

M.2 METHODOLOGY WITH REFERENCE TO UK LOCAL ENVIRONMENT AGENCY PLAN (LEAP)

1. INTRODUCTION

1.1 Purpose of This Document

The SAZP have enquired as to the methodology for the preparation of this and other REMPs. This document sets out a response describing the expected outputs and can serve as a guide to the work of Study Team members. This methodology presents what is considered to be a desirable approach, but that which was actually followed has, in practice, been somewhat different due to the time and resources available to the Study Team and other constraints (eg not all key stakeholders were fully involved in the Study).

1.2 Methodology - Principles

Good geographically referenced data, plus data analysis and interpretation, are an important foundation for a comprehensive description of the environmental situation in the Hron River Basin, or other basins, and will help with the identification of the main environmental issues. However these alone will not lead to a plan that reflects the needs and priorities of the people of the River Basin, which is important if the plan is to be of any significant value to Slovakia.

The preparation of a management plan that is to have some likelihood of being implemented should not be seen primarily as a technical exercise, dependent on good data and analytical tools. It also needs to be understood and supported by those people and organisations (government, non-government and private) who will be affected by the recommendations, policies etc contained in the plan and who will be responsible for its implementation. These 'interested' individuals and organisation are the Stakeholders.

Experience elsewhere shows that the best way of obtaining the understanding and support of the Stakeholders is for them to have some involvement in plan preparation. Therefore as well as information gathering, database / GIS establishment, technical analyses and report preparation being key components of our methodology, emphasis is also given to consultation and participation.

1.3 Experience from the UK and its Application in Slovakia

The SAZP have expressed their wish that the JICA team makes use of the experience of its

team members and of environmental planning practices in their home and other countries in developing a methodology for the REMP. The team members welcome this idea. They emphasise that 'Environmental Management Planning' is a relatively new concept and that there are no set theories or practices that are immediately applicable to a River Basin REMP in Slovakia ie there is no textbook approach that can be followed in all countries. Methodologies appropriate to the type of environmental management plan (catchment, coastal, regional, sectoral), to the availability of suitable data and to the administrative system of each country need to be developed and applied.

The team believes that the 'Local Environment Agency Plans' (LEAPs), prepared by the UK's Environment Agency for river catchments in England and Wales, are comparable to the proposed REMP and therefore provide a useful 'model' to follow (taking note of Slovakia's desire to join the EU and therefore to 'follow' procedures practised in EU Member States). However the UK LEAP model should not be followed exactly; the principles and processes need to be adapted to the Slovak situation.

The UK's Environment Agency has produced a LEAPs "Guidance" document of 27pp, supported by numerous appendices, to assist their Regional and Area Managers to prepare the LEAPs. This document had, in 1998, reached Version 3a; this version is still regarded as Interim and it is expected that it will be refined further. This indicates that development of the UK LEAP methodology has been following an *iterative process* ie the process develops in stages, in the light of feedback from the early applications of the draft methodology.

It can take time, effort and experience to develop a suitable and comprehensive methodology for a new category of plan, especially if the methodology is to be applicable to a range of situations - even when developed in a country with a fairly long history of planning and environmental monitoring, pollution control, conservation etc. The methodology should not be too detailed or it will not retain the flexibility needed to address the wide range of issues likely to occur in a large study area.

The LEAP Guidance will be explained in more detail later, but the document covers:

the scope of the LEAP;

- the documents to be published and their content;
- the processes to be followed in the preparation of the LEAP;
- the participation of stakeholders and

- the 'functional' aspects (conservation, land contamination, flood defence, waste, water quality, process industry regulation etc).

1.4 The First REMP in Slovakia

Though Environmental Action Plans for a number of Slovakia's *Kraj* (Regions) and *Okres* (Districts) have recently been completed, and also Water Management and Hydro-Ecological Plans for major river systems, the Hron River Basin REMP will represent the first so-called Environmental Management Plan for a River Basin in Slovakia.

The REMP is being prepared by non-Slovaks who, though specialists in their own disciplines (ecology, water etc), are not yet intimately familiar with the Hron River Basin nor with the environmental and other data available for the area, with the environmental monitoring and pollution control systems that exist in Slovakia, with the very complex institutional (legal and organisational) arrangements for environmental management etc. Therefore for the team to prepare a comprehensive 'manual' setting out a detailed methodology to be applied to this and other basins would be inappropriate at this stage - and is also beyond the scope of the Study Team's terms of reference. The Study Team have followed the general methodology set out in the Inception Report, aspects of which are now expanded below - drawing on carefully selected sections of the LEAP process being followed in England and Wales, modified to the Slovak situation.

1.5 Keeping the Methodology under Review

The Study Team have kept the methodology under review, during the course of the study, in the light of progress with its application, making adjustments as appropriate. Such flexibility is necessary to deal with unexpected difficulties eg in obtaining important data in a timely fashion (such as the GIS data held by private companies), limited support from Working Groups or poor responses to environmental questionnaires. However, when the first REMP is completed, it should be possible for the SAZP to review the successes and failures of the approach adopted and to define an improved methodology for the next REMP.

1.6 Structure of this Framework Document

After this Introduction, it might appear to be most logical to describe the Methodology next. However, since this has been described in some detail already, in the Inception Report, it is felt that it would be helpful to present first (in Section 2) a general description of the expected

content of the various REMP outputs (reports etc) - especially as the overall reporting programme has already been determined. Thus the elaboration of the Methodology, which is presented in Section 3, follows rather than precedes the Overall Outputs in Section 2. The latest thinking on more detailed headings for the Final Report is given in Section 4.

2. OVERALL OUTPUT

2.1 Project Reports - Summary List

Desirable outputs of the study in terms of reports, and their principal components, can be summarised as follows:

- **Inception Report** - Sets out the Background, overall Study Approach and Study Methodology.
- **Progress Report (1)** - Reviews progress with Data Gathering and Field Reconnaissance in Slovakia and makes initial presentation of information and data gathered.
- **Interim Report** - The main components of this report are contained in a single document that reviews the state of the environment in the Basin, identifies and classifies problems (pollution inventory) and examines the causes of those problems (eg pollution mechanisms, reasons for biodiversity losses etc). This involves preparation and initial analysis of the environmental database and GIS (ie includes some spatial analysis). Based on this review, some tentative early proposals are made for the 'Recommended Actions' that may be included in the Final REMP. This report provides the basis for stakeholder consultation on the REMP. The main document to be circulated to the Steering Committee and other carefully selected parties (including the Working Groups) for comment.
- In addition, two separate summary documents, based on the Interim Report, would (ideally) be prepared (see below); these to be the main focus for wider stakeholder consultation on the REMP. These documents were mentioned in the Progress Report (1) and are 'additional' reports, not clearly specified in the Inception Report.
- **Consultation Report, Detailed Summary** - Of around 20 pages aimed at *Kraj, Okres* and other institutions requiring some 'technical' information on which to respond - to be translated into Slovak by SAZP.
- **Consultation Report, Short Summary** - Of around 2/3 pages aimed at those groups (eg the general public) requiring a brief outline of the plan only - to be translated into Slovak by SAZP.
- **Progress Report (2)** - Review of Progress on Supplementary Data Gathering and Field Reconnaissance; Field Measurements; Spatial Analysis of Environmental Database; Consultations on Issues and Recommendations for Implementation of REMP. (N.B. This is just a short report stating progress and is not an updated version of the Interim Report; separate working papers, draft GIS plots etc to be prepared and these in due course may be incorporated into the Draft Final Report).
- **Draft Final Report** - This should be very close in format and content to the Final Report. See Final Report, below, and the following section for details.

- **Final Report** - For successful implementation this must be distributed widely to technical and non-technical institutions and the key components disseminated to local communities (and complete copies must also be readily available to interested parties). Careful thought must therefore be given to the Format and Content of the 'Final Report'. The basic framework is discussed and described below. The same format will be followed in the Draft Final Report, but the Final Report will address any comments that have been raised in the last stages of the consultation process and on the Draft Report (see Progress Report (1), section 2.5).

2.2 Final Report and Associated Materials

(1) Summary Report

It is important that a 'stand alone' document is produced that presents a Description of the Hron Basin Environment, the Key Environmental Issues and Proposals for Dealing with those Issues (these can be termed Recommended Actions or Measures). Accordingly the main elements of the REMP are presented in a document that need not be any more than 50pp, and which would include a few important maps, diagrams and photographs. SAZP can then translate the text of this report into the Slovak language and print it in an attractive form for wider circulation. In accordance with the diverse nature of the environment (Upper and Lower Basin) and the administrative structure of Slovakia, consideration was given to dividing, the Issues and Plan Proposals (Recommended Actions), according to the boundaries of Banska Bystrica and Nitra *Kraj*, but in the event this was not so practical. Policies, issues and proposals common to both *kraj* could have been presented first, in order to unify or link programmes and actions in the different parts of the Hron Basin so that the REMP could be seen to be working towards a common goal eg of sustainable development. The possible contents of such a report are described further in Section 4; the Draft Final Summary Report for the Hron Basin was, in fact a little different.

(2) Main Report

The Summary Report would contain all the key aims/objectives, policies and REMP proposals. However, for the SAZP and other users of the REMP, a report covering all the components of the REMP presenting more technical details will be necessary. The volume of the Main Report can be expected to be at least 3 - 4 times that of the Summary Report.

(3) Supporting Report

The Supporting Report should include relevant technical annexes that are of interest to experts and special interest groups, but which it is not necessary to include in the Main Report.

(4) GIS Maps

A separate volume of maps (probably of the A3 size) produced from the GIS environmental database. This consists primarily of maps not included in the Summary and Main Reports.

(6) GIS Database

The GIS database that the study team will have prepared will be left with the SAZP. (It is understood that it is then the intention of the SAZP to develop this further as new data becomes available, as a result of monitoring and co-operation with other government, non-government and private institutions).

3. METHODOLOGY

3.1 Introduction

The original, overall methodology has already been set out in the text and figures of the Inception Report and the team have in general tried to follow this methodology, but it seems that the SAZP would appreciate the presentation of a more detailed methodology. The Study Team, having now spent some time in Slovakia, seen some of the available data, met with some of the stakeholders and understood more clearly their roles and responsibilities, is now in a better position to elaborate this methodology. This would take into account knowledge of methodologies that have been adopted elsewhere for similar management plans. This methodology section starts with a definition of the REMP and a consideration of environmental management responsibilities and the scope of the plan. The **Overall Outputs** have already been described in **Section 2**; more detailed headings for the Final Report are presented in **Section 4**.

3.2 Basic Parameters - Definition, Responsibilities, Scope etc

3.2.1 Definition

A REMP should be 'An integrated management plan for identifying and assessing, prioritising and solving environmental issues in a River Basin, that takes into account both independent technical investigations and the views of the basin's stakeholders. The outcome should be programmes of action for environmental improvement that optimise the benefits for the environment of the Basin and its inhabitants.'

3.2.2 Responsibilities

It is common practice for those institutions that prepare a plan to have a clear role in its implementation, perhaps because of direct regulatory responsibilities for pollution control, through statutory powers to control development or as an implementor/budget holder for water management projects (eg hydropower, irrigation, flood protection measures). These responsibilities will then, in part, determine the scope and approach of the plan - and this applies to the LEAPs of the UK Environment Agency, and to the Water Management and Hydro-ecological Plans of Povodie Hrona¹. In the case of the REMP the SAZP, at present, does not have a significant, clearly defined role in environmental management in the Hron River Basin, except in relation to (*inter alia*):

- the protection of certain categories of conservation area through the Centre for Nature and Landscape Protection;
- the preparation of plans for 'Endangered (Polluted/Hazardous) Areas' (by the Centre for the Restoration of Polluted Landscapes);
- some of the activities of the Centre for Territorial Planning eg Programme for Village Renewal;
- World Heritage Sites as recently assigned to the new Centre for the Protection of Natural and Cultural Heritage (CPNCH/COKPD).

The role of the SAZP is more one of information gathering and dissemination. In the absence of a clearly defined role for the SAZP, the scope of the REMP remains rather broad and, for the plan to be effective, requires that those more directly responsible for environmental management be actively engaged in its preparation² - otherwise it runs the risk, at worst, of being positively rejected and, at best, ignored. One objective of the plan should therefore be to define more clearly a future role for the SAZP in the implementation, monitoring and follow-up of the REMP. Similarly it is intended that the responsibilities and roles of other stakeholders in implementation will also be indicated, in association with the recommended actions.

In the UK, the Environment Agency (EA) has emphasised the importance of developing

¹ It should also be pointed out that where a plan is prepared by an institution that has narrow responsibilities (eg restricted to a single resource such as water or to one activity such as agriculture) then it may not give due consideration to related matters eg forestry, wildlife conservation, landscape protection and alternative land uses. A strength of the current REMP is that it is multi-disciplinary and not restricted to one or two environmental parameters alone.

² The REMP Steering Committee primarily represents data-providing institutions which are not directly involved in Environmental Management. This emphasises the importance of involving more closely in the REMP those agencies that do have direct responsibilities for Environmental Management (eg Povodie Hrona, StVaK, LESOPROJEKT, Mesto/Obec and the Kraj and Okres offices).

partnerships in taking forward the LEAP process. Thus the first page of the LEAP guidelines states that:-

'involvement and participation in the decision-making process builds partnerships which lead to joint actions to implement the plan'.

Local Authorities in the UK are normally the most important partners for the EA in the LEAP process, since they have important statutory environmental functions. The EA believes that they need to share a common vision with Local Authorities for environmental improvement and be in broad agreement on issues and priorities. The equivalent Local Authorities in Slovakia (*Kraj, Okres* and Municipalities) also have important statutory environmental functions. Therefore the Study Team believe that the liaison with the *Kraj* and *Okres* offices and others, which is being developed by the SAZP and the team members, is an important part of the REMP methodology.

3.2.3 Scope

With reference to the scope of the REMP, the Study Team has taken a holistic view of the environment of the Hron River Basin, as far as the available data and the skills of the Study Team permits. Where possible, a REMP should cover a full range of environmental aspects and targets, except for nuclear and military related issues, based on national policies and standards as applied to the regional level; in setting targets reference should be made also to international, especially EU, standards.

3.2.4 Consultation - Issues and Actions

This topic is discussed elsewhere in this document (eg Section 1.2) and the methodology has already been set out in the Progress Report (1). To summarise, the REMP process should seek the views of stakeholders (SAZP, government and non-government partners and the public) on the prioritisation of issues and recommended actions/proposals.

It should be noted that the 'prioritisation of issues' is a part of the UK EA's methodology, but in practice not all LEAPs have prioritised the many issues and actions identified (eg East Suffolk Action Plan, p. 9) pointing out that these are subject to availability of resources (financial and human) and changes in priorities of partner organisations. The REMP Study Team recognises that it will be helpful to prioritise issues and actions and will do so where possible (see Section 3.3.7 below). However, it will always be difficult to compare, say, the importance of protection of biodiversity versus the clean-up of contaminated land, from a 'technical' point of

view. Prioritisation can therefore be a rather subjective process, hence the role of consultation in reaching acceptable conclusions. Annex N of this Supporting Report presents a Case Study for the Prioritisation of Wastewater Treatment schemes.

3.2.5 Timescales

Where information allows (eg nationally approved forecasts) the studies try to take a long term view of the trends in the Basin (25 years or the year 2025). However the proposed actions will, in general, have a five year time horizon.

3.2.6 Transparency

A REMP and its preparation should be transparent ie if the Study Team identifies environmental damage that gives rise for concern (contaminated land, losses of biodiversity) and can identify causes of these problems (which may be technical deficiencies, historic, mis-management / insitutional, financial etc) it will endeavour to describe and discuss these in an open manner.

3.3 REMP Process

3.3.1 Stakeholder Identification

The number of stakeholders identified at the Project Design stage, and reflected in the Steering Committee composition, was very limited. The work of the Study Team and the many meetings they have organised, thanks to the assistance of the Project Manager and others in the SAZP, has led to the identification of many stakeholders with an interest in the Hron Basin and the REMP.

3.3.2 Set up Multi-functional Steering Committee / Working Group(s)

Working Groups were not set up for the Hron River Basin REMP for a number of reasons. However they can play a useful role and should include SAZP staff and representatives from key external partner organisations. Initially it was thought that the Steering Committee and counterparts alone would fulfill this role, but as the study proceeded, it became apparent that various key stakeholders were not involved. Local Authorities (Kraj, Okres, and Municipalities) are amongst the key external consultees and need to be closely involved in the REMP process, since they are supported by the political process and have responsibilities for development control. This was raised with the SAZP who proposed the formation of a number of Working Groups. The proposal was welcomed by the Study Team, who suggested amendments to the WG composition, but they were never established.

3.3.3 Identify Environmental Targets and Objectives

These will relate to water, air, waste, biodiversity conservation etc and will be derived from National Environmental Policy, the National Environmental Action Programme, national legislation and international standards/guidelines – especially European Union directives. They should be identified and developed by the specialists in each field, in co-ordination with the Team Leader (Environmental Policy) and the Monitoring/Institutional (including Legal) specialist.

3.3.4 Assess the State of the Hron Basin Environment

This activity is described in the Inception Report (including Fig. 3.1, boxes 2,3,4,6 and 7); some additional suggestions are made in the next paragraph. This Annex does not describe how such assessments are made for each sector - this would require the equivalent of a textbook on water pollution assessment, forest resource assessment etc for each discipline. It is assumed that, by and large, each specialist is able to make the assessment for his own subject area, with reference to this Annex, Framework Document, the Inception Report, and the database/GIS specialists. The latter, in liaison with the Regional Environmental Management Planner, can advise on how best to present the data in map form eg according to administrative unit, sub-catchment etc. The work on this is already well underway.

The Environment Agency in the UK has recently (1997) suggested a framework for measuring the state of the environment entitled Viewpoints on the Environment, Developing a National Environmental Monitoring and Assessment Framework. According to this approach, a plan should report 'state of the environment data' according to the following six "viewpoints":

- (i) **Land use and environmental resources** - including land cover, geological resources, soil quality, wetland areas, contaminated land, conservation sites, water resources.
- (ii) **Key biological populations, communities and biodiversity** - including species and habitats of conservation interest, fish, river invertebrate communities, river habitats.
- (iii) **Compliance with environmental standards and targets** - including air quality EC and national standards, water quality EC standards and River Ecosystem (RE) targets.
- (iv) **The health of the environment** - including tree health surveys, algal blooms, acid waters, oyster embryo bioassay, fish health.
- (v) **Long term reference sites** - for example, Environmental Change Network, Acid Waters Monitoring Network, Harmonised Monitoring Scheme.
- (vi) **Aesthetic quality** - for example, Tranquil Areas, aesthetic quality of river corridors (pilot GQA), litter on beaches, landscape assessments.

In practice, not all UK LEAPs have followed this approach. Some details are clearly not

relevant to the REMP's in Slovakia (eg oyster embryo assay) and the Study Team does not propose to follow it in detail' having already developed its own format for describing environmental and related conditions in the Progress Report (1). Nevertheless, reference will be made to these 'Viewpoints' by the Study Team members during their 'assessments,' and the headings will be used where appropriate.

3.3.5 Evaluate Pressure (Stresses and Strains) upon the Environment

This text is developed from the UK EA guidelines. The approach has been followed to some extent in Slovakia, in the form of the REMP's 'Pressure State Response' framework, as applied to each environmental aspect/sector in Chapter 5, but not completely. The pressures on the environment can be thought of as different sets of stresses, and the manner in which they affect the state of the environment as causing different strains upon it. The pressures themselves arise from what are sometimes referred to as different drivers, which are essentially socio-economic: they include the desire for improved standards of living, wealth creation, and improved quality of life.

There are obviously many ways in which data on the pressures upon the environment can be categorized. One is to examine pressures in terms of whether they are historic, current, or have yet to arise. However, the framework suggested by the UK EA is based upon the following 6 categories.

1) Natural Forces

These include climate variations such as the extent and rate of changes in weather and rainfall patterns, temperature extremes and so on, all of which may require some form of action to mitigate or ameliorate their potential effects.

2) Societal Influences

These are perhaps the greatest and all-embracing pressures placed upon the environment. They range from the size and distribution of the population, the number of households in the region, the pattern of energy consumption, the nature and frequency of transport, planned changes in land use, recreational practices and activities, plus changes in public attitudes and perceptions of matters environmental.

3) Abstractions and Removals

These include the removal of water, minerals, and materials such as peat (and perhaps even the

cropping of trees, which cannot rapidly be replaced) where the quantities, the processes involved, the timing, or the rate of removal are of sufficient concern to require some form of regulatory control or other action.

4) Usage, Releases and Discharges

These include emissions from point sources to the environment, both fixed and mobile, plus the cumulative input from diffuse sources which are known and controlled on the basis of quantities used (such as fertilizers and pesticides) or discharged, or where their rate, timing or location are important with regard to their potential environmental impact.

5) Waste Arisings and Disposals

These include the by-products of industry and society in general which, by their very presence, in one way or another can either directly increase pressures on the environment or, by the manner in which they are handled (reused and recycled) can alleviate pressures on the environment.

6) Illegal Practices (Accidents and Non-Compliance with Regulations)

These include pollution incidents affecting air, land, and water; fly-tipping; the extent of organised environmental 'crime'; and recorded breaches of compliance with existing environmental licenses.

Past trends and forecasts should be used to indicate the direction of change in a stress and areas of concern for the future. For example, local emissions to air from power stations should be related to national emissions and to those from other sources; trends in emissions and planned reductions, where known, should be shown.

3.3.6 Identify the 'Environmental' Concerns of the Public

This part of the methodology was, in part, carried out by the preparation and circulation of an Environmental Questionnaire to all 264 Municipalities within the Basin. The results of this can and have been used to determine (a) if any environmental issues that are of concern to the public (or at least their elected representatives) have not been identified by other studies and plans (eg NEAP or *Kraj* or *Okres* Environmental Action Plans) and (b) how actions to address environmental issues might be prioritised - in relation to priorities as perceived by environmental specialists.

3.3.7 Establish and Classify Issues

It is difficult to give a concise definition of an environmental issue. In the context of 'pressures' (stresses and strains) we may think of an issue as being a significant strain or distortion of environmental quality or an environmental problem which justifies some form of response.

An issue may include any of the following:

- Existing or likely future non-compliance with Standards, Targets or Objectives.
- A matter of serious public concern.
- Insufficient data to enable us to decide whether or not we really have a problem.
- An opportunity for enhancement, such as improvements to habitats, aesthetic quality of river landscapes, access, fisheries, navigation.
- Existing or likely future, serious risk of pollution or harm to health of man or animals or wildlife.
- Compliance with consents / authorisations / licences but evidence or expectation of pollution from the discharge/process/site.

Although each and every strain or distortion should be considered a potential issue, and irrespective of whether or not it can be dealt with now or in the near future, we need to rigorously exclude very minor matters from the REMP process, so that full attention can be focused on more important matters. Very minor environmental strains could include those which are:-

- easily and quickly reversible;
- can be dealt with by a straight forward everyday action of Slovak Environmental or other authorities;
- can be quickly resolved by a meeting between the responsible parties;
- is a one-off technical infringement but of little if any adverse environmental impact.

Very minor matters should normally be dealt with by day to day action, not via the REMP. All other matters should be referred to in the Assessment of the appropriate environmental sector.

One methodology for identifying issues is the establishment of a matrix which interfaces the Pressures (Stresses and Strains) with the Viewpoints (Environmental Aspects in ISO 14001 terminology). Using information and data on stress and state, it should be possible to categorize the extent to which one can have an effect on the other - i.e., produce a strain on the

environment - either in terms of its actual effect now at a national, regional, or local scale, or its potential to have that effect in the future. Thus, for example, changes to the rate of water abstraction can affect the state of the environment with respect to all six Viewpoints, in one way or another, whereas changes to the level of compliance with certain licences may only affect one or two Viewpoints (see the simplified, selective example that follows).

ISSUE DETERMINING MATRIX (partial example)

PRESSURES → ↓VIEWPOINTS (ASPECTS)	Natural Forces	Societal Influences	Abstractions (Water) Increased	Illegal Practices (Non-Compliance) Reduced Compliance - fly-tipping
Land Use and Environmental Resources			Impact	Impact
Key Habitats and Species			Impact	
Compliance with Standards			Impact	
Health of the Environment			Impact	Impact

The UK EA have concluded that the full potential planning benefits of interfacing Stresses and Strains (Pressures) with Viewpoints can only be realised when there are readily available data sets and national standards for the assessment of environmental risks and values. Computer based systems will facilitate this, but it is recognised that, for the present, the interface can do little more than act as a checklist matrix for generating issues. For the Hron River Basin REMP the GIS has been used to help identify issues where appropriate (perhaps to show stretches of river in which pollutants exceed targets or standards), but much of the issue identification may be done using checklist matrices and/or more subjective approaches.

Once the main issues have been defined it is desirable that they are classified according to type. This can be done in accordance with issues raised in the National Environmental Policy (NEP) and National Environmental Action Programme (NEAP), and also in accordance with their occurrence in the Upper Basin (*Banska Bystrica Kraj*) or Lower Basin (*Nitra Kraj*).

Issues identified in those *Kraj* and *Okres* Environmental Action Programmes that have been obtained, and the SAZP Environmental Action Programme for the Central Hron Endangered Area," can be incorporated at this stage, except where the Study Team investigations indicate that they should be dropped. Other proposals that have been made to the Study Team in the course of their meetings relating to the Basin can be treated in a similar way.

Issues can be further classified as high or low priority according to the following criteria:-

High Priority Issues

- reversibility is more than 25 years
- public concern is high
- spatial scale widespread
- high scientific uncertainty about risks to sustainable development
- high risk to environment and people
- substantial environmental gain at disproportionately low cost.
- amenable to partnership or third party action
- specified in NEP and/or NEAP

Low Priority Issues

- reversibility is less than 5 years
- public concern is low
- low risks to the environment and people
- very local scale, restricted issue
- not specified in NEP or NEAP

Low priority issues should be considered as possibly not warranting further action in the REMP, but some may be included in the Interim Report in order to test public opinion.

Consultees (especially Working Groups) should be encouraged to express their views on priorities. Public and other consultations may lead to reclassification - see Progress Report (1), Annex L and other parts of this Annex M.2.

3.3.8 GIS Development

(1) General Considerations

It is not possible to describe in detail here exactly how databases and GIS can best be used in a REMP project. This Annex provides some ideas but Annex O gives further information on the 'Spatial Analysis of the Environmental Database'. The approach should depend on a review (Primary Analysis) of the digital data and maps that have been acquired during the first period of work on a REMP.

First, suitable base maps have to be prepared for the Basin and the preferred scales etc agreed for report presentation purposes. For the Hron River Basin REMP, it has already been suggested that, for some purposes, splitting the Basin according to Banska Bystrica and Nitra *Kraj*, which correspond approximately to the Upper and Lower parts of the Basin respectively, will be helpful - especially when it comes to implementation, much of which is likely to take place in accordance with the administrative structure of the State.

It is then expected that much of the remaining initial work will involve the compilation, geo-

referencing (or assigning to cadaster, stream section or subcatchment etc) and plotting of the digital data that has been obtained. The data and plots will then be examined to determine what thematic maps can be prepared and what spatial analyses may be possible.

Individual specialists are expected to liaise with the GIS and database specialists and the Regional Environmental Management Planning specialist to determine those components of the data that will prove useful to the REMP study, those which can be 'discarded' and those subject areas where additional data would be helpful and efforts should be made to acquire it in later work periods.

At this stage, and in accordance with the availability, quality and format of the data, the GIS should be used to help identify the locations of 'environmental issues' and to assess their severity eg by showing stretches of river with pollutant loads above standards or targets, mapping point sources of pollution etc. and displaying these in relation to environmentally sensitive areas eg riverside recreation and fishing areas, nature and landscape conservation areas, domestic water supply abstraction points. Progress with such analyses can help with the consultation role of the Interim Report.

In relation to GIS it is important for team members to realise that a REMP is a planning exercise to synthesise and integrate information, from different sectors/disciplines, in order to develop an overall view of the environmental management issues in a Basin and to make proposals for addressing those issues. Readily available data should be reviewed and analysed for its environmental significance and incorporated into the GIS, but a REMP should not be treated as an academic study/research project that will investigate individual environmental issues in great detail, by means of modelling studies etc. Recommendations for important research investigations, that will lead to a better understanding of environmental issues, should however be included in the proposed actions of the REMP. Some proposed investigations may be able to make use of existing data, others may require further monitoring or field research.

(2) Environmental Database

The establishment of an environmental (GIS) database should start with the "confirmation of available environmental data". The process of confirmation of available environmental data can be divided into two main parts: 1) information on digital data (GIS map layers and digital databases/ tables) and 2) other forms of information, such as reports, paper maps, etc...

The work in investigating available digital data typically involves two main approaches: a) questionnaire survey, and b) personal interviews.

- a) For the Hron River Basin, the Study Team prepared a GIS database questionnaire. It included 35 questions about GIS data sets and databases of monitoring networks. The questionnaires were sent to the Counterpart Organisations, namely Slovak Environmental Agency, Soil Fertility Research Institute, Forest Research Institute, Geological Survey of Slovak Republic and Slovak Hydro-Meteorological Institute. Based on the responses and completed questionnaires, a summary of available digital environmental data was made.
- b) The purpose of personal interviews is twofold: 1) clarify the contents of digital databases owned by counterpart organisations, and 2) identify other sources of environmental data already available but not yet owned by the counterpart organisations. During the Hron River REMP meetings, both state companies/institutes/ universities (e.g. Institute of Geodesy and Cartography, Matej Bela University Faculty of Natural Science, Comenius University, etc.) and private companies (e.g. ESPRIT, ErasData-PRO, Ekotrust, etc.) were visited.

Based on the information obtained on environmental data the “collection of existing data” can be started. Data collection in Slovakia has focused on the following main topics:

- Basic maps
- Natural conditions
- Socio-economic conditions
- Land use, vegetation
- Water use
- Pollution sources
- Environmental quality
- Relevant development plans
- Institutional aspects
- Others eg Cultural Heritage and Sites of Tourism Interest

The collection of existing data can be carried out in parallel to the “preparation of environmental database”. This step can include the following works:

- Review of existing GIS base maps
- Satellite imagery analysis
- Mapping of existing environmental conditions
- Preparation of an integrated environmental database.

(3) Analysis of Environmental Database

A list of the Study Team’s digital environmental databases for the Hron River basin REMP can be found in Annex O.1.

In each specific field the sector specialists and GIS/database experts need to work closely

together in the primary analysis of the environmental database, to integrate the available information – reports, hardcopy maps, digital data, digital maps, etc. – in the most effective way.

The results of the primary analysis are presented in each relevant chapter of the Main Report, primarily in Chapter 5. Below a summary list of typical thematic maps as presented in the Interim Report:

Chapter 1 INTRODUCTION

Map 1.3 - 1 Kraj and Okres boundary in the Study Area

Chapter 2 PHYSICAL AND NATURAL ENVIRONMENT

Map 2.2 - 1 Average Annual Rainfall Distribution Map

Map 2.2 - 2 Average annual Mean Temperature Distribution Map

Map 2.3 - 1 Shaded Relief and Basic Sub-catchment of Hron River Basin

Map 2.4 - 1 Forest Regions and Forest Management Units

Chapter 3 ECONOMIC ENVIRONMENT AND LAND USE

Map 3.4 - 1 Land Use Pattern (reclassified CORINE land cover), 1990

Map 3.4 - 2 Agricultural Land of the Study Area

Map 3.4 - 3 Forest Land of the Study Area

Map 3.4 - 4 Population Distribution Map – Number of Inhabitants (Villages/Towns)

Map 3.4 - 5 Population Density Map of the Study Area

Chapter 4 HUMAN ENVIRONMENT: POPULATION, HEALTH AND EDUCATION

Map 4.4 - 1 Distribution of Monuments in the Hron River Basin

Map 4.4 - 2 Construction State of Monuments in the Hron River Basin

Map 4.4 - 3 Monuments in the Hron River Basin by Type of Monuments

Chapter 5 ENVIRONMENTAL SERVICES

Map 5.2 - 1 Percentage of Population Connected to Public Water Supply

Map 5.2 - 2 Distribution of Reservoirs and Lake in Hron River Basin

Map 5.3 - 1 Percentage of Population Connected to Public Sewerage System

Map 5.4 - 1 Pollution Source of Solid waste

Map 5.5 - 1 Nature Protected Areas of the Study Area

Chapter 6 STATE OF THE ENVIRONMENT AND POLLUTION INVENTORY

Map 6.1 - 1 Sampling Points of Surface Water Quality in Hron River Basin

Map 6.2 - 1 Groundwater Sampling Plots (Geochemical Atlas of SK)

Map 6.2 - 2 “NO₃” Pollution Map of Groundwater

Map 6.2 - 3 “NH₄” Pollution Map of Groundwater

Map 6.2 - 4	“As” Pollution Map of Groundwater
Map 6.2 - 5	“Cd” Pollution Map of Groundwater
Map 6.2 - 6	“Pb” Pollution Map of Groundwater
Map 6.2 - 7	SHMU Sampling Points of Groundwater Quality
Map 6.2 - 8	“NO ₃ ” SHMU Pollution Map of Groundwater
Map 6.4 - 1	Soil Sampling Plots (Geochemical Atlas of SK)
Map 6.4 - 2	“As” Pollution Map of Soil
Map 6.4 - 3	“Cd” Pollution Map of Soil
Map 6.4 - 4	“Pb” Pollution Map of Soil
Map 6.5 - 1	Distribution of REZZO 1 Emission sources in the Study Area
Map 6.5 - 2	Monitoring Station and Major Factories in the Banska Bystrica Area
Map 6.8 - 1	Construction State of Monuments in the Hron River Basin

(4) Proposed Methodologies for Spatial Analysis of Environmental Database

The following items show the contents of this spatial analysis.

a) DEM creation

Digital Elevation Models (DEM). Using DEM the common topographic and hydrological analyses can be carried out and applied to determining slopes, slope lengths, watersheds, contributing areas, flow direction, flow accumulation, etc.

b) Spatial Interpolation

Both natural phenomena (e.g. meteorological and climatic variables) including the condition of the environment (e.g. air, water, soil quality) and human impacts on the environment (e.g. emissions, waste disposal) are monitored at point locations. In many cases these point observations should be interpreted on larger territorial units for studying environmental conditions, impact zones of specific human activities, etc. Spatial interpolation is a commonly applied technique for such purposes. Depending on the need, meteorological maps (e.g. wind, radiation, rainfall and temperature distribution), pollution maps (e.g. soil, groundwater pollution) can be made. Other maps will be prepared depending on the environmental issues / conflicts identified by specialists.

c) Aggregation / Disaggregation

Aggregation/ disaggregation techniques are commonly applied methods to derive indices, indices not only in the field of socio-economy but also in the field of environmental sciences and natural resource development. Traditionally, indicators are determined mainly from tabular data that are gathered by various organisations. Spatial aggregation and disaggregation techniques are less common because they require spatially distributed data as well as mapping and / or GIS capabilities. Spatial aggregation can be applied in preparing pollution and environmental resources inventories for the Study, in addition to socio-economic information. Moreover, soil and geological databases are often presented at highly aggregated level; careful

simplification is more suitable for planning. Then indicators / indices, for example, could be used to analyse trends and to prepare scenarios / alternatives for resource development. Spatial disaggregation tools are most helpful in the planning stage when the main criteria are established and the optimal areas must be located, for example, land suitability maps and related land use plans, and development for recreation, re-forestation, etc.

d) Image processing

In 1998 JICA purchased recent Landsat satellite imagery of the Study Area (scenes in May). Image processing includes atmospheric and geographic corrections, geo-referencing and land cover interpretation. The resulting thematic map will be the land cover map as of 1998 of the Study Area. SAZP can carry out the land cover classification because it has experience in preparing the CORINE land cover maps. Since the land cover is determined by supervised classification, it is essential to apply the same methodology if maps are going to be compared. Based on the available land cover maps and land use data, the Study team aims at investigating land use / cover changes in the Study Area. Among other applications, Landsat images can be used for determining forest types by tree species as well as mapping forest health conditions. LVU in Zvolen have prepared the forest health condition map using the same Landsat image (1998) that is used for land cover classification. Thematic maps derived from satellite images are useful not only because of the fine resolution information presented, but they provide a kind of boundary condition / enhancing tool for other spatial analysis applications.

e) Modelling

Often the spatial distribution of environmental characteristics and the impacts of human activities cannot be properly interpreted by simple spatial analysis techniques. If the phenomena needs to be described over time, the above mentioned techniques should be accompanied by modelling, that can vary from single algorithms (e.g. transport processes) to spatially distributed and physically based comprehensive models (e.g. catchment non-point source pollution models). The complexity of modelling depends on the purpose of use, the spatial and temporal scale of interest and, of course, the mechanisms / processes going to be simulated. The Study Team considers modelling as a useful tool for the better understanding of specific pollution mechanisms, but it also admits that models are not capable, so far, of comprehensive environmental planning. Therefore modelling should be used in the Study only when it is needed by field specialists, to analyse certain problems and/or prepare and optimise planning alternatives in well-defined topics.

3.3.9 Generate Possible Actions

In the light of issues identified, individual specialists would make proposals for actions to address those issues. There will be a brief explanation of how the proposed action will help to resolve the problem identified or capitalise on the opportunity that the issue represents. The actions should be grouped in the same way that the issues have been grouped. It is expected that actions will be also drawn from *Kraj* and *Okres* Environmental Action Plans, other plans (eg the Water Management and Hydro-Ecological Plans of Povodie Hrona) and other sources as appropriate - where they are seen to address an issue. Where possible, actions should be associated with achieving targets. Some actions will be location specific eg associated with a

particular industry or settlement, others may be applicable to a particular sector eg to an agricultural or forestry practice.

This is the point in the process where there is most opportunity for planning integrated action. Issues should be looked at collectively, in order to identify actions that can operate beneficially across a range of issues. For example acting to encourage Regional, Local and other Authorities to require pollution and other control measures at source for large scale new developments may benefit flood defence, water quality and fisheries.

In some cases there will be alternative options for achieving the same outcome. These options could be evaluated in terms of practicality, risk, costs and benefits. Rigorous cost benefit assessments should not be attempted (this is the function of a feasibility study); a simple comparison to illustrate the nature and scale of advantages and disadvantages will normally be sufficient.

The need for policy statements and/or goals to support the actions should be considered and text drafted where this will be helpful. To deal with some issues, a clearly stated policy may be all that is required as far as a REMP is concerned eg relating to improvements in water quality or control of development in forest and conservation areas. Where legislation may also be deemed necessary this should be indicated.

3.3.10 Consultation on Interim Report

This is described in more detail in Annex L. The UK EA points out that consultation is of diminished value unless consultees participate throughout the REMP process. Consultation has started in a rather informal way and it should be strengthened, eg through the Working Groups, as the REMP study proceeds.

The results of the consultation on the Interim Report should be fed back into the REMP preparation process (eg where new information and issues are raised or different approaches to environmental management suggested; these should be investigated, in the field and feedback obtained along with more information / data and the views of the concerned authorities). Revisions should be incorporated into the Draft Final Report.

Possible revisions may include:-

- Additions to or deletions of information / data
- Adding to or deleting issues
- Amending policies

- Amending proposals
- Changing priorities

4. CONTENTS OF THE FINAL REPORT

Although the headings and contents of the Draft Final Report Summary for the Hron REMP are a little different, the following are possible contents of the **Summary Report** of a REMP.

- **Foreword:** a brief introduction to the REMP, including its status in relation to other environmental plans, the role of the SAZP in its preparation and implementation (and that of other key players) and the assistance of donors, consultants and local stakeholders in its preparation.
- **The Main Challenges :** a two to three page description of the main environmental problems and opportunities in the Basin, the goals and objectives (overall aims) of the REMP and the major proposals to address them, supported by an A3 map. (Similar to an Executive Summary).

(1) Description of the River Basin Environment

A fairly brief overview of the basin to give the reader an understanding of its environmental resources and associated socio-economic conditions. A small number of thematic maps would accompany the descriptions, probably at A3 scale, eg Water; Biodiversity; Forestry; Agriculture; Social (Population and Health); Infrastructure and Industry; Pollution Sources (for this report it may be possible to 'combine' some thematic maps eg Forestry and Agriculture under Land Use).

(2) Issues and Proposed Actions

This would start with issues and associated actions relevant to the whole basin, and be followed by sections specific to specified administrative units (eg *Okres* or *Kraj*). Issues can be grouped into themes such as:

- Managing Water Resources
- Improving Water Quality
- Improving Air Quality
- Managing Solid Waste
- Regulating Major Industries
- Clean-up of Heavily Polluted Sites
- Multi-purpose Forest Management
- Agriculture and the Environment
- Enhancing Biodiversity
- Enhancing Cultural Heritage
- Environmental Awareness in Government and the Public

Conservation Plan and the Environmental Resources Management Plan mentioned in the Scope of Work and Inception Report for the Hron River Basin REMP. The Environmental Monitoring Plan is more of a 'Cross-cutting' matter applicable to a number of issues and the proposed actions for this may be presented separately from any specific issue. The Environmental Education Plan, the Environmental Information Network Plan and the Environmental Monitoring Plan may be developed in more detail in the Main Report or Supporting Report since they fall within the responsibility of the SAZP and are a particular interest of the Agency.

The issues and actions should be presented as text and tables, and will distinguish between high priority issues which should be financed and implemented within the first five years of the plan and issues of lower priority for financing and implementation in subsequent years. These should be supported by maps (eg one map showing location of proposed natural resource management projects and a second showing the location of urban and industrial clean-up projects).

Proposed actions for each high priority issue should will be discussed in terms of:

- Proposals (more than one if there are options)
- Targets (what the REMP aims to achieve)
- Effects (environmental and socio-economic)
- Lead Agency for Implementation
- Supporting Agencies
- Costs (if the data are available)
- Timescale for implementation

Where appropriate, actions should be expressed in terms of a 'partnership approach' (see Section 3.2.2) which will contribute to the delivery of the overall aims of the REMP, and the National Environmental Policy and the NEAP at a local level.

(3) Implementation of the REMP: Institutional and Financial Strategy

The purpose of this chapter is to consider what steps might need to be taken to implement the REMP. It is one thing to make recommendations for action, but another to ensure that those actions are undertaken. Environmental education will play a role, but most benefits arising from this will occur in the longer term. Institutional changes may be necessary to facilitate implementation and new approaches required to raising the capital and then recovering some of the costs from the beneficiaries. Some of these may require tackling at a national level, but suggestions should be given and are likely to include the 'partnership approach' advocated by

the UK Environment Agency.

(4) Supporting Policies and Legislation

Some improvements to the environment of the Basin, or protection of existing environmental resources, should be possible without direct financing. Thus, to assist with the implementation of the plan, clear policies may also be required to guide decision-making by government bodies, both centrally-appointed and municipal. These should be drafted in association with brief descriptions of the environmental issues and objectives that they are intended to tackle. In some cases, suggestions may be made for amendments to existing legislation or for the adoption of new legislation.

Appendices

These may include:

A) Glossary

B) Key Statistics eg

- *General* (Land Area, Main Towns and Population);
- *Administrative Details* (*Kraj, Okres, Mesto, Povodie Hrona, StVaK, SIZP, SAZP* and other authorities with a role in environmental management);
- *Health*
- *Water Resources and Infrastructure* (Quantities, number of Wastewater Treatment Plants, of licensed abstractions etc);
- *Water Quality* (Lengths of river with different classifications);
- *Waste Management* (Number of licensed waste management facilities according to type);
- *Air Quality* (Ambient and Major Point Source Emissions)
- *Pollution Control* (Summary of licenses to discharge to air and water);
- *Forestry*
- *Agriculture*
- *Biodiversity and Landscape Conservation* (Numbers and areas under different conservation categories);
- *Cultural Heritage* (Numbers of sites according to Slovak classification).

ANNEX N

CASE STUDY FOR THE PROJECT PRIORITISATION

CONTENTS

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N.1 GENERAL IDEA

1. INDICATORS AND CRITERIA FOR PROJECT PRIORITISATION

The followings are the general idea of the indicators, evaluation criteria and method of scoring for the prioritisation of the projects. This method is proposed for the judgement of priorities of the huge number of Environmental Action Programmes, which will be useful tool for the evaluation of the priorities especially the physical development projects, such as gas supply, water supply, sewerage and WWTP, landfills etc. Figure N.1-1 shows the diagram of the general idea for the study.

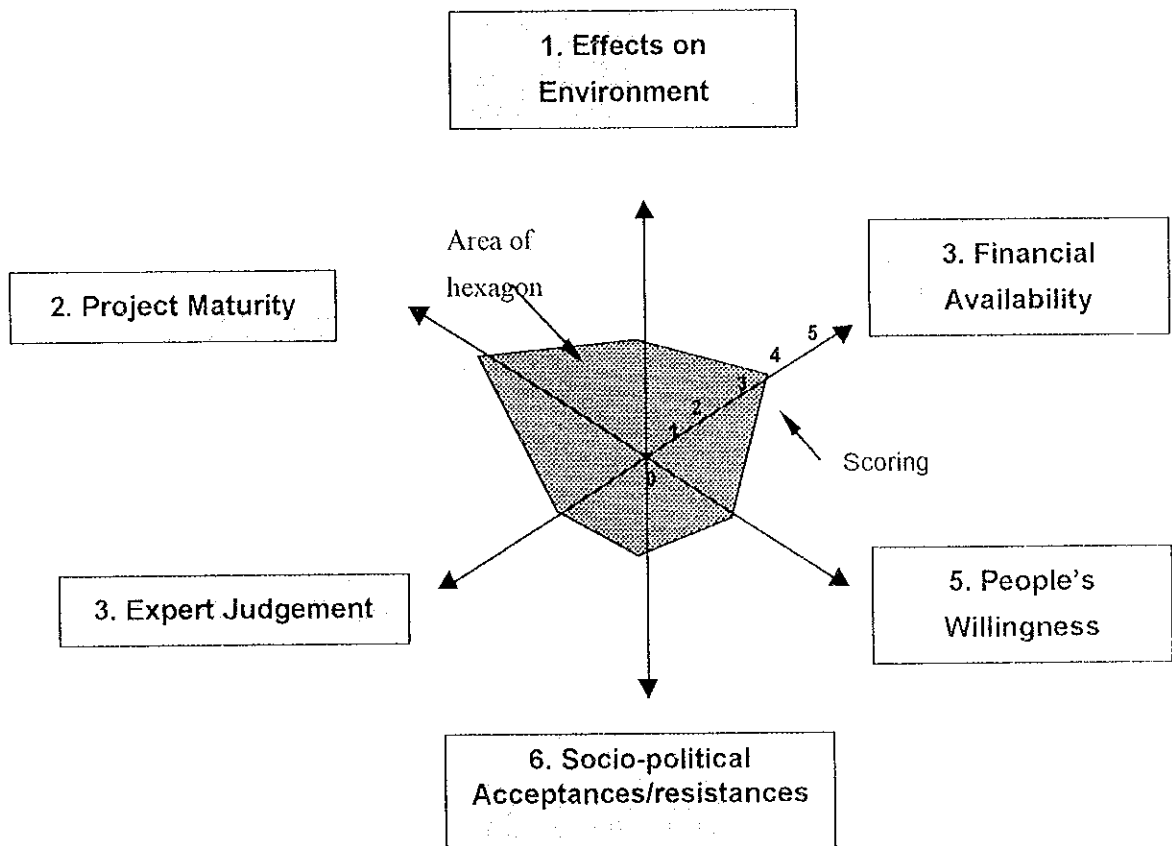


Figure N.1-1 Diagram of the General Idea for the Project Prioritisation Study

2 GENERAL CHECKLIST OF EVALUATION CRITERIA

The followings are the general checklist of the evaluation criteria for the project prioritisation. The evaluator can select useful criteria from the checklist, according to the purpose of the evaluation and availability of information.

(1) **Effects on Environment;** means Does the development contribute to the improvement of the environment ?

- Is pressure-state-response link (real causes-effects-possible alternative solution route) clear ?
- Does the effects can be measured quantitatively ?
- How much the existing pollution load can be decreased in the sector ? (to what degree are the targets achieved ?)
- How much does it contribute to the improvement in other environmental sectors ?
- Does the development bring significant increased negative environmental impact ?
- Does the development result in significant damage to the local environment ?

(2) **Project Maturity;** means Does the development has been appropriately elaborated ?

- Is it in the short/action project list of the current NEAP/REAP ?
- What is the stage of planning/designing ? (C/P, M/P, F/S, D/D ?)
- Are there any problems in EIA (environmental impact assessment) ?
- Does other options and/or alternatives examined ?
- Does the project well coordinated among other development projects
- Does the specific local situation addressed ?
- Does the project site prepare ?
- Is there an appropriate organisation with sufficient work capacity for implementation ?

(3) **Financial Availability;** means Does the development prospective in finance ?

- How much percentage of the cost can be provided for the implementation ?
- How much percentage of the cost are expected from other financial sources ?
- How much percentage of the maintenance cost can be provided ?
- How much percentage of the maintenance cost are expected from other sources ?

(4) **Expert Judgement;** means Does the development feasible in technical, economical and social, etc ? The experts will be employed in the judgement;

- Environmental engineering consultants
- Organisation and management consultants
- Medical experts
- Lawyers
- Accountants
- Banks
- Insurers, insurance companies

(5) **People's Willingness;** means Does the development meet with the people's willingness ?

- Does the development bring financial benefit ?
- Does the development benefit people in some other way ?
- Does the development create new employment ?
- Does the development result in people being worse off financially ?
- Does the development result in people's living being inconvenienced in some way ?
- Does over 25 % of the population of a place live within a short distance of the development ?
- Does the development bring some benefits to a community that might be seen to outweigh the disbenefit ?

Note; The direct questionnaire survey on people's desires may sometime effective.

(6) **Socio-political Acceptances / resistances;** means Does the development support by the socio-political organizations including state and local governments ?

- Neighbouring countries/international organizations
- State Government
- Decentralised Governmental institutions (Kraj/Okres)
- Local Governments (Mesto/Obec)
- Business world/community group
- NGO's
- Civilians individually or as group
- Posterity
- Educational and academic research institutes
- Concerned associations
- Mass media

3 **SCORING METHOD**

The scoring will be carried by the following steps;

Step-1: Judge and make points from 5 to 0 for each indicator

Step-2: Draw the picture (hexagon) for each project based on the above points

Step-3: Calculation of the area (hexagon)

Step-4: Classify the projects by the size of the area (hexagon) into following categories;

- 1) High priority (project with larger area)
- 2) Mid. priority (project with middle area)
- 3) Low priority (project with smaller area)

N.2 A CASE STUDY OF PROJECT PRIORITISATION OF AREAS AND SETTLEMENTS FOR SEWERAGE AND WASTEWATER TREATMENT

1 APPLIED METHOD FOR A CASE STUDY

The JICA Study Team has been examined project prioritisation for sewerage and wastewater treatment projects, which is the one of the major EAP programmes in the Study Area. The method of the examination is modified and simplified from the general idea, mentioned above, because of the limited available information about the projects. The JICA Study Team prepared 2 models for the evaluation of the project prioritisation to show how the study works for the project prioritisation. The applied indicators and selected evaluation criteria for case study are described below;

(1) Model-1: Selected evaluation criteria and points (even weight among the indicators)

a) Effects on Environment-1; reduction of pollutant load

Number of population to be served by the project (inhabitants ^{*)})	Points
1. more than 2 000	5
2. 1 500 – 1 999	4
3. 1 000 - 1499	3
4. 500 - 999	2
5. less than 499	1

Note; ^{*)} Number of inhabitants without house connection to the public sewer system at present.

Source; Statistical data on population and sewerage by Obec/Mesto (refer to ANNEX B.2 and E.1)

b) Effects on Environment-2; improvement of water quality

Existing river water quality in terms of BOD (mg/l) at the project site	Points
1. more than 8.0	5
2. 4.0 – 7.9	3
3. less than 3.9	1

Source; SHMU(9-3)

c) Socio-political Acceptances/resistances; Governmental support

Status of the project	Points
1. approved project as public works by the State Government in 1998	5
2. approved project ensured to proceed by the State Government in 1998	4
3. priority project in the Okres EAP list	3
4. proposal has been made once in the EAP documents	2
5. no proposal at all	0

Source; Summary of Environmental Management Projects and Proposals relevant to the Basin (refer to ANNEX D)

d) People's Willingness; community support

Response to the domestic wastewater in Q2*1) in the Environmental Questionnaire Survey	Points
1. most problematic issue	5
2. one of the most problematic issues	4
3. one of the priority issues	3
4. one of the problematic issues	2
5. one of the issues	1
6. no problem	0
7. no answer	0

Note; *1) Q2 is "What are the environmental problems in your Obec/Mesto"
Source; Environmental Questionnaire Survey (refer to ANNEX L.2)

(2) **Model-2: Selected evaluation criteria and points (higher weight on the indicators / criteria of the Effect on Environment-1 and -2, rather than other indicators / criteria)**

Note; The point number in **bold font** are changed from those in the model-1.

a) **Effects on Environment-1; reduction of pollutant load**

Number of population to be served by the project (inhabitants*1)	Points
1. more than 2 000	10
2. 1 500 - 1 999	4
3. 1 000 - 1499	3
4. 500 - 999	2
5. less than 499	1

Note; *1) Number of inhabitants without house connection to the public sewer system at present.
Source; Statistical data on population and sewerage by Obec/Mesto (refer to ANNEX B.2 and E.1)

b) **Effects on Environment-2; improvement of water quality**

Existing river water quality in terms of BOD (mg/l) at the project site	Points
1. more than 8.0	10
2. 4.0 - 7.9	3
3. less than 3.9	1

Source; SHMU(9.3)

c) **Socio-political Acceptances/resistances; Governmental support**

Status of the project	Points
1. approved project as public works by the State Government in 1998	5
2. approved project ensured to proceed by the State Government in 1998	4
3. priority project in the Okres EAP list	3
4. proposal has been made once in the EAP documents	2
5. no proposal at all	0

Source; Summary of Environmental Management Projects and Proposals relevant to the Basin (refer to ANNEX D)

d) **People's Willingness; community support**

Response to the domestic wastewater in Q2*1) in the Environmental Questionnaire Survey	Points
1. most problematic issue	5
2. one of the most problematic issues	4
3. one of the priority issues	3
4. one of the problematic issues	2
5. one of the issues	1
6. no problem	0
7. no answer	0

Note; *1) Q2 is "What are the environmental problems in your Obec/Mesto"
 Source; Environmental Questionnaire Survey (refer to ANNEX L.2)

2 SCORING

The scoring was made simply as follows;

- 1) Judge and make points on each criteria
- 2) Calculate the total points of 4 indicators by adding
- 3) Classify the projects into following categories;
 - a) High priority (higher total points)
 - b) Mid. Priority (middle total points)
 - c) Low priority (lower total points)

3 RESULTS OF THE CASE STUDY

The results of the model-1 and -2 studies are shown in the following tables;

- 1) Table N.2-1: The list of the municipalities, requires new construction of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-1)
- 2) Table N.2-2: The list of the municipalities, required improvement or expansion of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-1)
- 3) Table N.2-3: The list of the municipalities, requires new construction of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-2)
- 4) Table N.2-4: The list of the municipalities, required improvement or expansion of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-2)

The results and the process of the model-1 study are also shown in the following maps;

- 1) Map N.2-1: The total points (final evaluation)
- 2) Map N.2-2: Effects on Environment-1; reduction of pollutant load
- 3) Map N.2-3: Effects on Environment-2; improvement of water quality
- 4) Map N.2-4: Socio-political Acceptances/resistances; Governmental support
- 5) Map N.2-5: People's Willingness; community support

4 REMARKS

The following EAP projects are excluded from the above study;

- 1) Nation-wide central programmes, not specified particular areas
- 2) Small projects less than 5 million SK
- 3) Projects assisted by the foreign aid-programmes such as Phare
- 4) Study, survey, research, mapping, proposal making, declaration, events etc.
- 5) Projects respecting realisation of long-term perspective (after the year 2006)
- 6) Projects with uncertain descriptions for the Study Team

The Study Team expects to the SAZP or the related organisations to apply the method with more reliable and further information and develop more workable method for the project prioritisation in the future.

Table N.2-1 The list of the municipalities, requires new construction of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-1)

Municipality	Okres	Indicator				Total point	Priority
		People's Willingness; community support	Socio-political Acceptances / resistances; Governmental support	Effects on Environment-1; reduction of pollutant load	Effects on Environment-2; improvement of water quality		
KOZAROVCE	LEVICE	5	5	4	3	17	High
DETVANSK	DETVA	4	4	2	3	13	High
VIGLAS	DETVA	2	4	4	3	13	High
VELKY DUR	LEVICE	3	4	3	3	13	High
JASOVA	NOVE ZAMKY	3	4	3	3	13	High
TRNAVA HO	ZIAR NAD HRONOM	4	3	3	3	13	High
PONKY	BANSKA BYSTRICA	3	0	4	5	12	High
PLAVE VOZ	LEVICE	3	4	2	3	12	High
SVODIN	NOVE ZAMKY	0	4	5	3	12	High
STRBKOV	NOVE ZAMKY	0	4	5	3	12	High
NOVA VIES	NOVE ZAMKY	3	4	2	3	12	High
ZAVADKA N	BREZNO	5	0	5	1	11	Medium
NBMECKA	BREZNO	4	0	4	3	11	Medium
NOVA DEDI	LEVICE	0	4	4	3	11	Medium
HRONSKÉ K	LEVICE	1	4	3	3	11	Medium
FARNA	LEVICE	1	4	3	3	11	Medium
VELKE LUD	LEVICE	0	4	4	3	11	Medium
DUBNIK	NOVE ZAMKY	0	4	4	3	11	Medium
KAMENIN	NOVE ZAMKY	0	4	4	3	11	Medium
BAJTAVA	NOVE ZAMKY	3	4	1	3	11	Medium
OBYCE	ZLATE MORAVCE	0	4	4	3	11	Medium
ORAVCE	BANSKA BYSTRICA	4	0	1	5	10	Medium
POHRONSKA	BREZNO	5	0	4	1	10	Medium
STOZOK	DETVA	1	4	2	3	10	Medium
CAJKOV	LEVICE	0	4	3	3	10	Medium
RYBNIK	LEVICE	0	4	3	3	10	Medium
VELKE KOZ	LEVICE	0	5	2	3	10	Medium
ZEMBEROV	LEVICE	0	4	3	3	10	Medium
STARÝ TEK	LEVICE	0	4	3	3	10	Medium
KRSKANY	LEVICE	0	5	2	3	10	Medium
HONTIANSK	LEVICE	1	4	2	3	10	Medium
HRONOVCE	LEVICE	0	4	3	3	10	Medium
POHRONSKY	LEVICE	0	4	3	3	10	Medium
CATA	LEVICE	0	4	3	3	10	Medium
KOLTA	NOVE ZAMKY	0	4	3	3	10	Medium
RUBAN	NOVE ZAMKY	0	4	3	3	10	Medium
BINA	NOVE ZAMKY	0	4	3	3	10	Medium
GBELCE	NOVE ZAMKY	0	4	3	3	10	Medium
KAMENNY M	NOVE ZAMKY	0	4	3	3	10	Medium
NANA	NOVE ZAMKY	0	4	3	3	10	Medium
ZUPKOV	ZARNOVICA	5	0	2	3	10	Medium
TEKOVSKA	ZARNOVICA	4	0	3	3	10	Medium
DOLNA ZDA	ZIAR NAD HRONOM	2	3	2	3	10	Medium
CIBRNE KL	ZLATE MORAVCE	0	4	3	3	10	Medium
VOLKOVCE	ZLATE MORAVCE	0	4	3	3	10	Medium
MOLCA	BANSKA BYSTRICA	3	0	1	5	9	Medium
HROCHOT	BANSKA BYSTRICA	1	0	3	5	9	Medium
SEBBDIN-B	BANSKA BYSTRICA	3	0	1	5	9	Medium
HELPA	BREZNO	3	0	5	1	9	Medium
SUMIAC	BREZNO	2	3	3	1	9	Medium
CIBERNY BA	BREZNO	3	0	5	1	9	Medium
NOVÝ TEK	LEVICE	0	4	2	3	9	Medium
PODLUZANY	LEVICE	0	4	2	3	9	Medium
HORNA SEC	LEVICE	0	5	1	3	9	Medium
MYTNE LUD	LEVICE	0	4	2	3	9	Medium
VYSNE NAD	LEVICE	0	5	1	3	9	Medium
ZEMLIARE	LEVICE	0	5	1	3	9	Medium
DOLNY PIA	LEVICE	0	4	2	3	9	Medium
SAROVCE	LEVICE	0	2	4	3	9	Medium
CAKA	LEVICE	0	4	2	3	9	Medium
BARDONOVO	NOVE ZAMKY	0	4	2	3	9	Medium
DEBINKA	NOVE ZAMKY	0	4	2	3	9	Medium
BRUTY	NOVE ZAMKY	0	4	2	3	9	Medium
LOVCICA-T	ZIAR NAD HRONOM	0	3	3	3	9	Medium
DONOVALY	BANSKA BYSTRICA	0	2	1	5	8	Low
VIGLASSKA	DETVA	0	4	1	3	8	Low
STARA HUT	DETVA	0	4	1	3	8	Low
JUR NAD H	LEVICE	3	0	2	3	8	Low
PAVLOVA	NOVE ZAMKY	4	0	1	3	8	Low
SARKAN	NOVE ZAMKY	0	4	1	3	8	Low
MALA NAD	NOVE ZAMKY	0	4	1	3	8	Low
PROCHOT	ZIAR NAD HRONOM	0	3	2	3	8	Low
PRESTAVLK	ZIAR NAD HRONOM	0	3	2	3	8	Low
BZENICA	ZIAR NAD HRONOM	0	3	2	3	8	Low
BANSKY ST	BANSKA STIAVNICA	0	3	1	3	7	Low
POCUVADLO	BANSKA STIAVNICA	3	0	1	3	7	Low
BYSTRA	BREZNO	5	0	1	1	7	Low
RAZTOKA	BREZNO	3	0	1	3	7	Low
OSRBLIE	BREZNO	3	0	1	3	7	Low
KUNESOV	ZIAR NAD HRONOM	0	3	1	3	7	Low
KREBNICKE	ZIAR NAD HRONOM	0	3	1	3	7	Low
SLASKA	ZIAR NAD HRONOM	0	3	1	3	7	Low
BARTOSOVA	ZIAR NAD HRONOM	0	3	1	3	7	Low
HRONSKA D	ZIAR NAD HRONOM	0	3	1	3	7	Low
REPISIE	ZIAR NAD HRONOM	0	3	1	3	7	Low
ZBROJNIKY	LEVICE	1	0	2	3	6	Low
VOZNICA	ZARNOVICA	1	0	2	3	6	Low
BABINA	ZVOLEN	2	0	1	3	6	Low
HORNA LBH	BREZNO	2	0	2	1	5	Low
DEVICANY	LEVICE	0	0	1	3	4	Low

Table N.2-2 The list of the municipalities, required improvement of expansion of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-1)

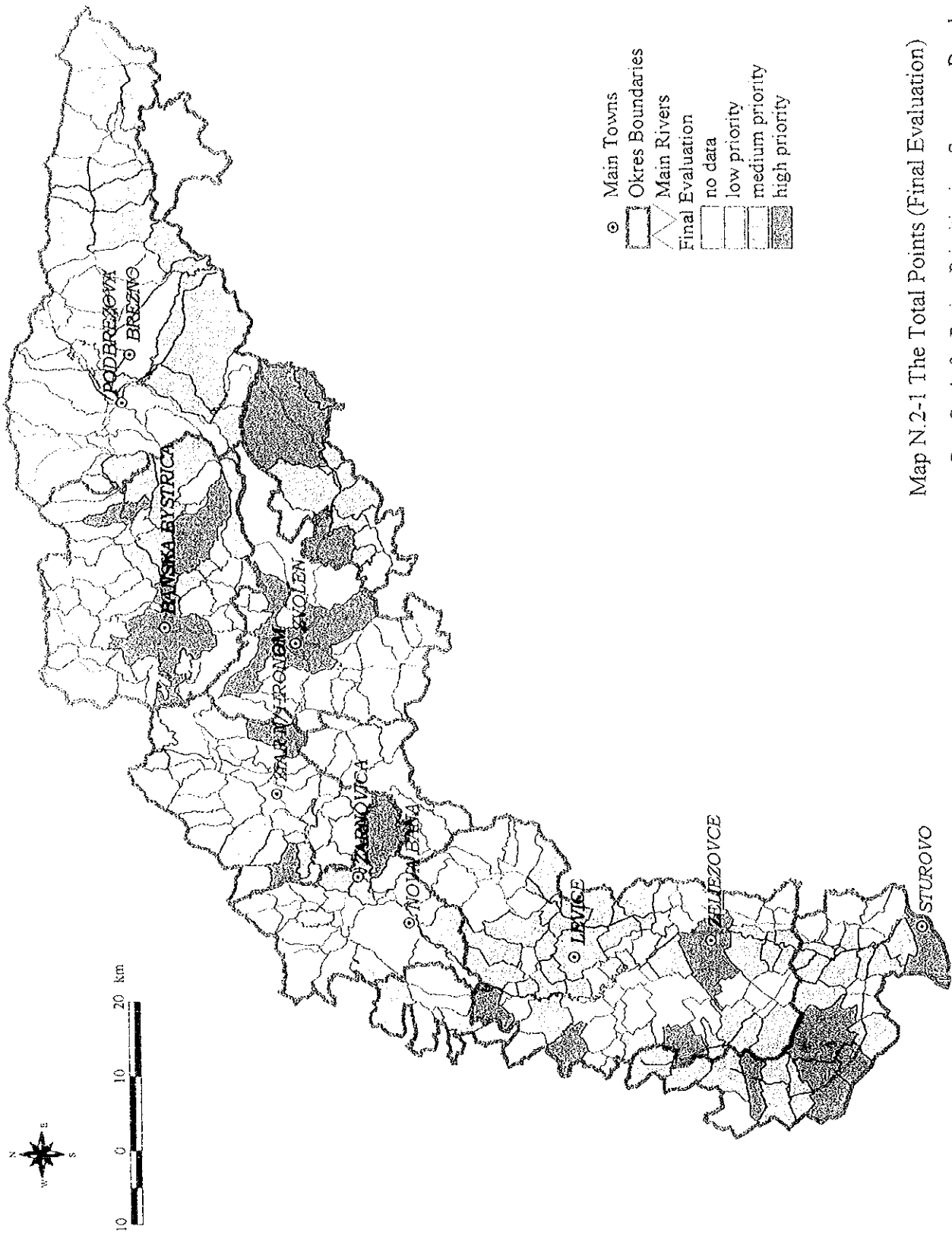
Municipality	Okres	Indicator				Total point	Priority
		People's Willingness; community support	Socio-political Acceptances / resistances; Governmental support	Effects on Environment-1; reduction of pollutant load	Effects on Environment-2; improvement of water quality		
HODRUSA-H	ZARNOVICA	5	2	4	3	14	High
ZVOLEN	ZVOLEN	0	4	5	5	14	High
MBDZIBROD	BANSKA BYSTRICA	2	3	3	5	13	High
BANSKA BY	BANSKA BYSTRICA	1	2	5	5	13	High
ZELIEZOVC	LEVICE	2	5	3	3	13	High
SLIAC	ZVOLEN	4	0	4	5	13	High
HIRNOVA	DETVA	0	4	5	3	12	High
STUROVO	NOVE ZAMKY	2	5	2	3	12	High
HORNA ZDA	ZIAR NAD HRONOM	5	3	1	3	12	High
BRUSNO	BANSKA BYSTRICA	0	3	3	5	11	Medium
SLOVENSKA	BANSKA BYSTRICA	0	3	3	5	11	Medium
LUBIETOVA	BANSKA BYSTRICA	1	3	2	5	11	Medium
POLOMKA	BREZNO	2	5	3	1	11	Medium
KRIVAN	DETVA	0	4	4	3	11	Medium
VALASKA	BREZNO	4	0	5	1	10	Medium
VELKA LEH	ZARNOVICA	4	0	3	3	10	Medium
DETVA	DETVA	1	0	5	3	9	Medium
KORYTARKY	DETVA	0	4	2	3	9	Medium
SLATINSKE	DETVA	0	4	2	3	9	Medium
LEVICE	LEVICE	0	3	3	3	9	Medium
ZARNOVICA	ZARNOVICA	1	0	5	3	9	Medium
BREZNO	BREZNO	2	2	3	1	8	Low
MALACHOV	BANSKA BYSTRICA	2	0	1	5	8	Low
KLOKOC	DETVA	0	4	1	3	8	Low
TLMACE	LEVICE	0	4	1	3	8	Low
KOSORIN	ZIAR NAD HRONOM	1	3	1	3	8	Low
JANOVA LE	ZIAR NAD HRONOM	0	3	2	3	8	Low
BANSKA BE	BANSKA STIAVNICA	3	0	1	3	7	Low
DOLNA TRN	ZIAR NAD HRONOM	0	3	1	3	7	Low
LEHOTKA P	ZIAR NAD HRONOM	0	3	1	3	7	Low
VYHNE	ZIAR NAD HRONOM	3	0	1	3	7	Low
KREMNICA	ZIAR NAD HRONOM	1	0	1	3	5	Low
KRAHULE	ZIAR NAD HRONOM	0	0	1	3	4	Low

Table N.2-3 The list of the municipalities, requires new construction of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-2)

Municipality	Okres	People's Willingness; community support	Indicator			Total point	Priority
			Socio-political Acceptances / resistances; Governmental support	Effects on Environment-1; reduction of pollutant load	Effects on Environment-2; improvement of water quality		
KOZAROVCE	LEVICE	5	5	4	3	17	High
PONIKY	BANSKA BYSTRICA	3	0	4	10	17	High
SVODIN	NOVE ZAMKY	0	4	10	3	17	High
STREKOV	NOVE ZAMKY	0	4	10	3	17	High
ZAVADKA N	BREZNO	5	0	10	1	16	High
ORAVCE	BANSKA BYSTRICA	4	0	1	10	15	High
MOLCA	BANSKA BYSTRICA	3	0	1	10	14	High
HROCHOT	BANSKA BYSTRICA	1	0	3	10	14	High
SEBEDIN-B	BANSKA BYSTRICA	3	0	1	10	14	High
CIERNY BA	BREZNO	3	0	10	1	14	High
DONOVALY	BANSKA BYSTRICA	0	2	1	10	13	High
DETVANSK	DETVA	4	4	2	3	13	Medium
VIGLAS	DETVA	2	4	4	3	13	Medium
VELKY DUR	LEVICE	3	4	3	3	13	Medium
JASOVA	NOVE ZAMKY	3	4	3	3	13	Medium
TRNAVA HO	ZIAR NAD HRONOM	4	3	3	3	13	Medium
PLAVE VOZ	LEVICE	3	4	2	3	12	Medium
NOVA VIES	NOVE ZAMKY	3	4	2	3	12	Medium
NEMECKA	BREZNO	4	0	4	3	11	Medium
NOVA DEDI	LEVICE	0	4	4	3	11	Medium
HRONSKE K	LEVICE	1	4	3	3	11	Medium
FARNA	LEVICE	1	4	3	3	11	Medium
VELKE LUD	LEVICE	0	4	4	3	11	Medium
DUBNIK	NOVE ZAMKY	0	4	4	3	11	Medium
KAMENIN	NOVE ZAMKY	0	4	4	3	11	Medium
BATAVA	NOVE ZAMKY	3	4	1	3	11	Medium
OBYCE	ZLATE MORAVCE	0	4	4	3	11	Medium
POHRONSKA	BREZNO	5	0	4	1	10	Medium
STOZOK	DETVA	1	4	2	3	10	Medium
CAJKOV	LEVICE	0	4	3	3	10	Medium
RYBNIK	LEVICE	0	4	3	3	10	Medium
VELKE KOZ	LEVICE	0	5	2	3	10	Medium
ZEMBEROVCI	LEVICE	0	4	3	3	10	Medium
STARÝ TEK	LEVICE	0	4	3	3	10	Medium
KRSKANY	LEVICE	0	5	2	3	10	Medium
HONTIANSK	LEVICE	1	4	2	3	10	Medium
HRONOVICE	LEVICE	0	4	3	3	10	Medium
POHRONSKY	LEVICE	0	4	3	3	10	Medium
CATA	LEVICE	0	4	3	3	10	Medium
KOLTA	NOVE ZAMKY	0	4	3	3	10	Medium
RUBAN	NOVE ZAMKY	0	4	3	3	10	Medium
BINA	NOVE ZAMKY	0	4	3	3	10	Medium
GBELCE	NOVE ZAMKY	0	4	3	3	10	Medium
KAMENNY M	NOVE ZAMKY	0	4	3	3	10	Medium
NANA	NOVE ZAMKY	0	4	3	3	10	Medium
ZUPKOV	ZARNOVICA	5	0	2	3	10	Medium
TEKOVSKA	ZARNOVICA	4	0	3	3	10	Medium
DOLNA ZDA	ZIAR NAD HRONOM	2	3	2	3	10	Medium
CIERNE KL	ZLATE MORAVCE	0	4	3	3	10	Medium
VOLKOVCE	ZLATE MORAVCE	0	4	3	3	10	Medium
HELPA	BREZNO	3	0	5	1	9	Medium
SUMIAC	BREZNO	2	3	3	1	9	Medium
NOVÝ TBKO	LEVICE	0	4	2	3	9	Medium
PODLUZANY	LEVICE	0	4	2	3	9	Medium
HORNA SEC	LEVICE	0	5	1	3	9	Medium
MYTNE LUD	LEVICE	0	4	2	3	9	Medium
VYSNE NAD	LEVICE	0	5	1	3	9	Medium
ZEMLIARE	LEVICE	0	5	1	3	9	Medium
DOLNY PIA	LEVICE	0	4	2	3	9	Medium
SAROVCE	LEVICE	0	2	4	3	9	Medium
ČAKA	LEVICE	0	4	2	3	9	Medium
BARDONOVO	NOVE ZAMKY	0	4	2	3	9	Medium
DEDINKA	NOVE ZAMKY	0	4	2	3	9	Medium
BRUTY	NOVE ZAMKY	0	4	2	3	9	Medium
LOVCICA-T	ZIAR NAD HRONOM	0	3	3	3	9	Low
VIGLASSKA	DETVA	0	4	1	3	8	Low
STARÁ HUT	DETVA	0	4	1	3	8	Low
JUR NAD H	LEVICE	3	0	2	3	8	Low
PAVLOVA	NOVE ZAMKY	4	0	1	3	8	Low
SARKAN	NOVE ZAMKY	0	4	1	3	8	Low
MALA NAD	NOVE ZAMKY	0	4	1	3	8	Low
PROCHOT	ZIAR NAD HRONOM	0	3	2	3	8	Low
PRESTAVLK	ZIAR NAD HRONOM	0	3	2	3	8	Low
BZENICA	ZIAR NAD HRONOM	0	3	2	3	8	Low
BANSKY ST	BANSKA STIAVNICA	0	3	1	3	7	Low
POCUVADLO	BANSKA STIAVNICA	3	0	1	3	7	Low
BYSTRA	BREZNO	5	0	1	1	7	Low
RAZTOKA	BREZNO	3	0	1	3	7	Low
OSRBLIE	BREZNO	3	0	1	3	7	Low
KUNESOV	ZIAR NAD HRONOM	0	3	1	3	7	Low
KREMNICKE	ZIAR NAD HRONOM	0	3	1	3	7	Low
SLASKA	ZIAR NAD HRONOM	0	3	1	3	7	Low
BARTOSOVA	ZIAR NAD HRONOM	0	3	1	3	7	Low
HRONSKA D	ZIAR NAD HRONOM	0	3	1	3	7	Low
REPISTE	ZIAR NAD HRONOM	0	3	1	3	7	Low
ZBROJNIKY	LEVICE	1	0	2	3	6	Low
VOZNICA	ZARNOVICA	1	0	2	3	6	Low
BABINA	ZVOLEN	2	0	1	3	6	Low
HORNA LEH	BREZNO	2	0	2	1	5	Low
DEVICANY	LEVICE	0	0	1	3	4	Low

Table N.2-4 The list of the municipalities, required improvement of expansion of sewerage and WWTP projects by priorities of high, mid and low. (result of Model-2)

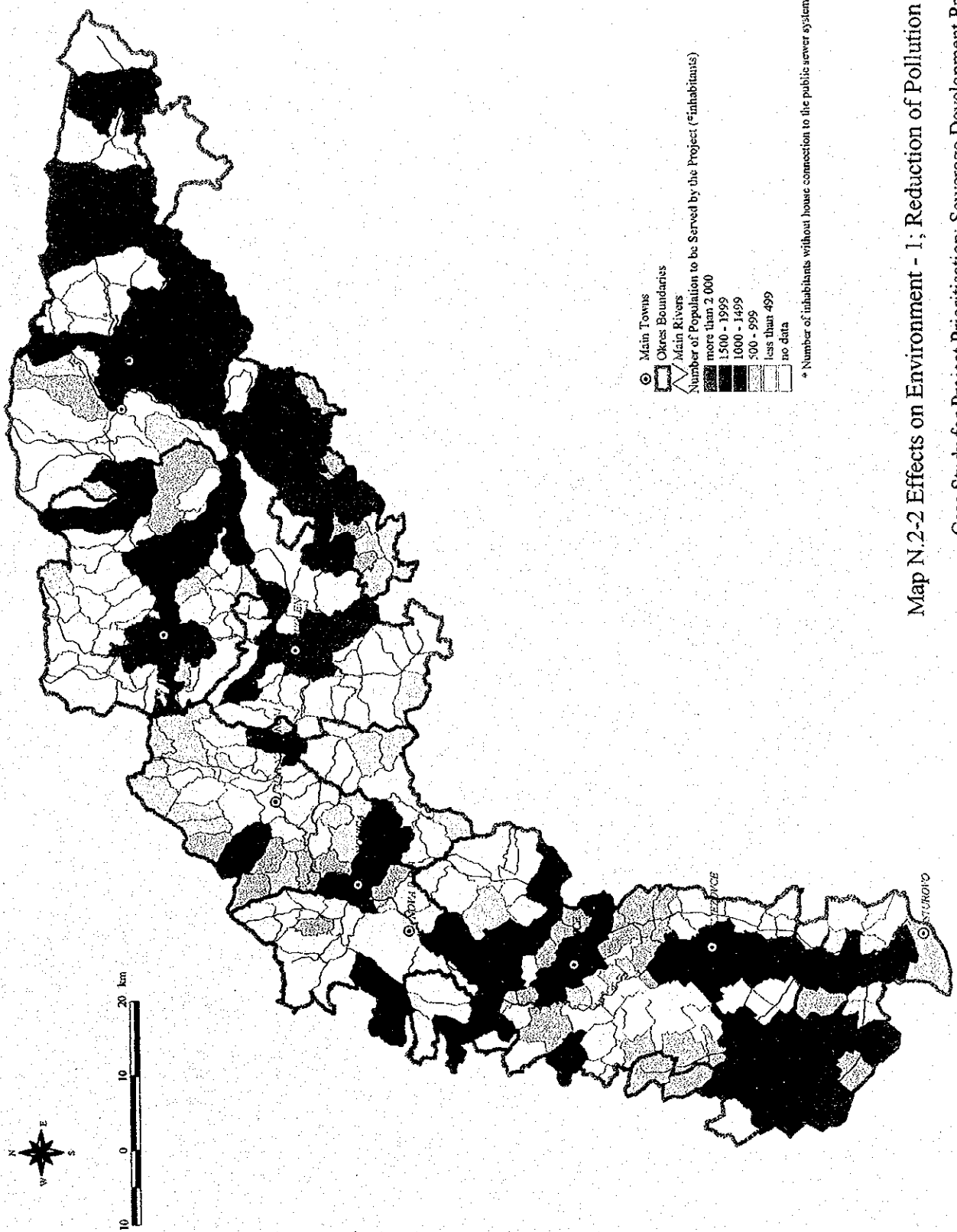
Municipality	Okres	Indicator				Total point	Priority
		People's Willingness; community support	Socio-political Acceptances / resistances; Governmental support	Effects on Environment-1; reduction of pollutant load	Effects on Environment-2; Improvement of water quality		
ZVOLEN	ZVOLEN	0	4	10	10	24	High
BANSKA BY	BANSKA BYSTRICA	1	2	10	10	23	High
MEDZIBROD	BANSKA BYSTRICA	2	3	3	10	18	High
SLIAC	ZVOLEN	4	0	4	10	18	High
HRINOVA	DETVA	0	4	10	3	17	High
BRUSNO	BANSKA BYSTRICA	0	3	3	10	16	High
SLOVENSKA	BANSKA BYSTRICA	0	3	3	10	16	High
LUBETOVA	BANSKA BYSTRICA	1	3	2	10	16	High
VALASKA	BREZNO	4	0	10	1	15	High
DETVA	DETVA	1	0	10	3	14	Medium
HODRUSA-H	ZARNOVICA	5	2	4	3	14	Medium
ZARNOVICA	ZARNOVICA	1	0	10	3	14	Medium
MALACHOV	BANSKA BYSTRICA	2	0	1	10	13	Medium
ZBLEZOVCI	LEVICE	2	5	3	3	13	Medium
STUROVO	NOVE ZAMKY	2	5	2	3	12	Medium
HORNA ZDA	ZIAR NAD HRONOM	5	3	1	3	12	Medium
POLOMKA	BREZNO	2	5	3	1	11	Medium
KRIVAN	DETVA	0	4	4	3	11	Medium
VELKA LEH	ZARNOVICA	4	0	3	3	10	Medium
KORYTARKY	DETVA	0	4	2	3	9	Medium
SLATINSKE	DETVA	0	4	2	3	9	Medium
LEVICE	LEVICE	0	3	3	3	9	Low
BREZNO	BREZNO	2	2	3	1	8	Low
KLOKOC	DETVA	0	4	1	3	8	Low
TLMACE	LEVICE	0	4	1	3	8	Low
KOSORIN	ZIAR NAD HRONOM	1	3	1	3	8	Low
JANOVA LE	ZIAR NAD HRONOM	0	3	2	3	8	Low
BANSKA BE	BANSKA STIAVNICA	3	0	1	3	7	Low
DOLNA TRN	ZIAR NAD HRONOM	0	3	1	3	7	Low
LEHOTKA P	ZIAR NAD HRONOM	0	3	1	3	7	Low
VYHNE	ZIAR NAD HRONOM	3	0	1	3	7	Low
KREMNICA	ZIAR NAD HRONOM	1	0	1	3	5	Low
KRAHULE	ZIAR NAD HRONOM	0	0	1	3	4	Low



- ⊙ Main Towns
- ▭ Okres Boundaries
- ▭ Main Rivers
- Final Evaluation
 - ▭ no data
 - ▭ low priority
 - ▭ medium priority
 - ▭ high priority

Map N.2-1 The Total Points (Final Evaluation)

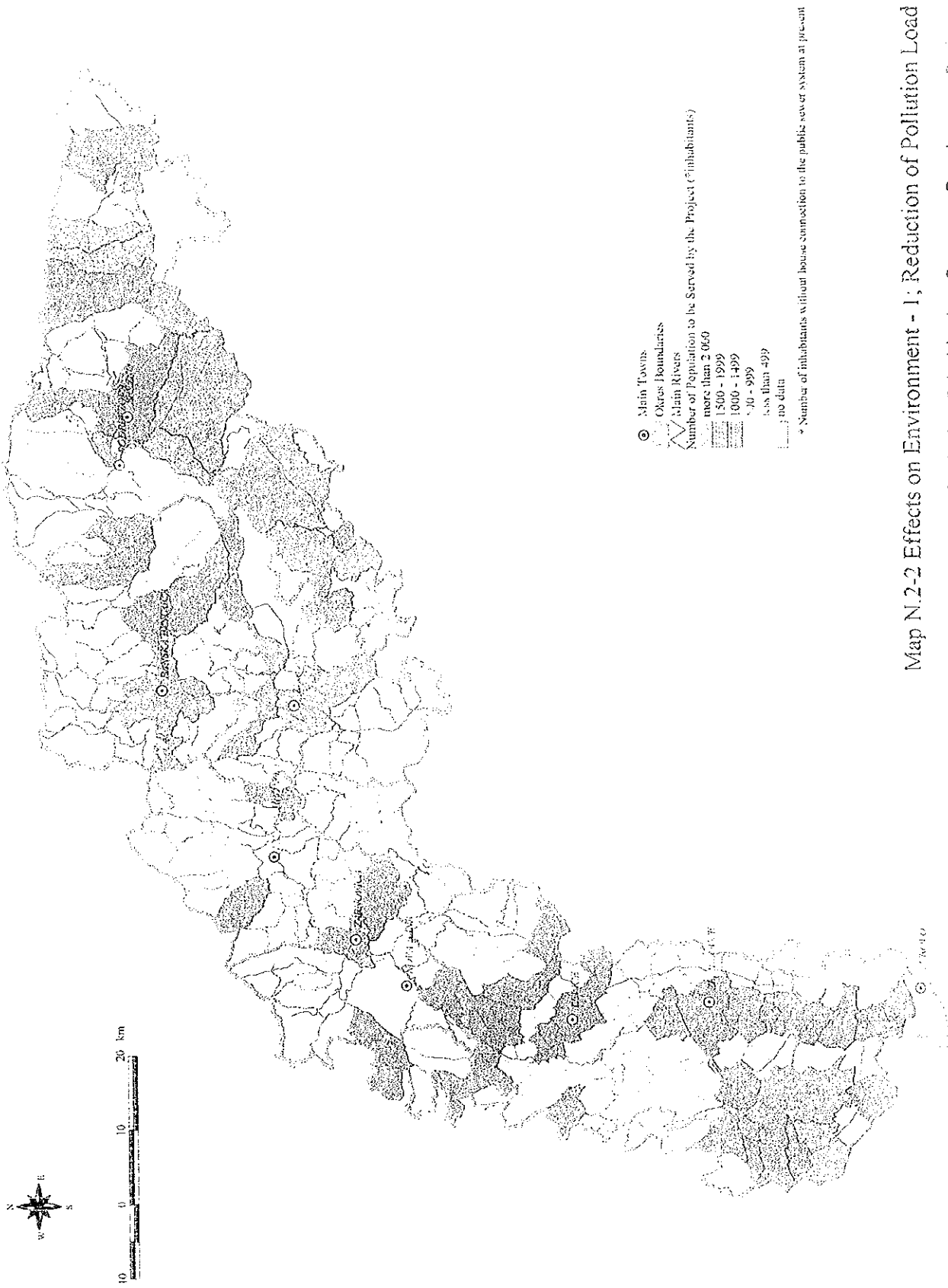
Case Study for Project Prioritisation: Sewerage Development Projects

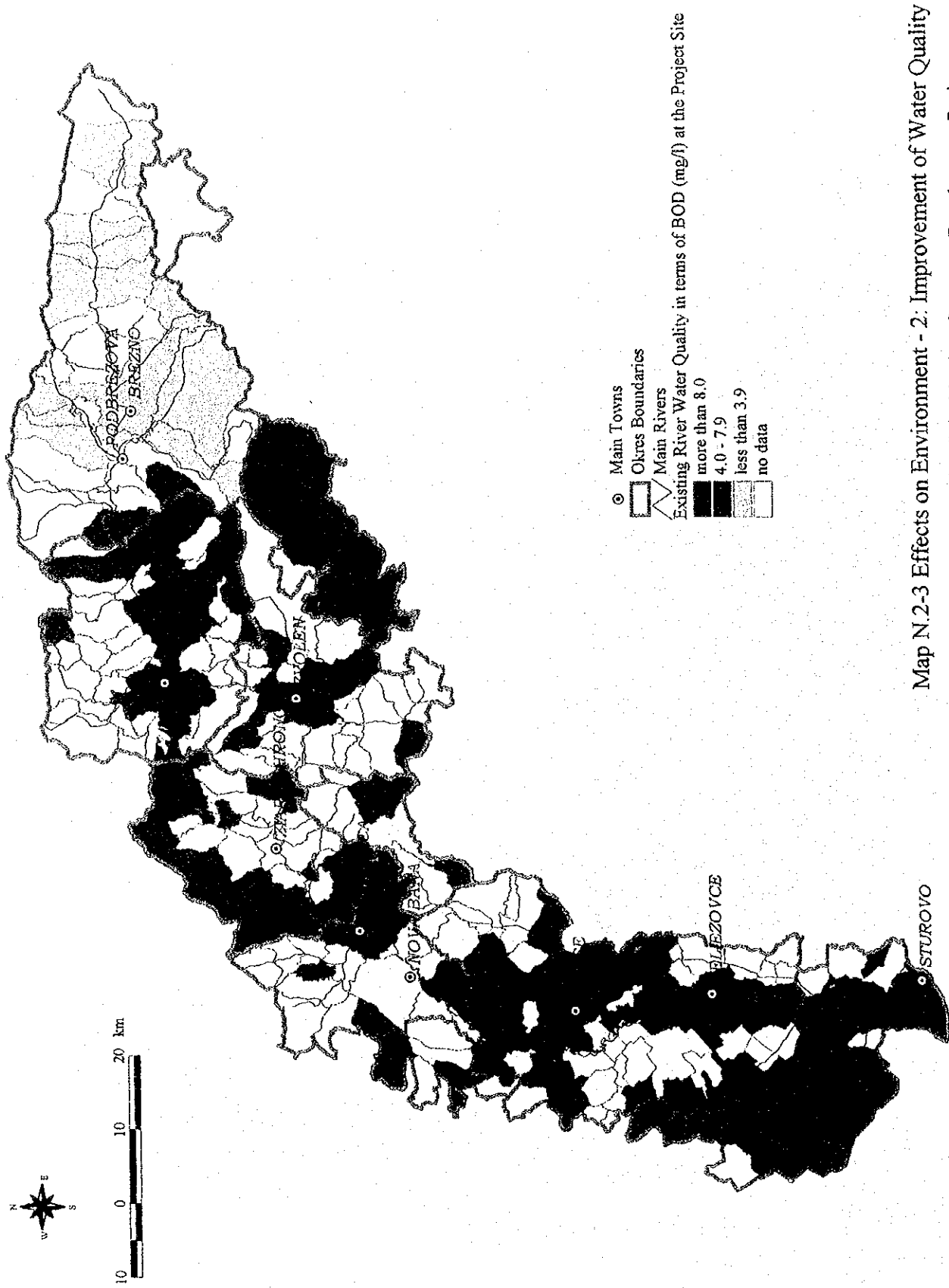


* Number of inhabitants without house connection to the public sewer system at present

Map N.2-2 Effects on Environment - 1; Reduction of Pollution Load

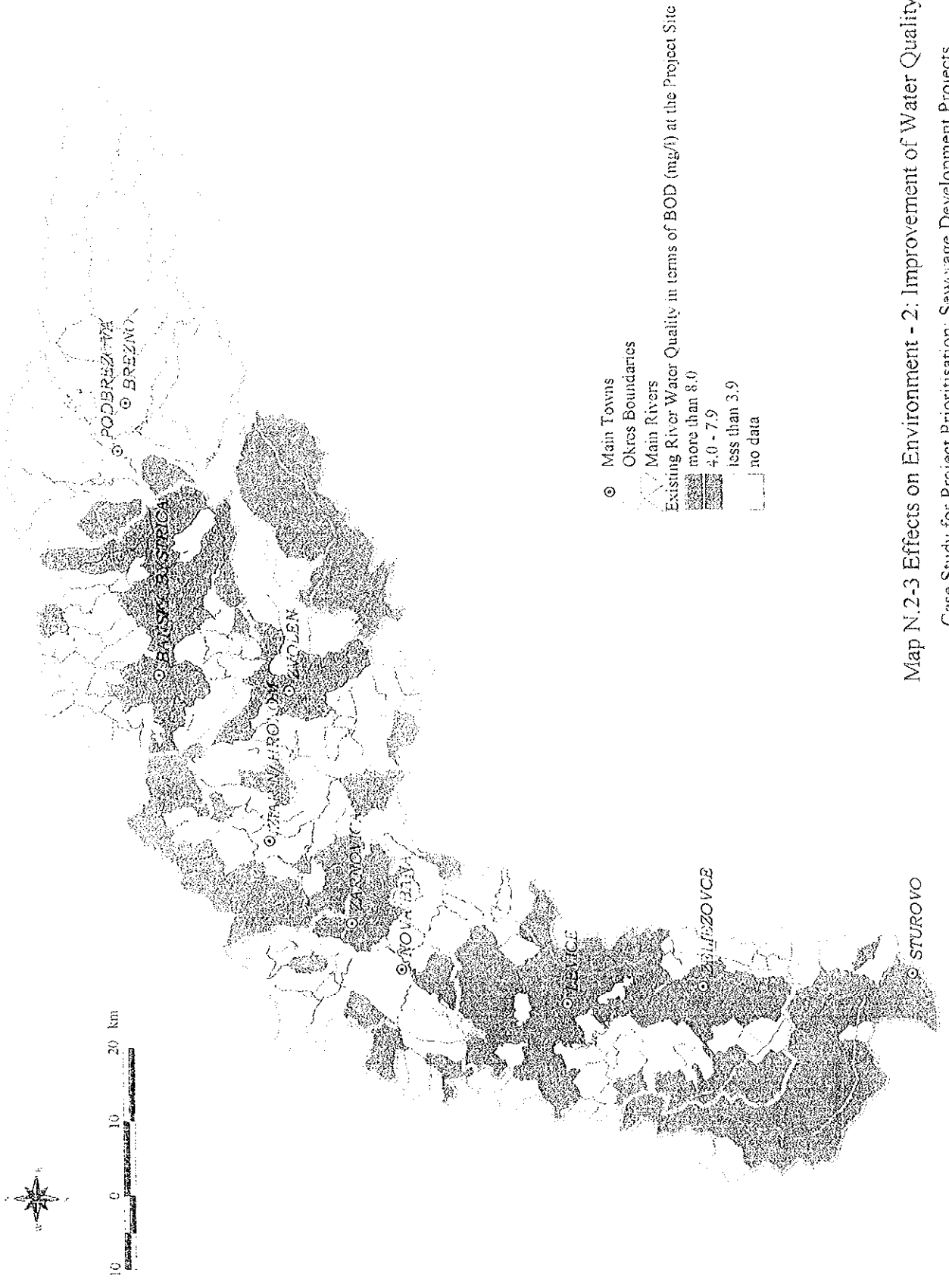
Case Study for Project Prioritisation: Sewerage Development Projects



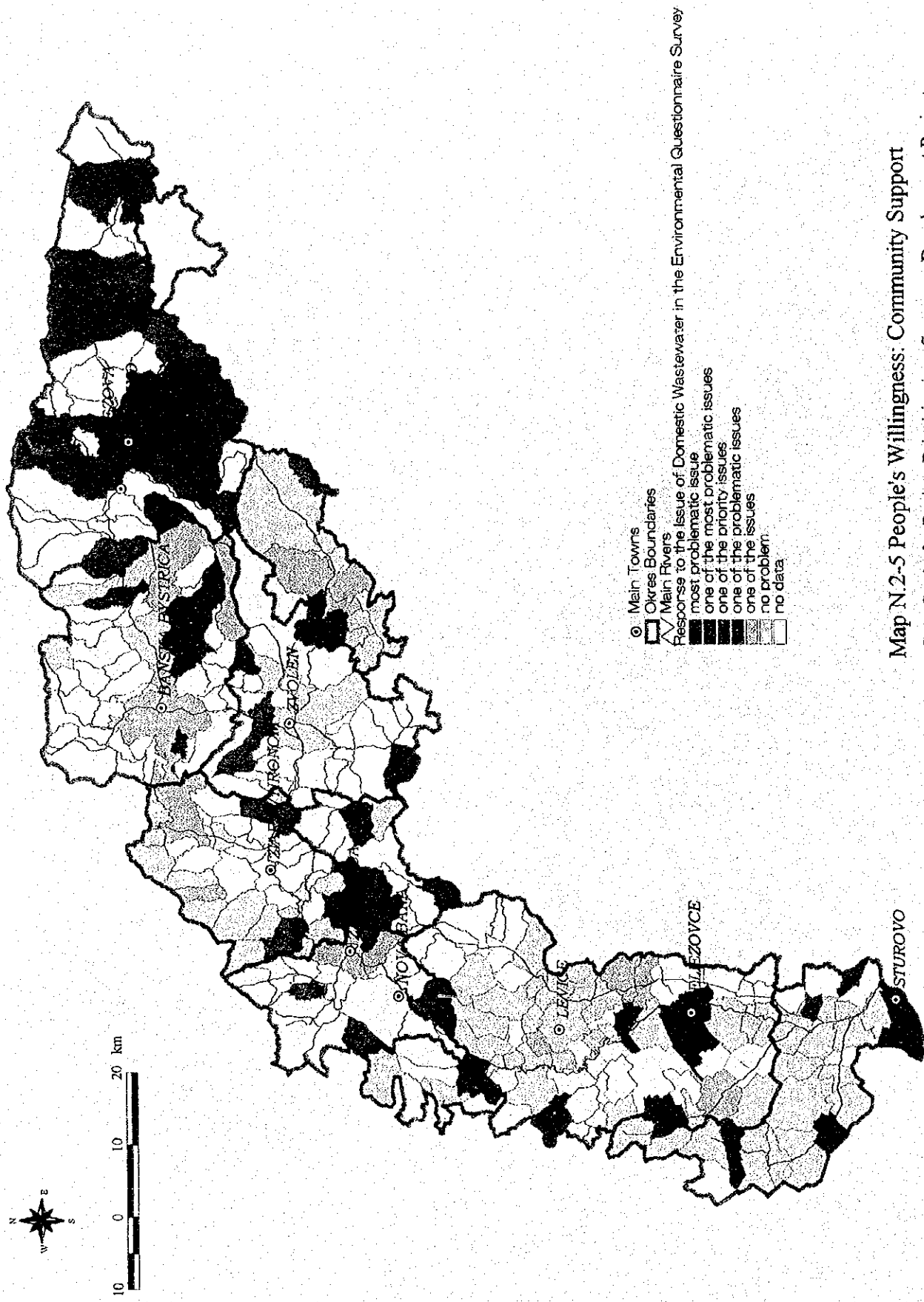


- ⊙ Main Towns
- ▭ Okres Boundaries
- ▭ Main Rivers
- Existing River Water Quality in terms of BOD (mg/l) at the Project Site
 - more than 8.0
 - 4.0 - 7.9
 - less than 3.9
 - no data

Map N.2-3 Effects on Environment - 2: Improvement of Water Quality
 Case Study for Project Prioritisation: Sewerage Development Projects



Map N.2-3 Effects on Environment - 2: Improvement of Water Quality
 Case Study for Project Prioritisation: Sewerage Development Projects



Map N.2-5 People's Willingness: Community Support
 Case Study for Project Prioritisation: Sewerage Development Projects

