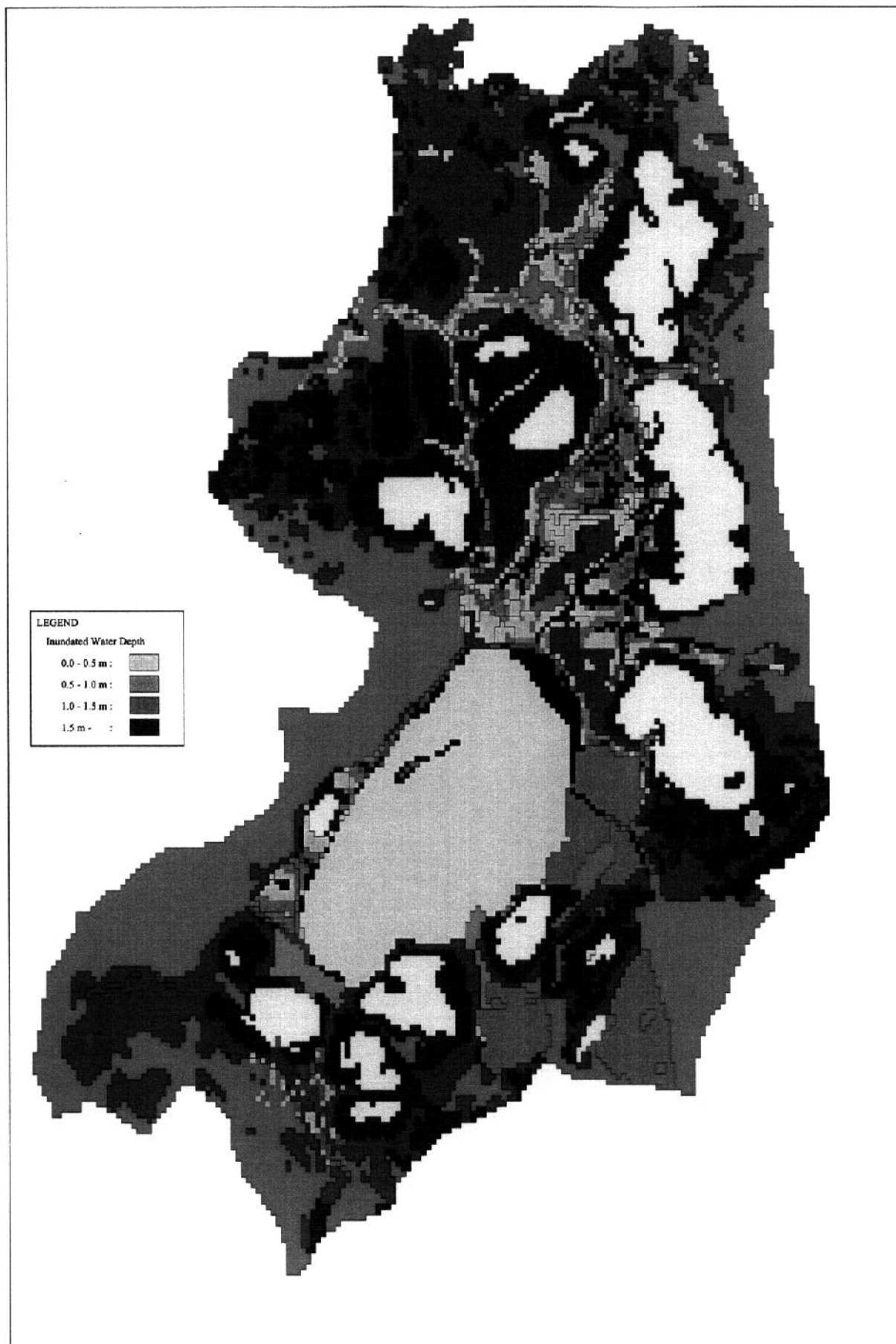


**Figure 15.2.2 Flood Situation in each Biotope Category**  
(Flood scale of once per 2-year)

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for Lubana Wetland Complex in the Republic of Latvia

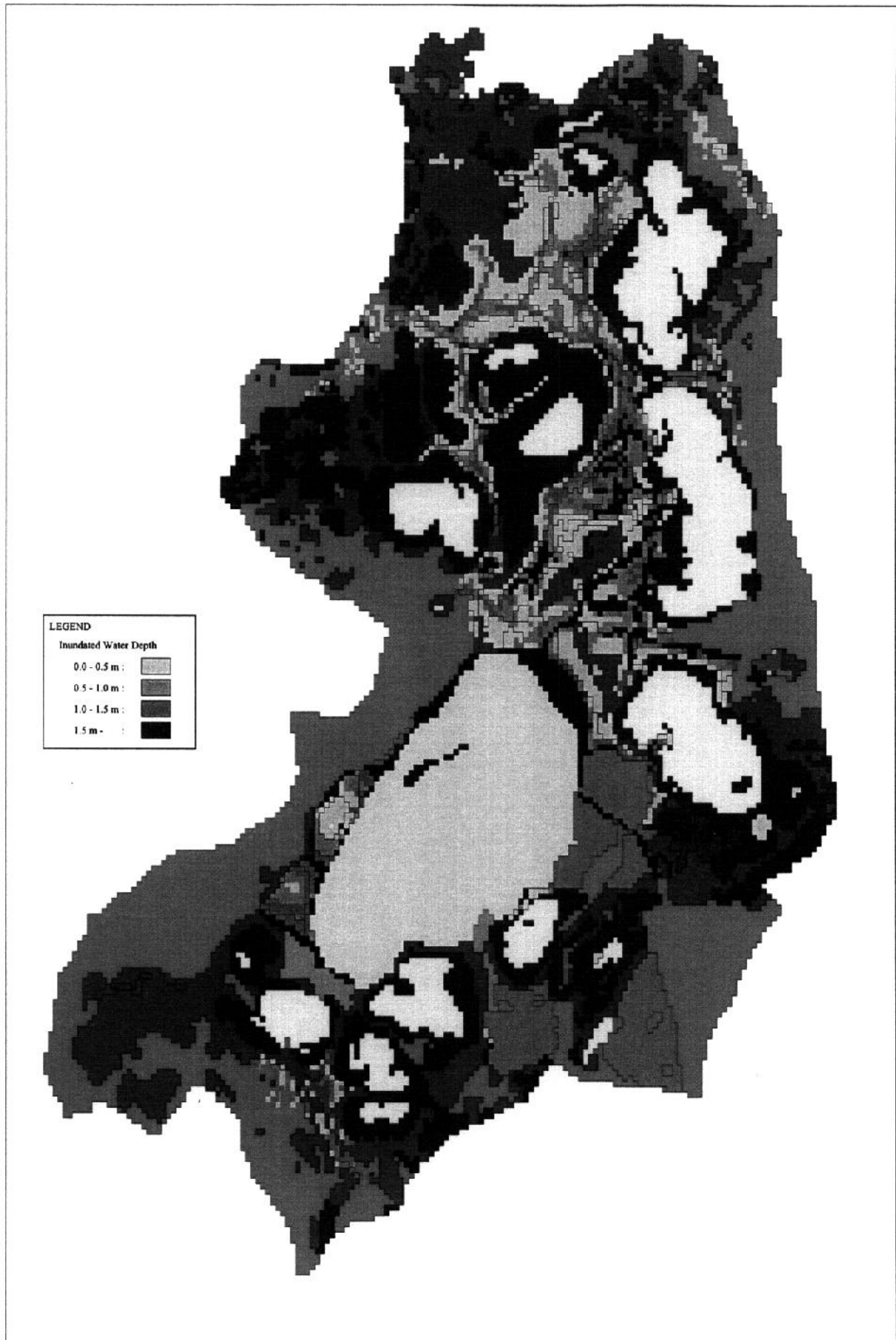
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**Figure 15.2.3 Flood Situation in each Biotope Category**  
 (Flood scale of once per 5-year)

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 for Lubana Wetland Complex in the Republic of Latvia

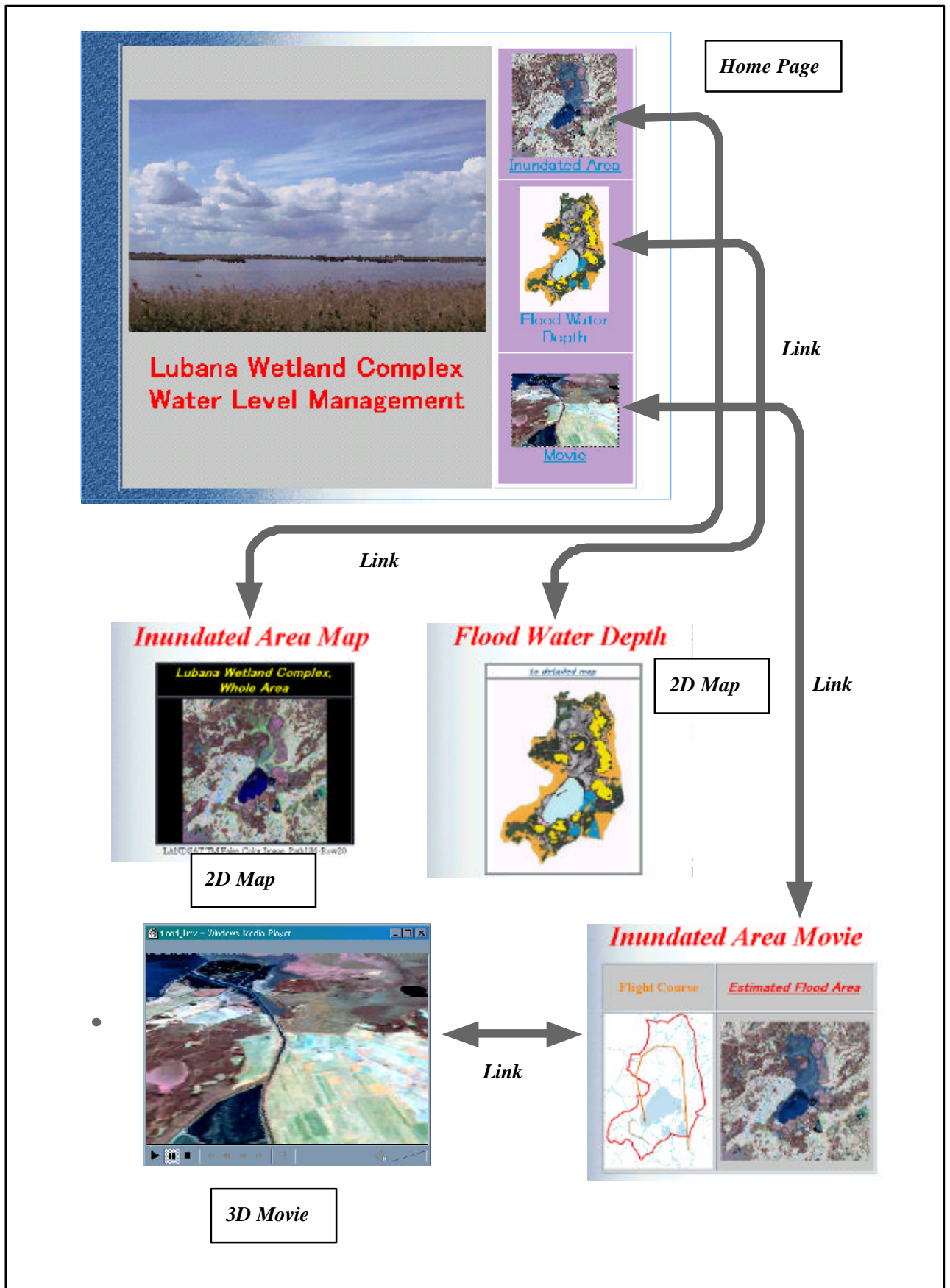
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**Figure 15.2.4 Flood Situation in each Biotope Category**  
(Flood scale of once per 10-year)

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

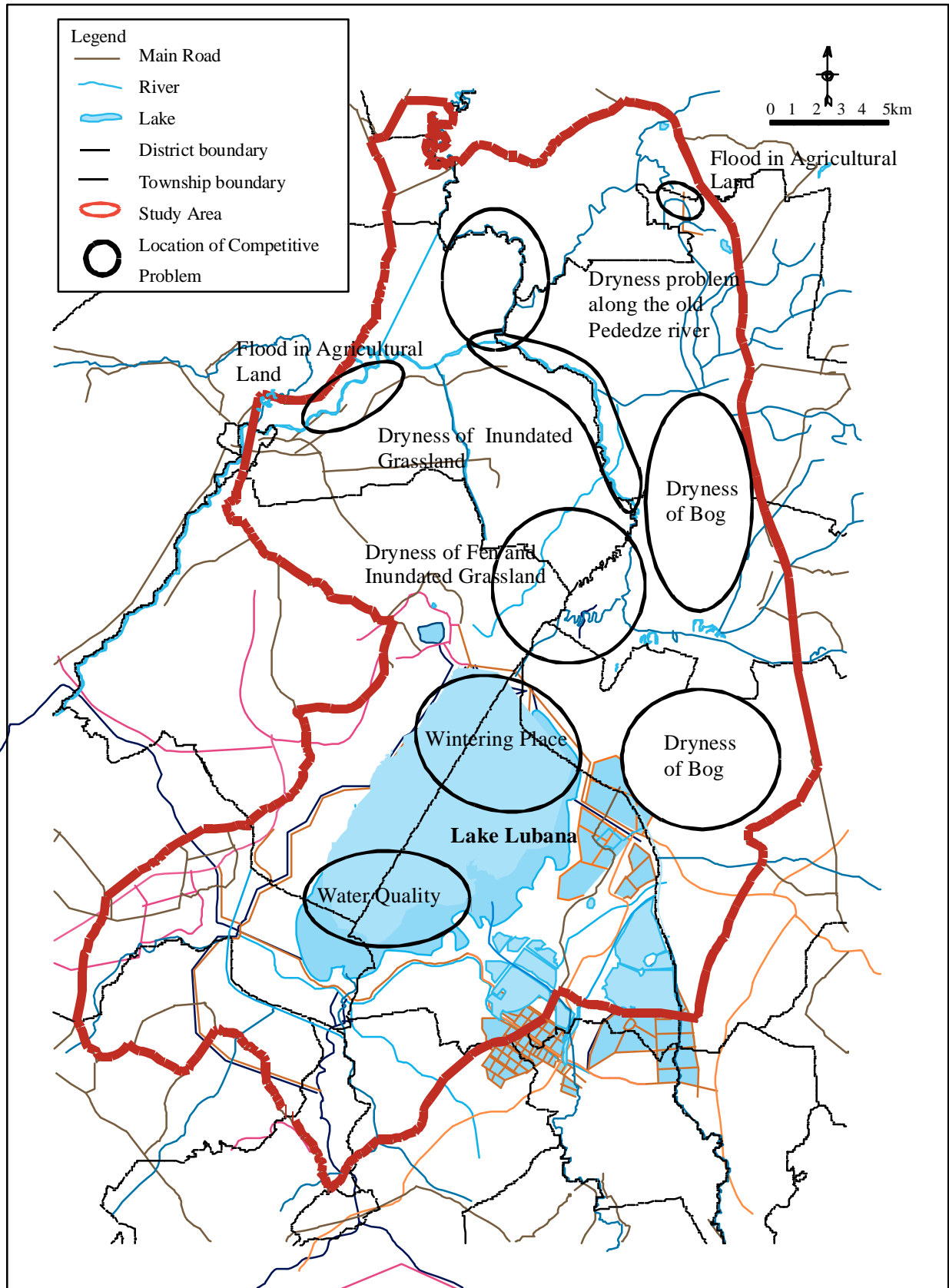
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**Figure 15.2.5 Proposed Display System**

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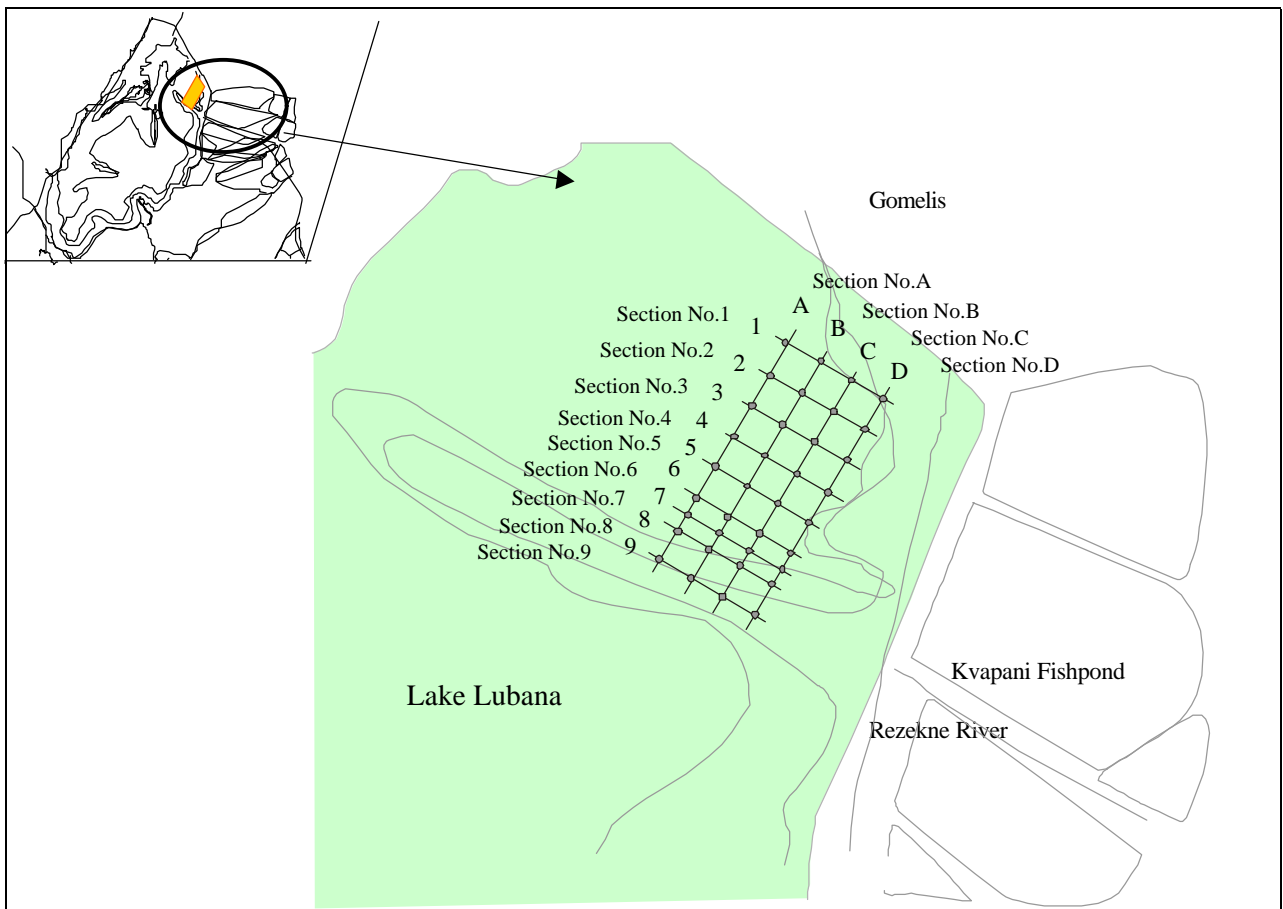
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**Figure 15.3.1** Location Map of Competitive problem in LWC

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Location of Survey Point

		A	B	C	D
1	Latitude	56°47 ' 29.0"	56°47 ' 25.7"	56°47 ' 22.5"	56°47 ' 19.2"
	Longitude	26°56 ' 03.2"	26°56 ' 13.3"	26°56 ' 23.5"	26°56 ' 33.7"
2	Latitude	56°47 ' 23.3"	56°47 ' 20.1"	56°47 ' 16.9"	56°47 ' 13.6"
	Longitude	26°55 ' 57.3"	26°56 ' 07.5"	26°56 ' 17.6"	26°56 ' 27.8"
3	Latitude	56°47 ' 17.7"	56°47 ' 14.5"	56°47 ' 11.2"	56°47 ' 08.0"
	Longitude	26°55 ' 51.4"	26°56 ' 01.6"	26°56 ' 11.8"	26°56 ' 22.0"
4	Latitude	56°47 ' 12.1"	56°47 ' 08.9"	56°47 ' 05.6"	56°47 ' 02.4"
	Longitude	26°55 ' 45.5"	26°55 ' 55.7"	26°56 ' 05.9"	26°56 ' 16.1"
5	Latitude	56°47 ' 06.5"	56°47 ' 03.2"	56°47 ' 00.0"	56°46 ' 56.8"
	Longitude	26°55 ' 39.6"	26°55 ' 49.8"	26°56 ' 00.0"	26°56 ' 10.2"
6	Latitude	56°47 ' 00.9"	56°46 ' 57.6"	56°46 ' 54.4"	56°46 ' 51.1"
	Longitude	26°55 ' 33.7"	26°55 ' 43.9"	26°55 ' 54.1"	26°56 ' 04.3"
7	Latitude	56°46 ' 58.1"	56°46 ' 54.8"	56°46 ' 51.6"	56°46 ' 48.3"
	Longitude	26°55 ' 30.8"	26°55 ' 41.0"	26°55 ' 51.2"	26°56 ' 01.4"
8	Latitude	56°46 ' 55.3"	56°46 ' 52.0"	56°46 ' 48.8"	56°46 ' 45.5"
	Longitude	26°55 ' 27.9"	26°55 ' 38.0"	26°55 ' 48.2"	26°55 ' 58.4"
9	Latitude	56°46 ' 49.6"	56°46 ' 46.4"	56°46 ' 43.1"	56°46 ' 39.9"
	Longitude	26°55 ' 22.0"	26°55 ' 32.2"	26°55 ' 42.4"	26°55 ' 52.5"

Survey Result (Bottom Elevation :m)

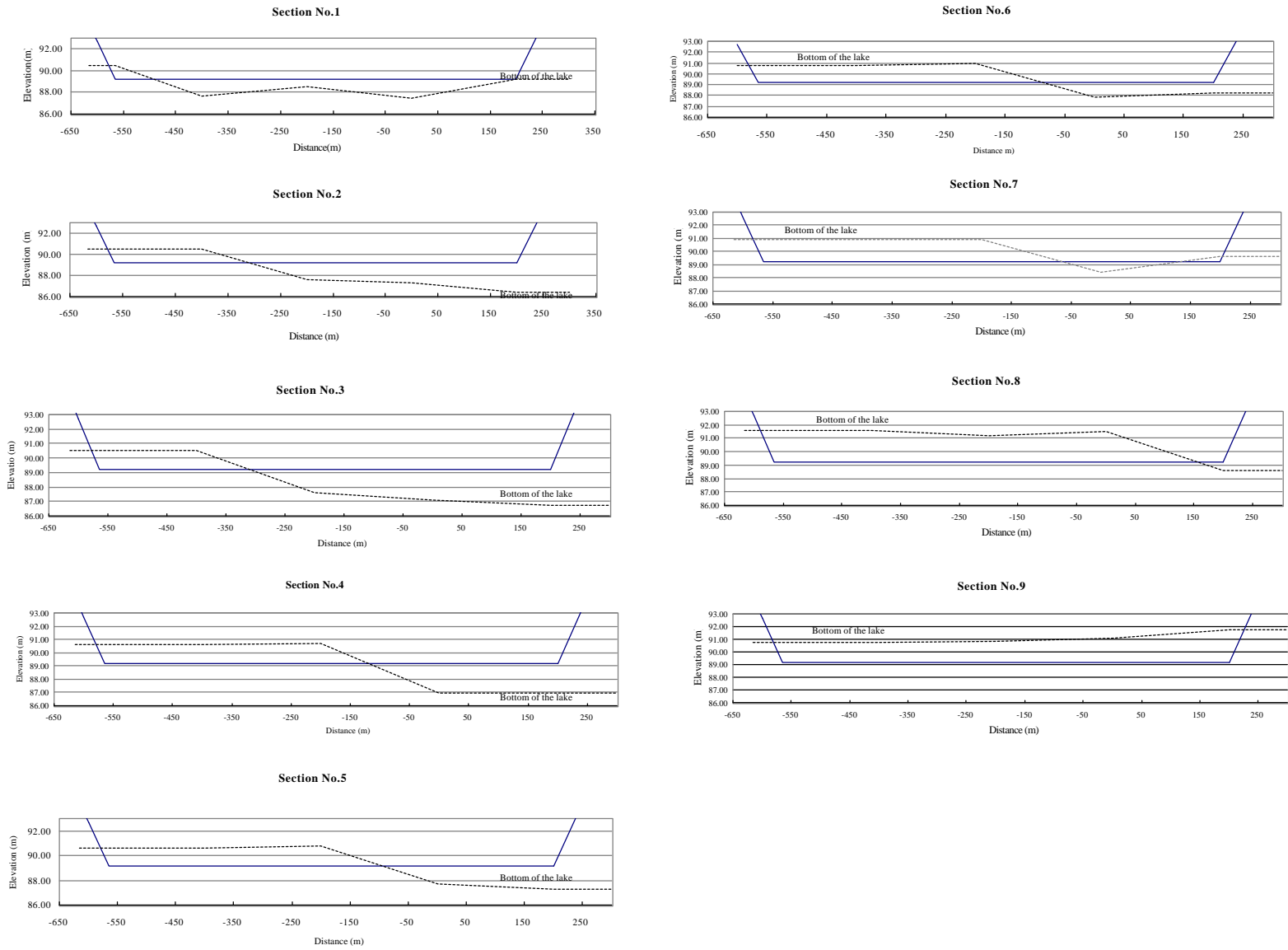
	A	B	C	D
1	87.62	88.52	87.42	89.22
2	90.52	87.62	87.32	86.42
3	90.52	87.62	87.12	86.72
4	90.62	90.72	86.92	86.92
5	90.62	90.82	87.72	87.32
6	90.72	90.92	87.82	88.22
7	90.92	90.92	88.42	89.62
8	91.62	91.22	91.52	88.62
9	90.72	90.82	91.12	91.72

: Deep Area

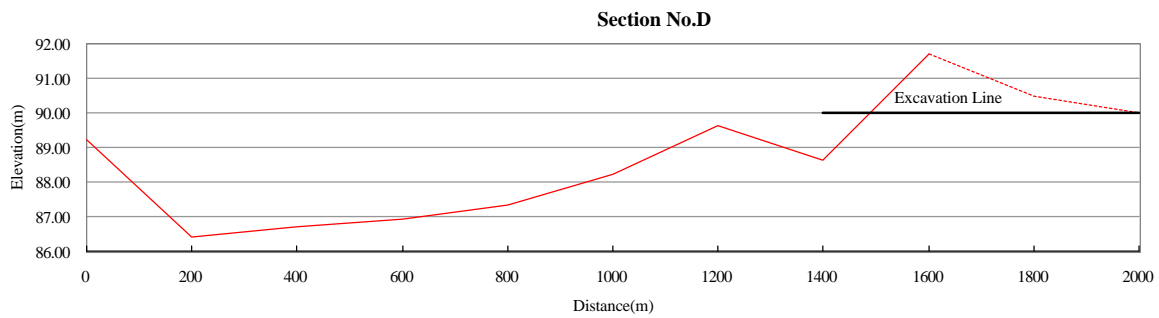
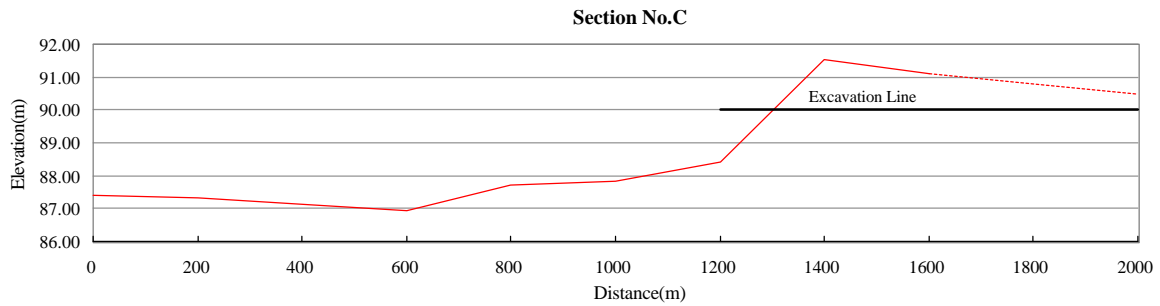
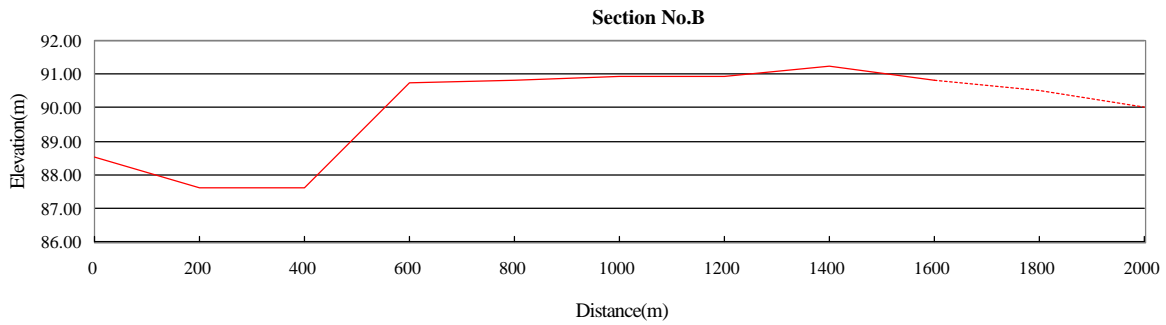
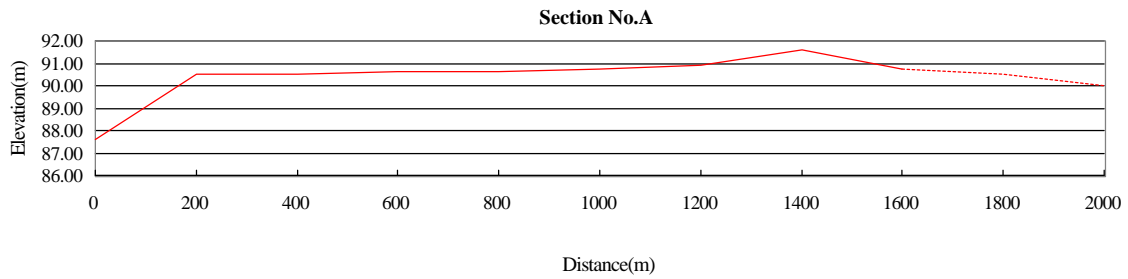
**Figure 15.3.2 Location Map and Survey Point in Lake Lubana**

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**Figure 15.3.3** Cross Section of Fish Wintering Place



Section No.A	
Distance	GL
0	87.62
200	90.52
400	90.52
600	90.62
800	90.62
1000	90.72
1200	90.92
1400	91.62
1600	90.72
1800	90.50
2000	90.00

Section No.B	
Distance	GL
0	88.52
200	87.62
400	87.62
600	90.72
800	90.82
1000	90.92
1200	90.92
1400	91.22
1600	90.82
1800	90.50
2000	90.00

Section No.C		
Distance	GL	Plan
0	87.42	
200	87.32	
400	87.12	
600	86.92	
800	87.72	
1000	87.82	
1200	88.42	90.00
1400	91.52	90.00
1600	91.12	90.00
1800	90.80	90.00
2000	90.50	90.00

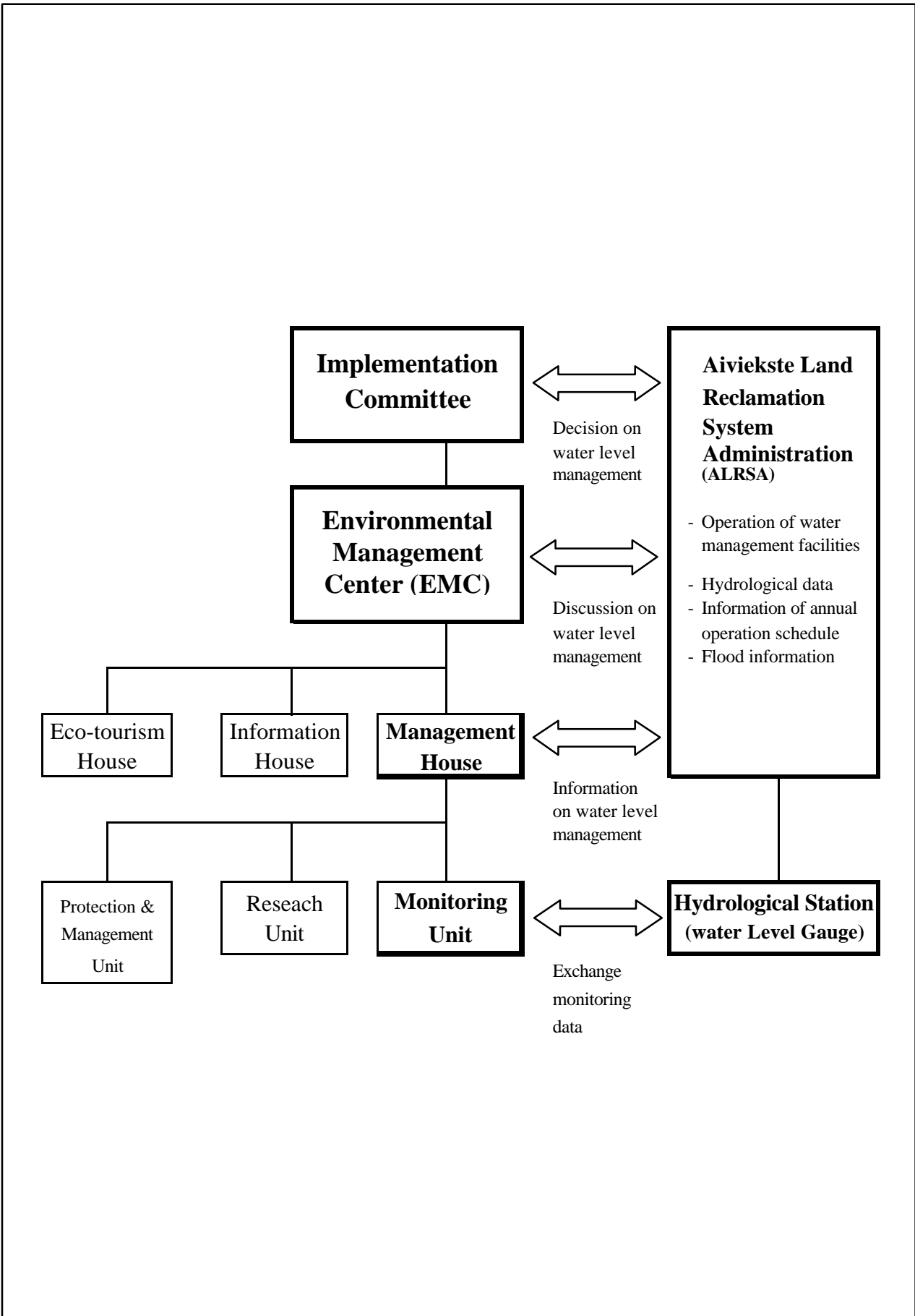
Section No.D		
Distance	GL	Plan
0	89.22	
200	86.42	
400	86.72	
600	86.92	
800	87.32	
1000	88.22	
1200	89.62	
1400	88.62	90.00
1600	91.72	90.00
1800	90.50	90.00
2000	90.00	90.00

**Figure 15.3.4 Cross Section of the Proposed Fish Channel in Lake Lubana**

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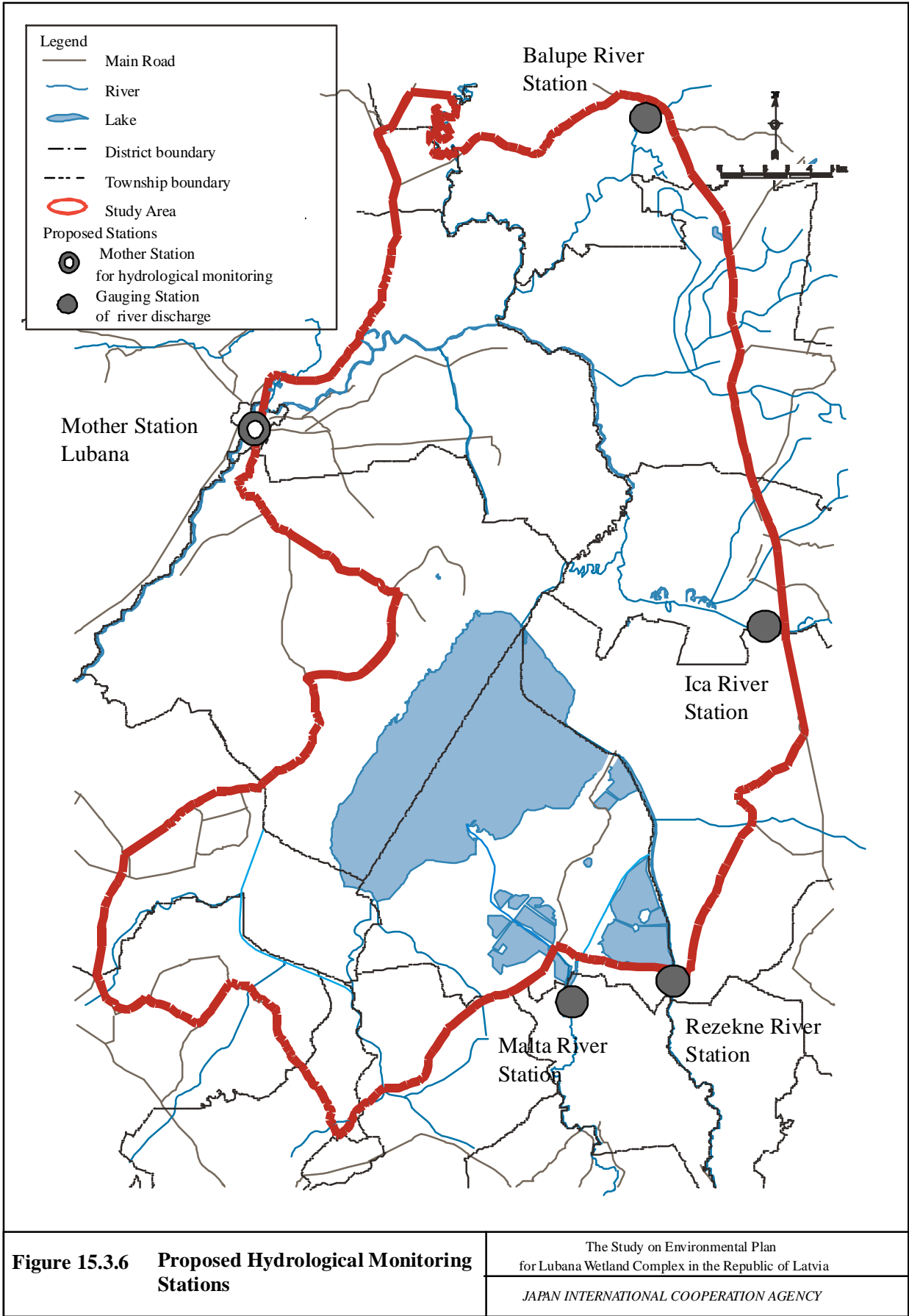




**Figure 15.3.5 Proposed organization for water level management**

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# **CHAPTER 16**

## CHAPTER 16 ECONOMIC AND FINANCIAL ANALYSIS

### 16.1 Proposed Environmental Projects and Programs

#### 16.1.1 Proposed Projects and Programs

Several concrete projects and programs have been proposed within EMP framework by each sector. Based on the sector wise evaluation related to effectiveness, necessity, and technical feasibility, the 11 projects and programs (EMP Projects) are selected for EMP as shown in the next table.

##### (1) Wetland conservation plan

Since the wetland conservation plan is to be a core of EMP, all actual projects proposed by the wetland conservation sector are put high priority in the EMP projects. Based on the concepts and objectives of the proposed projects, one project and three programs are formulated in the wetland conservation plan. The Environmental Management Center (EMC) Construction Project is a building work for installation of the facility and equipment, and for establishment of the organization responsible for the implementation of EMP. The Biotope Conservation Program consists of four subprograms focusing on conservation of the natural environment. The Environmental Research and Monitoring Program includes equipment installation and actual research and monitoring activities. The Environmental Education and Public Awareness Promotion Program consists of the EIMS subprogram and the Environmental Education subprogram. The indicative cost including O/M cost up to 2010 is estimated at about 2.3 million LVL.

##### (2) Eco-tourism development plan

Although LWC embraces much attractive natural resources and high development potentials of eco-tourism, it has never experienced any eco-tourism and rural tourism projects so far. Therefore, the strategies of local community driven development and of focusing on the most potential areas are recommended for actual eco-tourism development of LWC. Thus the Indrani and Lubana Eco-tourism Development Project and the Nagli and Gaigalava Eco-tourism Development Project are proposed as the concrete core projects for the eco-tourism development plan. These two projects are to be the pilot projects for full-scale investment in future. The indicative cost including O/M cost up to 2010 is about 0.9 million LVL.

##### (3) Fishery development plan

Due to the LWC's very small fishery production and gloomy demand prospect of carp fishery, the fishery development plan should focus on the exploitation of valuable fishes such as pike and pikeperch, and recreational fishery. Therefore, the Fish Hatchery Development Project and the Angling Promotion Project are formulated in line with the

sustainable use of fish resources and promotion of eco-tourism activities. The indicative cost including O/M cost up to 2010 is about 0.6 million LVL.

#### (4) Water level management plan

Necessary measures related to water level management to keep the natural environment in good condition are included in the wetland conservation plan. Besides, it should be substantial to rehabilitate the existing Aiviekste and Kalnagala sluices in order to manage the water level of the lake properly. So, the Aiviekste Sluice Rehabilitation Project and the Kalnagala Sluice Rehabilitation Project are proposed for EMP. Moreover, the hydrological data and information is indispensable to prepare an appropriate operation manual and to operate the water level control facilities. Therefore, the Hydrological Station Construction Project is proposed within EMP to improve current insufficient conditions. The indicative cost including O/M cost up to 2010 is about 0.3 million LVL.

### 16.1.2 Costs for the Environmental Management Plan

Initial costs and operation and maintenance (O/M) costs for each proposed project and program are shown in the following table. The total cost including the initial cost, O/M cost, and physical contingency (15% of the initial cost) up to 2010 is estimated at 4.6 million LVL, indicatively.

#### Proposed Projects and Programs for EMP

(Unit: 1,000 LVL)

Name of Projects and Programs	Initial Cost	O/M Cost	Total Cost
<b>I. Wetland Conservation Plan</b>	<b>1,444</b>	<b>879</b>	<b>2,323</b>
1. Environmental Management Center Construction Project	375	105	480
2. Biotope Conservation Program	796	78	874
2-a. Bird conservation subprogram	114	34	148
2-b. Mammal conservation subprogram	19	3	22
2-c. Bog and inundation grassland conservation subprogram	208	27	235
2-d. Fish conservation subprogram	390	14	404
3. Environmental Research and Monitoring Program	166	248	414
4. Environmental Education and Public Awareness Program	107	448	555
4-a. EIMS subprogram	74	171	245
4-b. Environmental education subprogram	33	277	310
<b>II. Eco-tourism Development Plan</b>	<b>521</b>	<b>393</b>	<b>914</b>
5. Indrani and Lubana Eco-tourism Development Project	242	171	413
6. Nagli and Gaigalava Eco-tourism Development Project	279	222	501
<b>III. Fishery Development Plan</b>	<b>414</b>	<b>227</b>	<b>641</b>
7. Fish Hatchery Development Project	315	156	471
8. Angling Promotion Project	99	71	170
<b>IV. Water Level Management Plan</b>	<b>293</b>	<b>9</b>	<b>302</b>
9. Aiviekste Sluice Rehabilitation Project	138	6	144
10. Kalnagala Sluice Rehabilitation Project	145	1	146
11. Hydrological Station Construction Project	10	2	12
Physical Contingency (15 %)	401	-	401
<b>Grand Total</b>	<b>3,073</b>	<b>1,508</b>	<b>4,581</b>

Note: O/M cost is the total cost up to 2010.

## 16.2 Economic Evaluation

### 16.2.1 Approach of Cost Benefit Analysis

#### (1) Conceptual framework of cost benefit analysis

The economic analysis is integrated into the evaluation of EMP considering the direct costs of equipment, operation and maintenance as well as the benefits and damage costs

avoided in the uses of environmental resources in LWC. This analysis builds on the environmental economic capabilities developed so far, aiming at evaluating feasibility of EMP's implementation from the socioeconomic point of view.

For evaluation of socioeconomic feasibility, "Cost Benefit Analysis" approach, which is internationally common and accepted, is applied with its general conceptual framework of evaluation equation as follows:

$$NB = Bd + Be - Cd - Cp - Ce$$

where NB : Net benefit generated by implementation of the projects

Bd : Productive benefit directly generated by the projects

Be : Environmental benefit by the projects

Cd : Direct cost necessary for the implementation of the projects

Cp : Cost for preventive measures for environmental conservation, if applied

Ce : Cost as environmental damage due to the project implementation

In many cases of productive or infrastructure sector projects, conventionally, "Be" and "Ce" have been ignored as items of the external economy and external diseconomy respectively, both of which are regarded as tangible in monetary terms. A major part of "Bd" in EMP is equivalent to "Be", and "Cd" equals "Cp". It is that its main targets are originally to conserve a good quality of environment or to further improve the environmental quality. On the other hand, "Ce" hardly accrues from EMP for the same reason. Therefore, the most proper cost-benefit equation for EMP is as below:

$$NB = Be - Cp$$

If "Be" of EMP is still left unmeasured as conventional, any cost-benefit analysis of calculating "NB" can not be carried out. In this context and nature of EMP's benefits, the study team considered "Be" calculation as most essential and is challenging its difficult evaluation, applying the existing evaluation methods for environmental values.

## (2) Points of analytical approach

With increasing knowledge of both the economic and environmental values of LWC's ecosystems, cost benefit analysis can serve as a useful tool in analyzing conservation projects for these ecosystems. Considering the following four points, the evaluation is being carried out on various important aspects of LWC such as wetland vegetation, environmental education, and eco-tourism.

### 1) Use of social cost and benefit

Economic data, namely "social cost/benefit", reflecting real scarcity and consumption of local resources should be utilized, rather than focusing on individual enterprise's profits and expenditures in cash flow.

### 2) Application of Economic Internal Rate of Return (EIRR)

Among the three typical evaluation criteria, i.e. EIRR, net present value (NPV) and benefit-cost ratio (B/C), EIRR is applied to finally examine the economic viability, because EIRR has no troublesome in selecting discount rates from the very beginning.

### 3) Appropriate time horizon for analysis

The economic analysis has to cover all the period when any cost or benefit accrues from EMP's implementation consisting of both construction and operation stages. EMP's benefits will last long further beyond a period requiring the direct costs of management. However, 30- to 40-year is used as a time horizon subject to the economic analysis, since any costs and benefits accruing beyond such a period are discounted into present value of extremely small amount. One possibility to assess the economic soundness of EMP for further future is to discount the environmental benefits by setting basis years for discounting at the beginning of every generation (every 30 ~ 40 years). This approach will be also tried if really necessary and useful at the final stage of the study.

### 4) With-project/without-project framework

The analysis is carried out based on the net costs and benefits, identifying incremental costs/benefits generated purely due to EMP's implementation. Natural degradation of environment, measured in the without-project framework, has to be distinguished from that under the with-project situation.

## 16.2.2 Monetary Evaluation Methods for Environmental Benefits

The main purpose to apply the monetary evaluation methods is to quantitatively measure the benefits from implementation of EMP, not to measure LWC's value as a whole. Potential methods for estimating the monetary value of environmental resources and benefits, which may result from implementation of EMP, were examined. The next table presents a menu of valuation techniques, which have been developed so far in environmental economics field, as well as examples of the types of effects valued.

**Menu of Valuation Methods for Environmental Effects**

Valuation Method	Typical Effects Valued
<b>A. Objective Valuation Approaches (OVA)</b>	
1) Change in Productivity	Productivity
2) Cost of Illness	Health (morbidity)
3) Human Capital	Health (mortality)
4) Replacement (Restoration) Cost	Capital assets, and natural resource assets
<b>B. Subjective Valuation Approaches (SVA)</b>	
1) Preventive (mitigative) Expenditure	Health, productivity, capital assets, and natural resource assets
2) Hedonic Approaches - Property (Land) Value - Wage Differential	Environmental quality, and productivity Health
3) Travel Cost (TCM)	Natural resource assets, and tourist attractions
4) Contingent Valuation (CVM)	Any effects including biological and aesthetic values

Source: Economic Analysis of Environmental Impacts, ADB/WB, 1994

#### (1) Objective valuation approaches (OVA)

The first set of methods in the table are OVA that are based on physical relationships that formally describe cause and effect relationships and provide objective measures of effects resulting from various causes. It uses "damage functions" which relate the level of offending activity to the degree of physical damage to a natural or man-made asset, or to the degree of health impact. The OVA in general provide measures of the gross benefits, in the sense of losses avoided, of preventive or remedial actions. The important assumptions are:

- Net value of averting damage is at least equal to the cost which would be incurred if the damage actually occurred; and
- Rational individuals, in order to prevent some damage from occurring, would be willing to pay an amount less than or equal to the costs arising from the predicted level of environmental effects.

## (2) Subjective valuation approaches (SVA)

In contrast to OVA, SVA is based on more subjective assessments of possible damage expressed in real or hypothetical market behavior. Using revealed behavior involves examination of real markets for goods or services which are affected by environmental impacts such as water pollution, in which people actually make trade-off between the environmental impact and other goods or income.

The travel cost method (TCM) is a means of determining value figures for things which are generally not bought and sold, and therefore fall outside of the market's pricing system. The non-market assets which are most often applied to are "recreational resources which necessitate significant expenditure for their enjoyment" as eco-tourism development in EMP. The basic premise of TCM is that, although the actual value of the recreational experience does not have a price tag even some activities collect fee such as proposed canoeing program in EMP, the costs incurred by individuals in travelling to the site can be used as surrogate prices (L. Karasin, 1999).

In other cases environmental impacts cannot be valued, even indirectly, through market behavior. The alternative is to construct hypothetical markets for various options to reduce environmental damages and to ask directly a sample of people to express how much they would be willing to pay for various reductions in environmental impacts. These are called the contingent valuation methods (CVM).

## (3) Evaluation of Eco-tourism Development

So far, LWC has not been well used for tourism activity though LWC is considered to have potential with rich natural resources to fascinate tourists. Through implementation of EMP, the proposed eco-tourism development will bring out the potential value of LWC in terms of the recreational use.

Some services and facilities provided by the proposed eco-tourism projects have market prices such as hotel charge and canoeing program fee. However, those revenues can not be counted as total value of the eco-tourism because many services and facilities, which are mainly common facilities and infrastructure, do not have market price such as use of boardwalk and road in LWC, and people can use them freely. In addition, it is assumed that people has motivation to come to LWC for recreational purpose under the proposed eco-tourism development, only when people think that they can get benefit from the eco-tourism more than they spend for market and non-market cost.



Under these circumstances, TCM will be attempted in the study to evaluate the recreational value of LWC brought out by the eco-tourism development. In TCM, transportation cost, travel time cost calculated as wages working, opportunity cost for length of stay in LWC is counted at various origin and occupation groups. Then, the estimated travel cost is multiplied by forecasted number of tourists to LWC for eco-tourism purpose to calculate total travel cost, on the premise that the forecasted number of tourists should be estimated based on the potential demand of the eco-tourism development in LWC.

### 16.2.3 Questionnaire Survey

#### (1) Methodology

##### 1) Objectives of questionnaire survey

To get intention of local residents reflected in the proposed EMP, a questionnaire survey was conducted to collect information on public opinion and awareness on environmental protection and development in the study area, evaluation of environmental conditions, willingness-to-pay (WTP) to environmental conservation.

##### 2) Area subject to survey and number of sampling

A total of 513 households that are around 1 % of total households in townships related to LWC in Rezekne, Madona, Balvi, and Gulbene districts were selected by random sampling method.

##### 3) Survey method

Questionnaire was designed to meet the above objective as shown in Table 16.2.1. Main items included in the questionnaire are shown as follows. The questionnaire survey was conducted by the Latgarian Ecological Society under technical supervision of the JICA study team from August to October 1999.

**Main Items in Questionnaire**

Subject	Items of Questions
Socioeconomic condition	Number of household members, income, occupation, educational level, satisfactory level to living condition, etc.
Intention on development	- Issues on present local economy, - Desirable direction of development, - Expectation to eco-tourism development, etc.
Intention on environment	- Satisfactory level to surrounding environment, - Recreational activities in Lubana wetland complex, - Other activities in the wetlands, - Environmental issues in and around the wetlands, etc.
Value of Lubana wetland complex	- Significance of the wetland's existence, - Necessity of the wetland conservation, - Preference between development and conservation, - Satisfactory level to the wetland landscape, - WTP to conserve the wetland, - Intention to voluntarily join environmental activities, etc.

## (2) Results of the survey

The survey was conducted to households living in and around LWC. Total sample number is 513 households. Number of sampled households in each town and township is shown as follows.

**Number of Samples by Town and Townships**

Town and Township	District	Number of Samples
1) Daksare	Rezekne	54
2) Gaigalva	Rezekne	40
3) Nagli	Rezekne	40
4) Berzpils	Balvi	40
5) Lazdukalna	Balvi	40
6) Rugaji	Balvi	40
7) Lubana Town	Madona	40
8) Barkava	Madona	50
9) Murmastiene	Madona	50
10) Osupe	Madona	39
11) Varaklani	Madona	40
12) Daukti	Gulbene	40
Total		513

### 1) Properties of interviewees

Average number of households' member interviewed is three as shown in Table 16.2.2. Main occupations of the households interviewed (interviewee) are shown in the following table. Other occupations include self-employed businessperson and physical labor. Occupational structure of interviewees by town and townships is shown in Table 16.2.3 and Figure 16.2.1.

**Occupation of Interviewed Households**

Occupation	Number (%)
1) Farmer	81 (14)
2) Fishery	22 (4)
3) Forestry	4 (1)
4) Public civil servant (official, policeman, etc.)	82 (14)
5) Private service (restaurant, driver, retailer, trader, etc.)	112 (19)
6) Professional (doctor, lawyer, etc.)	84 (14)
7) Retired	64 (11)
8) Unemployment	40 (7)
9) Others	90 (16)
Total	579 (100)

Income levels of the households interviewed are classified as shown in Table 16.2.4 and Figure 16.2.2. Monthly income from 50 to 100 LVL is dominant (about 50 % of total). Regarding to income level by occupation shown in Table 16.2.5 and Figure 16.2.3, income of fishery and private service sectors are higher than that of others.

### 2) Intention and preference on environmental protection and future tourism development

#### a) Present recreational use of Lake Lubana by local people

Most interviewed households have visited Lake Lubana more than once (about 70 % of total). Among them, popular activities are fishing and recreation (about 65 % of total). Households living near Lake Lubana tend to go to the Lake more frequently (Nagli township: 95 % more than 2 times/year, on the other hand, Rugaji township: 50 %). Recreation and angling are major purpose to visit Lake Lubana for local residents (about 80% of total). Picking berries is also a popular activity. Major

transportation to Lake Lubana is private car (about 60 % of total). Detailed results are shown in Table 16.2.6 to 16.2.8 and Figure 16.2.4 to 16.2.6.

Popular recreational activities in LWC are angling (57%) and hunting (29%) as shown in Table 16.2.9 and Figure 16.2.7. However, the local people does not tend to spend holiday in LWC with such activities since most of interviewees work or stay at home in holiday (about 70 %) as shown in Table 16.2.10 and Figure 16.2.8.

#### b) Intention on future tourism development

In total, more than half of people is hoping future tourism development in LWC (about 60 % of total) as shown in Table 16.2.11 and Figure 16.2.9. By occupations, 95% of Fishery, 75% of Professional, 70 % of Private service and Public sector have large ratio of the expectation of future development as shown in Table 16.2.12. This results shows those sectors would get increase of business opportunities and benefit by the development in LWC.

Interviewees who have positive expectation to future tourism development in LWC expect improvement of natural environment by tourism development (about 40 % of total interviewees) as shown in Table 16.2.13 and Figure 16.2.10. This result shows people expect that the tourism development in LWC bring out better natural environment and management.

On the other hand, interviewees who have negative expectation to future tourism development in LWC worry some problems caused by people from outside for tourism (about 60 % of total interviewees) as shown in Table 16.2.14 and Figure 16.2.11. And also, environmental damage is expected (about 30% of total interviewees). This result shows those people expect that the tourism development in LWC make existing conditions of both living and nature in LWC worse.

Tourism development for both domestic and international tourists is preferred (45 %) as shown in Table 16.2.15 and Figure 16.2.12 while only international tourism is not so preferred (6% and only for domestic is 30 %). Most of interviewees intend to participate in the tourism development in LWC by some ways (65 %) as shown in Table 16.2.16 and Figure 16.2.13. Some interviewees propose that advertisement is necessary for the tourism development in LWC.

#### c) Intention on environmental protection

Although willingness-to-pay for environmental conservation was asked to local people in the survey, almost all people do not have intention to pay voluntarily. Most of interviewees do not object development in LWC (60 %) as shown in Table 16.2.17 and Figure 16.2.14. However, these results would not mean people does not have intention on environmental protection in LWC because people consider the environment with development as stated above.

Answers on favorite points of landscape near local people's residences were dominated by "Lake and pond (20 %)", "Flower (13 %)", "Spacious view (13 %)", and "Trees and woods (12 %)" as shown in Table 16.2.18 (1)&(2) and Figure 16.2.15. These points are typical component of landscape in LWC, which have potential to fascinate tourists to LWC.

### 3) Conclusion

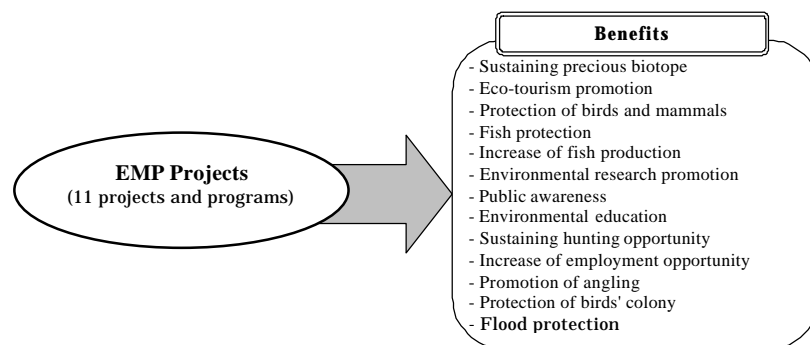
Although the Survey was limited to only about 500 samples in the townships locating near LWC, the results of the survey shows some representative facts, ideas, and intentions of local people living in and around LWC. On the whole, people have intention on the environment in LWC with development issue directly connecting to local people's lives.

To image environmental protection and tourism development of LWC in future might be ambiguous and rather difficult for interviewees in present circumstance, which there is no concrete plan and program in the area. More positive ideas and opinions from local people would be obtained by showing concrete image of the future environment and development to be proposed by EMP.

#### 16.2.4 Benefits of Projects and Programs for EMP

The vision of EMP is the wise and sustainable use of nature resources in LWC, so that key components for the economic analysis are environmental goods or services that have been treated as external factors in the conventional analysis. It should be noted that the environmental management hardly generates direct marketable products that can be important factors to assess the economical and financial validity.

The projects and programs for EMP (the EMP Projects) are proposed from different sectors as described in the previous chapters. The EMP Projects are expected to bring about many kinds of benefits as shown below. All the EMP Projects are planned to be interdependent and contribute to each other to gain overall benefit of EMP effectively. Therefore, economic benefits are estimated for each type of benefit, not for each project or program. After the identification of benefits and costs of the EMP Projects, economic evaluation is conducted for the overall EMP implementation.



**Proposed Projects and Programs (EMP Projects) and their Benefits**

In principle, economic evaluation of the development project is conducted by estimating the net benefit between "Without-project" and "With-project". The same manner is taken

to the economic evaluation of the EMP Projects. The net benefit with implementation of the EMP Projects (with-project case) is estimated and then is compared to the net benefit of without the EMP Projects (without-project case).

#### 16.2.5 Monetary Valuation Methods for Benefit Calculation

Implementation of the EMP Projects brings about various benefits in many aspects of EMP as shown in the previous table. Considering the correlation of the benefits, those benefits are synthesized to the conservation of biotope, eco-tourism promotion, and protection of birds and mammals. These types of benefits are valued as follows.

##### (1) Conservation of biotope

Existing precious biotope in LWC will be gradually degraded with certain period in the future unless proper management methods and countermeasures are executed. It means that value of the biotope in LWC will be deteriorated without EMP implementation (without-project case). It is assumed that present biotope will be changed in the future as follows in case of the without-project, while the existing biotope, especially in NPZ and AMZ, will be maintained by implementation of the EMP Projects.

The following transitional periods of the biotopes are applied considering the low pressure to the nature environment by development activity in LWC under an assumption for the without-project case that the present level of the development activity in LWC continue in the future. However, in the case where level of development activity in LWC increase in the future, the transitional period of the biotope will shorten. Consequently the net benefit of differences between with-project and without-project cases will increase.

**Possible Change of Biotopes in Case of Without-Projects**

Biotope Types	Specific Features	Transition Phenomena	Transitional Period
Inundated grassland	Breeding place of the Great snipes and other ecological functions	Changing into shrub such as willow by dryness and reduction to narrow area only along the river	50 years
Raised/Transitional bog area	Distinct biotope and other ecological functions	Vanishing by dryness due to existing drain ditches, and changing into shrub	over 200 years

Natural fire may cause serious damage and loss of the biotope in LWC. However, it is not included in the economic evaluation since it is difficult to predict its frequency.

Monetary values of unit area by type of ecosystem, which were estimated by a research (Robert Costanza et al., 1997), is applied to calculate indicative benefit of the biotope in LWC, though detailed ecological study is necessary for more appropriate valuation of the biotope in LWC. The research groups ecosystem functions into 17 major categories including both market and non-market components as shown in Table 16.2.19. By using the valuation results, economical value for unit area by each biotope type in LWC is estimated as shown in Table 16.2.20.

By applying the unit values by type of the biotope, total present economic value of biotope in LWC is estimated at about 28 million LVL/year at the year 2000 price level in Latvia as shown in Table 16.2.20. In the economic analysis, the loss of the economic value is considered as cost in without-project case, while the avoidable cost by implementation of the EMP Projects is considered as benefit in the with-project case. Assume that the EMP Projects on wetland conservation start the operation at the beginning of year 2003, total annual benefits are 373 thousand LVL in 2003 and 1,244 thousand LVL in 2010 as shown in Table 16.2.21.

In the estimation, only value of unit area by biotope type is considered, but the ecosystem existing in certain extent area is not valued. Namely, precious ecosystem can be considered to be valued higher with wider extent area in the view of preciousness. Also non-use value such as option, existence and bequest values were not estimated since detailed survey for the contingent valuation method (CVM) should be conducted for relative long study period. These values may also place an additional large amount of value in LWC.

## (2) Eco-tourism promotion

In order to estimate incremental value of recreational use of LWC by implementing the eco-tourism projects, travel cost method known as an economic valuation technique is applied in the study.

A prerequisite of the travel cost method that recreational use value of designated area depends on consumption by tourists to the area is applied to estimation of economic benefit brought about by the eco-tourism projects in LWC. It is assumed that eco-tourists to LWC place higher value on eco-tourism service than their travel expenses consisting of transportation fee and travel time cost as wage (opportunity cost) as next simple equation. The travel cost method thus reveals minimum value of the recreational use value of the eco-tourism projects.

$$\text{Travel cost} = \text{Transportation cost} + \text{Travel time cost}$$

Potential number of eco-tourists to LWC out of both foreign and domestic tourists is estimated around 430 tourists/year at present in total and will potentially increase up to around 850 in 2010 based on estimation by the JICA study team. It is assumed that the amount of potential eco-tourist in 2010 can be realized in the case of with-project, and that the present situation is not enough capacity for eco-tourism activity and facility in LWC.

Based on the tourism statistics in Latvia, a rate of foreign tourists in total number of tourists is estimated. And then number of foreign tourists is allocated by country of origin. Average prices of airfare and wage by country are applied for the estimation of the travel cost for each country. Suppose that the EMP Projects on eco-tourism start the operation at the beginning of year 2003, 22,000 LVL in 2003 and 67,000 LVL in 2010 are estimated as economic benefit as shown in Table 16.2.22.

In the above estimation, the following assumptions are applied:

- a) Flat rate of airfare is assumed during project period due to international competition of the market.
- b) Annual increment rate of wage level as opportunity cost is 0.5 % per annum on average.
- c) Number of potential annual tourists is realized at 6 % per annum of increase rate by implementing the EMP Projects, while almost the same number of present tourists visit LWC in case of without-project.
- d) Origin countries of foreign tourists to LWC are considered based on present tendency of tourists. Therefore, potential tourists from other countries such as Japan are not included though there may be high possibility of increase.
- e) Tourists tend to visit several other destinations, not only LWC. Therefore, suppose that 50 % of total estimated travel cost is applied to LWC's valuation.

### (3) Protection of birds and mammals

Compared to the without-project case, implementation of the EMP Projects brings out positive results on protection of birds and mammals by maintaining and improving present nature conditions in LWC. Protection cost of animals as the proposed projects is rather lower than restoration cost of lost habitat, and it is impossible to restore in some cases. In a sense, the cost avoided by implementation of the protection instead of the restoration in the future is considered as economic benefit of the EMP Projects.

The restoration cost method would be assumed to apply to evaluate economic benefit from protection of birds and mammals in the case of with-project. However, any related study and research on cost for restoring or mitigating similar habitat of LWC to be applied is not available at present, so that quantitative valuation can not be conducted except for the protection of habitat by maintaining present biotope which has already evaluated in the above.

Also, low number of bird and mammal species in Latvia compared to that in other countries can be protected in LWC by implementing the EMP Projects. Therefore, it should be evaluated on such significance and role of LWC in the viewpoint of protecting biological diversity in Latvia.

### (4) Agriculture and forestry

The rural tourism in connection with eco-tourism projects proposed in EMP will create an additional income opportunity for farmers. Part of the benefit from the rural tourism is included in the above estimation of economic valuation for eco-tourism projects. However, any expansion of agricultural land and introduction of new products will not be done by the EMP Projects. Therefore, economic benefit on agricultural production change is not brought about by the EMP Projects.

Forestry sector also does not have any influence by implementation of the EMP Projects. Proper forestry development is conducted with the existing practice operated by the

State-shared Forestry Company. Therefore, forestry is not also considered in the estimation of the valuation.

### Valuation Items

Type	Benefit to be Quantified	Valuation Method
Biotope	Maintained precious biotope functions	Application of estimated unit value of biotopes
Eco-tourism	Tourists satisfaction to LWC nature and eco-tourism facilities & activities	Travel cost method
Birds and mammals	Environmental services and goods from birds and mammals	Restoration cost method (Related data is not available for specific species seen in LWC.)

#### 16.2.6 Preliminary Cost-Benefit Analysis

Costs of the EMP Projects are summarized in Section 16.1.3. Only the Standard Conversion Factor (SCF) at 0.8 is preliminarily applied to convert financial cost to economic cost, considering the high value added tax rate in Latvia. The project period is set as 40 years, in terms of the period where the EMP Projects should be totally renewed and discounting effect for calculation of the present value.

Economic viability of the EMP Projects is evaluated by Economical Internal Rate of Return (EIRR) with 40-year project period though the target year of EMP is 2010. As a result of the estimation, EIRR shows about 30 % as shown in Table 16.2.23. Compared to interest rates ranging from 10 % to 15 % in the conventional economic analysis, the result means that the EMP Projects are viable economically even though some parts of benefits of them are only quantified in monetary value and all costs of the EMP Projects are estimated.

In the economic analysis, changes of national welfare by the EMP Projects are focused on and evaluated. Fair distribution of benefits is not taken into account for both spatial and temporal viewpoints. Beneficiaries of the EMP Projects consist of various stakeholders such as eco-tourists, private entrepreneurs, municipality, and local residents.

Considering that sustainable environmental conservation and economic development in LWC are realized by local residents, a mechanism that most benefits should be distributed to local people in the long term would be necessary. In this sense, employment opportunity for local residents in and around LWC should be created such as nature guide for eco-tourism, business for eco-tourism activities, and rural tourism.

## 16.3 Financial Analysis

### 16.3.1 Cost Estimation

#### (1) Conditions of cost estimate

Major conditions applied for the indicative cost estimation in the above chapters are summarized below:



- a) Initial cost for each project and program covers the expenses for labor, material, construction, equipment, and the contractor's indirect cost.
- b) Prices are based on labor, materials and equipment prices as of Sept. 2000. The exchange rate applied in the estimation is 1 LVL = 1.61 USD.
- c) Land acquisition cost is excluded because almost every facilities will construct on public land.
- d) Engineering service expense is included in the initial cost and operation & maintenance cost (O/M cost).
- e) Taxes such as VAT are included in the cost estimated.
- f) Renovation/renewal of the facilities and equipment: the renovation and renewal schedule and costs for the EMP Projects are included in the O/M cost based on their schedule as below.
- g) Almost all materials and equipment can be procured in domestic market. Therefore, import of materials and equipment are not considered.

#### Renovation and Renewal Schedule

Item	Frequency	Cost
1. Facility*	Once 20 years	25 % of initial cost
	Once 10 years	10 % of initial cost
	Once 5 years except the above period	3 % of initial cost
2. Equipment and Vehicle (Bus)	Once 5 years (Once 10 years)	100 % of initial cost

Note: Renovation of the RC dam for bog conservation is every 10 years at 50 %.

#### (2) Cost of the EMP Projects

Indicative costs for the EMP Projects are estimated in relevant chapters and summarized below. Initial cost of the EMP Projects consisting of those for design, construction, equipment procurement, and physical contingency is estimated at about 3.1 million LVL. The O/M cost of them including training cost for staff from year 2001 to 2010 are estimated at about 1.5 million LVL. Total cost up to year 2010 is about 4.6 million LVL.

#### Cost of the EMP Projects

(Unit: 1,000 LVL)

EMP Projects	Initial Cost	O/M Cost up to 2010	Total
I. Wetland Conservation Plan	1,444	879	2,323
II. Eco-tourism Development Plan	521	393	914
III. Fishery Development Plan	414	227	641
IV. Water Level Management Plan	293	9	302
Physical Contingency (about 15 % of the above)*	401	-	401
Total	3,073	1,508	4,581

Note: \* The high physical contingency rate is applied because present estimation of the EMP Projects was conducted under preliminary specification of the EMP Projects.

#### 16.3.2 Cost Recovery Schedule and Balance Sheet

The EMP Projects are interdependent and the benefits of EMP are brought about by overall implementation of the EMP Projects. Therefore, cost recovery mechanism should be considered within EMP framework, not by each project and program. The projects on

eco-tourism and angling could collect certain amount of fee for cost recovery, but the projects on wetland conservation and water level management plan do not recover the expenses by themselves. However, only the projects on eco-tourism and angling can not cover the required revenue of EMP as shown in Table 16.4.2.

The following financial sources should be additionally sought:

- a) Governmental subsidy for Ramsar site: The governmental budget for the Ramsar sites may be subsidized to EMP of LWC in a regular basis after LWC is designated as the Ramsar site.
- b) Special assistance for environmental program: The renovation/renewal of equipment may be applied to grant aid programs by national or international organizations such as LEPPF, Fish Fund, LIFE Nature, and Global Environment Facility.

## **16.4 Implementation Schedule**

### **16.4.1 Phased Plan**

The EMP Projects were proposed as required measures to realize EMP. To implement the EMP Projects systematically and steadily, a stepwise implementation schedule, namely a phased plan, is required. Considering necessary time of capacity building for the implementation of the EMP Projects such as preparation of financial, technical, and human resources, and the consistency and linkage among the EMP Projects, a plan with three phases is proposed as follows:

- Phase I : Preparation period of the EMP Projects with design, procurement of equipment, construction, and civil works (year 2001 to 2003).
- Phase II : Commencement period of most of the EMP Projects with capacity building (year 2004 to 2007).
- Phase III : Full implementation period of the EMP Projects for sustainable operation after year 2010 (year 2008 to 2010).

These phases can be utilized not only for development of implementation schedules but also for checking the progress of the EMP Projects. Corresponding to the phases set above, the implementation schedules of the EMP Projects are prepared in Table 16.4.1. In these schedules, the stage classification such as design, equipment procurement, construction, training, and O/M were incorporated as shown in the patterned bar charts in the table.

### **16.4.2 Investment Program**

The investment schedule during 2001 to 2010 based on the phased plan is shown below. It is important to note that O/M costs will be still needed after the target year 2010 to implement the EMP Projects continuously.

### Investment Schedule (2001 - 2010)

(Unit: 1,000 LVL)

Items	Phase I (2001-2003)	Phase II (2004-2007)	Phase III (2008-2010)	Total (2001-2010)
Initial Cost	2,405	668	0	3,073
O/M Cost	124	848	536	1,508
Total Cost	2,529	1,516	536	4,581

Note: Initial cost includes the physical contingency in 15 %.

Objective of the financial analysis is to analyze viability of the financial plan for EMP as shown in Table 16.4.2, examining whether there will be enough money available to recover the estimated costs for the EMP implementation. Money necessary for implementation can be largely classified into initial cost and O/M cost. Since EMP consists of many components that can not recover their expenses by themselves unlike conventional development projects, it is difficult to expect high financial turnover from the implementation. Therefore, conventional financial evaluation criteria such as Financial Internal Rate of Return (FIRR) are not be applied for EMP.

#### 16.4.3 Financial Arrangement for Initial Cost

The financial arrangement for initial cost of the EMP Projects may be made with combination of the loan and grant scheme from potential international donors. Assume that the grant scheme is applied to the Environmental Research & Monitoring Program and the EIMS subprogram which provide only equipment, and other projects and programs apply for the soft loan, which is low interest rate and long repayment period loan scheme. Under the condition, total amounts of the soft loan and grant applied are allocated below.

#### Financial Application for Initial Cost

(Unit: 1,000 LVL)

Soft Loan	Grant	Total
2,797	276	3,073

In case that the Latvian government borrows initial cost through bilateral soft-loan under the following conditions to implement the EMP Projects, repayment schedule is shown as Table 16.4.2.

- Interest Rate: 0.75 % per annum
- Repayment Period: 40 years including grace period 10 years

From 2001 to 2010, only interest will be repaid at about 21,000 LVL/year. Then, from 2011 to 2040 total repayment amount with the principal and interest will be about 104,000 LVL/year.

The O/M cost is basically born by domestic budget. Therefore, the total Latvian expenditure for the EMP Projects consists of the O/M cost and repayment of soft loan. Annual expenditure ranges from about 21,000 LVL/year to 445,000 LVL/year between 2001 and 2010, and 172,000 LVL/year on average. After the year 2011, annual

expenditure ranges from about 222,000 LVL/year to 725,000 LVL/year and 361,000 LVL/year on average as shown in Table 16.4.2. Considering affordability of the expenditure for the EMP Projects, domestic annual revenue same as the annual expenditures should be at least required as shown in Table 16.4.2.

Figure 16.4.1 shows structure of financial arrangement for the proposed EMP projects. Although Latvian government guarantees the return of loan to a loan institution, it is essential to have main implementation bodies that are directly involved in the EMP projects, namely EMC, LETA, and ALRSA. Then, necessary budgets are allocated to the implementation agencies through the Ministry of Finance (MOF) and the district councils concerned, which are in positions to endorse and financially supervise the activities of the implementation agencies.

**Table 16.2.1 (1) Questionnaire Form**

Date: \_\_\_\_\_

QUESTIONNAIRE TO LOCAL RESIDENTS

1. Address: \_\_\_\_\_
2. Number of total household members: \_\_\_\_\_ (persons)
3. Main occupations household members live on:
  - 3.1 Farmer
  - 3.2 Tourism industry
  - 3.3 Private services (restaurant, drivers, retailer, trader, etc.)
  - 3.4 Public civil servant (official, policeman, etc.)
  - 3.5 Fisheries
  - 3.6 Professional (doctor, lawyer, etc.)
  - 3.7 Other ( \_\_\_\_\_ )
4. Amount of household's monthly total income (before tax payment) on average during the last 12 months: \_\_\_\_\_  
\_\_\_\_\_ Ls/month
5. The household members have visited the Lubana lake: (Put circle only one item.)
  - 5.1 never
  - 5.2 less than one time a year
  - 5.3 2 ~ 5 times a year
  - 5.4 6 ~ 10 times a year
  - 5.5 more than 10 times a year
  - 5.6 much more frequently for recreational purpose
6. What kinds of activities do you do?
  - 6.1 Work
  - 6.2 Recreation
  - 6.3 Hunting
  - 6.4 fishing
  - 6.5 Others ( \_\_\_\_\_ )
7. How do you usually come to the Lubana lake ?  
(Put circle only one item, unless you circled Item "5.1".)
  - 7.1 Private car
  - 7.2 Hired car (e.g. chartered bus, taxi, etc.)
  - 7.3 Private motorbike
  - 7.4 Boat/ship
  - 7.5 Bicycle
  - 7.6 Local line-bus
  - 7.7 On foot
  - 7.8 Other ( \_\_\_\_\_ )
8. Do you hope for future tourism development in Lubana area?
  - 8.1 Yes
  - 8.2 No
  - 8.3 Neither (no idea)
9. For those who answered "Yes", what you hope for?
  - 9.1 Increase of job opportunity
  - 9.2 Upgrade of infrastructure
  - 9.3 Improve of natural environment
  - 9.4 Others: \_\_\_\_\_
10. For those who answered "No", what you anticipate?
  - 10.1 Many people come from outside and their attitude
  - 10.2 Encroachment of natural environment
  - 10.3 Deterioration of landscape by tourism facilities such as hotels
  - 10.4 Increase of accident by increased cars
  - 10.5 Others: \_\_\_\_\_
11. Do you want to preserve Lubana area as it is ?
  - 11.1 Yes, never change by any development
  - 11.2 Yes, but some developments to improve residents life are acceptable.
  - 11.3 No, I do not mind any development is done.
  - 11.4 No, but if living and natural environment can be kept as it is or better, some developments are acceptable.
  - 11.5 No idea
  - 11.6 Other opinion: \_\_\_\_\_
12. Do you want to make Lubana area whether international or domestic tourism area?
  - 12.1 International tourism area
  - 12.2 Domestic tourism area
  - 12.3 Both
  - 12.4 Neither

**Table 16.2.1 (2) Questionnaire Form**

13. How can you cooperate the tourism development in Lubana area?  
13.1 I really want to cooperate, if there is chance.  
13.2 I can cooperate, If needed.  
13.3 I can work as tourist guide in volunteer base (without wage).  
13.4 I can cooperate, but other way: \_\_\_\_\_  
13.5 I do not like to cooperate the development at all.
14. What kinds of facilities and/or plan will attract tourists to Lubana area?  
Please describe: \_\_\_\_\_
15. What kinds of effect will be expected by the tourism development in Lubana area?  
15.1 Positive effects: \_\_\_\_\_  
15.2 Negative effects: \_\_\_\_\_
16. What kind of activities do you do in your holiday mainly?  
Please describe: \_\_\_\_\_
17. What kind of recreations are popular in Lubana area?  
Please describe: \_\_\_\_\_

In accompany with future economic activities and development, environment of the Lubana area will be degraded, conserved or improved with proper environmental protection measures. Please envisage the following three future images in your mind, and continue to answer the questions below :

Image A : Very polluted

Lubana area with Lubana lake will be very much polluted by water contamination, air pollution, unmanaged solid waste, etc. so that environment in Lubana area becomes as bad as being improper for recreation at all.

Image B : No change - conserved as now

Essential anti-pollution measures will be carried out to let present environmental conditions remain at the same level as now.

Image C : Slightly cleaner water

Full-scale anti-pollution and conservation measures will be implemented, and environmental quality of the Lubana area could be a little bit more improved.

18. Referring to your answer to the Question 4 above, in order to prevent severely degraded environmental situation of Lubana area like Image A, how many percentage to your household s monthly income will you donate every year ? (Please circle a percentage level !)
- 18.1 0 % (no interest in donation)  
18.2 Less than 0.1 % (=Monthly Income x 0.001)  
18.3 0.1 ~ 0.5 % (=Monthly Income x 0.005)  
18.4 0.5 ~ 1.0 % (=Monthly Income x 0.01)  
18.5 1.0 ~ 1.5 % (=Monthly Income x 0.015)  
18.6 1.5 ~ 2.0 % (=Monthly Income x 0.02)  
18.7 2.0 ~ 2.5 % (=Monthly Income x 0.025)  
18.8 more than 2.5 % ( \_\_\_\_\_ % of your monthly income)
19. Referring again to your answer to the Question 4 above, in order to conserve the present environmental situation of Lubana area like Image B, how many percentage to your household s monthly income will you donate every year ? (Please circle a percentage level !)
- 19.1 0 % (no interest in donation)  
19.2 Less than 0.1 % (=Monthly Income x 0.001)  
19.3 0.1 ~ 0.5 % (=Monthly Income x 0.005)  
19.4 0.5 ~ 1.0 % (=Monthly Income x 0.01)  
19.5 1.0 ~ 1.5 % (=Monthly Income x 0.015)  
19.6 1.5 ~ 2.0 % (=Monthly Income x 0.02)  
19.7 2.0 ~ 2.5 % (=Monthly Income x 0.025)  
19.8 More than 2.5 % ( \_\_\_\_\_ % of your monthly income)

**Table 16.2.1 (3) Questionnaire Form**

20. Referring again to your answer to the Question 4 above, in order to realize slightly better environmental situation of Lubana area like Image C, how many percentage to your household s monthly income will you donate every year ? (Please circle a percentage level !)

- 20.1 0 % (no interest in donation)
- 20.2 Less than 0.1 % (=Monthly Income x 0.001)
- 20.3 0.1 ~ 0.5 % (=Monthly Income x 0.005)
- 20.4 0.5 ~ 1.0 % (=Monthly Income x 0.01)
- 20.5 1.0 ~ 1.5 % (=Monthly Income x 0.015)
- 20.6 1.5 ~ 2.0 % (=Monthly Income x 0.02)
- 20.7 2.0 ~ 2.5 % (=Monthly Income x 0.025)
- 20.8 more than 2.5 % ( \_\_\_\_\_ % of your monthly income)

21. Is there any good landscape that you willingly watch near your residence?

- Name of the place -                      - Location of the place -

- (A)
- (B)
- (C)
- (D)
- (E)

22.\* What is your favorite point about above-mentioned places?

(Please put a tick on any favorite points.)

(Your favorite point)                      (A)              (B)              (C)              (D)              (E)

- Mountain
- Trees and woods
- Grassy plain
- Flower
- Lake and pond
- Farm
- Orchard
- Row of trees
- Row of houses and streets
- Night scene
- Sky and clouds
- Spacious view
- Composition of view
- Other favorite points (Please specify below.)

- (A)
- (B)
- (C)
- (D)
- (E)

Note: \* Although the original questionnaire prepared by JICA study team included "Birds and Animals" as a option of the answer in the question 22, the questionnaire translated and rearranged by the Latgarian Ecological Society does not include this option.

**Table 16.2.2 Average Number of Households' Member**

Town and Township	Number of Samples
Total Average	3
1) Daksare	3
2) Gaigalava	3
3) Nagli	3
4) Berzpils	3
5) Lazdukalna	4
6) Rugaji	4
7) Lubana Town	4
8) Barkava	3
9) Murmastiene	4
10) Osupe	3
11) Varaklani	3
12) Dauksti	3

**Table 16.2.3 Occupational Structure of Sample Households**

Town and Township	Farmer	Fishery	Forestry	Public civil servant	Private service	Professional	Retired	Unemployed	Others	Total
Total Number	81 (14)	22 (4)	4 (1)	82 (14)	112 (19)	84 (15)	64 (11)	40 (7)	90 (16)	579 (100)
1) Daksare	5 (8)	4 (6)	1 (2)	12 (19)	10 (16)	1 (2)	13 (21)	4 (6)	12 (19)	62 (100)
2) Gaigalava	8 (19)	1 (2)	0 (0)	6 (14)	17 (40)	2 (5)	6 (14)	2 (5)	0 (0)	42 (100)
3) Nagli	3 (5)	9 (16)	0 (0)	3 (5)	9 (16)	12 (21)	3 (5)	1 (2)	17 (30)	57 (100)
4) Berzpils	10 (20)	1 (2)	0 (0)	6 (12)	8 (16)	7 (14)	11 (22)	1 (2)	5 (10)	49 (100)
5) Lazdukalna	3 (6)	3 (6)	0 (0)	10 (20)	4 (8)	5 (10)	5 (10)	12 (24)	7 (14)	49 (100)
6) Rugaji	1 (3)	3 (8)	0 (0)	10 (25)	5 (13)	10 (25)	2 (5)	7 (18)	2 (5)	40 (100)
7) Lubana Town	7 (15)	0 (0)	3 (7)	6 (13)	9 (20)	8 (17)	2 (4)	0 (0)	11 (24)	46 (100)
8) Barkava	8 (29)	0 (0)	0 (0)	8 (29)	5 (18)	2 (7)	1 (4)	1 (4)	3 (11)	28 (100)
9) Murmastiene	17 (28)	0 (0)	0 (0)	2 (3)	16 (26)	1 (2)	8 (13)	7 (11)	10 (16)	61 (100)
10) Osupe	14 (27)	0 (0)	0 (0)	3 (6)	8 (16)	14 (27)	4 (8)	0 (0)	8 (16)	51 (100)
11) Varaklani	4 (9)	1 (2)	0 (0)	0 (0)	10 (23)	11 (26)	3 (7)	1 (2)	13 (30)	43 (100)
12) Dauksti	1 (2)	0 (0)	0 (0)	16 (31)	11 (22)	11 (22)	6 (12)	4 (8)	2 (4)	51 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.4 Income Structure of Sample Households**

Town and Township	0~50 LVL/month	51~100 LVL/month	101~150 LVL/month	151~200 LVL/month	201~300 LVL/month	301~ LVL/month	Total
Total Number	93 (27)	167 (48)	59 (17)	20 (6)	6 (2)	1 (0)	1 (100)
1) Daksare	10 (20)	19 (37)	17 (33)	3 (6)	2 (4)	0 (0)	0 (100)
2) Gaigalava	18 (53)	13 (38)	3 (9)	0 (0)	0 (0)	0 (0)	0 (100)
3) Nagli	3 (13)	13 (54)	4 (17)	2 (8)	1 (4)	1 (4)	1 (100)
4) Berzpils	17 (55)	14 (45)	0 (0)	0 (0)	0 (0)	0 (0)	0 (100)
5) Lazdukalna	11 (34)	11 (34)	7 (22)	1 (3)	2 (6)	0 (0)	0 (100)
6) Rugaji	0 (0)	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	0 (100)
7) Lubana Town	4 (17)	12 (50)	7 (29)	1 (4)	0 (0)	0 (0)	0 (100)
8) Barkava	11 (26)	27 (63)	1 (2)	4 (9)	0 (0)	0 (0)	0 (100)
9) Murmastiene	0 (0)	15 (60)	8 (32)	2 (8)	0 (0)	0 (0)	0 (100)
10) Osupe	5 (24)	16 (76)	0 (0)	0 (0)	0 (0)	0 (0)	0 (100)
11) Varaklani	7 (30)	7 (30)	5 (22)	3 (13)	1 (4)	0 (0)	0 (100)
12) Dauksti	7 (21)	17 (50)	6 (18)	4 (12)	0 (0)	0 (0)	0 (100)

Note: Number in ( ) shows percentage of total.



**Table 16.2.5 Average Income of Sample Households by Occupation**

(Unit: LVL/month)

Town and Township	Farmer	Fishery	Forestry	Public	Private	Professional	Retired	Unemployed	Others
Total Average	50	99	53	69	85	69	62	28	46
1) Daksare	141	137	120	107	101	140	84	29	78
2) Gaigalava	40	-	-	32	62	74	44	3	-
3) Nagli	47	129	-	133	142	80	97	-	50
4) Berzpils	23	-	45	50	63	47	45	-	44
5) Lazdukalna	56	160	-	77	131	98	86	62	41
6) Rugaji	-	-	-	7	30	32	-	-	-
7) Lubana Town	71	-	30	59	69	60	44	-	44
8) Barkava	104	-	-	74	107	70	-	-	53
9) Murmastiene	52	-	-	90	85	80	48	-	40
10) Osupe	22	-	-	22	54	45	36	-	18
11) Varaklani	-	-	-	-	95	102	98	61	39
12) Dauksti	-	-	-	91	101	89	84	44	68

Note: Number in ( ) shows percentage of total.

**Table 16.2.6 Number of Visit to Lake Lubana in a Year**

Town and Township	0	1	2~5	6~10	10~	Often	Often
Total Average	161 (32)	142 (28)	119 (23)	22 (4)	27 (5)	37 (7)	508 (100)
1) Daksare	18 (33)	24 (44)	6 (11)	2 (4)	1 (2)	3 (6)	54 (100)
2) Gaigalava	16 (40)	15 (38)	5 (13)	0 (0)	0 (0)	4 (10)	40 (100)
3) Nagli	0 (0)	2 (5)	9 (23)	5 (13)	15 (38)	8 (21)	89 (100)
4) Berzpils	21 (54)	12 (31)	5 (13)	0 (0)	0 (0)	1 (3)	89 (100)
5) Lazdukalna	12 (30)	13 (33)	11 (28)	4 (10)	0 (0)	0 (0)	40 (100)
6) Rugaji	3 (8)	17 (43)	14 (35)	1 (3)	0 (0)	5 (13)	37 (100)
7) Lubana Town	4 (10)	7 (18)	21 (54)	4 (10)	1 (3)	2 (5)	39 (100)
8) Barkava	19 (39)	23 (47)	7 (14)	0 (0)	0 (0)	0 (0)	49 (100)
9) Murmastiene	33 (67)	5 (10)	10 (20)	1 (2)	0 (0)	0 (0)	49 (100)
10) Osupe	8 (21)	7 (18)	11 (28)	4 (10)	5 (13)	4 (10)	39 (100)
11) Varaklani	7 (18)	10 (25)	9 (23)	0 (0)	4 (10)	10 (25)	40 (100)
12) Dauksti	20 (50)	7 (18)	11 (28)	1 (3)	1 (3)	0 (0)	40 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.7 Purpose of Visit to Lake Lubana**

Town and Township	Work	Recreation	Hunting	Angling	Others	Total
Total Number	22 (5)	252 (53)	36 (8)	143 (30)	24 (5)	477 (100)
1) Daksare	1 (2)	29 (59)	3 (6)	12 (24)	4 (8)	49 (100)
2) Gaigalava	0 (0)	19 (63)	1 (3)	10 (33)	0 (0)	30 (100)
3) Nagli	5 (8)	37 (60)	4 (6)	16 (26)	0 (0)	62 (100)
4) Berzpils	0 (0)	14 (74)	1 (5)	4 (21)	0 (0)	19 (100)
5) Lazdukalna	7 (17)	20 (49)	4 (10)	9 (22)	1 (2)	41 (100)
6) Rugaji	0 (0)	24 (57)	0 (0)	17 (40)	1 (2)	42 (100)
7) Lubana Town	0 (0)	34 (59)	6 (10)	16 (28)	2 (3)	58 (100)
8) Barkava	5 (16)	7 (23)	5 (16)	7 (23)	7 (23)	31 (100)
9) Murmastiene	0 (0)	3 (15)	0 (0)	16 (80)	1 (5)	20 (100)
10) Osupe	1 (3)	26 (67)	1 (3)	10 (26)	0 (0)	38 (100)
11) Varaklani	1 (2)	25 (45)	11 (20)	17 (30)	2 (4)	56 (100)
12) Dauksti	2 (6)	14 (45)	0 (0)	9 (29)	6 (19)	31 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.8 Mode of Visit to Lake Lubana**

Town and Township	Private Car	Hired Car	Motorbike	Boat	Bicycle	Bus	On foot	Others	Total
Total Number	203 (58)	33 (9)	26 (7)	1 (0)	46 (13)	10 (3)	15 (4)	11 (3)	345 (100)
1) Daksare	20 (51)	6 (15)	3 (8)	0 (0)	3 (8)	3 (8)	1 (3)	3 (8)	39 (100)
2) Gaigalava	13 (54)	0 (0)	0 (0)	0 (0)	5 (21)	0 (0)	6 (25)	0 (0)	24 (100)
3) Nagli	14 (38)	1 (3)	4 (1)	1 (3)	10 (27)	0 (0)	6 (16)	1 (3)	37 (100)
4) Berzpils	13 (76)	1 (6)	0 (0)	0 (0)	2 (12)	0 (0)	0 (0)	1 (6)	17 (100)
5) Lazdukalna	19 (68)	2 (7)	2 (7)	0 (0)	2 (7)	2 (7)	0 (0)	1 (4)	28 (100)
6) Rugaji	23 (62)	11 (30)	0 (0)	0 (0)	2 (5)	1 (3)	0 (0)	0 (0)	37 (100)
7) Lubana Town	26 (72)	5 (14)	2 (6)	0 (0)	1 (3)	0 (0)	1 (3)	1 (3)	36 (100)
8) Barkava	13 (43)	3 (10)	2 (7)	0 (0)	8 (27)	3 (10)	1 (3)	0 (0)	30 (100)
9) Murmastiene	12 (80)	0 (0)	3 (20)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	15 (100)
10) Osupe	16 (55)	2 (7)	1 (3)	0 (0)	8 (28)	0 (0)	0 (0)	0 (0)	27 (100)
11) Varaklani	18 (56)	2 (6)	7 (2)	0 (0)	5 (16)	0 (0)	0 (0)	0 (0)	32 (100)
12) Dauksti	16 (67)	0 (0)	2 (8)	0 (0)	0 (0)	1 (4)	0 (0)	4 (17)	23 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.9 Popular Recreational Activities in LWC**

Town and Township	Angling	Hunting	Swimming	Collecting Berries	Others	Total
Total Number	357 (57)	182 (29)	23 (4)	41 (7)	18 (3)	621 (100)
1) Daksare	28 (50)	15 (27)	5 (9)	8 (14)	0 (0)	56 (100)
2) Gaigalava	28 (74)	7 (18)	1 (3)	1 (3)	1 (3)	38 (100)
3) Nagli	30 (60)	11 (22)	2 (4)	4 (8)	3 (6)	50 (100)
4) Berzpils	30 (77)	9 (23)	0 (0)	0 (0)	0 (0)	39 (100)
5) Lazdukalna	30 (55)	17 (31)	0 (0)	3 (5)	5 (9)	45 (100)
6) Rugaji	25 (76)	6 (18)	0 (0)	2 (6)	0 (0)	33 (100)
7) Lubana Town	24 (55)	10 (23)	3 (7)	5 (11)	2 (5)	44 (100)
8) Barkava	16 (31)	32 (62)	0 (0)	1 (2)	3 (6)	52 (100)
9) Murmastiene	44 (64)	21 (30)	0 (0)	4 (6)	0 (0)	69 (100)
10) Osupe	33 (55)	14 (23)	8 (13)	5 (8)	0 (0)	60 (100)
11) Varaklani	38 (51)	27 (36)	1 (1)	4 (5)	4 (5)	74 (100)
12) Dauksti	31 (61)	13 (25)	3 (6)	4 (8)	0 (0)	51 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.10 Activities in Holiday**

Town and Township	Go Outside	Stay at Home	Work	Others	Total
Total Number	124 (26)	101 (21)	240 (51)	6 (1)	471 (100)
1) Daksare	21 (46)	12 (26)	12 (26)	1 (2)	46 (100)
2) Gaigalava	16 (44)	3 (8)	17 (47)	0 (0)	36 (100)
3) Nagli	16 (46)	3 (9)	16 (46)	0 (0)	35 (100)
4) Berzpils	5 (17)	1 (3)	22 (76)	1 (3)	29 (100)
5) Lazdukalna	8 (20)	16 (40)	16 (40)	0 (0)	40 (100)
6) Rugaji	9 (23)	8 (20)	23 (58)	0 (0)	40 (100)
7) Lubana Town	7 (19)	15 (42)	13 (36)	1 (3)	46 (100)
8) Barkava	12 (25)	6 (13)	30 (63)	0 (0)	48 (100)
9) Murmastiene	3 (7)	19 (41)	24 (52)	0 (0)	46 (100)
10) Osupe	10 (26)	5 (13)	22 (58)	1 (3)	37 (100)
11) Varaklani	11 (29)	7 (18)	19 (50)	1 (3)	38 (100)
12) Dauksti	6 (15)	6 (15)	26 (67)	1 (3)	39 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.11 Expectation of Future Tourism Development in LWC**

Town and Township	Yes		No		No Idea		Total	
Total Number	286	(56)	64	(13)	161	(32)	511	(100)
1) Daksare	23	(43)	6	(11)	25	(46)	54	(100)
2) Gaigalva	17	(44)	8	(21)	14	(36)	39	(100)
3) Nagli	35	(88)	4	(10)	1	(3)	40	(100)
4) Berzpils	24	(60)	6	(15)	10	(25)	40	(100)
5) Lazdukalna	26	(65)	1	(3)	13	(33)	40	(100)
6) Rugaji	34	(85)	2	(5)	4	(10)	40	(100)
7) Lubana Town	34	(85)	1	(3)	5	(13)	40	(100)
8) Barkava	21	(42)	8	(16)	21	(42)	50	(100)
9) Murmastiene	19	(38)	5	(10)	26	(52)	50	(100)
10) Osupe	16	(41)	11	(28)	12	(31)	39	(100)
11) Varaklani	17	(44)	8	(21)	14	(36)	39	(100)
12) Dauksti	20	(50)	4	(10)	16	(40)	40	(100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.12 Expectation of Future Tourism Development in LWC by Occupation**

Town and Township	Yes		No		No Idea		Total	
Total Number	286	(56)	64	(13)	161	(32)	511	(100)
1) Farmer	45	(56)	13	(16)	22	(28)	80	(100)
2) Fishery	21	(95)	0	(0)	1	(5)	22	(100)
3) Forestry	4	(100)	0	(0)	0	(0)	4	(100)
4) Public civil servant	66	(68)	9	(11)	17	(21)	92	(100)
5) Private service	78	(70)	9	(8)	24	(22)	111	(100)
6) Professional	64	(76)	5	(6)	15	(18)	84	(100)
7) Retired	18	(28)	10	(16)	36	(56)	64	(100)
8) Unemployed	19	(48)	1	(3)	20	(50)	40	(100)
9) Others	46	(51)	15	(17)	29	(32)	90	(100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.13 Positive Expectation of Future Tourism Development in LWC**

Town and Township	Job Opportunity		Upgrade of Infrastructure		Improve of Natural Environment		Others		Total	
Total Number	180	(33)	154	(28)	202	(37)	5	(1)	541	(100)
1) Daksare	18	(35)	17	(33)	17	(33)	0	(0)	52	(100)
2) Gaigalava	8	(24)	14	(42)	10	(30)	1	(3)	33	(100)
3) Nagli	31	(35)	26	(30)	30	(34)	1	(1)	88	(100)
4) Berzpils	15	(30)	17	(34)	18	(36)	0	(0)	50	(100)
5) Lazdukalna	18	(47)	4	(11)	14	(37)	2	(5)	38	(100)
6) Rugaji	7	(14)	16	(31)	28	(55)	0	(0)	51	(100)
7) Lubana Town	20	(34)	18	(31)	21	(36)	0	(0)	59	(100)
8) Barkava	16	(55)	8	(28)	5	(17)	0	(0)	29	(100)
9) Murmastiene	13	(43)	1	(3)	16	(53)	0	(0)	30	(100)
10) Osupe	13	(41)	9	(28)	10	(31)	0	(0)	32	(100)
11) Varaklani	15	(35)	13	(30)	14	(33)	1	(2)	43	(100)
12) Dauksti	6	(17)	11	(31)	19	(53)	0	(0)	36	(100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.14 Negative Expectation of Future Tourism Development in LWC**

Town and Township	Problems caused by People from Outside	Damage to Environment	Damage to Landscape by Facilities	Increase of Car Accident	Others	Total
Total Number	43 (48)	19 (21)	10 (11)	7 (8)	11 (12)	90 (100)
1) Daksare	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	6 (100)
2) Gaigalava	9 (56)	1 (6)	1 (6)	4 (25)	1 (6)	16 (100)
3) Nagli	2 (33)	1 (17)	2 (33)	0 (0)	1 (17)	6 (100)
4) Berzpils	4 (57)	1 (14)	1 (14)	0 (0)	1 (14)	7 (100)
5) Lazdukalna	1 (25)	3 (75)	0 (0)	0 (0)	0 (0)	4 (100)
6) Rugaji	0 (0)	2 (67)	0 (0)	0 (0)	1 (33)	3 (100)
7) Lubana Town	- (-)	- (-)	- (-)	- (-)	- (-)	(100)
8) Barkava	2 (17)	4 (33)	3 (25)	3 (25)	0 (0)	12 (100)
9) Murmastiene	1 (17)	2 (33)	2 (33)	0 (0)	1 (17)	6 (100)
10) Osupe	9 (75)	0 (0)	0 (0)	0 (0)	3 (25)	12 (100)
11) Varaklani	9 (69)	2 (15)	0 (0)	0 (0)	2 (15)	13 (100)
12) Dauksti	4 (80)	0 (0)	0 (0)	0 (0)	1 (20)	5 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.15 International and/or Domestic Tourism Development in LWC**

Town and Township	International	Domestic	Both	Neither	Total
Total Number	31 (6)	137 (28)	213 (43)	115 (23)	496 (100)
1) Daksare	3 (6)	26 (52)	14 (28)	7 (14)	50 (100)
2) Gaigalava	0 (0)	4 (10)	22 (56)	13 (33)	39 (100)
3) Nagli	0 (0)	9 (23)	24 (62)	6 (15)	39 (100)
4) Berzpils	4 (10)	2 (5)	26 (67)	7 (18)	39 (100)
5) Lazdukalna	7 (18)	23 (58)	9 (23)	1 (3)	40 (100)
6) Rugaji	2 (5)	11 (28)	22 (55)	5 (13)	40 (100)
7) Lubana Town	4 (10)	15 (38)	15 (38)	6 (15)	40 (100)
8) Barkava	4 (8)	9 (18)	14 (29)	22 (45)	39 (100)
9) Murmastiene	0 (0)	15 (31)	1 (2)	32 (67)	38 (100)
10) Osupe	1 (3)	12 (33)	21 (58)	2 (6)	36 (100)
11) Varaklani	3 (8)	5 (13)	22 (58)	8 (21)	38 (100)
12) Dauksti	3 (8)	6 (16)	23 (61)	6 (16)	38 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.16 Participation of Tourism Development in LWC**

Town and Township	1	2	3	4	5	Total
Total Number	136 (30)	162 (35)	4 (1)	0 (0)	157 (34)	459 (100)
1) Daksare	8 (19)	22 (52)	1 (2)	0 (0)	11 (26)	42 (100)
2) Gaigalava	14 (35)	13 (33)	1 (3)	0 (0)	12 (30)	40 (100)
3) Nagli	8 (21)	20 (51)	0 (0)	0 (0)	11 (28)	39 (100)
4) Berzpils	9 (26)	19 (54)	0 (0)	0 (0)	7 (20)	35 (100)
5) Lazdukalna	15 (45)	13 (39)	2 (6)	0 (0)	3 (9)	33 (100)
6) Rugaji	17 (46)	3 (8)	0 (0)	0 (0)	17 (46)	37 (100)
7) Lubana Town	13 (35)	19 (51)	0 (0)	0 (0)	5 (14)	37 (100)
8) Barkava	16 (39)	1 (2)	0 (0)	0 (0)	24 (59)	41 (100)
9) Murmastiene	3 (6)	1 (2)	0 (0)	0 (0)	45 (92)	49 (100)
10) Osupe	11 (31)	18 (51)	0 (0)	0 (0)	6 (17)	35 (100)
11) Varaklani	14 (38)	15 (41)	0 (0)	0 (0)	8 (22)	37 (100)
12) Dauksti	8 (24)	18 (53)	0 (0)	0 (0)	8 (24)	34 (100)

Note: Number in ( ) shows percentage of total.

- 1: I really want to cooperate, if there is chance.
- 2: I can cooperate, If needed.
- 3: I can work as tourist guide in volunteer base (without wage).
- 4: I can cooperate, but other way.
- 5: I do not like to cooperate the development at all.

**Table 16.2.17 Preservation and Conservation of LWC**

Town and Township	1	2	3	4	5	6	Total
Total Number	39 (8)	58 (12)	309 (63)	29 (6)	55 (11)	1 (0)	491 (100)
1) Daksare	6 (12)	13 (25)	23 (44)	4 (8)	6 (12)	0 (0)	52 (100)
2) Gaigalava	1 (3)	0 (0)	28 (82)	4 (12)	1 (3)	0 (0)	34 (100)
3) Nagli	3 (8)	1 (3)	30 (77)	3 (8)	2 (5)	0 (0)	39 (100)
4) Berzpils	3 (8)	0 (0)	35 (90)	0 (0)	0 (0)	1 (3)	39 (100)
5) Lazdukalna	0 (0)	14 (37)	16 (42)	4 (11)	4 (11)	0 (0)	38 (100)
6) Rugaji	0 (0)	0 (0)	34 (92)	1 (3)	2 (5)	0 (0)	37 (100)
7) Lubana Town	1 (3)	16 (42)	16 (42)	2 (5)	2 (5)	0 (0)	37 (100)
8) Barkava	13 (27)	1 (2)	20 (41)	5 (10)	10 (20)	0 (0)	49 (100)
9) Murmastiene	5 (10)	1 (2)	24 (48)	2 (4)	18 (36)	0 (0)	50 (100)
10) Osupe	1 (3)	4 (11)	29 (76)	2 (5)	1 (3)	0 (0)	37 (100)
11) Varaklani	5 (13)	4 (10)	26 (67)	0 (0)	4 (10)	0 (0)	39 (100)
12) Dauksti	1 (3)	4 (10)	28 (70)	2 (5)	5 (13)	0 (0)	40 (100)

Note: Number in ( ) shows percentage of total.

1: Yes, never change by any development

2: Yes, but some developments to improve residents' life are acceptable.

3: No, I do not mind any development is done.

4: No, but if living and natural environment can be kept as it is or better, some developments are acceptable.

5: No idea

6: Other opinion

**Table 16.2.18(1) Favorite Points of Landscape**

Town and Township	Total	1) Daksare	2) Gaigalva	3) Nagli	4) Berzpils	5) Lazdukalna	6) Rugaji
a) Mountain	22 (6)	3 (7)	1 (2)	1 (8)	1 (8)	9 (15)	0 (0)
b) Trees and woods	47 (12)	7 (16)	5 (11)	2 (17)	1 (8)	7 (11)	0 (0)
c) Grassy plain	15 (4)	1 (2)	4 (9)	0 (0)	0 (0)	2 (3)	0 (0)
d) Flower	49 (13)	10 (22)	11 (24)	1 (8)	2 (15)	7 (11)	0 (0)
e) Lake and pond	73 (19)	12 (27)	5 (11)	1 (8)	1 (8)	9 (15)	0 (0)
f) Farm	5 (1)	0 (0)	2 (4)	1 (8)	0 (0)	0 (0)	0 (0)
g) Orchard	19 (5)	6 (13)	4 (9)	0 (0)	1 (8)	1 (2)	0 (0)
h) Row of trees	4 (1)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)	0 (0)
i) Row of houses and streets	9 (2)	0 (0)	2 (4)	0 (0)	0 (0)	3 (5)	0 (0)
j) Night scene	32 (8)	2 (4)	1 (2)	0 (0)	0 (0)	4 (6)	0 (0)
k) Sky and clouds	33 (9)	0 (0)	6 (13)	4 (3)	2 (15)	5 (8)	0 (0)
l) Spacious view	50 (13)	1 (2)	4 (9)	2 (17)	4 (31)	9 (15)	0 (0)
m) Composition of view	17 (4)	3 (7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
n) Others	8 (2)	0 (0)	0 (0)	0 (0)	1 (8)	5 (8)	0 (0)
Total	383 (100)	45 (100)	45 (100)	12 (100)	13 (100)	62 (100)	0 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.18(2) Favorite Points of Landscape**

Town and Township	7) Lubana Town	8) Barkava	9) Murmastiene	10) Osupe	11) Varaklani	12) Dauksti
a) Mountain	0 (0)	1 (4)	0 (0)	0 (0)	1 (4)	5 (8)
b) Trees and woods	0 (0)	5 (20)	10 (13)	0 (0)	2 (8)	8 (13)
c) Grassy plain	0 (0)	2 (8)	1 (1)	1 (9)	1 (4)	3 (5)
d) Flower	0 (0)	2 (8)	3 (4)	1 (9)	4 (16)	8 (13)
e) Lake and pond	0 (0)	10 (40)	25 (32)	1 (9)	4 (16)	5 (8)
f) Farm	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	1 (2)
g) Orchard	1 (25)	1 (4)	0 (0)	0 (0)	2 (8)	3 (5)
h) Row of trees	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	2 (3)
i) Row of houses and streets	1 (25)	0 (0)	1 (1)	0 (0)	1 (4)	1 (2)
j) Night scene	1 (25)	0 (0)	8 (10)	1 (9)	1 (4)	13 (21)
k) Sky and clouds	0 (0)	1 (4)	5 (6)	3 (27)	1 (4)	6 (10)
l) Spacious view	0 (0)	3 (12)	14 (18)	4 (36)	3 (12)	6 (10)
m) Composition of view	1 (25)	0 (0)	10 (13)	0 (0)	1 (4)	2 (3)
n) Others	0 (0)	0 (0)	0 (0)	0 (0)	2 (8)	0 (0)
Total	4 (100)	25 (100)	77 (100)	11 (100)	25 (100)	63 (100)

Note: Number in ( ) shows percentage of total.

**Table 16.2.19 Ecosystem Functions**

Type of Functions	Content of Functions	Examples
1. Gas regulation	Regulation of atmospheric chemical composition	CO <sub>2</sub> /O <sub>2</sub> balance, O <sub>3</sub> for UVB protection, and SO <sub>x</sub> levels
2. Climate regulation	Regulation of global temperature, precipitation, and other biologically mediated climatic processes at global or local levels.	Green gas regulation, DMS production affecting cloud formation.
3. Disturbance regulation	Capacitance, damping and integrity of ecosystem response to environmental fluctuations	Storm protection, flood control, drought recovery and other aspects of habitat response to environmental variability mainly controlled by vegetation structure.
4. Water regulation	Regulation of hydrological flows	Provision of water for agricultural (such as irrigation) or industrial (such as milling) processes or transportation.
5. Water supply	Storage and retention of water.	Provision of water by watersheds, reservoirs and aquifers.
6. Erosion control	Retention of soil within an ecosystem	Prevention of loss of soil by wind, runoff, or other removal process, storage of silt in lakes and wetlands.
7. Soil formation	Soil formation process	Weathering of rock and the accumulation of organic materials.
8. Nutrient cycling	Storage, internal cycling, processing and acquisition of nutrients	Nitrogen fixation, N, P and other elemental or nutrient cycles.
9. Waste treatment	Recovery of mobile nutrients and removal or breakdown of excess or xenic nutrients and components	Waste treatment, pollution control, detoxification
10. Pollination	Movement of floral gametes	Provision of pollinators for the reproduction of plant populations.
11. Biological control	Trophic-dynamic regulations of populations	Keystone predator control of prey species, reduction of herbivory by top predators.
12. Habitat refugia	Habitat for resident and transient populations	Nurseries, habitat for migratory species, regional habitats for locally harvested species, or overwintering grounds.
13. Food production	That portion of gross primary production extractable as food	Production of fish, game, crops, nuts, fruits by hunting, gathering, subsistence farming or fishing.
14. Raw materials	That portion of gross primary production extractable as raw materials	The production of lumber, fuel or fodder.
15. Genetic resources	Sources of unique biological materials and products	Medicine, products for materials science, genes for resistance to plant pathogens and crop pests, ornamental species (pets and horticultural varieties of plants).
16. Recreation	Providing opportunities for recreational activities	Eco-tourism, angling, and other outdoor recreational activities.
17. Cultural	Providing opportunities for non-commercial uses	Aesthetic, artistic, educational, spiritual, and/or scientific values of ecosystems.

Source: The Value of the world's ecosystem services and natural capital, Robert Costanza et al., Nature vol.387 May 1997

Table 16.2.20 Pricing of Unit Area by Type of Biotope

(Unit: USD/ha/year)

Ecosystem Type -LWC Biotope Type	Ecosystem Function	1* Gas regulation	2* Climate regulation	3 Disturbance regulation	4 Water regulation	5 Water supply	6 Erosion control	7 Soil formation	8 Nutrient cycling	9 Waste treatment	10 Pollinatio n	11 Biological control	12 Habitat refugia	13 Food productio	14 Raw materials	15 Genetic resources	16** Recreatio n	17 Cultural	Total	Converted for Latvian Level of 2000*	Area in LWC (ha)	Total Present Value (USD/year)
<b>Forest</b>		-	<b>141</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>96</b>	<b>10</b>	<b>361</b>	<b>87</b>	-	<b>2</b>	-	<b>43</b>	<b>138</b>	<b>16</b>	<b>66</b>	<b>2</b>	<b>969</b>	<b>174</b>		
- Forest		-	141	2	2	3	96	10	361	87	-	2	-	43	138	× 0	66	2	953	172	33,589	5,761,857
<b>Wetlands</b>		<b>133</b>	-	<b>####</b>	<b>15</b>	<b>####</b>	-	-	-	<b>####</b>	-	-	<b>304</b>	<b>256</b>	<b>106</b>	-	<b>574</b>	<b>881</b>	<b>14,785</b>	<b>2,661</b>		
-Inundated grassland		3 44	-	####	15	3 ####	-	-	-	1 ####	-	-	3 101	256 × 0	-	× 0	3 294	8,424	1,516	5,247	7,955,659	
-Fen		2 89	-	####	15	2 ####	-	-	-	2 ####	-	-	2 203	128 × 0	-	2 287	2 587	8,896	1,601	1,520	2,433,991	
-Raised bogs/transitional bogs		1 133	-	####	× 0	1 ####	-	-	-	3 ####	-	-	1 304	128 1 106	-	1 574	1 881	9,588	1,726	9,997	17,252,923	
<b>Lakes/rivers</b>		-	-	-	<b>####</b>	<b>####</b>	-	-	-	<b>665</b>	-	-	-	<b>41</b>	-	-	<b>230</b>	-	<b>8,498</b>	<b>1,530</b>		
-Lake, river, canal		-	-	-	####	####	-	-	-	665	-	-	-	41	-	-	230	-	8,498	1,530	8,256	12,628,708
-Fish pond		-	-	-	× 0	× 0	-	-	-	× 0	-	-	-	41	-	-	230	-	271	49	2,685	130,974
<b>Cropland</b>		-	-	-	-	-	-	-	-	-	<b>14</b>	<b>24</b>	<b>0</b>	<b>54</b>	-	-	-	-	<b>92</b>	<b>17</b>		
-Agricultural land/dry grass land		-	-	-	-	-	-	-	-	-	14	24	0	54	-	-	-	-	92	17	19,853	328,766
Total																					81,147	<b>46,164,112</b>

Note: Bold figures are unit prices based on the reference.

"- " means lack of available information in the reference.

" " shows the type of biotope has the function. The number with " " shows rank of the function. Based on the rank, the pricing is weighted to original research data.

"×" shows the type of biotope does not have the function.

" " shows the type of biotope does not have the function fully in LWC. Suppose that half of function is functioned.

The estimated prices of unit area by type of biotope are converted from prices in USA into that in Latvia at year 2000 price.

\* Ecosystem function of the gas regulation and climate regulation is not counted in the economic analysis since those functions can not be considered only within the national economy.

\*\* Ecosystem function of the recreation is counted in valuation of eco-tourism. Therefore, it is not counted in the valuation of

Source: The Value of the world's ecosystem services and natural capital, Robert Costanza et al., Nature vol.387 May 1997

LVL 28.673.361







**Table 16.4.2 Required Annual Revenue of the EMP Projects**

(Unit: 1,000 LVL)

No.	Year	Expenditure				Minimum Required Revenue
		O/M Cost	Repayment of Loan		Total Cash Outflow	
			Principal	Interest Payment		
1	2001	0	0	21	21	21
2	2002	30	0	21	51	51
3	2003	94	0	21	115	115
4	2004	101	0	21	122	122
5	2005	116	0	21	137	137
6	2006	208	0	21	229	229
7	2007	424	0	21	445	445
8	2008	240	0	21	261	261
9	2009	180	0	21	201	201
10	<b>2010</b>	116	0	21	137	137
11	2011	214	83	21	318	318
12	2012	537	84	20	641	641
13	2013	261	85	20	366	366
14	2014	195	85	19	299	299
15	2015	116	86	18	220	220
16	2016	223	87	18	328	328
17	2017	424	87	17	528	528
18	2018	240	88	16	344	344
19	2019	180	89	16	285	285
20	2020	116	89	15	220	220
21	2021	218	90	15	323	323
22	2022	621	91	14	726	726
23	2023	306	91	13	410	410
24	2024	228	92	12	332	332
25	2025	116	93	12	221	221
26	2026	244	93	11	348	348
27	2027	424	94	10	528	528
28	2028	240	95	10	345	345
29	2029	180	96	9	285	285
30	2030	116	96	8	220	220
31	2031	214	97	8	319	319
32	2032	537	98	7	642	642
33	2033	261	98	6	365	365
34	2034	195	99	5	299	299
35	2035	116	100	5	221	221
36	2036	223	101	4	328	328
37	2037	424	101	3	528	528
38	2038	240	102	2	344	344
39	2039	180	103	2	285	285
40	2040	116	104	1	221	221
<b>Total</b>		<b>9,209</b>	<b>2,798</b>	<b>547</b>	<b>12,553</b>	<b>12,553</b>

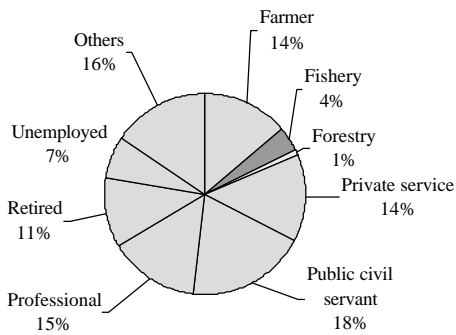


Figure 16.2.1 Occupational Structure of Sample Households

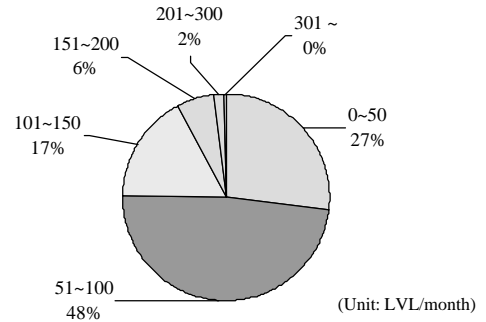


Figure 16.2.2 Income Structure of Sample Households

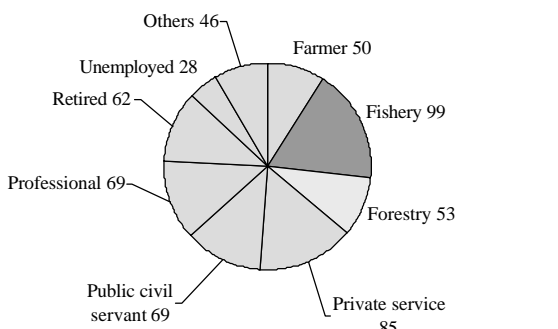


Figure 16.2.3 Average Income of Sample Households by Occupation

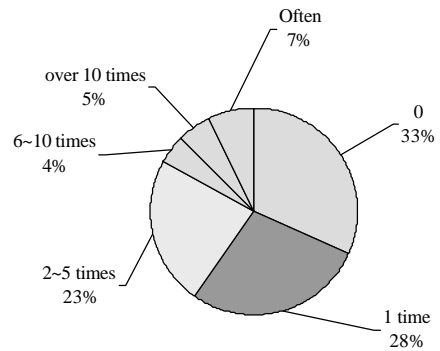


Figure 16.2.4 Number of Visits to Lake Lubana in a Year

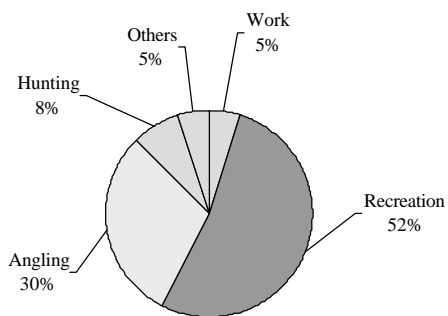


Figure 16.2.5 Purpose of Visit to Lake Lubana in a Year

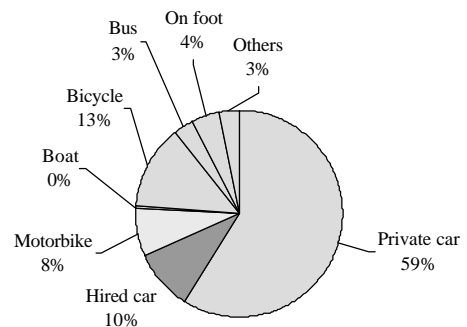


Figure 16.2.6 Mode of Visit to Lake Lubana

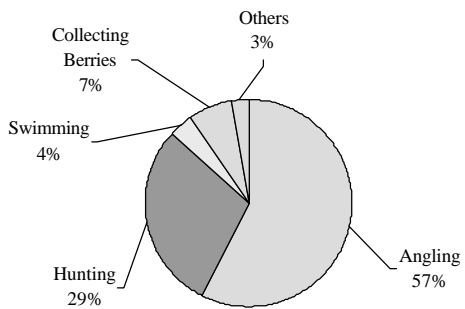


Figure 16.2.7 Popular Recreational Activities in LWC

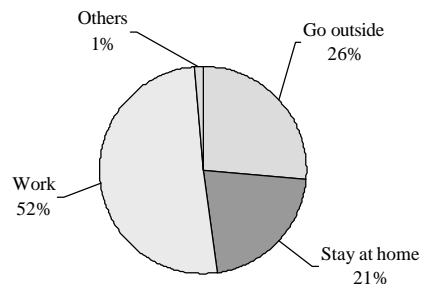


Figure 16.2.8 Major Activities in Holiday

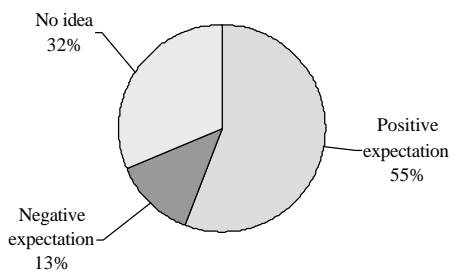


Figure 16.2.9 Expectation of Future Tourism Development in LWC

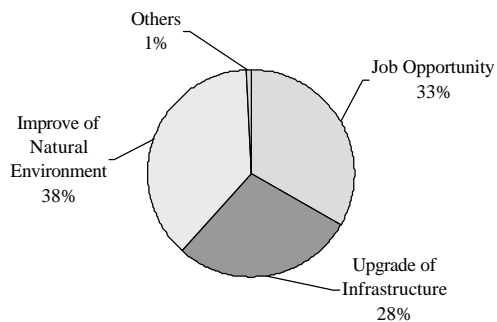


Figure 16.2.10 Positive Expectation of Future Tourism Development in LWC

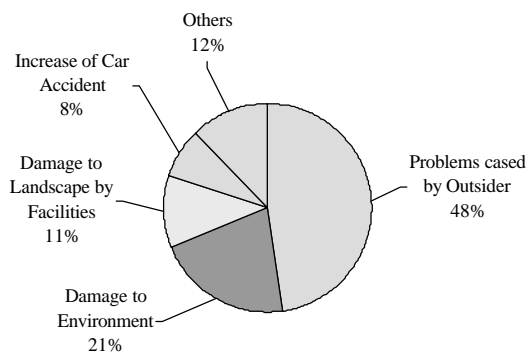


Figure 16.2.11 Negative Expectation of Future Tourism Development in LWC

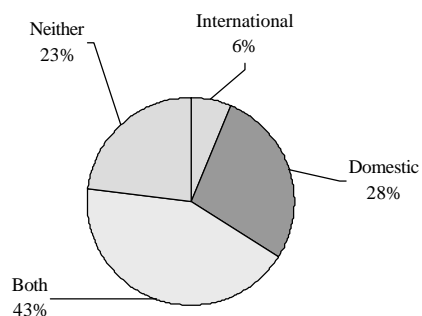
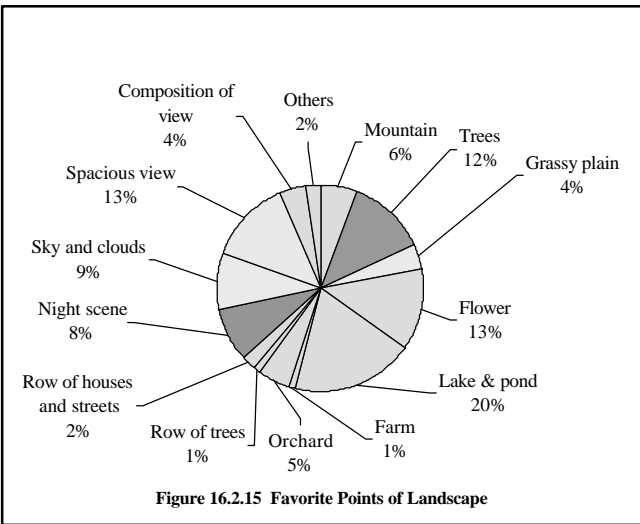
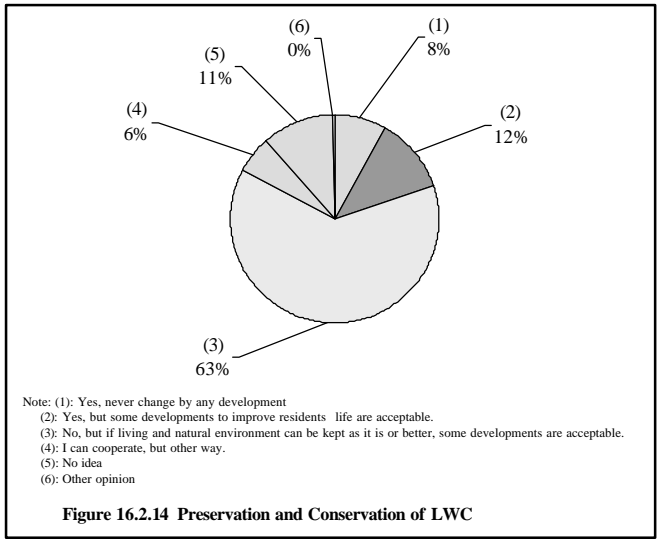
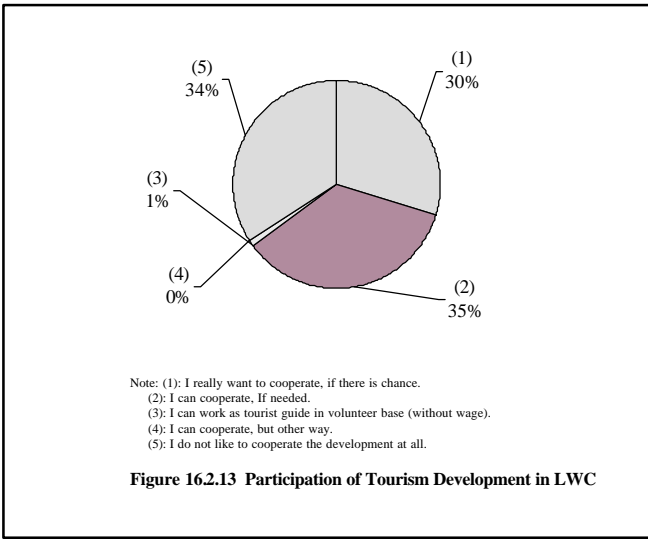
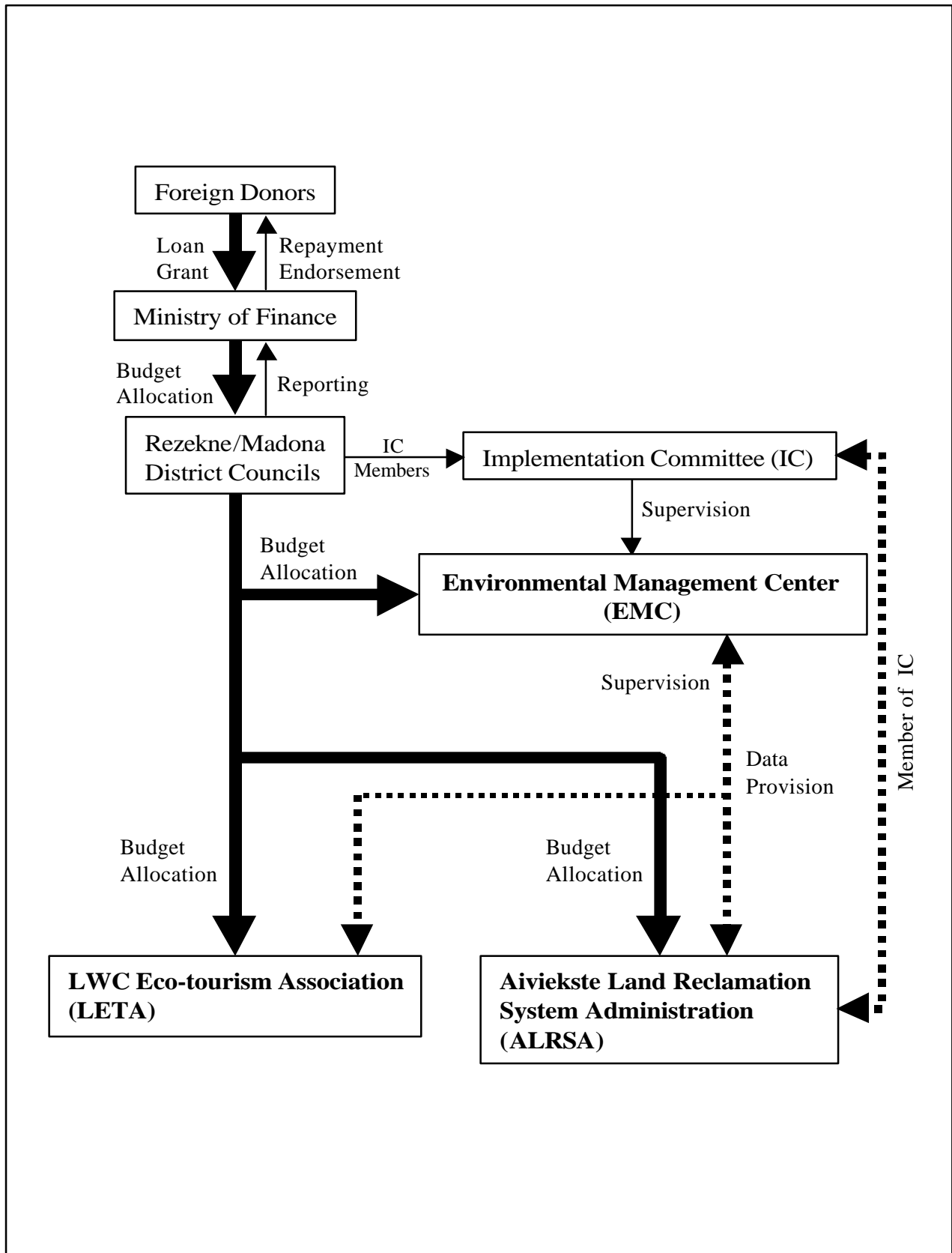


Figure 16.2.12 Preference of International/Domestic Tourism Development in LWC





**Figure 16.4.1 Financial Arrangement Structure for EMP Projects**

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

*JAPAN INTERNATIONAL COOPERATION AGENCY*

# **CHAPTER 17**

## CHAPTER 17 RECOMMENDATIONS

### 17.1 Recommendation

#### 17.1.1 Regional Development

- (1) Three strategies are recommended for development in LWC, small scale rural development, multi sector development, and eco-tourism and rural tourism promotion. Under these strategies, it is essential to make use of any resources in LWC to improve the living standard of the local people. For example, idle arable land should be used for development such as afforestation for forestry activities, and eco-tourism and rural tourism should be actively introduced targeting the LWC naturalness and the existing primary industries. But this direction must be in accordance with sustainable development concept ignoring adverse impacts on environment.
- (2) The primary industries with a long history such as agriculture, forestry and fishery should be continued simultaneously, neither terminating all these activities nor specializing a specific industry. It is not recommendable to introduce exotic industry such as heavy industry and mass tourism. LWC should aim at small-scale rural development based on the land and environment.
- (3) Socioeconomic levels represented by employment rate, wage and education level in LWC should reach the national average. For this purpose, the development side requires local manpower, expertise, budget and institutional privileges in introducing non-traditional primary goods or processing methods, and in training local residents for eco-tourism and new productive technology. This requisite has a possibility to bring about financial or institutional conflicts with implementation of the proposed conservation projects. However, it is also a fact that financially rich communities can easily promote environmental conservation in contrast.
- (4) In order to reach the economic growth with the nationally predicted rate in LWC, it is recommended to consider development projects at the regional or district level, regarding LWC as part of a larger project area. For example, further development in LWC can be carried out within the framework of the development plan for Latgale region prepared recently. Development directions in this plan such as rural tourism and information technology are to be expanded to LWC.

#### 17.1.2 Land Use

- (1) The recommended five land use strategies are 1) restriction on change of the existing land use pattern, 2) flexible and small scale conversion of the idle arable lands into forests, 3) harmonization of productive and recreational usage of water bodies, 4) building of small scale factories, facilities, and infrastructure, and 5) application of land use technologies friendly to local environment.
- (2) The future land use planning of LWC is recommended to follow the proposed land use map, which is based on development potentials in the future as well as proposed land



use appropriate for environmental conservation. The depicted land use categories are classified into four areas, forest land, agricultural land, urban area, and retardation basin. Nature Preservation Zone (NPZ) is to be strictly preserved and the present land use pattern in Active Management Zone (AMZ) should not be changed in principle, while the land use pattern within Development Zone (DZ) is proposed to change.

- (3) Since land in LWC is owned by different stakeholders such as private persons, private enterprises, the state and local municipalities, due agreement and compensation should be required where private land is planned to be converted to the 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 by providing local people with opportunities to participate in planning the concrete land use for LWC under the EMP framework.
- (4) The already established land use situation should not be changed as much as possible, also ignoring additional construction of large-scale facilities and infrastructure. It is not only to prevent damages to the wetland ecosystem of LWC, but also to guarantee the productive land resource to the owners. A large part of LWC should 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.
- (5) Idle arable land is recommended to be flexibly converted between cultivated land and forest depending on economic profitability of the both industries. The agricultural and forest lands can 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.
- (6) An independent land use planning unit is recommended to be established for LWC. At the highest level, land use planning must be dealt with by a small committee of permanent members drawn from the local municipalities and agencies concerned with LWC. The land use committee should make recommendations on priorities, the creation and allocation of resources, and the establishment, approval and coordination of land development programs. Alternatively, these functions could be added to the proposed EMC and IC.

### 17.1.3 Fishery Development

- (1) It is recommended to set a site specific concept on fishery in LWC as **Lake of Pike**. Pike and pikeperch must be the most important and symbolic fish species to be produced and conserved in LWC, because demand of ordinary freshwater fishes like carp species seems not to increase in near future considering people's general preference. This concept should be taken into consideration in relevant development

and conservation activities, particularly for eco-tourism development. For the fishery development in LWC, the fish hatchery development project and the angling promotion project are proposed. The total cost for these projects up to 2010 is estimated at about 641,000 LVL including necessary facilities and equipment.

- (2) The construction of new hatchery complex is required in LWC for production of fish fry for restocking to natural waters and for release to fish angling ponds. Besides, a hatchery educational aquarium and some demonstration facilities about fish reproduction are necessary for eco-tourism development. A series of earthen ponds for brood-stock and juveniles are also included in this hatchery complex. A recommendable site of the fish hatchery complex is the wintering pond area of the Nagli fish farm.
- (3) Angling should be considered as a substantial and important core of future regional development of LWC from viewpoint of wise use of natural resources. Considering current management situation of fishponds, several angling ponds should be opened by rehabilitation of a part of present aquaculture ponds of the Nagli fish farm. For promotion of angling activities in LWC, supporting facilities such as angler's huts available for car park, watching tower, fishing lots, and rental boats are proposed around the lake from fishing management viewpoint.

#### 17.1.4 Wetland Conservation

- (1) The recommended strategies taken for wetland conservation of LWC are to emphasize the biodiversity in rivers and lake, to preserve and conserve the wetland vegetation, to strengthen the function of forests, to manage game animals and birds through hunting, to promote eco-tourism for nature protection, and to focus on environmental education and public awareness. The conservation criteria should be determined not only preserving the present status but also retrieving old status as much as possible, in order to achieve the naturalness of LWC around 1930. At the same time, ecologically meritorious nature alterations like fishponds for waterfowl must be maintained.
- (2) In addition to the regulations of protected areas, biodiversity of LWC should be protected by the proposed wetland conservation plan (WCP) which includes concrete projects and programs to be implemented in line with EMP. The total cost for WCP is indicatively estimated about 2.3 million LVL including O/M costs up to 2010.
- (3) As a project, the construction of the Environmental Management Center (EMC) at Idena is recommended to establish a base for actual implementation of the proposed programs. The Biotope Conservation Program consists of 4 conservation subprograms for bird, mammal, bog & inundated grassland, and fish. Under the subprogram for bird, it is recommended to implement such concrete actions as improvement of natural breeding place for waterfowl, artificial breeding islands and nests for waterfowl, water level control of fishponds for waterfowl breeding, artificial nesting places and feeding for raptors, protection of natural nesting places, increase of prey animals for raptors, maintenance of grassland habitat for great snipe, and cormorant population control.

The mammal conservation subprogram necessitates wildlife corridor construction, enrichment of forest-meadow ecotone, and beaver population control. The bog and inundated grassland conservation subprogram is strongly recommended because raised bog, inundated grassland and fen are the characteristic biotopes of LWC, and because water level management is commonly crucial for their conservation. The subprogram for fish conservation proposes wintering place, patrolling, restocking of native fish species, spawning place, and river water level control as fish habitat.

- (4) Environmental research and monitoring program is also recommended. Research in EMC is to be for management purpose, and pure scientific researches must be limited only when they are closely linked with management. For scientific environmental management, especially for early warning, monitoring of natural environment as well as socioeconomic activities is indispensable. In line with the items that are required to the Ramsar information sheet, such items as fauna & flora, water-related items, socioeconomic statistics, and environmental & educational activities should be monitored in LWC and related areas. In addition, the EIMS sub-program and the Environmental Education sub-program are proposed. Dissemination of the research and monitoring results through EIMS in the form of annual report is strongly recommended.
- (5) Since LWC fulfills the Ramsar convention criteria, it is recommended to register important biotopes of LWC collectively as a Ramsar site at the commencement point of EMP. Collective registration is necessary to prevent fragmentation of conservation areas. Only Barkava oak stand, however, is excluded from the Ramsar site because it has few wetland components in its biotope and is fragmented from the main area.

#### 17.1.5 Environmental Information Management and Education

- (1) The objectives of the Environmental Information Management System (EIMS) are recommended to be 1) decision-making, 2) monitoring, 3) environmental education, 4) public awareness, and 5) science promotion. The institutional framework for EIMS must be under the jurisdiction of EMC. Three system engineers relevant to GIS data input, public awareness promotion, and environmental education promotion should be staffed to activate the evaluation/feedback and monitoring systems provided by EIMS. In addition, an ornithologist, a botanist, and a hydrologist should be manned in accordance with the conservation needs. Hardware and software should be procured in Latvia, which must not require special knowledge for operation. The grand total for the hardware and software is about 74,000 LVL.
- (2) The recommended Environmental Education and Training (EE&T) Plan is formulated based on the directives and principles stipulated in the national policies on environmental education. As no intention to formulate an education plan can be seen at the regional level, it is advisable to integrate the EE&T plan formulated by EMP for LWC into the national guideline on education through MEPRD. Following the

national guideline, the regional education authorities and local schools can arrange their classes for environmental education.

#### 17.1.6 Eco-tourism Development

- (1) In order to attract the potential eco-tourists (around 400 persons/year at present, and 700 to 1,000 persons/year in 10 years), LWC should be well improved in terms of information, advertisement, access to the site, tourism facility, and tourism management. Reflecting the specific situations in and around LWC, strategies of eco-tourism development are recommended to be 1) sustainable natural resources management, 2) local community driven development process, 3) entrepreneurship promotion, 4) full support by local government and public institutions, 5) collaboration between public and private sectors, 6) small scale eco-tourism and long-term benefits, 7) supply-oriented management, 8) differentiation and diversification of eco-tourism, and 9) focusing on the most potential areas.
- (2) Taking the locations and characteristics of eco-tourism resources into account, two eco-tourism development projects are recommended. The Indrani and Lubana Eco-tourism Development Project includes facility construction of tourism information center, accommodation lodge, canoe terminal & station, camping site as well as information board & signposts. On the other hand, the Nagli and Gaigalava Eco-tourism Development Project requires eco-tourism services through EMC facilities, tourist facilities at Kuvapani and the Orenisi island, observation tower/hut, camping site, board walk, canoe station, sanitation facility, and other necessary equipment. The total initial cost for the eco-tourism project in Gaigalava and Nagli is about 242,000 LVL, while that for Indrani and Lubana is 279,000 LVL.
- (3) For the purpose of materializing the two eco-tourism development projects, it is proposed to form the LWC Eco-tourism Association (LETA) consisting of interested local governments, interested local people groups supported by academic institutes. Possible local governments which are active in promoting these projects are Gaigalava, Nagli, Lubana, Indrani and other interested townships. Possible academic institutes which will support the eco-tourism projects are DPU, the Teici State Nature Reserve Office and other interested institutions which are willing to support LWC eco-tourism from the academic capability. LETA is to be placed in EMC.
- (4) The implementation of the tourism projects should be coordinated with other projects proposed under EMP. For instance, the tourist information building is a part of EMC. Therefore, it should be planned and constructed at the same time with good coordination. Bird watching towers, huts and a board-walk facility are to be used for wetland conservation program as well as eco-tourism. Based on the concept “carrying capacity”, visitor management must deal with regulations and zoning to protect the nature, licensing for hunters and anglers, warden patrols by EMC, and access controls of approachable locations, seasons, activity types and number of visitors.

- (5) Eco-tourism activities and services should be regularly improved by the systematic evaluation and feedback system to attract more visitors and prevent inappropriate activities for nature protection. As an administrative organization, EMC needs to monitor eco-tourism activities if they meet the regulations. Governments should facilitate economically viable entrepreneurship providing financial, technical, regulatory, institutional, and physical supports for the private sector. The public sector investment is indispensable in the first phase, and then its operation and management should be gradually handed over to the private sector.

#### 17.1.7 Water Level Management

- (1) The principal purposes of the water level management plan should be to sustain the current ecosystem, to maintain suitable water level for the activities of agriculture, fishery, and forestry, and to protect towns and villages against floods. It is preferable not to change an existing water level for the existing ecosystem. Especially, the influence on the fish and birds should be avoided in and around Lake Lubana. At the same time, the water level management should be coordinated for existing industries such as agriculture, the fishery, and forestry as well as for prevention of any flood damage to Lubana town.
- (2) For fish habitat conservation of the old Pededze river, the recommendable measure is to construct a gate structure in the embankment of the Pededze river left bank at the junction point of the old Pededze river. In addition to the gate structure, one small dam near Mierini village to keep water level high in the river section will be necessary. The amount to be diverted from the Pededze river should be estimated in consideration of water volume needed for the eco-tourism plan. The gate structure of slide type with 1m width and 1m height is proposed. The cost is estimated at 45,000 LVL indicatively. The small dam made of massive concrete with length of 25m will cost about 20,000 LVL.
- (3) Water depth of 2.5m or more is required in the lake in order to ensure the wintering of fish. The possible countermeasures for the wintering place are: heightening of dyke bank, excavation of lakebed, excavation of fish channel, and excavation of canal system in the lake. The excavation of fish channel is the best solution for this problem from the viewpoint of the cost (384,000LVL) and the eco-system conservation.
- (4) Continuous outflow from the Kalnagala sluice is recommendable as one of the effective solutions to improve water circulation for improvement of water quality in the southern part of the lake. About 6.5 to 16.5 m<sup>3</sup>/sec of water can be discharged from the Kalnagala sluice even after ensuring 1.5 m<sup>3</sup>/sec of river maintenance flow from the Aiviekste sluice. It is possible to manage by revising the existing operation rule of the lake.
- (5) For improvement of the existing operation manual for Lake Lubana, important points to be considered are the influence of desiccation to the northern wetland by the volume change of outflow through the Aiviekste sluice and the influence to fish conservation. Therefore, the revised manual should include the following points:

- Utilize the Kalnagala sluice as much as possible to improve water quality.
  - Basically, the proposed operation rule is based on the existing one.
  - Discharge from the sluice should be the same amount as the inflow from two rivers as much as possible.
  - Water level should keep at the level of 91.75 m or more for the fish conservation.
- (6) At least four hydrological stations are recommended to estimate the flood water volume in the Balupe and Ica rivers for northern wetland and in the Malta and Rezekne rivers for the lake. The automatic data-collection system on an electronic basis is recommendable. In addition, one thermometer is necessary to estimate roughly the starting date of snow melting. The station should equip an automatic water level gauge, water-conveyance pipes, a storage box for a device with tower, and a data-transmission device using telephone line. One computer with a device for receiving data is necessary at the station to receive electric data. The indicative cost for establishment of the hydrological stations is about 10,000 LVL.
- (7) As for the Aiviekste sluice, the whole structure should be replaced, including gate leaves, gate frames, culverts, inlet and outlet structures. One gate type structure is recommendable for smooth operation and simplified discharge control. The cost of rehabilitation of the Aiviekste sluice is about 138,000 LVL. The rehabilitation works of the Kalnagala sluice gate structure is also recommended, consisting of rehabilitation and strengthening of existing concrete structures and replacement of gate leaf. The cost of rehabilitation of the Kalnagala sluice is about 145,000 LVL.

#### 17.1.8 Environmental Management Plan

- (1) The fundamental vision of the EMP for LWC is recommended to be **Wise Use of the Lubana Wetland Complex**, with such goals to attain this vision as conservation of natural environment and sustainable use of natural resources. The target area of EMP should be the whole LWC (about 810 km<sup>2</sup>) including Lake Lubana. These goals must give a way for designation to the Ramsar site in future. EMP comprehensively consists of such six components as 1) wetland conservation plan, 2) eco-tourism development plan, 3) guideline for environmental information management system, 4) water level management plan, 5) guideline for regional development, and 6) directions for land use planning.
- (2) The EMP area is recommended to be divided into three zones, namely Nature Preservation Zone (NPZ), Active Management Zone (AMZ), and Development Zone (DZ). The environmental zone shows the direction and intensity of actual measures of the wetland conservation plan. "Preservation" should be a principal direction in NPZ, "Protection" and "Conservation" is in AMZ, and "Restoration" mainly in DZ. In NPZ, a modification should be applied because of its preservation approach. In AMZ and DZ, however, a rehabilitation and reconstruction should be applied for protection, conservation, and restoration of natural environment.

- (3) The conservation criteria under EMP should be achieved by the good combination of a facility plan and a regulatory plan. Since the regulatory plan for EMP needs to cover all types of proposed protection areas in LWC, it must be applicable for preparation of a site specific regulation of each protection area. The major activities to be restricted in LWC are largely categorized into 1) physical activities, 2) pollution activities, 3) ecological disturbance, and 4) other activities.
- (4) Establishment of the Implementation Committee (IC) and the Environmental Management Center (EMC) is proposed for actual implementation of EMP for LWC. IC should be a management authority of EMP which deliberates, authorizes, and coordinates substantial matters related to EMP, and EMC is recommended as a site specific organization for actual implementation of EMP. These two organizations should be established before implementation of EMP because it will require a lot of preparatory works.
- (5) In order to effectively and steadily implement the programs and projects proposed under EMP, five major institutional roles should be set up to realize wise and sustainable use of LWC and to manage the existing institutional difficulties. Those are 1) initiative role for local people's participation, 2) coordination role between environmental side and development sector, 3) enforcement and technical role on implementation, 4) environmental monitoring role for LWC, and 5) environmental education role for residents and visitors.
- (6) Considering that sustainable environmental conservation and economic development in LWC are realized by local residents, a mechanism that most benefits should be distributed to local people in the long term would be necessary. In this sense, employment opportunity for local residents in and around LWC should be created such as nature guide for eco-tourism, business for eco-tourism activities, and rural tourism.
- (7) Initial cost of the EMP Projects consisting of those for design, construction, equipment procurement, and physical contingency is estimated at about 3.1 million LVL. The O/M cost of them including training cost for staff from year 2001 to 2010 are estimated at about 1.5 million LVL. Total cost up to year 2010 is about 4.6 million LVL. The financial arrangement for initial cost of the EMP Projects is recommendable to be made with combination of the loan and grant scheme from potential international donors. It is recommended that the grant scheme is applied to the Environmental Research & Monitoring Program and the EIMS sub-program which provide only equipment, and other projects and programs apply for the soft loan, which is low interest rate and long repayment period loan scheme. The O/M cost should be basically born by domestic budget.
- (8) The total Latvian expenditure for the EMP Projects must consist of the O/M cost and repayment of soft loan. Annual expenditure ranges from about 21,000 LVL/year to 445,000 LVL/year between 2001 and 2010, and 172,000 LVL/year on average. After the year 2011, annual expenditure ranges from about 220,000 LVL/year to 725,000

LVL/year and 361,000 LVL/year on average. Considering affordability of the expenditure for the EMP Projects, domestic annual revenue same as the annual expenditures should be at least required.

- (9) The Wetland Conservation Plan, the Eco-tourism Development Plan, and the Hydrological Station Construction Project could be priority projects among the proposed 11 EMP Projects considering their quick effect and urgency. It is recommended that the Fishery Development Project should be implemented in line with the overall development of the Latgale region, and the Aiviekste and Kalnagala Sluice Rehabilitation Projects be designed taking the basin's flood control plan into account.

## **17.2 Conclusion**

The development of a comprehensive EMP for LWC is acutely needed, and it is justified by its ecological importance, the political and problematic background of LWC, and the strong intention of Latvian people concerned. LWC has been known as an important habitat for migrating birds including rare species, and the International Council for Bird Reservation identified LWC as an important bird area in Europe and recommended its conservation in early 1990s. It is natural that a movement to apply LWC for a Ramsar site arose among the concerned people.

EMP indicates the implementation program, the relation with the local development plans, and the environmental benefit of the local society as much as possible. EMP leads the people concerned to contribute and participate in wise use of natural resources, and guides the direction of environmental conservation in harmony with regional development by giving common environmental goals and targets of LWC.

In accordance with the goals and strategies, EMP provides the following seven major functions in line with the envisaged outputs. All these EMP's functions are closely connected each other.

- a) Establishment of conditions for Ramsar site registration,
- b) Biotope conservation,
- c) Environmental information management and monitoring,
- d) Environmental education,
- e) Integrated water level management,
- f) Eco-tourism promotion, and
- g) Baseline for development and land use of LWC.

The present number of water birds is supported by fishponds. Before construction of fishponds, those areas were seasonally flooded wet meadows, and not suitable habitats for waterfowl. Probably, Criteria 5 and 6 of the Ramsar convention had not been satisfied in the past. Dyke construction also prevented migration of fishes between the lake and rivers though it seems not a decisive impact on the fish abundance. If no conservation measures



are taken in LWC, Criteria 5 and 6 will not be satisfied because inundated grassland will lose its original vegetation by desiccation and cessation of mowing. Fishpond will also soon lose its function as good bird habitat. By implementing EMP, however, these problems will be solved and LWC will be able to accommodate more water birds, also improving habitat for fishes and mammals. There are following merits for the Ramsar-site designation: 1) monitoring is obliged, 2) the result is shared worldwide by the Ramsar Bureau, 3) local people can easily understand the wetland values, and 4) meritorious for attracting tourists.

Several concrete projects and programs have been proposed within EMP framework by each sector. Based on the sector wise evaluation related to effectiveness, necessity, and technical feasibility, the 11 projects and programs are selected for EMP. The EMP Projects are expected to bring about many kinds of environmental and economic benefits. All the EMP Projects are planned to be interdependent and contribute each other to gain overall benefit of EMP effectively. Implementation of the EMP Projects brings about various benefits in many aspects. Considering the correlation of the benefits, those benefits are synthesized to the conservation of biotope, eco-tourism promotion, and protection of birds and mammals.

Economic viability of the EMP Projects is evaluated by Economical Internal Rate of Return (EIRR) with 40-year project period though the target year of EMP is 2010. As a result of the estimation, EIRR shows about 30 %. Compared to interest rates ranging from 10 % to 15 % in the conventional economic analysis, the result means that implementation of EMP is viable economically even though some parts of its benefits are only quantified in monetary value and all costs of the EMP Projects are estimated.

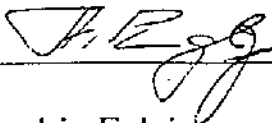
As an overall conclusion, the proposed EMP could be justified in terms of social necessity and urgency, and the recommended projects and programs would be feasible and viable from technical and economic standpoints. So the projects and programs within the EMP framework are recommended to be implemented as quick as possible before the important wetland ecosystem in LWC is further degraded.

# **APPENDICES**

SCOPE OF WORK  
FOR  
THE STUDY  
ON  
ENVIRONMENTAL MANAGEMENT PLAN FOR LUBANA  
WETLAND COMPLEX  
IN  
THE REPUBLIC OF LATVIA

AGREED UPON BETWEEN  
THE MINISTRY OF ENVIRONMENTAL PROTECTION AND REGIONAL DEVELOPMENT  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

RIGA, MARCH 18, 1999



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Mr. Andris Eglajs  
Deputy State Secretary  
Ministry of Environmental Protection  
and Regional Development (MEPRD)



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Mr. Masahiro Ota  
Leader of Preparatory Study Team  
Japan International Cooperation  
Agency (JICA)

## I. INTRODUCTION

In response to the request of the Government of the Republic of Latvia (hereinafter referred to as "the Government of Latvia"), the Government of Japan has decided to conduct the Study on Environmental Management Plan for Lubana Wetland Complex in the Republic of Latvia (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the official implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Latvia.

The present document sets forth the scope of work with regard to the Study.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are :

1. to develop an environmental management plan for sustainable use of Lubana Wetland Complex, taking into account of characteristics of the ecosystem, water management, land-use and people's living
2. to carry out technology transfer on environmental management planning and its implementation to the counterpart personnel through the joint work in the course of the Study.

## III. STUDY AREA

The Study area shall cover the Lubana Wetland Complex. (approximately 78,000 ha)

## IV. SCOPE OF THE STUDY

The integrated Environmental Management Plan, which is expected output of the Study, will consist of the scope as follows,

1. to identify the representatives of ecosystems in the area, particularly the vegetation type of forests and marshlands, wildlife including waterfowl and their habitat, and human and natural impacts to the habitat ecosystem
2. to identify fluctuation of the seasonal water level, submersion and damage by flooding and possible countermeasures
3. to identify and review the present land-use and to develop ideas for future

- land use planning
4. to review the GIS for the Study and for the implementation of the management plan developed according to the Study
  5. to formulate an integrated environmental management plan according to the above Study and consultation with the counterpart organizations including local administrations

To achieve the above objectives, the Study will cover the following items:

1. Collection and review of existing data and information

- (1) Social and economic condition
- (2) Natural condition (meteorology, hydrology, topography and geology)
- (3) Land use, vegetation and eco-system
- (4) Water level and water quality
- (5) Laws and regulations related to the environmental management and conservation
- (6) Organizations and institutions related to the environmental management and conservation
- (7) Development plans and policies in the Study area
- (8) Related projects by other donors

2. Aerial photo and/or satellite image analysis

3. Field reconnaissance

- (1) Hydrology and Topography
- (2) Fauna and flora
- (3) Land use, vegetation and eco-system
- (4) Water level
- (5) Infrastructure, tourism facilities and other related facilities
- (6) Environmental resources and landscape

4. Analysis of present condition and function of its eco-system and environment impact by human activities

5. Formulation of environmental management plan

- (1) Socio-economic framework
- (2) Environmental zoning plan for wetland conservation and sustainable use
- (3) Environmental monitoring plan
- (4) Recommendation for future land use
- (5) Local community development plans including eco-tourism

- (6) Environmental management plan including the utilization of GIS
- (7) Facility plan
- (8) Institutional arrangement and financial plan
- (9) Evaluation and recommendation

## V. SCHEDULE OF THE STUDY

The Study will be conducted in accordance with the tentative schedule as attached in the Appendix 1. The schedule is tentative and subject to be modified when both parties agree upon any necessity that arises during the course of the Study.

## VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Latvia.

1. Inception Report:  
Thirty(30) copies at the beginning of the work in Latvia.
2. Progress Report (1):  
Thirty(30) copies at the end of the first work period in Latvia.
3. Interim Report:  
Thirty(30) copies at the beginning of second work period in Latvia.
4. Progress Report (2):  
Thirty(30) copies at the end of second work period in Latvia.
5. Draft Final Report:  
Fifty(50) copies at the third field work period.  
The Government of Latvia shall submit its comments within one(1) month after the receipt of the Draft Final Report.
6. Final Report:  
Fifty(50) copies within two(2) months after receipt of the comments on the Draft Final Report.

## VII. UNDERTAKINGS OF THE GOVERNMENT OF LATVIA

1. To facilitate the smooth implementation of the Study, the Government of Latvia shall take necessary measures:
  - (1) to secure the safety of the Japanese Study Team (hereinafter referred to as "the Team")

- (2) to permit the members of the Team to enter, leave and sojourn in Latvia for the duration of their assignment therein, and to exempt them from foreign registration requirements and consular fees,
  - (3) to exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Latvia for the implementation of the Study,
  - (4) to exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study,
  - (5) to provide necessary facilities to the Team for remittance as well as utilization of funds introduced into Latvia from Japan in connection with the implementation of the Study,
  - (6) to secure permission for entry into private properties or restricted areas for the implementation of the Study,
  - (7) to secure permission for the Team to take all data and documents (including photographs and maps) related to the Study out of Latvia to Japan, and
  - (8) to provide medical services as needed. Its expenses will be chargeable on the members of the Team.
2. The Government of Latvia shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.
  3. Ministry of Environmental Protection and Regional Development (hereinafter referred to as "MEPRD") shall act as a counterpart agency to the Team and shall also act as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.
  4. MEPRD shall, at its own expense, provide the Team with the followings, in cooperation with other organizations concerned:

- (1) available data and information related to the Study,
- (2) counterpart personnel,
- (3) suitable office space with necessary equipment and furniture in Riga and the project site.
- (4) an appropriate number of vehicles with drivers, and
- (5) credentials or identification cards.

#### VIII. UNDERTAKINGS OF JICA

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, the Team to Latvia, and
2. to pursue technology transfer to the Latvia counterpart personnel in the course of the Study.

#### IX. CONSULTATION

JICA and MEPRD shall consult with each other in respect of any matter that may arise from or in connection with the Study.



## TENTATIVE SCHEDULE

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
WORK IN LATVIA																					
WORK IN JAPAN																					
REPORT PRESENTATION	△ IC/R					△ P/R (1)			△ IT/R				△ P/R (2)				△ DF/R			△ F/R	

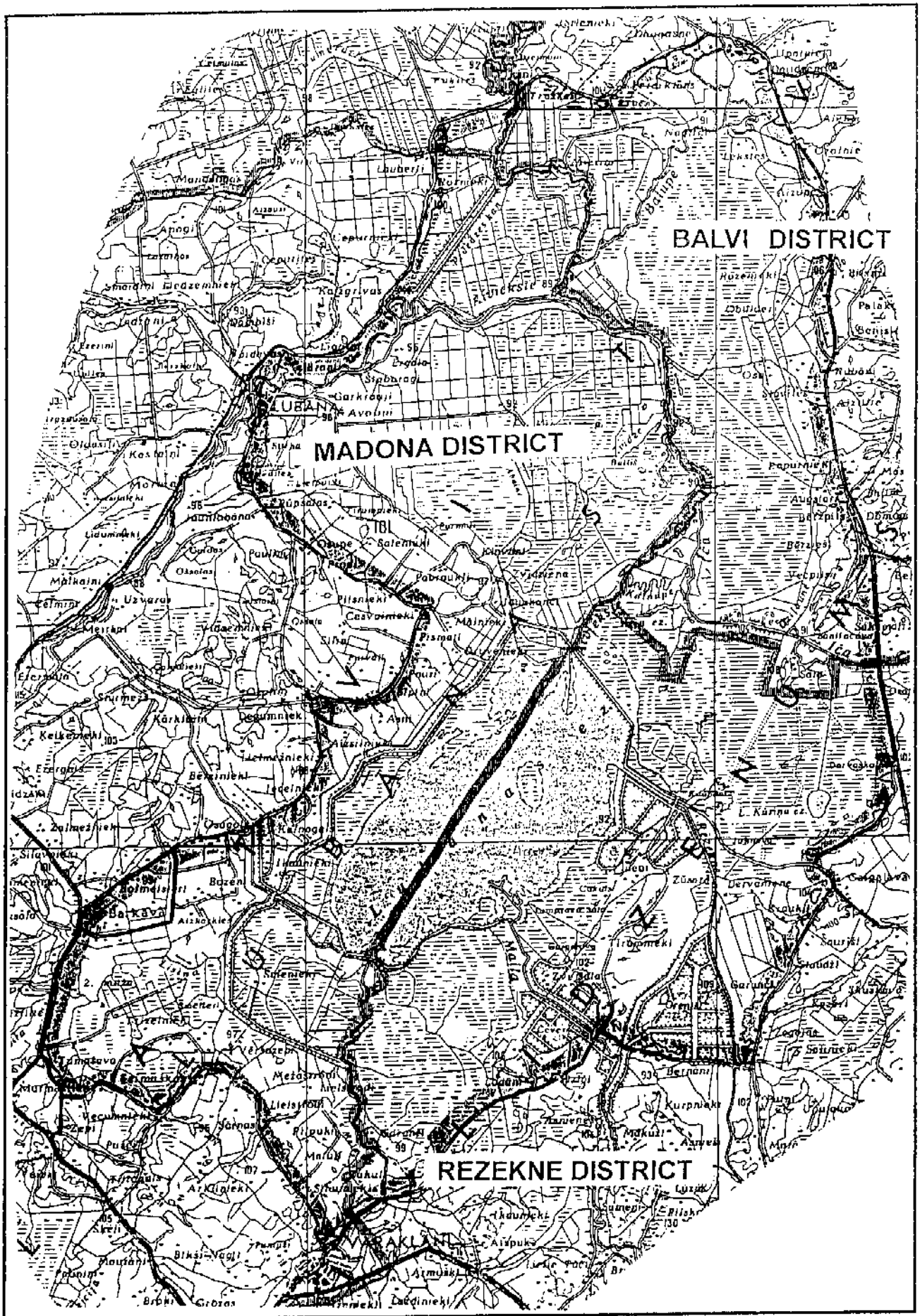
REMARKS:

- IC/R : Inception Report
- P/R : Progress Report
- IT/R : Interim Report
- DF/R : Draft Final Report
- F/R : Final Report

Appendix 1

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D.F. H



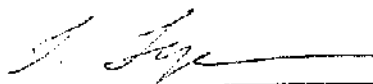
STUDY AREA FOR LUBANA WETLAND COMPLEX  
A-8

*J. E. MO*

MINUTES OF MEETING  
ON  
THE SCOPE OF WORK  
FOR  
THE STUDY  
ON  
ENVIRONMENTAL MANAGEMENT PLAN FOR LUBANA  
WETLAND COMPLEX  
IN  
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AGREED UPON BETWEEN  
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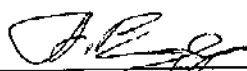


Ms. Ilona Jepsen  
Deputy Director,  
Environmental Protection Department,  
for the Director of Environmental  
Protection Department,  
Ministry of Environmental Protection  
and Regional Development (MEPRD)



Mr. Masahiro OTA  
Leader of the Preparatory Study Team  
Japan International Cooperation Agency  
(JICA)

Witness



Mr. Andris Eglajs  
Deputy State Secretary  
Ministry of Environmental Protection  
and Regional Development (MEPRD)

In response to the request of the Government of the Republic of Latvia (hereinafter referred to as "the Government of Latvia"), the Government of Japan has decided to conduct the Study on Environmental Management Plan for Lubana Wetland Complex in the Republic of Latvia (hereinafter referred to as "the Study") through the Japan International Cooperation Agency (hereinafter referred to as "JICA").

The Japanese Preparatory Study Team (hereinafter referred to as "the Study Team"), headed by Mr. Masahiro OTA, visited the Republic of Latvia and carried out field surveys of the study area and had a series of meetings with the Ministry of Environmental Protection and Regional Development (hereinafter referred to as "MEPRD") and other authorities concerned of the Government of Latvia from March 7th to March 26th, 1999. The list of attendants is shown in Annex.

The draft S/W (scope of work) proposed by the Study Team was discussed in detail between MEPRD and the Study Team, and both side agreed to adopt the S/W with the following understandings.

#### I Study area

The study area shall cover the Lubana Wetland Complex which is indicated on the map attached in the Scope of Work. However, the areas intensively studied will be finalized during the discussions at the commencement of the Study on the basis of the each component of the Scope of Work.

#### II Target year

It is agreed that the Study would cover the period until the year of 2010..

#### III Coordination of the Study with other Ministries and local Organizations concerned

In order to coordinate the interests among Ministries concerned and to secure smooth implementation of the Study, it is agreed to establish the Steering Committee under a chairmanship of MEPRD. The members of the Committee consists of organizations as follows,

- Ministry of Finance
- Ministry of Foreign Affairs
- Ministry of Economy
- Ministry of Agriculture,
  - Dept. of Forestry,
  - Dept. of Fisheries,
  - Dept. of Land Reclamation System Administration
- Ministry of Science and Education

In order to reflect interests of the local organizations and communities to the output of the Study, and to secure smooth implementation of the Study, it is also agreed that the Working Group at the local level is established under the leadership of MEPRD and its Regional Environmental Boards. Major members of the Group may consist of organizations as follows,

- The Regional Environmental Boards,
- The District Administration of Rezekne, Madona and Belvi
- The Land Reclamation System Administration,

The Forestry Superintendence,  
Council for Regional Development for Latgale Region,  
The Fishery Administration  
Teici state reserve  
Some townships concerned

The researchers of Laboratory of Ecology, Daugavpils University who own intensive scientific research experiences in the Study area may play a role of coordination among the Group members.

#### IV Full-Scale Study Team

The full-scale study team, which JICA dispatches, consists of members required to perform the Scope of Work (S/W). The professions may include subjects as follows,

Environmental Management  
Regional Development/ Eco-tourism Development  
Wetland Hydrology  
Ornithologist and/or Wildlife Management  
Forestry, Vegetation and/or ecology  
Land-use Specialist/ GIS specialist  
Agricultural Policy and Economics  
Inland fishery specialist

#### V Joint Work with MEPRD and Working Group

It is agreed that each member of the full-scale study team works together with the counterpart personnel, including an official who plays a role of the project manager, assigned by MEPRD and the Working Group members to make sure incorporation of their interests to the Study output and smooth implementation of the Study.

#### VI Data and Information for the Study

It is agreed that MEPRD provides the available data and information necessary for the Study to the full-scale study team for the implementation of the Study. Some of them, for example, are as follows,

All relevant archives  
Satellite image  
Hydro-meteorological data  
Digital maps  
Forest inventory data  
Land survey data / Latvian state geological survey data

It is also agreed that MEPRD makes necessary arrangement for other Ministries and local organizations to provide data and information for free to the full-scale study team.

#### VII Arrangement of the Study Implementation

1. The Study Team requested MEPRD to provide interpreters (Latvian-English) for smooth implementation of the Study. However, MEPRD expressed difficulty to respond to the Team's request due to financial reasons. The Study Team replied to convey the situation on interpreters to the

JICA Headquarters.

2. The Study Team requested that MEPRD would provide two vehicles with drivers necessary for the Study. However, MEPRD expressed difficulty over the request due to shortage of official vehicles. The Study Team replied to convey the situation on vehicles to the JICA Headquarters.

3. The Study Team requested that MEPRD is to arrange the offices with communication facility and office furniture for the full-scale study team in Riga, Rezekne and Daugavpils University. The telecommunication cost, however, will be paid by the full-scale study team. MEPRD will make necessary arrangement for the full-scale study team.

#### VIII Counterpart Training in Japan

According to the request made by MEPRD concerning the training of a counterpart personal in Japan held by JICA, the Study Team replied to convey the request to the JICA Headquarters for consideration.

#### IX Seminar and Workshop

According to the request to organize seminar at the final stage and workshops on the occasion of submission of each report to MEPRD by the full-scale study team, the Study Team replied to convey the request to the JICA Headquarters.

#### X Others

MEPRD acknowledged briefing of the JICA Development Study Program made by the Team.

## MEMBER LIST

### Ministry of Foreign Affairs

Ms. Dace Treija Head of Asia and Africa Division  
Ms. Egita Sedule Second Secretary, Asia and Africa Division

### Ministry of Environmental Protection and Regional Development

Mr. Rolands Arturs Bebris Director, Environmental Protection Department  
Ms. Ilona Jepsen Deputy Director, Environmental Protection Department  
Mr. Vilnis Bernards Senior Official, Environmental Protection Department  
Ms. Ilona Tesnova Senior Official, Environmental Protection Department  
Mr. Ilgonis Strauss Head of Division, Investments Department  
Mr. Janis Aizsalnicks External Relations Coordinator, Investments Department  
Mr. Janis Karro Director Rezekne Regional Environmental Board  
Ms. Erika Ruskule Deputy Director, Rezekne Regional Environmental Board  
Mr. Jevgenijs Sobko Director, Madona Regional Environmental Board  
Dr. Ilze Kirstuka Director, Latvian Environmental Data Center  
Ms. Polina Berg Specialist of Information Department, Latvian Hydro-meteorology Agency  
  
Ms. Inga Gavena Adviser, State Geological Survey  
Mr. Agris Lacis State Geological Survey

### Ministry of Agriculture

Ms. Gunta Ozolina Deputy Director, National Board of Fishery  
Ms. Inga Erta Engineer, Rezekne Forestry Superintendancy

### Rezekne District Council

Mr. Monvids Svarcs Chairman  
Mr. Valerijs Zvirgzdins Executive Director  
Ms. Sandra Ezmale Main Specialist, Territorial Planning Department  
Mr. Janis Berzins Territorial Planner, Osupe Township Administration  
Mr. Stanislavs Smelters Head of Barkava Township Administration  
Mr. Dzintars Kazulis Deputy Head of Osupe Township Administration  
Mr. Voldemars Dreimanis Head of Nagli Township Administration  
Ms. Ginta Kalvane Director, Nagli Fish Firm  
Mr. Juris Smocs Licensed Fisherman in Lake Lubana

### Aiviekste State Department of Land Reclamation System

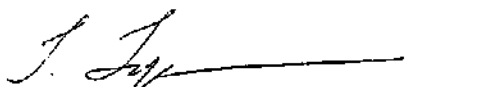
Mr. Arkadijs Sluckis Director

### Daugaupils Pedagogical University

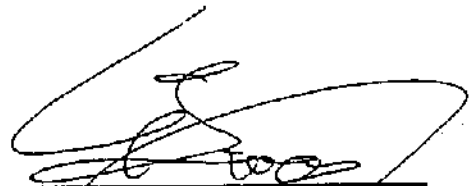
Dr. Arturs Skute Head of Ecology Laboratory  
Mr. Jevgenijs Cernihovics Forest Resource Management, Ecology Laboratory  
Mr. Juris Soms GIS Expert, Department of Geography

THE MINUTES OF MEETING  
ON  
THE INCEPTION REPORT  
OF  
THE STUDY ON  
ENVIRONMENTAL MANAGEMENT PLAN FOR  
LUBANA WETLAND COMPLEX  
IN  
THE REPUBLIC OF LATVIA

Riga, August 11, 1999



Ms. ILONA JEPSEN  
Deputy Director,  
Environmental Protection Department,  
Ministry of Environmental Protection  
& Regional Development



MR. YOICHI IWAI  
Team Leader,  
JICA Study Team



In accordance with the Scope of Work (S/W) for the Study on Environmental Management Plan for Lubana Wetland Complex (The Study) agreed upon between the Ministry of Environmental Protection & Regional Development (MEPRD) and the Japan International Cooperation Agency (JICA), the JICA Study Team prepared the Inception Report (IC/R), and submitted 30 copies of the English version to MEPRD.

On August 9, 1999, a discussion meeting on the contents of IC/R prepared by the JICA Study Team was held in the Rezekne District Council. On August 10, the MEPRD held a meeting in Riga to discuss the contents of IC/R. The attendants to these two meetings from the Latvian side included the MEPRD staffs, representatives for the Rezekne Regional Environmental Board (RREB) and the Rezekne District Council (RDC), and local scientists. The attendants from the Japanese side included the representative from the JICA Headquarters, the JICA Advisory Committee member, and the JICA Study Team members. The lists of the attendants are provided in Attachment-I and Attachment-II respectively.

Ms. Ilona Jepsen, Deputy Director of the Environmental Protection Department, MEPRD chaired the meeting on August 10 on behalf of the Latvian counterpart agencies. The JICA Study Team presented the contents of IC/R. Then, the comments from the attendants to the meeting were presented. Based on the discussions in Rezekne and Riga, the followings have been agreed between the Latvian counterpart agencies and the JICA Study Team.

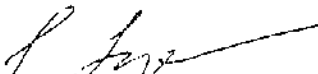
### **1. Official Authorisation**

The Latvian side officially agreed the contents of IC/R prepared by the JICA Study Team, and authorised the commencement of the Study in accordance with the IC/R.

### **2. Organisation of Working Group and Steering Committee**

- (1) The Latvian side agreed that the counterpart agency of the Study is MEPRD.
- (2) The Latvian side agreed that the Working Group (W/G) at the local level is established under the leadership of MEPRD, consisting of the following bodies which actually function as a counterpart team for the JICA Study Team :

- 1) Regional Environmental Boards of Rezekne and Madona
- 2) District Administration of Rezekne, Madona, Balvi, and Gulbene
- 3) Land Reclamation System Administration,
- 4) Forestry Superintendencies of Ziguru, Cesvaines, Rezekne, and Gulbene
- 5) Council for Regional Development for Latgale Region,
- 6) Fishery Administration,
- 7) Teici State Reserve Office, and
- 8) Townships concerned of Daukstu, Indranu, Osupes, Barkavas, Murmastienas, Varaklanu, Rugaju, Lazdualna, Berzpiļi, Gaigalavas, Naglu, and Deksarū



- (3) The Latvian side agreed that the Steering Committee (S/C) for the Study is established with the representatives from the national-level agencies.

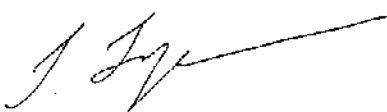
### **3. First Steering Committee**

Both the Latvian side and the JICA Study Team agreed that the Steering Committee as organised above will hold the first meeting to discuss with the JICA Study Team on the IC/R on August 19, 1999, and that the results of discussion will be recorded in a written note.

### **4. Reflection of the Comments on the Study**

The JICA Study Team agreed to reflect the following comments from the Latvian side as much as possible according to the agreement in the S/W :

- (1) Three more water quality survey points (at the downstream of the Aiviekste river just after the conjunction with the main drainage canal, the Lubana lake side at the Aiviekste water gate, and the inflow point of the Rezekne river to the Lubana lake just after the fish ponds) are to be added during the water quality survey. The JICA Study Team agreed to add these three survey points for the water quality survey.
- (2) The water quality survey is to be also implemented in spring of 2000. The JICA Study Team will consider its necessity based on the results of the 1999's survey.
- (3) Supplementary field survey under the regional ecosystem survey is to be implemented for representative spots mainly in the northern part of the study area, considering limitation of the survey period. And some survey items such as fauna population trends, relation between fauna/flora and water level/quality and animal distribution map will be surveyed as much as possible. The JICA Study Team agreed on these comments and to modify the TOR for the regional ecosystem survey so that it reflects the survey constraints and actual ecological situations of the study area.
- (4) Some of the data and information requested by the JICA Study Team are not available. The JICA Study Team understood the situation related to the data collection and agreed to carry out the Study as proper as possible based on the obtained data and information.



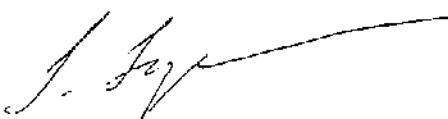
**Attachment-I : List of Attendants (in Rezekne District Council, August 9, 1999)**

Latvian Side

Rolands Bebris	Director, Environmental Protection Department, MEPRD
Erika Ruskule	Deputy Director, RREB
Monvids Svarcs	Chairman, RDC
Sandra Ezmale	Main Specialist, Territorial Planning Department, RDC
Arturs Skute	Head of Laboratory of Ecology, Daugavpils Pedagogical University (DPU)
Jevgenijs Cemihovics	Leading Specialist, DPU
Diana Rakvica	University of Latvia
Tereze Kruste	Rezekne High School

Japanese Side

Atsuhiro Yoshinaka	JICA Advisory Committee Member
Kazunobu Suzuki	JICA Headquarters
Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Manabu Masaki	JICA Study Team



**Attachment-II : List of Attendants (in MEPRD, August 10, 1999)**

Latvian Side

Ilona Jepsen	Deputy Director, Environmental Protection Department, MEPRD
Vilnis Bernards	Senior Official, Environmental Protection Department, MEPRD
Kristine Senele	Public Relations Coordinator, MEPRD
Erika Ruskule	Deputy Director, RREB
Sandra Ezmale	Main Specialist, Territorial Planning Department, RDC
Arturs Skute	Head of Laboratory of Ecology, DPU
Juris Soms	Laboratory of Ecology, DPU

Japanese Side

Atsuhiko Yoshinaka	JICA Advisory Committee Member
Kazunobu Suzuki	JICA Headquarters
Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Manabu Masaki	JICA Study Team
Janis Prols	Director, GEO Consultant (on behalf of U. Bergmanis in the JICA Study Team)

RECORDS OF DISCUSSION  
ON  
THE INCEPTION REPORT OF THE STUDY ON ENVIRONMENTAL  
MANAGEMENT PLAN FOR LUBANA WETLAND COMPLEX

Riga, August 19, 1999

In line with Item 3 in the Minutes of Meeting on the Inception Report (IC/R) of the Study on Environmental Management Plan for Lubana Wetland Complex (The Study), which was agreed upon between the Ministry of Environmental Protection & Regional Development (MEPRD) and the JICA Study Team (the Team) on August 11, 1999, the first meeting of the Steering Committee (S/C) was held on August 19, 1999 in the MEPRD.

The meeting was chaired by Ms. Ilona Jepsen, Deputy Director of the Environmental Protection Department, MEPRD. The attendants consisted of representatives from the S/C member agencies and the Team members, as listed in Attachment. The Team presented the contents of IC/R. Then, the discussions on the following items were held among the attendants to the meeting. At the end of the meeting, it was informed that the 2nd S/C meeting is scheduled in the end of November, 1999.

**1. Impact on Fish of the Water Level Management**

Consideration regarding negative impacts on fish of the water level management, such as fish path, is important for the downstreams of the Aiviekste river. The Team answered that such impacts should be examined through environmental impact assessments for individual projects, and that the Team will study the impacts only in the study area to formulate EMP.

**2. Fishery and Aquaculture**

Fishery and aquaculture are not clearly classified in IC/R. The Team commented that these two sectors will be studied in accordance with their different definitions.

**3. Commercial Fishery and Recreational Angling**

There are two types of fishing, commercial fishery and recreational angling (sports fishing), in the study area although these do not seem to be clearly distinguished in IC/R. The Team answered that they will be studied based on understanding of each fishing nature.

**4. Participation of Fishery Administrative Agencies to Informal Meeting**

It is recommendable to include such the administrative agencies as Inland Water Laboratory and National Board of Fisheries as participant to the planned informal meeting on fishery sector. The Team commented that the Team will carefully consider on this recommendation.

**5. Ecotourism and Water Level Management for Fishery**

It is recommended to pay attention to fishing in studying ecotourism and water level management. The Team answered that the Team will consider the angling resources and fishery facilities/regulation, as far as data and information are available.

## **6. Additional Items for Ecotourism and Fishery Studies**

Other recreational items including angling and boating have to be added in the ecotourism study, while fishing records are to be added as data collection item for the fishery study. The Team answered that these will be included in the studies.

## **7. Consideration on Agricultural Activities**

How will EMP affect the agricultural activities and the existing drainage system ? The Team answered that necessary regulation and zoning will be proposed on the agricultural land based on the farmers' intention and the study results, implying land compensation or purchasing by the government, and that the existing drainage system will be fully utilized with appropriate rehabilitation proposal.

### **Attachment : List of Attendants (in MEPRD, August 19, 1999)**

#### Latvian Side

Ilona Jepsen	Deputy Director, Environmental Protection Department, MEPRD
Rasma Ivanovska	Senior Official, Department of Asia & Africa, Ministry of Foreign Affairs
Normunds Riekstins	Director, National Board of Fisheries, Ministry of Agriculture (MOA)
Alda Nikodemusa	Senior Official, Division of Spatial Planning, MEPRD
Astra Vilnite	National Board of Municipalities, MEPRD
Imants Tiesnieks	Head of Capital Market Policy Division of Economic Analysis and Fiscal Policy Department, Ministry of Finance
Andis Zeikars	Department of Agricultural Strategy and Co-operation, MOA
Lasma Abolina	National Board of Forestry, MOA
Maija Malnaca	Project Assistant, Environmental Protection Department, MEPRD

#### Japanese Side

Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Manabu Masaki	JICA Study Team
Motokazu Ando	JICA Study Team
Ugis Bergmanis	JICA Study Team
Yukiyasu Sumi	JICA Study Team
Inta Rimsane	Interpreter
Janis Prols	Director, GEO Consultant (Interpreter)

**Attachment : List of Attendants (in MEPRD, August 19, 1999)**

Latvian Side

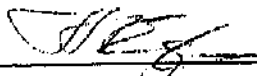
Iiona Jepsen	Deputy Director, Environmental Protection Department, MEPRD
Rasma Ivanovska Affairs	Senior Official, Department of Asia & Africa, Ministry of Foreign Affairs
Normunds Riekstins	Director, National Board of Fisheries, Ministry of Agriculture (MOA)
Alda Nikodemusa	Senior Official, Division of Spatial Planning, MEPRD
Astra Vilnīte	National Board of Municipalities, MEPRD
Imants Tiesnieks	Head of Capital Market Policy Division of Economic Analysis and Fiscal Policy Department, Ministry of Finance
Andis Zeikars	Department of Agricultural Strategy and Co-operation, MOA
Lasma Abolina	National Board of Forestry, MOA
Maija Malnaca	Project Assistant, Environmental Protection Department, MEPRD

Japanese Side

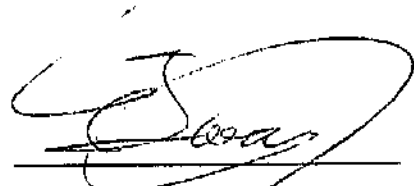
Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Manabu Masaki	JICA Study Team
Motokazu Ando	JICA Study Team
Ugis Bergmanis	JICA Study Team
Yukiyasu Sumi	JICA Study Team
Inta Rimsane	Interpreter
Janis Prols	Director, GEO Consultant (Interpreter)

THE MINUTES OF MEETING  
ON  
THE PROGRESS REPORT (1)  
OF  
THE STUDY ON  
ENVIRONMENTAL MANAGEMENT PLAN FOR  
LUBANA WETLAND COMPLEX  
IN  
THE REPUBLIC OF LATVIA

November 29, 1999



Mr. ANDRIS EGLAJS  
Deputy State Secretary,  
Ministry of Environmental Protection  
& Regional Development



Mr. YOICHI IWAI  
Team Leader,  
JICA Study Team



In accordance with the Scope of Work (S/W) for the Study on Environmental Management Plan for Lubana Wetland Complex (the Study) agreed upon between the Ministry of Environmental Protection & Regional Development (MEPRD) and the Japan International Cooperation Agency (JICA), the JICA Study Team prepared the Progress Report (P/R) (1), and submitted 30 copies of the English version to MEPRD.

On November 23, 1999, the 1st Workshop on the Study was held in the Rezekne District Council. The attendants to the workshop amounted to about 40 including the representatives of MEPRD, the regional environmental boards, the district councils, and the townships concerned as well as the local residents in the study area.

The 2nd meeting of the Steering Committee (S/C) on P/R (1) was held on November 26, 1998 where Mr. Andris Eglajs, Deputy State Secretary, MEPRD chaired on behalf of the Latvian counterpart agencies. The attendants to the meeting is shown in the list attached herewith. The JICA Study Team presented the contents of P/R (1), and the attendants made some comments on the contents of P/R (1). Based on the discussion of the S/C meeting, the followings have been agreed between the S/C member agencies and the JICA Study Team.

#### **1. General Acceptance of P/R (1)**

The Latvian side generally accepted P/R (1) and appreciated the quality of the contents. The both sides agreed that the JICA Study Team continues to study in accordance with the proposed directions in P/R (1).

#### **2. Continuation of Study on Fish Species**

It was pointed out by the Latvian side that less attention had been made to fish species compared with the other ecological objects. The JICA Study Team described a lack of the existing fish species data, but agreed to continue to study based on the data of fish species and the fishery licenses provided by the Latvian side.

#### **3. Information Dissemination of the Places of the Endangered Species**

The Latvian side is concerned about the information dissemination of the nesting places of the endangered bird species contained in the P/R (1). The JICA Study Team agreed to carefully deal with the information, especially for the dissemination to the public.

#### **4. More Detailed Water Level Management Plan**

The Latvian side expressed its expectation for more detailed water level management plans which are crucial for the study area. The JICA Study Team responded that it is because the

concerned analysis is still going on, and agreed that the results of the water management modelling and water level analysis are to be reflected in the Interim Report.

#### **5. Correction of Description in P/R (1)**

The Latvian side pointed out misunderstandings in some description related to environmental education system, national land use plan, and mapping agency. The JICA Study Team agreed to modify these based on the correct data and information provided by the Latvian side.

#### **6. Importance of Water Quality Management**

The Latvian side is worried about further degradation of water quality in Lake Lubana, which will affect the eco-tourism development in the study area. The JICA Study Team agreed to pay more attention to the water quality of the upstream area in Rezekne city and the on-site.

#### **7. Modification of the Study Area**

The JICA Study Team proposed to modify the study area slightly expanding the northern part because of the finding of the additional important sites from the ecological point of view. The Latvian side agreed to this modification.

#### **8. Cooperation of the Latvian Side for the Further Study**

The Latvian side promised to cooperate with the JICA Study Team for the further study, by providing necessary information and data for more detailed surveys and planning.

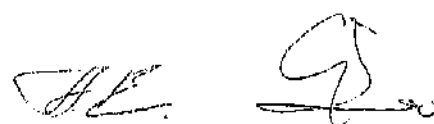
## **Attachment : List of Attendants**

### **Latvian Side**

Mr. Andris Eglajs	Deputy State Secretary, MEPRD
Ms. Alda Nikodemusa	Senior Official, Division of Spatial Planning, MEPRD
Ms. Gunta Ozolina	National Board of Fisheries, Ministry of Agriculture (MOA)
Ms. Rasma Ivanovska	Senior Official, Department of Asia & Africa, Ministry of Foreign Affairs
Mr. Andis Zeikars	Department of Agricultural Strategy and Cooperation, MOA
Ms. Maija Malnaca	Assistant of Director, MEPRD


### **Japanese Side**

Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Motokazu Ando	JICA Study Team
Ugis Bergmanis	JICA Study Team
Tomoo Aoki	JICA Study Team
Yukiyasu Sumi	JICA Study Team



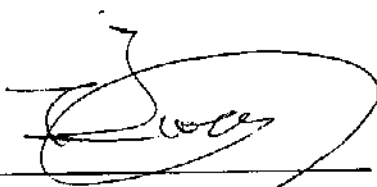
THE MINUTES OF MEETING  
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THE INTERIM REPORT  
OF  
THE STUDY ON  
ENVIRONMENTAL MANAGEMENT PLAN FOR  
LUBANA WETLAND COMPLEX  
IN  
THE REPUBLIC OF LATVIA

May 4, 2000



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Ms. ILONÁ JEPSEN  
Deputy Director of EPD,  
Ministry of Environmental Protection  
& Regional Development



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Mr. YOICHI IWAI  
Team Leader,  
JICA Study Team

In accordance with the Scope of Work (S/W) for the Study on Environmental Management Plan for Lubana Wetland Complex (the Study) agreed upon between the Ministry of Environmental Protection & Regional Development (MEPRD) and the Japan International Cooperation Agency (JICA), the JICA Study Team prepared the Interim Report (It/R), and submitted 30 copies of the English version to MEPRD.

The 3rd meeting of the Steering Committee (S/C) on It/R was held on May 4, 2000 where Ms. Ilona Jepsen, Deputy Director of EPD, MEPRD chaired on behalf of the Latvian counterpart agencies. The attendants to the meeting is shown in the list attached herewith. The JICA Study Team presented the contents of It/R, and the attendants made some comments on the contents of It/R. Based on the discussion of the S/C meeting, the followings have been agreed between the S/C member agencies and the JICA Study Team.

### **1. General Acceptance of It/R**

The Latvian side generally accepted It/R, and appreciated the major addition related to water level management as well as the quality of the other contents. The both sides agreed that the JICA Study Team continues to study in accordance with the proposed directions in It/R, considering the comments from the Latvian side mentioned as below.

### **2. Further Study on Inland Fishery**

It was pointed out by the Latvian side that there are some misunderstanding description on the inland fishery, regarding potentiality of lamprey and carp, Fish Fund system, fish market, fishery organisation, production history of crayfish, monitoring places and items for fishery management, species evaluation for angling, and fishery in environmental zoning. The JICA Study Team requested the Latvian side to provide these comments in a written form, and the Latvian side agreed to do so. The JICA Study Team agreed to further study in inland fishery of LWC, based on discussion with and information provided by the Latvian side.

### **3. Description about Regional Development, Land Use, and Database Mapping**

The Latvian side requested some descriptive correction on national and local planning situation related to regional development and land use, and mentioned a mistaken organisation name in charge of mapping. The JICA Study Team requested the Latvian side to provide these comments in a written form, and the Latvian side agreed to do so. The JICA Study Team agreed to correct the description based on information from the Latvian side.

### **4. Information to Establish the Socioeconomic Frame of LWC**

The JICA Study Team requested the Latvian side to provide information on the Long Term Strategy of Economic Development of the State, to establish the future socioeconomic frame for LWC. The Latvian side explained that it is still under drafting by the Ministry of Economy in cooperation with EU, but agreed that they will provide data and information helpful to the frame establishment as available as possible.

## 5. Selection of Model Area for the Detailed Biotope Map

The JICA Study Team proposed the Alternative Model Area 1 (Idena and Kvapani ponds and adjoining areas) among the 4 alternative areas to make the detailed biotope map. The Latvian side agreed with this proposal.

### Attachment : List of Attendants

#### Latvian Side


Ms. Ilona Jepsen	Deputy Director, EPD, MEPRD
Mr. Ilgonis Strauss	Head of Division, Investment Department, MEPRD
Ms. Alda Nikodemusa	Senior Official, Division of Spatial Planning, MEPRD
Mr. Vilnis Bernards	Senior Desk Officer, MEPRD
Mr. Normunds Riekstins	National Board of Fisheries, Ministry of Agriculture (MOA)
Ms. Liga Drozdovska	Ministry of Agriculture
Ms. Inara Ozerska	Ministry of Forestry

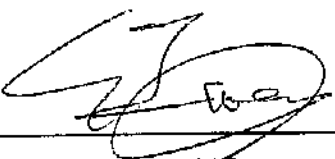
#### Japanese Side

Atsuhiko Yoshinaka	JICA Advisory Committee Member
Kazunobu Suzuki	JICA Headquarters
Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Motokazu Ando	JICA Study Team
Ugis Bergmanis	JICA Study Team
Masanori Doi	JICA Study Team
Yukiyasu Sumi	JICA Study Team

THE MINUTES OF MEETING  
ON  
THE PROGRESS REPORT (2)  
OF  
THE STUDY ON  
ENVIRONMENTAL MANAGEMENT PLAN FOR  
LUBANA WETLAND COMPLEX  
IN  
THE REPUBLIC OF LATVIA

July 27, 2000

  
Mr. ANDRIS EGLAJS  
Deputy State Secretary,  
Ministry of Environmental Protection  
& Regional Development

  
Mr. YOICHI IWAI  
Team Leader,  
JICA Study Team

In accordance with the Scope of Work (S/W) for the Study on Environmental Management Plan for Lubana Wetland Complex (the Study) agreed upon between the Ministry of Environmental Protection & Regional Development (MEPRD) and the Japan International Cooperation Agency (JICA), the JICA Study Team prepared the Progress Report (2) (P/R2), and submitted 30 copies of the English version to the Latvian side.

The 4th meeting of the Steering Committee (S/C) on P/R2 was held on July 27, 2000 where Mr. Andris Eglajs, Deputy State Secretary of MEPRD chaired on behalf of the Latvian counterpart agencies. The attendants to the meeting are shown in the list attached herewith. The JICA Study Team presented the contents of P/R2, and the attendants made some comments on the contents of P/R2. Based on the discussion of the S/C meeting, the followings have been agreed between the S/C member agencies and the JICA Study Team.

### **1. Financial and Organisational Arrangement of EMP**

The Latvian side generally accepted P/R2. But as for the financial arrangement proposed by the JICA Study Team, the Latvian side will further examine the proposal in consultation of the Ministry of Finance which has responsibility of financial decision. And the Latvian side will consider more the organizational proposal of the Implementation Committee (IC) and the Environmental Management Center. The JICA Study Team requested to offer the results of this Latvian side's consideration to the Japanese side.

### **2. LWC Conservation**

It was commented by the member from the University of Latvia on importance of water level control harmonising bird protection with fishery. And he asked about involvement of the other qualified academic institutes into the EMP implementation. The JICA Study Team explained that the proposed organization for the EMP implementation included such institutes familiar to LWC to make the organizational structure slim, although participation of the other institutes was possible. He agreed with it and promised to submit more detailed comments in a written form.

### **3. Fishery and Fish Conservation**

The S/C member from the National Board of Fishery (NBF) of the Ministry of Agriculture (MOA) supported all the proposed projects for fishery and fish conservation, and made some additional comments on angling and subsidy sources. The JICA Study Team requested to send these comments in a written form to the Japanese side. NBF agreed on it.

### **4. Directions for Fish Conservation**

It was confirmed between the JICA Study Team and NBF that the fishway at the Aiviekste sluice was unnecessary, that the whole Lake Lubana should be demarcated as the Active Management Zone (AMZ), and that the operation manual of Lake Lubana would be modified for proper water circulation of the southern part of Lake Lubana.



## 5. Participation of Local People and Governments

The Latvian side made inquiry on efforts for the JICA Study Team to involve local people and governments for the Study. The JICA Study Team explained that local participation was a direction of the Study from the very beginning, according to which the Study had been carried in cooperation with the local people and governments concerned.

## 6. Submission of the Comments

It was agreed by the Latvian side that the discussion results and comments related to Items 1 ~ 3 abovementioned should be delivered to the JICA Study Team in Japan from MEPRD by the end of August, 2000.

### Attachment: List of Attendants

#### Latvian Side

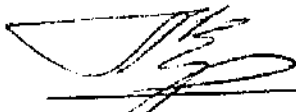
Mr. Andris Eglajs	Deputy State Secretary, MEPRD
Ms. Ilona Jepsen	Deputy Director, EPD, MEPRD
Mr. Vilnis Bernards	Senior Desk Officer, EPD, MEPRD
Ms. Astra Vilnite	Board of Municipalities, MEPRD
Mr. Batijors Hasans	Ministry of Foreign Affairs
Ms. Santa Martuza	Rural Development Dept., Ministry of Agriculture
Mr. Normunds Struve	Forestry Dept., Ministry of Agriculture
Ms. Gunta Ozolina	Senior Officer, Board of Fisheries, Ministry of Agriculture
Mr. Janis Priednieks	Associated Professor, University of Latvia

#### Japanese Side

Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Motokazu Ando	JICA Study Team
Ugis Bergmanis	JICA Study Team
Toshiro Hamada	JICA Study Team
Tomoo Aoki	JICA Study Team
Kengo Naganuma	JICA Study Team
Kazuhiko Anzai	Japanese Embassy of Latvia

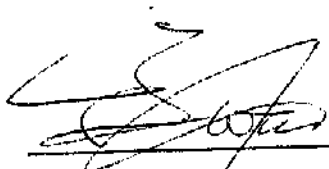
THE MINUTES OF MEETING  
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ENVIRONMENTAL MANAGEMENT PLAN FOR  
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IN  
THE REPUBLIC OF LATVIA

October 25, 2000



---

Mr. ANDRIS EGLAJS  
Deputy State Secretary,  
Ministry of Environmental Protection  
& Regional Development



---

Mr. YOICHI IWAI  
Team Leader,  
JICA Study Team

In accordance with the Scope of Work (S/W) for the Study on Environmental Management Plan for Lubana Wetland Complex (the Study) agreed upon between the Ministry of Environmental Protection & Regional Development (MEPRD) and the Japan International Cooperation Agency (JICA), the JICA Study Team prepared the Draft Final Report (DF/R), and submitted 50 copies of the English version to the Latvian side.

The 5th meeting of the Steering Committee (S/C) on DF/R was held on October 24, 2000 where Mr. Andris Eglajs, Deputy State Secretary of MEPRD chaired on behalf of the Latvian counterpart agencies. The attendants to the meeting are shown in the list attached herewith. The JICA Study Team presented the contents of DF/R, and the attendants made some comments on the contents of DF/R. Based on the discussion of the S/C meeting, the followings have been agreed between the S/C member agencies and the JICA Study Team.

### **1. Appreciation on DF/R**

The Latvian side had been satisfied with the high quality contents of DF/R well integrating environmental conservation and regional development, and with the JICA Study Team's attitude in due cooperation with local residents and municipalities. It appreciated correction and modification based on the previous comments from the Latvian side.

### **2. Rural Tourism in LWC**

The Ministry of Agriculture (MOA) asked about relations between rural tourism and eco-tourism for LWC. The JICA Study Team commented that rural tourism was important to develop the eco-tourism in LWC, and the Latgale Region Development Agency (LRDA) had regarded rural tourism as a key sector for the regional development. So the Team had taken rural tourism as important part of the eco-tourism development projects proposed in DF/R.

### **3. Angling and Fishery Development**

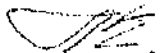
It was commented by the member from the National Board of Fishery (NBF) that development and conservation sides related to fish in LWC were well managed proposing the low-cost eco-tourism and angling projects which could be implemented easily with financial sources available.

### **4. Implementation of the EMP Projects**

MEPRD commented that the Latvian side would like to realize the EMP projects, by formulating a financial scheme, a council and a management authority which should organize multiple ministries and agencies concerned to integrate their cooperation and coordination.

### **5. Request on Submission of F/R Electric File**

MEPRD requested the JICA Study Team to submit the Final Report also in the electronic file format. The Team agreed to submit them with a set of electronic files as well.



## 6. Submission of the Comments

It was agreed by the Latvian side that any additional comments on the DF/R should be delivered to the JICA Study Team in Japan from MEPRD by 20th of November, 2000.

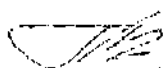
### Attachment: List of Attendants

#### Latvian Side

Mr. Andris Eglajs	Deputy State Secretary, MEPRD
Ms. Ilona Jepsen	Director of Nature Protection Department, MEPRD
Ms. Alda Nikodemusa	Senior Officer of Regional Development Department, MEPRD
Mr. Normunds Struve	Senior Officer of Forestry Department, MOA
Mr. Andis Zeikars	Senior Officer of Rural Development Department, MOA
Ms. Gunta Ozolina	Senior Officer of Board of Fisheries, MOA
Ms. Astra Vilnite	Administration Unit of Local Government Office
Ms. Laura Silina	Infrastructure & ISPA Coordinator, FAPCO

#### Japanese Side

Yoichi Iwai	Team Leader, JICA Study Team
Hiroshi Hasegawa	JICA Study Team
Motokazu Ando	JICA Study Team
Manabu Masaki	JICA Study Team
Ugis Bergmanis	JICA Study Team



Study on Environmental Management Plan for Lubana Wetland Complex

**Discussion Notes  
of Informal Meeting with Local Residents on Fishery**

August 31, 1999

**Participants of the Meeting :**

Fishermen of the townships located around the Lubana lake, Chairmen of Lubana and Rezekne District Councils and JICA study team members (34 attendants in total as listed in the Attendant List attached herewith)

At the beginning, there were short introductory phrases about the JICA Study on the management plan for Lubana wetland (especially regarding goals, study duration and informal meetings) by the JICA Study Team. Then, the participants were asked to express their ideas about the possible management plan and about the present situation and future prosperity in the local fishery sphere.

**Comments from Mayor of Lubana Town :**

- (1) Since the sluice between the Aiviekste river and the Lubana lake was built in the Soviet times, fish have been unable to go to the lake for their spawning. It caused the loss of many fish species. The local people could catch the fish almost by hands before the sluice construction.
- (2) The spawning takes place on the inundated meadows, which causes the loss of the fish spawns as the water level decreases. Many valuable species have disappeared including the local salmon.
- (3) The local authorities had ignored the local people's worries about the loss of the fish. In the Soviet times, the greatest attention was paid to the development of the agriculture and industry rather than fishery, which was not the most important field at that time. The Soviet Government had built a lot of cow and pig collection farms (Kolkhozes) around the lake, but without the sewage treatment plants. Pollution from the farms and factories killed many fish species resulting in lack of fish resources in the lake.

- (4) This area is recommendable to be used for eco-tourism needs. In the soviet times the anglers visited this place very often because of 3-kg carps and other species.
- (5) In the soviet times there was the Nagli Kolkhoz (founded in 1950) which produced and sold the fish. It was located on the Lubana lake. Its production was first sold in the local market. Later they were sent to Russia (1,500~1,800 t per year). Now they have only the local market (200~300 t per year) that demands only pike-perches, pikes, etc, at the low price and at the same time only the fresh ones.
- (6) The greatest problem is how to transport the fish to the market (i.e. in the refrigerators or in the water). The local fishermen do not have these transportation facilities, so that they like to cooperate with the middlemen (for the reasonable price and regular trading) or with the fish processing factories. Until now their collaboration has not been successful. Some factory representatives have come and gone without any special intentions.

#### **Fishermen's Comments :**

- (1) In the Soviet times about 10 t fish smolts per year were let into the lake and fish ponds every year. As nobody has paid attention to this kind of business after getting independence, there is no growth of fish smolts at all.
- (2) There is fish dying during summer and winter periods because of low water level.
- (3) The new territorial reform has caused socioeconomic problems with the lake borderline. Some townships feel offended because of the lost territories. The Lubana lake is now divided into 2 equal parts ; a half which belongs to Madona district and another half which belongs to Rezekne district. The new territorial reform is supposed to change this borderline for the benefit of one or another region. The local people have not been well informed about the reasons of this change. If it is ruled that one can do fishery only in his own territory, his income level from fishery will diminish.
- (4) Historically fishery has been concentrated mostly in the Lubana area. The fishermen have been in every house. But, fishing has not been the main business of these people, because it is forbidden to do any fishing or angling for about 1 ~ 3 months during fish spawning time forcing the fishermen to do something else (e.g. cutting woods and agriculture).
- (5) The number of fishermen working for the Nagli Kolkhoz was about 300 people. They got the salary every month and had stable income level. The Kolkhoz was responsible for letting the fish smolts in the lake after building the sluice, since they

could not get into the lake by themselves. The Kolkhoz also grew the fish on the ponds. After the Kolkhozes were ruined, people started to feel insecure and unsure about their future. As local people have to be responsible for everything by themselves, they want a controlling team (responsible body) again. After the Kolkhoz ruined, everybody remained alone with his own problems (no fish market, low income level, no credits for starting his own business, etc.) and nobody is responsible for anything.

- (6) Some people are however unwilling to start the cooperatives like the Soviet Kolkhoz system because they have had very bad experience in the Soviet times. The Soviet Kolkhozes had ruined not only the economy of the country but also the nature itself. In 1940 and 1945 when Russian came to Latvia, all the people in the rural areas were forced to enter the Kolkhoz. Their property was taken away and became the property of Kolkhozes. The people who refused to give their property away were sent to Siberia. Those are why the part of people (usually Latvian) hated the Soviet system while the comers from Russia supported and support it even nowadays. The people of this area should learn about the cooperatives in other parts of Latvia.
- (7) Most of the good ideas about the development of this area have been hampered by the lack of good roads. The Soviet Government had financed for the important roads (Riga – Moscow, St. Petersburg – Warsaw, etc.). Lubana area geographically is not in the central position so that the roads in this area are in bad condition. The new Latvian Government does not have money for these needs, too. Without good roads, it is difficult to quickly and safely transport raw materials, products and visitors associated with any development activities.
- (8) There is a great necessity to have one coordinating authority (team) that would manage the Lubana area like one unit, not taking into account the existing territorial division. Now there are many departments that take care of different issues separately.
- (9) The former system without any sluice should be renewed. It includes some natural slope places along 16 km from the Aiviekste source and near Kalnagala sluice. These slope places were used for the fish migration to the spawning places in spring and against suffocation in winter. (The JICA Study Team is supposing that rehabilitation to the natural slope will not enhance damages at the downstream area because the downstream flooding scale will not differ so much regardless of the natural slope places.)
- (10) There is no any necessity to ruin anything. The people should maintain the existing system, avoiding the possible mistakes and taking into account the right water level

management system.

- (11) There are some illegal fishermen who work also during spawning time when it is very easy to get the fish with nets and electricity. If they are caught by the fishery inspectors, they must pay a fee and their names are published in the newspapers. The illegal fishing has decreased the fish amount.
- (12) After getting independence, the fishing Kolkhoz had met many financial problems so that it was refused to continue the management of fish ponds and the lake. Now the local fishermen work both on the lake and the fishponds individually. The lack of financial resources has also caused the break of the facilities. The sluices and water gates have not been repaired since 1991. They gradually are ruined not only by the time but also by some hooligans.
- (13) Everybody in the Lubana area supports the necessity for one management plan that could unite the farmers', hunters' and fishermen's interests. Everybody understands the international importance of the Lubana wetland and is ready to combine his/her group's interests with the needs of the natural conservation.
- (14) There is the necessity to implement some new ideas in the management plan, for example, to start growing wild horses, to make this area suitable for eco-tourism, to renew the fish smolts naturally, etc.
- (15) The danger of the floods had been exaggerated in the Soviet times to get more financial support from Moscow. The local people are even waiting for this flooding period to get the fertile sapropel from the lakebed. It is used for fertilizing the fields.



## ATTENDANT LIST of the Informal Meeting with Local Residents on Fishery

Date: August 31, 1999 (9:30 – 12:30)

Place: Lubana City Club, Lubana City Municipality

No	NAME	POSITION / ADDRESS
1	Joanne McGuire	Business consultant – Madona Regional Council, Saieta laukums – 1, Madona, LV - 4810
2	Vilnis Strautins	Chairman of Indrani township. Lubana Balozu street 2, LV – 4830
3	Vineta Strautina	Vidzeme region tourism information center specialist. Saieta laukums 1, Madona, LV-4801
4	Valdis Bukelu	Aiviekste MSVP inspector. Lubana Parka 3, LV-4830
5	Peteris Igauns	Aiviekste MSVP inspector. Lubana Parka 3, LV-4830
6	Valdis Springis	Aiviekste MSVP inspector, fisherman. Lubana Parka 3, LV-4830
7	Janis Duda	Fisherman. Naglu township, Idena.
8	Dzintars Kazulis	Chairman of Osupe township.
9	Stanislavs Smelters	Chairman of Barkava township.
10	Juris Smocs	Fisherman
11	Valdemars Dreimanis	Chairman of Nagli township.
12	Ivars Ruzans	Rezekne Environmental Board Specialist
13	Erika Ruskule	Rezekne Environmental Board Deputy Director
14	Arturs Skute	DPU, Ecological laboratory
15	Janis Berzins	Planer of Osupe township, fisherman.
16	Ivars Bodzs	Executive director of Lubana town.
17	Dzintars Ziedins	Fisherman.
18	Arturs Betlers	Fisherman. Osupe township
19	Martins Trops	Fisherman. Osupe township
20	Roberts Reblis	Fisherman. Nagli township
21	Antons Pless	Fisherman. Nagli township
22	Antons Sveds	Fisherman. Nagli township
23	Valdis Pusts	Fisherman. Gaigalava township
24	Janis Macans	Fisherman. Nagli township
25	Karlis Doropolskis	Fisherman. Lubana, Ozolu 14-41
26	Andrejs Celpiters	Chairman of Madona district. Madona Saieta laukums 1, T:4822231
27	Jevgenijs Sabko	Madona Regional Environmental board.
28	Mikelis Gruzitis	Chairman of Lubana town. Tilta street 11. LV-4830
29	Monvids Svarts	Chairman of Rezekne district, Chairman of Gaigalava township.

### JICA Study Team

Hiroshi HASEGAVA (Land Use/Regional Development)

Manabu MASAKI (Water Management/Hydrology)

Ugis BERGMANIS (Wildlife/Ornithology)

Yoshiyasu SUMI (Coordinator)

Inta RIMSANE (Interpreter)

Study on Environmental Management Plan for Lubana Wetland Complex

**Discussion Notes  
of Informal Meeting with Local Residents on Agriculture**

September 15, 1999

Participants were farmers from the townships located around the Lubana lake, some staff of the local municipalities, and JICA study team members (35 attendants in total as listed in the Attendant List attached herewith).

At the beginning, there were short introductory phrases about the JICA Study on the management plan for Lubana wetland (especially regarding goals, study duration and informal meetings) by the JICA Study Team. Then, the participants were asked to express their ideas about the possible management plan and about the present situation and future prosperity in the local agricultural activities including forestry. Main comments and requests from the farmers were as follows :

**Income from Agriculture**

- (1) Since 1920s (the time of the first independence of Latvia) the local people had owned about 15 ~ 20 ha of land per family. In the Soviet times everybody had to enter the collective farms (Kolkhozes) to unite all the lands. After getting the latest independence the people got the former land back (the same 15 ~ 20 ha as before), while some of them have got around 100 ha by buying or renting land. They grow rye, wheat, barley and peas. (All farmers in the meeting agree that these amounts of land are too small to get enough income from the agriculture.)
- (2) Experiencing the Soviet collective farming system, the people do not want the cooperatives. There are many farmers' unions and societies founded after 1991. The leaders of these organizations receive the salary, while the farmers get any benefit or support neither from these organizations nor from the local governments. Therefore, they feel rather depressed and lonely in this area.
- (3) The local farmers have been forced to work only for their own needs. Nothing is produced for the market. This situation brings no hopes for the farmers themselves or for their children, who go to the cities and do not come back.

**Subsidies and Market for Agriculture**

- (4) The farmers know about the biologically clean production (e.g. organic agriculture) that is supported by the EU countries. Since the market relation with Russia has been broken after 1991, the biologically clean production can be the first step to establish the new market. However, in the Lubana area there is not enough financial resources to build the new laboratories for checking the production quality, which is an essential

factor for starting this type of business. Moreover, the farmers do not have the necessary knowledge about the biologically clean production. They are willing to attend the necessary seminars or courses on this subject if there is governmental supports.

- (5) The local farmers do not have the equal opportunities with EU farmers who receive subsidies from their countries. The EU agricultural products have been sent to Latvia with rather low price in comparison with the local price so that the consumers choose the foreign goods, creating the losses for the local farmers. This is a very dishonest competition for Latvian farmers, as the local farmers have received no or ridiculously little subsidies from the government.
- (6) In the Soviet times, the Latvian farmers also got subsidies. For example, the purchase price of milk was much higher than its price in the shops. At the same time the fuel price was very low. Nowadays this situation is just the opposite. It has turned out the situation that farmers do not receive any income from agricultural activities.
- (7) The Latvian government should make agreement with the Russian government about the free borderline between these 2 countries. While this problem is not solved, the farmers of the Lubana area have no market possibilities. It means that there is no future for the agriculture in Lubana area.
- (8) There is the regional fund in Latvia that gives the financial support for the townships and businessmen if they prepare the successful project application. The townships should pay more attention to such financial opportunities.

### **Credit Services for Agriculture**

- (9) The interest rate in the banks was rather acceptable for the farmers in the beginning of 1990s. Some of the farmers had taken the credits for further development or for paying back the former credits, so that agricultural development in the rural areas of Latvia had been started. However, during the last 3 years, the farmers met many problems in having credits from the banks because of very high interest rates (sometimes up to 20%) and mortgage necessity (the banks of Latvia do not accept land as the mortgage possibility).
- (10) In spite of these severe economic situations, there are some younger farmers (also among the participants) who utilize the credit services and have profits from agriculture, e.g. by growing seed material.

### **Forestry**

- (11) The government supports growing forests in the rural area. The farmers should use this support and start tree planting on their agricultural land. This business may give them a good income. At the same time, growing the new forests will give the possibility to increase number of endangered wild animal species in these territories.

(12) There are some sawmills and wood processing factories in the area (in Nagli 2, and in Gaigalava 7). As the territory has rather many woods, this business may give a good income for the people who work there. As the labor force is cheap but the production quality is high, the middlemen from Riga come and bring the production to the cities.

#### **Intention to Protected Area**

(13) The former arable land is full of bushes and weeds at present. The people like to improve this situation, but they do not have enough money for the new machinery or equipment. There is a joke about the possibility of growing endangered bird or animal species in these “wild areas”. In this case agriculture is not necessary at all.

(14) The farmers are not interested in having any protected areas on their own land because the government does not compensate the losses created by the land use restrictions. The townships also are not interested in land use tax exemption (in protected areas) for individual farmers, because the townships lose money in these cases. The government should ratify the special regulations about the compensation matters.

#### **Intention to Inundation Control**

(15) Since 1991, the flooding danger in the Lubana area has increased because the flood control facilities such as dams and sluices have not been satisfactorily repaired. For example, there were inundated areas in June of 1998 when there was much rain but the pumping stations could not regulate the water level appropriately. The crop was under the water for more than 3 weeks, then it was completely lost. Before having the dams around the lake, natural spring floods had left fertile soil on the fields and meadows, while after building the dams the soil always is left in the lake and there are only the floods caused by the precipitation.

(16) In the Soviet years the government was interested in having a great amount of arable land. The subsidies to the townships depended on the amount of arable land. All the possible areas were drained, including meadows, bogs, etc. Nowadays it is not possible to grow oak, maple or conifer trees in these areas because these timbers have rather low quality. This soil is good only for birch-trees. The farmers around the Lubana area agree to decrease the amount of the drained areas.

#### **Intention to Eco-tourism**

(17) The farmers from the Osupe and Indrani townships have positive attitude towards tourism development, because there are many tourism spots around the Lubana lake. Some people have already started to collect the necessary information such as the number and location of the possible “bed-and-breakfast” places, the hosts’ education level, the necessary road marks, etc.

(18) When tourism industry is developed, it is necessary to decrease the amount of agricultural lands. But the specific situation in this area (bushes and weeds on the

wasted arable land) does not demand the decrease of the agricultural land. Tourism is a good option for this area if the local people start to clean and improve the environment that is a necessary factor for attracting visitors to the Lubana Lake.

### **Expectation to JICA Study**

- (19) Agricultural land accounts for about 70 % of the whole Osupe township area. The township is interested in having the research (if possible, just in this JICA project) about the necessary amount of “wood belt” that protects the soil from erosion. And the local people like the JICA study to include more information about the plain meadows, for example, what to do with these meadows if they belong to the important biotopes of Latvia (to grow endangered animal species or to use them for the agricultural needs).
  
- (20) Most of the local farmers are willing to live in the Lubana area, by uniting their own interests with fishery and forestry needs. They stressed that there are problems that can be solved only with the governmental support. JICA study team should propose also on the governmental actions in the management plan.

## ATTENDANT LIST of Informal Meeting with Local Residents on Agriculture

Date: September 15, 1999 (10:00 – 13:30)

Place: Township Hall, Indrani Pagast (Township)

No	NAME	POSITION / ADDRESS
1	Vilnis Strautins	Farmer, Indrni township.
2	Vineta Strautina	Madona District Council
3	Evalds Sternieks	Farmer, Lazdukalna township
4	Andrijs Krakups	Agriculture department of Balvi district
5	Jelena Saicane	Development department of Balvi district
6	Aloizs Justs	Farmer, Varaklani township
7	Vija Koka	Farmer, Osupe township
8	Imants Koks	Farmer, Osupe township
9	Janis Klavins	Consultant of Lubana town
10	Vilis Ozolins	Farmer, Balvi district
11	Juris Pilka	Land surveyor of Balvi district
12	Peteris Everts	Executive Director of Rugaju township
13	Janis Ozolnieks	Farmer, Osupe township
14	Janis Berzins	Farmer, Osupe township
15	Dzintars Kozulis	Farmer, Osupe township
16	Stanislavs Smelters	Chairman of Barkavas township
17	Vilnis Kaptunis	Farmer, Rugaju township
18	Gunars Apsenieks	Farmer, Berzpils township
19	Zigrīda Sproģe	Farmer, Osupe township
20	Alda Jansone	Farmer, Osupe township
21	Sandra Ezmale	Development department of Rezekne district
22	Janis Jansons	Farmer, Osupe township
23	Uldis Dekters	Farmer, Osupe township
24	Juris Cevers	Farmer, Osupe township
25	Peteris Vovers	Farmer, Sudranu township.
26	Astrida Semjonova	Agriculture consultant of Osupe township

### JICA Study Team

Hiroshi HASEGAVA (Land Use / Regional Development)

Manabu MASAKI (Water Management / Hydrology)

Ugis BERGMANIS (Wildlife / Ornithology)

Isao SAKAI (Wetland Vegetation)

Kenichi SHIBATA (GIS)

Shouji MASUMURA (Agriculture / Fishery)

Yoshiyasu SUMI (Coordinator)

Inta RIMSANE (Interpreter)

Oskars SKREDELIS (Interpreter)

### **Discussion Notes of the 3rd Informal Meeting on Eco-tourism and Rural Tourism in LWC**

July 13, 2000

Participants consist of fishermen, farmers, businessmen and local governmental representatives, amounting to 24 persons as shown in the list attached herewith. The JICA study team at first made brief introductory presentation on eco-tourism for LWC, followed by the free discussion among the participants on prospects, constraints and local ideas for the tourism development. The main comments are as below.

#### **Institutional Aspect**

- (1) Every local resident of the townships concerned has some tourism resources that are available for tourists such as boats and attractive landscape. These resources can be united if the people make a cooperative organization. The organization could make tourism-project applications for the governmental supports. (Participant from Osupe Township)
- (2) There were tourists from Sweden in Nagli the other day. They spent one day enjoying the fishpond and other activities, but did not leave any money. Travel agents in Riga took all the money. It means that local people who want to develop the tourism really need a local cooperative organization. (Fisherman from Nagli township)
- (3) Cooperation among the local people is agreeable, because LWC is very wide and divided among many townships which have their own potentials and resources. They should be united for developing the tourism. (Chairman of Nagli township)
- (4) About 10 years ago, the townships and different organizations tried to found an organization that would deal with management problems of LWC. But it was not successful, because quarrel among the local people happened about the borderline dividing Rezekne and Madona districts in Lake Lubana and about the best fishing places for bream. (Mayor of Lubana town)
- (5) Although Latvian people usually do not want to collaborate, it is agreeable that tourism industry would unite the people. When somebody decides to provide the overnight services for the tourists, he needs the neighbors' support to entertain the tourists for some days. His neighbors could offer some hiking routes or natural trails. (Participant from Osupe township)
- (6) Local residents are ready to collaborate only when they can get profit from the collaboration. Farmers and fishermen are willingly to accept visitors from other districts of Latvia if their visit brings some income. (Mayor of Lubana town)
- (7) The people must unite at first in order to make it much easier to start the new projects supported by the governmental organizations. (Participant from Gaigalava township)

#### **Financial Aspect**

- (8) There is a personal experience in finding financial support to build the facilities for anglers. The township municipality and all other institutions supported this idea in all

the ways except for the financial one, due to their poor financial capacity. It will be appreciated if the Japanese Government would offer possible financial sources to the local residents. (Businessman from Gaigalava township)

- (9) Local farmers are very afraid of financial cooperation with private organizations, since there have been hardly positive results of such cooperation in Latvia. People have been usually cheated at the end by the private organizations without any guarantees. (Farmer from Osupe township)
- (10) It is doubtful and unrealistic that the SAPARD program helps people in the eastern part of Latvia, because it still has many financial barriers to be cleared by the local farmers. The program requires the initial capital as it will cover only a part of the expenses afterwards. The farmers must take the bank loan with high interest rates in Latvia. (Many participants)
- (11) It will be necessary to prepare at least 5,000 LVL to rehabilitate the house for tourist needs, including new electricity line, bathroom, toilet and road. While a few out of about 200 farmers around Lake Lubana will agree to take the credits with low interest rates, the most will not want to have a risk. They hate to leave the debts to their children, as tourism business does not give much profit. It can be assumed that only 100 local tourists at most usually come in summer and that they cannot pay as much as 10 LVL/night. It means that the farmer cannot get back the money he has spent for the renewal of the house. (Mayor of Lubana town)
- (12) The farmers are not so much worried about such financial risk, and are ready to take the loan with low interest rates. (Many participants)
- (13) Comparing the tourism development budgets of the Baltic countries such as 436,000 LVL of Estonia, 362,000 LVL of Lithuania and 102,000 LVL of Latvia, the Latvian government looks to have less interest in developing the tourism business. (Chairman of Indrani township)

### **Potential Tourists**

- (14) It will be difficult to expect many foreign tourists to LWC. It is necessary to think more about the local tourists, especially the school pupils. Every school in Latvia organizes the excursions twice a year (in spring and autumn), for which LWC may arrange a tourism program for one day at least so that the pupils would come to LWC rather than Liepaja or Ventpils. (Participant from Nagli township)
- (15) The landscape is mostly similar all over Latvia. It will be hopeless to attract the usual tourists to LWC, because nobody will farther come to LWC by seeing the same landscape as LWC. Only the anglers and hunters want to visit LWC. (Fisherman from Gaigalava township)
- (16) At present, another negative factor to attract the foreign tourists existing in LWC is language barrier, as the local people do not know the foreign languages. (Chairman of Indrani township)
- (17) The number of the tourists has decreased by 46 % since 1998 in comparison with Lithuania and Estonia. Foreign tourists do not want to visit Latvia due to expensive services of very low quality. (Mayor of Lubana town)



- (18) These data are for the situation of the hotels in large cities, as there are only few tourists in the rural areas. There are many 4 star hotels that offer low quality services. (Chairman of Indrani township)

### **Angling and Hunting**

- (19) The Nagli fish farm has had many difficulties in finding the market for their production. Therefore, it has already started to bring visitors from other districts, by leasing some fishponds for angling. The visitors pay some money for angling and purchasing carp from the pond. In its privatization process, angling in addition to fishery is preferable as far as it generates profit. (Chairman of Nagli township)
- (20) The existing hunting regulations should be modified so that geese hunting is allowed in spring season. (Mayor of Lubana town)

### **Publicity of LWC**

- (21) There are many rare bird species and other natural resources, but nobody has advertised them. (Chairman of Nagli township)
- (22) It is possible to find all the information about rare bird species of LWC in Internet. The Daugavpils Pedagogical University have already put this information in its home page. (Researcher of the Daugavpils Pedagogical University)
- (23) There are tourism associations in Latvia. It is necessary to make effective use of such organizations to easily spread the information about tourism potentials in LWC. (Participant from Gaigalava township)

### **Other Aspects**

- (24) It is recommendable to integrate two kinds of projects such as dyke rehabilitation and environmental conservation as a package. (Researcher of the Daugavpils Pedagogical University)
- (25) Latvians had been isolated from the world for 50 years. Now people are sure that Latvia has to take everything from Europe. However, Latvians must not forget their own traditions and standards. Everything coming from abroad is not always acceptable to Latvia. (Chairman of Indrani township)

### ATTENDANT LIST of the 3rd Informal Meeting on Eco-tourism and Rural Tourism

Date : July 13th 2000 (10:00 – 12:30), Place : Meeting Room (4F) in Rezekne District Council

No	NAME	POSITION / ADDRESS
1	JAZEPS BRENCIS	FISHERMAN; NAGLI, IDENA
2	ANNA MACANE	ECONOMIST; NAGLI TOWNSHIP, IDENA
3	DZINTARS KOZULIS	CHAIRMAN OF OSUPE TOWNSHIP
4	AIJA SPICA	EXECUTIVE DIRECTOR OF GAIGALAVA TOWNSHIP MUNICIPALITY
5	LILITA DEKTERE	FARMER; OSUPE TOWNSHIP
6	ERIKA RUSKULE	DEPUTY DIRECTOR OF REZEKNE ENVIRONMENTAL BOARD
7	VILNIS STRAUTINS	CHAIRMAN OF INDRANI TOWNSHIP
8	MIKELIS GRUZITIS	MUNICIPALITY OF LUBANA TOWN
9	INGA CEVERE	HOUSEWIFE, NAGLI
10	JEVGENIJS CERNIHOVICS	MAIN SPECIALIST, DPU, LAB. OF ECOLOGY
11	VOLDEMARS DREIMANIS	CHAIRMAN OF NAGLI TOWNSHIP
12	JANIS BERZINS	OSUPE TOWNSHIP
13	JANIS BERZINS	OSUPE TOWNSHIP, TERRITORIAL PLANNER
14	VIJA KOKA	OSUPE TOWNSHIP, FARMER
15	DIANA MARGA	NATURE FUND OF LATVIA; REZEKNE
16	JEVGENIJS SABKO	DIRECTOR OF MADONA ENVIRONMENTAL BOARD
17	BRIGITA ARBIDANE	REZEKNE DISTRICT COUNCIL, SPECIALIST OF PLANNING DEPARTMENT
18	LIGA SALENIECE	METHODIST; BARKAVA
19	JURIS SMOCS	FISHERMAN; NAGLI TOWNSHIP
20	JANIS MACANS	FISHERMAN, NAGLI
21	JURIS SPICS	BUSINESSMAN, GAIGALAVA
22	EDMUNDS SVARCS	OPERATOR OF THE FUEL STATION; GAIGALAVA
23	JANIS BIRZE	BUSINESSMAN, GAIGALAVA
24	SANDRA BIRZE	GAIGALAVA

#### JICA Study Team

Youichi IWAI (Team Leader / Regional Conservation)

Hiroshi HASEGAVA (Land Use / Regional Development)

Toshiro HAMADA (Tourism / Eco-tourism)

Tomoo AOKI (Socio-economy / Financial Analysis)

Kengo NAGANUMA (Coordinator)

Inta RIMSANE (Interpreter)

Study on Environmental Management Plan for Lubana Wetland Complex

**1st Workshop on Progress Report (1)**

November 23 of 1999, in RDC

**Discussion Memorandum**

**1. Population in LWC**

A local participant made an inquiry about the estimated population of about 6,500, and commented importance of consideration on external landowners. The JICA study team responded that this population figure was estimated only for LWC based on the local municipalities' demographic data, and requested the Latvian counterparts to provide the data available for the external land owners of LWC.

**2. Fish Species**

A local researcher commented that the study result didn't include description on such important fish species. The JICA study team responded that further study on fish species would be continued although available data on fish were more limited than other fauna.

**3. Eco-tourism Development**

A staff from the tourism institute asked about profits and costs of eco-tourism activities proposed in AMZ. She also expressed interest in eco-tourism but stressing importance of market research to confirm actual demand and to promote as business.

**4. Regional Development**

The chairman of Rezekne district commented that human development with education was more important so that local business and private enterprise activities could be promoted, in spite of financial difficulties. Local participants expressed their intentions that they had done economic activities including fishery together with environmental protection even before the independence. And they like to actively participate into EMP actions, because they think that local involvement and natural protection under EMP are important for the future generation as well. The JICA study team commented that EMP was just a starting point for sustainable development in LWC.

## 5. Water Quality

The chairman of Madona district stressed importance of water quality in LWC and its downstream areas for eco-tourism and fishery. The JICA study team totally agreed with his comment, and explained that water in the southern Lake Lubana and some fishponds had been stagnated and effluent water quality from the wastewater treatment plan in Rezekne city did not meet the discharge standard. Therefore, the team agreed to continue to pay attention to water quality during the further study.

## 6. General Comments from Counterpart Agencies

Mr. Bernards of MEPRD appraised the Japanese cooperation through the current JICA study in supporting the area financially and technically, expecting the final study results to be a good basement for the future projects in Latvia. Representative from MREB explained that the board also has involved into this JICA study together with other researchers and local residents, and intended its further cooperation. He also regarded this study as what has shown possibilities for further planning in Latvia.

**List of Latvian Participants in the 1st Workshop**

No.	Name	Occupation/Position	Address
1	Jevgenijs Sobko	Madona Regional Environment Board-director	Blaumana iela 7, Madona, LV-4801
2	Normunds Vejonis	Madona Regional Environment Board-head of the department	Blaumana iela 7, Madona, LV-4801
3	Arkadijs Sluckis	Aiviekste Land Reclamation System Administration- chairman	Parka iela 3, Madonas rajons, Lubana, LV-4830
4	Andrejs Celapiters	Madona District Council- chairman	Saieta laukums 1, Madona, LV-4801
5	Janis Barbals	Chairman of Varaklani township	Latgales prospekts 12, Varaklani, Madonas raj., LV-4838
6	Modra Vilkevica	Deputy chairman of Murmastiene township	Jaunatnes iela 14, Murmastiene, Madonas raj., LV-4835
7	Dzintars Kozulis	Chairman of Osupe township	Degumnieki, Madonas raj., LV-4833
8	Vilnis Strautins	Chairman of Indrani township	Balozu iela 2, Lubana, Madonas raj., LV-4830
9	Mikelis Gruzitis	Chairman of Lubana town council	Tilta iela 11, Lubana, Madonas raj., LV-4830
10	Inta Sirmace	Chairman of Dauksti township	Darza iela 10, p/n "Staki", Gulbenes raj., LV-4417
11	Vilnis Bernards	Specialist, Environmental Protection Department, MEPRD	Peldu iela 5, Riga, LV 1494
12	Arnis Greidins	Cesvaine Main Forestry- assisstant of the main forester	Drza iela 4, Cesvaine, Madonas raj., LV-4871
13	I. Erta	Engineer, Rezekne Main Forestry	Raznas iela 6, Rezekne, LV 4603
14	Janis Berzins	Deputy chairman of Osupe township, fisherman	Me a iela 8-1, Ošupes pagasts, Madonas raj., LV-4833
15	Ansis Deksnis	Lubana High School, teacher, fisherman	Brivibas iela 9-5, Lubana, Madonas raj., LV-4830
16	Arturs Betlers	Unemployed, fisherman	Varavīksnes gatve 8-27, Rīga
17	V. Zvidrins	Rezekne District Council-executive director	Rezekne, Atbrīvošanas aleja 95, LV 4600
18	S. Ezmale	Rezekne District Council- planning dpt.; Manager of Latgale Development agency, Rezekne branch	Rezekne, Atbrīvošanas aleja 95, LV 4600
19	B. Dreimane	Rezekne District Council- planning dpt.	Rezekne, Atbrīvošanas aleja 95, LV 4600
20	Janis Macans	fisherman	Idena, Nagli pagasta, Rezekne raj.

No.	Name	Occupation/position	Address
21	Sandra Brise	fisherman	Gaigalava pagasta, Rezekne raj.
22	E. Ruskule	RREB- deputy director	Zemnieku iela 5, Rezekne, LV 4601
23	I. Vanags	Ziguri Main Forestry-Ecologist	Ziguri, Rupnicas iela 8, Balvu raj., LV 4584
24	I. Bodrova	Rezekne Main Forestry-Engineer	Raznas iela 6, LV 4603, Rezekne
25	J. Karro	RREB- director	Zemnieku iela 5, Rezekne, LV 4601
26	M. Svarcs	Rezekne District Council, Gaigalava township- chairman	Rezekne, Atbrivošanas aleja 95, LV 4600
27	V. Iljanova	Balvi District Council- chair person	Berzpils 1 a, Balvi, LV 4501
28	A. Dreimanis	Chairman of Nagli township	Naglu pag., Rezeknes raj.
29	J. Benislavskis	Chairman of Dekšares township	Dekšares, Rezeknes raj., LV 4614
30	A. Kindzuls	Chairman of Berzpils township	Berzpils, Balvu raj., LV 4576
31	G. Kalvane	Farm " Nagli"	Z/ba "Nagli", Rezeknes raj.
32	E. Skrnars	RREB; hidro biologist	Larclnkaln pag., Balvi raj.
33	A. Skute	Laboratory of Ecology, DPU, Head	13, Vienibas str., Daugavpils LV-5400
34	Rita Krevene	farmer	Rugaji pag., Balvi raj.
35	J. Spenners	Executive director of Dauksti township	Dauksti township, Gulbene
36	I. Sture	Lecturer in tourism department, Vidzeme Institute of Higher Education	Terbatas iela 10, Valmiera, LV 4200
37	S. Smelters	Chairman of Barkava township	Barbava, Brivibas 9
38	H. Gajonors	RDC	Rezekne, Atbrivošanas aleja 95, LV 4600

Study on Environmental Management Plan for Lubana Wetland Complex

## 2nd Workshop on Progress Report (2)

July 24 of 2000, in RDC

### Discussion Memorandum

#### 1. Future Socioeconomic Frame

Ms. S. Ezmale (Office Manager of LRDA) commented that socioeconomic figures for each district concerned should exclude city's data to reflect the real countryside situation. The JICA study team responded that the socioeconomic data for the districts in the frame accounted only for figures of towns and townships, excluding data of cities like Rezekne city.

#### 2. Financial Aspect

Mr. J. Karro (Director of RREB) and Mr. J. Sabko (Director of MREB) totally agreed with the visions envisaged in EMP, but mentioned concerns about financial arrangement to implement the EMP projects. The JICA study team explained that financial affordability of the potential sources had been and would be analyzed in the financial plan proposed for the EMP projects. And the team recommended that there should be a strong collaboration and united directions between the Rezekne and Madona sides for financial application to donors.

The team had recognized that political and financial support by the central government was essential, as Dr. A. Skute (DPU) commented. In particular, some commitment of MEPRD as the counterpart ministry is quite important to receive foreign assistance for the EMP implementation.

#### 3. Fishery Development

The proposed concept for fishery development, "Lake of Pike", was supported by the RREB Director, who was but worried about migration of fish species. The JICA study team mentioned that its analysis on migration concluded unnecessary of fishway at the Aiviekste sluice, considering ecological and economical merits/demerits of its construction. But it could be reconsidered to be included in the proposed Aiviekste Sluice Rehabilitation Project, if requested strongly by the Latvian side.

#### 4. Institutional Aspect and Training

Mr. V. Zvidrins (Executive Director of RDC) insisted on necessity for the local municipalities and people to commence actions by themselves, and appraised the JICA study as a masterpiece which would attract investors and connect the organizations

concerned. The JICA study team presented the same opinion on organizational connection function of EMP which would not but generate ordinary direct benefits.

The MREB Director mentioned difficulty in actual implementation of EMP, especially for necessary experts and training. The JICA study team responded that EMC as an action body was proposed under the Implementation Committee so that the various agencies concerned could be consistently directed and EMP could be actually implemented.

It was noticed by the team that necessary actions on training/education were proposed in two chapters of the Progress Report (2). Specialists required for eco-tourism and natural conservation are expected to be arranged in cooperation of the existing institutes such as DPU, the Teici Nature Reserve Office, and the Rezekne High Education Institute, as Dr. Skute commented.

## 5. Management in AMZ

Dr. Skute reminded of importance of private land treatment in AMZ. The JICA study team agreed with this importance, and mentioned that agreement with these private land owners should be established for the EMP implementation by coordinating their intentions for development.

## 6. Implementation Timing of Eco-tourism Projects

Mr. V. Strautins (Chairman of Indrani township) made an inquiry about different commencement year between the Indrani & Lubana Eco-tourism Development Project (2003) and the Nagli & Gaigalava Eco-tourism Development Project (2001). The JICA study team explained that it was because of a higher maturity of the Nagli & Gaigalava project to be carried out as a pilot project, followed by the Indrani & Lubana project. It can be possible to start the both at the same time.

### List of Latvian Participants in the 2nd Workshop

No.	Name	Occupation/Position	Address
1	Jevgenijs Sobko	Madona Regional Environment Board-director	Blaumana iela 7, Madona, LV-4801
2	Normunds Vejonis	Madona Regional Environment Board-head of the department	Blaumana iela 7, Madona, LV-4801
3	Arkadijs Sluckis	Aiviekste Land Reclamation System Administration- chairman	Parka iela 3, Madonas rajons, Lubana, LV-4830
4	Andrejs Celapiters	Madona District Council- chairman	Saieta laukums 1, Madona, LV-4801
5	Janis Barbals	Chairman of Varaklani township	Latgales prospekts 12, Varaklani, Madonas raj., LV-4838
6	Modra Vilkavsā	Deputy chairman of Murmastiene township	Jaunatnes iela 14, Murmastiene, Madonas raj., LV-4835
7	Dzintars Kozulis	Chairman of Osupe township	Degumnieki, Madonas raj., LV-4833
8	Vilnis Strautins	Chairman of Indrani township	Balozu iela 2, Lubana, Madonas raj., LV-4830
9	Mikelis Gruzitis	Chairman of Lubana town council	Tilta iela 11, Lubana, Madonas raj., LV-4830
10	Inta Sirmace	Chairman of Dauksti township	Darza iela 10, p/n "Staki", Gulbenes raj., LV-4417

No.	Name	Occupation/position	Address
11	Janis Zeiers	Ltd Holzwerke – general director	Parka iela 1, Lubana, Madonas raj., LV-4830
12	Arnis Greidins	Cesvaine Main Forestry- assisstant of the main forester	Drza iela 4, Cesvaine, Madonas raj., LV-4871
13	Martinš Trops	Osupe township, farmer, fisherman	Ošupe pag., "Paukulnieki", Madonas raj., LV-4833
14	Janis Berzins	Deputy chairman of Osupe township, fisherman	Me a iela 8-1, Ošupes pagasts, Madonas raj., LV-4833
15	Ansis Deksnis	Lubana High School, teacher, fisherman	Brivibas iela 9-5, Lubāna, Madonas raj., LV-4830
16	Arturs Betlers	Unemployed, fisherman	Varaviksnas gatve 8-27, Rīga
17	V. Zvidrins	Rezekne District Council-executive director	Rezekne, Atbrivošanas aleja 95, LV 4600
18	S. Ezmale	Rezekne District Council- planning dpt.; Manager of Latgale Development agency, Rezekne branch	Rezekne, Atbrivošanas aleja 95, LV 4600
19	B. Dreimane	Rezekne District Council- planning dpt.	Rezekne, Atbrivošanas aleja 95, LV 4600
20	J. Zvidrins	Rezekne District Council- planning dpt.	Rezekne, Atbrivošanas aleja 95, LV 4600
21	G.Ozolina	Aguriculture Ministry, Fishery dpt.- specialist	Zemkopības ministrija, VZP, Rīga
22	E. Ruskule	RREB- deputy director	Zemnieku iela 5, Rezekne, LV 4601
23	I. Vanags	Ziguri Main Forestry-Ecologist	Ziguri, Rupnīcas iela 8, Balvu raj., LV 4584
24	I. Bodrova	Rezekne Main Forestry-Engineer	Raznas iela 6, LV 4603, Rezekne
25	J. Karro	RREB- director	Zemnieku iela 5, Rezekne, LV 4601
26	M. Svarcs	Rezekne District Council, Gaigalava township- chairman	Rezekne, Atbrivošanas aleja 95, LV 4600
27	V. Iljanova	Balvi District Council- chair person	Berzpils 1 a, Balvi, LV 4501
28	A. Dreimanis	Chairman of Nagli township	Naglu pag., Rezeknes raj.
29	J. Benislavskis	Chairman of Dekšares township	Dekšares, Rezeknes raj., LV 4614
30	A. Kindzuls	Chairman of Berzpils township	Berzpils, Balvu raj., LV 4576
31	G. Kalvane	Farm " Nagli"	Z/ba "Nagli", Rezeknes raj.
32	A. Skredele	RREB; hidro biologist	Zemnieku iela 5, Rezekne, LV 4601
33	A. Skute	Laboratory of Ecology, DPU, Head	13, Vienības str., Daugavpils LV-5400
34	R. Reblis	Naglu, fisherman	Naglu pag., Idene, Rezeknes raj.
35	J. Spenners	Executive director of Dauksti township	Dauksti township, Gulbene
36	J. Smocs	Naglu, fisherman	Naglu pag., Idene, Rezeknes raj.
37	S. Smelters	Chairman of Barkava township	Barbava, Brivibas 9
38	A. Skrebinskis	Head of construction department, Rezekne distr. council	Rezekne, Atbrivošanas aleja 95, LV 4600
39	D. Arike	Director of Madona IC	Saieta laukums 1, Madona
40	J. Apsite	Project leader of Madona IC	Saieta laukums 1, Madona
41	V. Strautina	Tourism specialist of Madona district council	Saieta laukums 1, Madona
42	I. Purmale	Interpreter of Rezekne district council	Rezekne, Atbrivošanas aleja 95, LV 4600



**Seminar Program**  
**on Environmental Management Plan**  
**for Lubana Wetland Complex**

1. Date: October 26th, 2000 (One day seminar)
2. Place: Riga Congress Center (Small Hall)  
 Address: 5, Kr. Vardemara str., Riga, LV1010, Latvia, Tel/Fax: 371-7830244
3. Program:
  - 1) Opening Speech 9:30-9:50
    - by Mr. A. Eglajs, Deputy State Secretary of MEPRD 9:30~9:40 (10 min.)
    - by Representative of Embassy of Japan 9:40~9:50 (10 min.)
  - 2) Presentation part-I 9:50-11:45
    - I-1 Wetland Conservation Policy and Action in Latvia 9:50~10:20 (30 min.)  
 by Ms. I. Jepsen, Director of MEPRD
    - (Break) 10:20~10:40 (20 min.)
    - I-2 Outline of the JICA Study on EMP for LWC 10:40~11:45 (65 min.)  
 by JICA Study Team
  - 3) Discussion 11:45-12:30  
 Lunch (in Center : buffet style) 12:30-13:30
  - 4) Presentation part-II 13:30-16:00
    - II-1 Sustainable Development and Conservation of Wetland Resources 13:30~14:00 (30 min.)  
 by Mr. M. Ohta, JICA Advisory Committee
    - II-2 Practice of Wetland Conservation in Japan 14:00~14:30 (30 min.)  
 by JICA Trainee to Japan
    - (Coffee Break) 14:30~15:00 (30 min.)
    - II-3 Lithuanian Experiences of Ramsar Site Management 15:00~15:30 (30 min.)  
 by Representative of Lithuania
    - II-4 Estonian Experiences of Eco-tourism Development 15:30~16:00 (30 min.)  
 by Representative of Estonia
  - 5) Discussion 16:00-16:50
  - 6) Closing Speech 16:50-17:00

by Mr. A. Eglajs, Deputy State Secretary of MEPRD

**List of Participants to the Seminar**

No	Name	Organization, Position, Tel	Address
1	<u>Jevgenijs Sobko</u>	Madona Regional Environmental Board, Director, Tel. 48-23774	Blaumaa iela 7, Madona, LV-4801
2	Normunds Vejonis	Madona Regional Environmental Board, Head of the Department, Tel. 48-21601/9415495	Blaumaa iela 7, Madona, LV-4801
3	E. Ruskule	Rezekne Regional Environmental Board, Deputy Director	Zemnieku iela 5, Rezekne, LV-4601
4	J. Karro	Rezekne Regional Environmental Board, Director	Zemnieku iela 5, Rezekne, LV-4601
5	Arkadijs Sluckis	Aiviekste Land Reclamation System Administration, Chairman, Tel. 9207387	Parka iela 3, Madonas rajons, Lubana, LV-4830
6	Andrejs Celapiters	Madona District Council, Chairman, Tel. 4822231	Saieta laukums 1, Madona, LV-4801
7	A. Jasko	Madona District Council	Saieta laukums 1, Madona, LV-4801
8	A. Apeinis	Madona District Council, Planning	Saieta laukums 1, Madona, LV-

		Department	4801
9	M. Svarcs	Rezekne District Council / Gaigalava Township, Chairman	Rezekne, Atbrvošanas aleja 95, LV-4600
10	S. Ezmale	Rezekne District Council, Planning Department	Rezekne, Atbrvošanas aleja 95, LV-4600
11	Inga Goldberga	Director of Latgale Development Agency	Rgas 2, Daugavpils, LV-5400
12	B. Dreimane	Rezekne District Council, Planning Department	Rezekne, Atbrvošanas aleja 95, LV-4600
13	Juris Kancs	Murmastiene Township, Deputy Chairman, Tel. 4862237	Jaunatnes iela 14, Murmastiene, Madonas raj, LV-4835
14	Vilnis Strautins	Chairman of Indrani Township, Tel. 4894400	Balozu iela 2, Lubana, Madonas raj., LV-4830
15	Mielis Gruzitis	Chairman of Lubana Town Council, Tel. 4894044	Tilta iela 11, Lubana, Madonas raj, LV-4830
16	Inta Sirmace	Chairman of Dauksti Township, Tel. 4497380 / 4497275	Drza iela 10, p/n "Sti", Gulbenes raj., LV-4417
17	A. Dreimanis	Chairman of Nagli Township, Tel. 4668423	Naglu pag., Rezeknes raj.
18	I. Erta	Rezekne Forestry Office, Engineer, Tel. 4622166	Raznas iela 6, LV-4603, Rezekne
19	I. Vanags	Ziguri Forestry Office, Ecologist	Žguri, Rpnecas iela 8, Balvu raj., LV-4584
20	Martinovs	Rezekne Institute of Higher Education, Dean of the Faculty of Engineering	Atbrvošanas aleja 90, Rezekne
21	Janis Viksne	Ornithology Laboratory, Institute of Biology, Tel. 2945437 / 2945393	Miera iela 3, LV-2169, Salaspils
22	Andis Liepa	Kemeru National Park, Tel. 7765386 / 9365295	"Mž a mjas", LV-2012, Kemeru, Jrmala
23	Otars Opermanis	DARUDEC Project of Species and Biotopes	DARUDEC "Sugu un biotopu projekts", Kau 11a, LV-1050, Riga
24	Andris Eglajs	Ministry of Environmental Protection & Regional Development (MEPRD)	Peldu 25, Riga, LV-1050
25	Ilona Jepsena	MEPRD	Peldu 25, Riga, LV-1050
26	Ilgonis Strauss	MEPRD	Peldu 25, Riga, LV-1050
27	Vilnis Bernards	MEPRD	Peldu 25, Riga, LV-1050
28	Tatjana Jansone	MEPRD	Peldu 25, Riga, LV-1050
29	Rolands Bebris	MEPRD	Peldu 25, Riga, LV-1050
30	Andris Zeikars	Ministry of Agriculture	Republikas laukums 2, Riga, LV-1010
31	R. Stalbe	Ministry of Agriculture, Institute of Fishery Research, Tel. 7334478	Republikas laukums 2, Riga, LV-1010
32	Batjors Hasans	Ministry of Foreign Affairs	Brvbass bulvris 36, Riga, LV-1050
33	Laura Silina	Board of International Programs, Ministry of Finance	Smilšu iela 1, LV-1919, Riga
34	Astra Vilniete	Municipality Board, MEPRD	Peldu 25, Riga, LV-1050
35	Andris Egle	State Environment Inspection	Rpniecbas 25, LV-1045, Riga
36	Roberts Silis	Nature Fund of Latvia	Kronvalda bulv. 4, LV-1842, Riga
37	<u>Alda Nikodemusa</u>	Control Group of MEPRD	Peldu 25, Riga, LV-1050
38	<u>Inese Gmizo</u>	Director of Country Office in Latvia, REC	Peldu 26/28, 3, P.O.Box 1039, LV-1050, Riga
39	<u>Jonas Karpavicius</u>	Ministry of Environment, Lithuania	A.Jaksto 4/9, LT-2694 Vilnius, Lithuania
40	Gediminas Rascius	Division Head, Department of Forest & Protected Areas, Lithuania	A.Jaksto 4/9, LT-2694 Vilnius, Lithuania
41	Jolita Ruzgiene	Ministry of Environment, Lithuania	A.Jaksto 4/9, LT-2694 Vilnius, Lithuania
42	Eugenijus Leonavicius	Ministry of Environment, Lithuania	A.Jaksto 4/9, LT-2694 Vilnius, Lithuania
43	Romas Meceonis	Nemunas Delta Regional Park, Lithuania	A.Jaksto 4/9, LT-2694 Vilnius, Lithuania
44	Aivar Ruukel	President, Estonian Ecotourism Association	Estonia
45	Haas Ainika	Photographer, Estonian Ecotourism	Estonia

		Association	
46	Aku Leivit	Research Director, Nigla Nature Reserve	Estonia
47	Ilze Aigare	MEPRD	Peldu 25, Riga, LV-1050
48		Embassy of Sweden	A. Pumpura 8, Riga, LV-1010
49	Maija Meluvaia	MEPRD	Riga
50	Rolands Rathrelders	MEPRD	Riga
51	Fanis Kate	Kemeru National Park	Kemeru
52	Viesturs Dintulis	Kemeru National Park	Kemeru
53	Kazuhiko Anzai	Embassy of Japan	Riga
54	Elize Suridfake	Embassy of Japan	Riga
55	Ints Mednis	Pasaules Daeas Funds	Riga
56	Laila Sica	VAS. Lah vulas meji	Riga
57	Juris Sous	Geographical Department, Dpils University	Riga
58	Bent Jepsen	Kemeru National Park	Kemeru
59	Buris Busegamari	Riga Times	Riga
60	Aigars Vglite	NRA	Riga