Ecological and Sustainable Redevelopment of Mining Zones in Gorj County, Romania

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This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U. S. government. The opinions, findings, conclusions or recommendations expressed in this document are those of the authors and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report.

October 2008
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Ecological and Sustainable Redevelopment of Mining Zones in Gorj County, Romania

October 2008

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Lakewood

Prairie Crossing

Chicago Center for Green Technology

EXECUTIVE SUMMARY

The economy and social structure of Gorj County, located in southwest Romania was heavily dependent upon mining prior to the early 1990’s. As Romania changed from communism to capitalism, the inefficient mining industry closed many active mines resulting in large numbers of unemployed and environmentally unsound mine closures. As Romania emerged from communist rule in the late 1980s and early 1990s, mining, was revealed to be economically inefficient and environmentally unsound. As Gorj County enters the competitive market-based economy and the European Union, the development vision for Gorj County, Romania embraces both the natural geographic characteristics and the human/culture resources of the region in an environmentally and economically sustainable manner. To this end, Gorj County has aggressively prepared strategic development plans, upon which this report has drawn much information for its analysis of social, economic and natural resources in the county. The analysis provided the basis for a methodology to score proposed projects using an *ex ante* “Indicator Scoring System (ISS)”. The primary goal of the project described in this report is to develop decision-support tools that will aid in holistic and sustainable project planning – from the standpoint of the environment and the economy; but also from social, cultural perspectives.

For this reason, the project team established two broad objectives to direct its efforts throughout the USTDA grant and to provide the long-term strategy required to maintain a sustainable development plan:

1. To smoothly integrate the principles of sustainable development into the region’s on-going economic and environmental sustainable initiatives; and
2. To develop a knowledge-based and participatory method of evaluating and prioritizing sustainable development projects for Gorj County and its communities.

These two broad themes are interrelated and reflect the current economic and environmental situation. The first theme relates to the sustainability of the future initiatives focused on developing a mixed market economy and represents a long-term goal that is fundamental to the mandate and mission of the European Union. Sustainable communities are defined here as those that are able to further social, economic and environmental objectives without creating problems for another group, community or generation. Oftentimes, not all stakeholders will participate in and embrace sustainable development strategies. The second objective of integrating sustainable development principles into ongoing initiatives was very evident as the project progressed. Gorj County was in the midst of creating a Strategic Development Plan and therefore, much of the research focused on understanding those reports and integrating them with the analysis and stakeholder interviews necessary for understanding the opportunities and constraints in Gorj and also development of the appropriate tool for evaluation of projects.

A vision for sustainable development implies a long-term process, in which decisions focusing on the economic, environmental, and social/cultural assessment are based on the best available information and coordinated at the local, regional, and global levels. Sustainable development brings these three vital assessment categories into balance with each other and negotiates among the interest groups and stakeholders involved in the process. It requires the consideration of disparities in spatial and temporal scales, and an understanding of the intricate interdependence between the economic, environmental, and social/cultural factors (Campbell 1995). Therefore, a sustainable development strategy is a functional synthesis of economic development, environmental protection, and quality of life for the stakeholders.

Similar to any larger planning project, a practical and critical barrier to sustainable development is how to make and coordinate a wide range of priorities and decisions at local and regional levels and how these projects may change over time. To address these factors, we developed a database tool for
sustainable development to support the decision making process. Technical tools are essential for both information and judgment driven decision making and takes into consideration economic, environmental, and social/cultural factors of the region. The tool developed through the process of this project is called the Indicator Scoring System (ISS) and it is an attempt for projects to be judged in a very objective manner and reviewed by experts in each of the categories – economic, social/cultural and economic. The Indicator Scoring System (ISS) is a simplified, integrated mathematical hierarchical decision-support tool to investigate the impact of various redevelopment projects using sustainable strategies. Most importantly, the tool helps track multiple projects and allows for qualitative reasoning to be tracked by project.

During the project research and analysis of the economic, social/cultural and natural resources of Gorj County and development of the Indicator Scoring System (ISS), many stakeholder meetings were held. The team was able to present and learn about current economic, social/cultural and natural resource concerns of the stakeholders. Additionally, the logic, overview and details concerning the ISS were presented. The team received a good feedback regarding the ISS and modified the tool to add additional details, integrate map features, allow for easier and store project data.

An essential part of the process is for *ex ante* evaluation of impacts to be conducted early in the decision process for project prioritization - allowing for an analysis of strengths, weaknesses and potentials for regional sustainability. This not only provides authorities with stakeholder input relative to policy, program and project priorities, but also presents an opportunity for transparency in the decision-making process. *Ex ante* evaluations need to be conducted at the time when discussions and negotiations are underway to set a future programme in motion, often before the program is fully defined. One key aspect is that *ex ante* evaluation may be done when stakeholders are in position to express desired outcomes and, as such, contribute to the inclusion of revised aspects to projects that may not have been part of an original proposal.

During the review of strategic plans, background information and stakeholder meetings many potential projects were discussed. The following is a list of the projects that were consistently identified as of high priority which at first consideration are consistent with the principles of sustainable business development. The projects were conceptually reviewed based on assumptions in terms of their financial cost and infrastructure needs. Additional scoring will need to be completed based on the environmental, social and economic perspectives and how these projects fit into the overall goals for Gorj.

1. Gorj County and Motru: Industrial Development Parks that including environmental remediation of polluted lands and implementation of Best Management Practices (BMPs)
3. Baia de Fier: Establishing a Regional Tourist Zone
4. Sustainable Agriculture Infrastructure and Landuse planning for Small Farms and Villages.
5. Green Space and Park Planning in Targu Jiu
6. Implementation of a Training Program for Project Management for Sustainable Development:

Initial data collection for this study focused on the compilation of projects and project data in order to prioritize these via sustainable development criteria. As the project progressed it became apparent that developing a prioritized list would be very difficult because of insufficient data, data that were not gathered in a consistent way, or the absence of necessary information for specific projects. Due to these difficulties, the team focused on creating a standardized project management tool to manage, track, evaluate, prioritize and visualize projects.
Sustainable development is emerging as a new approach to the dilemma of balancing the trade-offs between the needs of current versus future generations, as well as between economic development and resource conservation. Sustainable development consists of objectives that are economically viable, environmentally sound, and socially acceptable. Sustainable development is by definition a dynamic process; new inventions are changing the way business is being done, completed projects will influence new projects, social, economic and natural landscapes and resources are changing daily. Because of this, it is recommended that the stakeholders further develop, refine, and implement the project management process, described in detail in Chapter 2, to fit the detailed needs of Gorj County. While this project has developed the first version of the ISS tool and started the evaluation process, it is the responsibility of Gorj County to implement the process and to continue to develop and refine the details in order to enhance its functionality. The overall process is designed to encourage public participation, provide unbiased quantitative and qualitative evaluation, integrated agency database compilation and provide data analysis tools/techniques and viewing applications. Only with this dynamic, interactive process can sustainable development be realized.
CHAPTER 1: BACKGROUND AND INTRODUCTION

1.1 Background

As Romania emerged from communist rule in the late 1980s and early 1990s, one particular industrial sector, mining, was revealed to be economically inefficient and environmentally unsound. Since 1990, the painful process of closing the country’s sub-performing mines has caused wide-spread unemployment. From over 300,000 workers in the late 1980s, employment in mining declined to 68,000 (2003). As of 2004 there remained 120 active mines, including 61 lignite mines, while 480 mines had been closed. Most of the mines that remain active are slated for closure by 2008. The economic distress caused by mine closures is of primary concern to Romanian officials. In addition, Romania’s pending accession into the European Union requires remediation of the extensive environmental damage caused by mining activities.

The economies of twenty-two of Romania’s forty-one counties have been reliant on mining. Among the most affected is Gorj County in southwest Romania, where closure of lignite mines in the Oltenia region has devastated the local economy and left mine wastes in locations where they threaten human health and natural resources. Gorj County is about 250 kilometers west of Bucharest. The county covers 5,602 square kilometers and has a population of just over 387,000. Târgu Jiu is the county capital and has a population of just under 100,000. A second municipality, Motru, has a population slightly over 20,000. There are several smaller towns, including Rovinari, Bumbesti-Jiu, Târgu Cărbunești, Novaci, Țicleni, and Tismana, and a number of even smaller communities, including Baia de Fier, Albeni, and others. The southern Carpathian Mountains (also known as the Transylvanian Alps) rise to over 1,700 meters in the north and northwest, with elevations decreasing toward the southern hills and plain and hills to about 450 meters. Two outstanding natural areas, Retezat National Park and Biosphere Reserve and Domogled-Cerna Valley National Park, each fall partly within the far northwest portions of Gorj County. Historically, Gorj County was largely agricultural, with little or no mining activities. Târgu Jiu served as a market and administrative center of the region. Beginning in the 1960s, however, the government opened a number of open-pit and underground lignite coal mines and constructed two power plants – Rovinari and Turceni – in the county to convert the lignite to electricity. Workers for the mines immigrated into Gorj County from around the country, attracted by the relatively high wages. In addition, a large metal and machinery fabrication and manufacturing industry was developed to support mining activities, and a mining Institute was established in a nearby county to provide engineering and other technical services to the mines.

During its peak in the late 1980s, lignite mining in the Oltenia region employed over 90,000 workers directly, along with large numbers employed in the Institutes and in supporting industries. That direct employment has declined to under 18,000 today, with commensurate reductions in supporting industries and commercial activities. A total of 34 mines in Gorj and a neighboring county are now slated for full closure, with ultimate employment not known but substantially lower than at present. This will leave only two or three very large open-pit mines remaining open to serve the power plants.

In order to address the complex issues related to mining closures, Romania established Agenția Națională pentru Dezvoltarea Zonelor Miniere (ANDZM – National Agency for Development in Mining Zones) to deal with issues of financing of social and economic regeneration. Romania has received successive loans from the World Bank targeted at mine closures, a portion of which has been targeted for Gorj County. As part of the ascension process, significant funding has been made available for rehabilitation and improvement of many aspects of the country’s infrastructure, and for economic development and social capacity building. Over the next 6 years, an estimated 13 billion Euros will be provided to Romania and Romanian organizations, and Gorj County will be the recipient a significant portion of this funding for various types of projects.

Going forward, the development vision for the Oltenia region of Gorj County, Romania embraces both the natural geographic characteristics and the human/culture resources of the region in an environmentally and economically sustainable manner. The success of environmental, socially and
economically sustainable development strategies is dependent on developing a mixed market economy that utilizes the natural resources of the Oltenia region. To this end, the USTDA contracted with a team of experts from various disciplines, including mining, ecology, economics and sociology. The team was a partnership from Romania and the United States. The primary goal of the project described in this report is to develop tools that will aid in decision-making that is holistically sustainable – from the standpoint of the environment and the economy; but also from social, cultural, and larger planning perspectives.

1.2 The Vision

Drawing on the following Vision for Sustainable Development as found in the Gorj County Strategic Plan for 2013:

Vision for many communities in Gorj County is to have healthy and safe models of sustainability. The sustainability vision includes housing, infrastructure and support services, including potable and sanitary water facilities comparable to those of similar size and function elsewhere in European Union. Within a protected environment, they will have effective transportation and communications links to the rest of the country and ample affordable, clean sources of energy. Community members, especially women and youth, will have acceptable opportunities for education, will participate in the economy, and will be able to get involved in local governance.

Land claims and issues such as management and access to natural resources, and land tenure will have been largely settled through negotiations and fair market transactions. Community planning and development will be long term, locally driven and comprehensive. The municipalities will be more self-sufficient and the region will be more prosperous. As communities become healthier, safer, and economically and environmentally stable, the people will manage their own affairs and make stronger contributions to the country as a whole.

The project team established two broad objectives to direct its efforts throughout the USTDA grant and to provide the long-term strategy required to maintain sustainable development plan:

1. To smoothly integrate the principles of sustainable development into the region’s on-going economic and environmental sustainable initiatives; and

2. To develop a knowledge-based and participatory method of evaluating and prioritizing sustainable development projects for Gorj County and its communities.

These two broad themes are interrelated and reflect the economic and environmental situation described above. The first theme relates to the sustainability of the future initiatives focused on developing a mixed market economy and represents a long-term goal that is fundamental to the mandate and mission of the European Union. Sustainable communities are defined here as those that are able to further social, economic and environmental objectives without creating problems for another group, community or generation. Often sustainable development strategies may not be embraced by all stakeholders. The second objective of integrating sustainable development principles into ongoing initiatives was very evident as the project progressed. Gorj County was in the midst of creating a Strategic Plan and therefore, much of the research focused on understanding those reports and integrating them with the analysis and stakeholder interviews necessary for understanding the opportunities and constraints in Gorj and also development of the appropriate tool for evaluation of projects.

Rational use of land resources is only possible if urban and economic expansion in Gorj County is guided by the concept of sustainable development. Sustainable development is emerging as a new approach to the dilemma between the needs of current versus future generations, as well as between
economic development and resource conservation. Sustainable development consists of objectives that are economically viable, environmentally sound, and socially acceptable.

1.3 Introduction

A vision for sustainable development implies a long-term process, in which decisions focusing on the economic, environmental, and social/cultural assessment are based on the best available information and coordinated at the local, regional, and global levels. Sustainable development brings these three vital assessment categories into balance with each other and negotiates among the interest groups and stakeholders involved in the process. It requires the consideration of disparities in spatial and temporal scales, and an understanding of the intricate interdependence between the economic, environmental, and social/cultural factors (Campbell 1995). Therefore, a sustainable development strategy is a functional synthesis of economic development, environmental protection, and quality of life for the stakeholders.

Similar to any larger planning project, a practical and critical barrier to sustainable development is how to make and coordinate a wide range of priorities and decisions at local and regional levels. To address these factors, we developed a database tool for sustainable development to support the decision making process. Technical tools are essential for both information and judgment driven decision making and takes into consideration economic, environmental, and social/cultural factors of the region. Most importantly, the tool helps track multiple projects and assists in the decision making process. The tool, or Indicator Scoring System (ISS) is an attempt for projects to be assessed in an objective manner and reviewed by experts in each of the categories – economic, social/cultural and economic.

The ultimate goal is to facilitate a process under which local authorities, governments, and international organizations, e.g. European Union, are able to support sustainable development initiatives as well as coordinate and evaluate their own independent activities. Sustainable development tools that are well integrated with decision-making processes and valued by decision-makers will contribute to the implementation of the objectives of sustainable development.

The end result of this project is the development of a simple, integrated hierarchical decision-support tool to evaluate the ex ante impact of various redevelopment projects using sustainable strategies that could be implemented by regional public authorities to improve economic development in Gorj County. An integrated model combines simplified criteria descriptions of the assessment categories with expert judgments and empirical data used to define model input.

This study will investigate and evaluate the environmental and socio-economic redevelopment needs for communities of the Oltenia Region that are impacted by lignite mine closures.
1.4 Project Team

- **Applied Ecological Services, Inc.** - a Wisconsin-based firm whose company mission is to bring the science of ecology to all land use decisions. AES staff includes ecologists, environmental engineers, biologists, ecotoxicologists, geologists, hydrologists, soil scientists, landscape architects, and GIS specialists. The AES Ecological Systems Approach™ is to identify and alleviate major obstacles before they create complex problems. Ecological principles are the foundation for land decisions and these principles are integrated with the other disciplines involved in the project. AES has undertaken complex environmental restoration, brownfield redevelopment and mine closure.

- **The University of Wisconsin-Milwaukee** - doctoral-granting Research University with over 26,000 students. UWM has developed particular expertise in research and education in both surface waters and groundwater ecosystems. The UWM and Ovidius University in Constanța, Romania are outstanding educational and research institutions. They have established an inter-institutional agreement intended to promote international educational cooperation and educational exchanges. This agreement is now being expanded to include Petroșani University, which is in a county that borders Gorj.

- **Ovidius University** - one of the main state Universities in south-eastern Romania with over 19,000 students. OUC is the founding member of BSUN - Black Sea Universities Network and also is a member of European Universities Association. Natural Sciences and Agricultural Sciences Faculty is part of some international programs such as The University of Milwaukee – Wisconsin – in the field of Environmental Protection and Ecology. Natural Sciences and Agricultural Sciences Faculty offers postgraduate studies in diverse fields such as marine biology and integrated ecology.

- **Black & Veatch, Inc.** – an engineering, consulting and construction company specializing in infrastructure planning and development in energy, water, and environmental markets. Founded in 1915, Black & Veatch is an employee-owned firm based in Overland Park, Kansas, and has over 6,000 employees in over 90 offices worldwide. There are over 1,000 European employees in 13 offices in Great Britain as well as offices in Warsaw, Prague, İstanbul, and Moscow. Black & Veatch is currently working on a major water infrastructure project in Sibiu and also supporting development of a coastal erosion program for the Black Sea coast. 
CHAPTER 2: PURPOSE AND METHODOLOGY

2.1 Formulation of a Framework for Sustainable Development

Most discussions of sustainable development begin with what has been called the “Three Pillars” model - where the trade-offs among economic, environmental and social consequences of projects and programs are estimated and balanced according to the objectives established by decision makers. The anticipated outcome of this approach is to eventually “improve the performance of the strategies by enhancing the positive effects, minimizing the negative ones an avoiding the transfer of negative impacts to future generations” (Arbeter 2007). Although this approach seeks to find “win-win” situations to emphasize, in fact the “Three Pillars” model by its very nature establishes a conflict mentality among competing interests.

An extension of this model is to emphasize a “social learning” component to the process and integrate sustainable development as a regulatory idea into monitoring and governance (George 2007). The key elements of this model are based upon stakeholder involvement in the decision- and policy-making process. In this extended approach the principles of sustainable development are expressed in national strategic planning and passed down to local administrations. This results in sustainable development being expressed as a steering and regulatory overlay on society, wherein the social, economic and environmental aims of the society are embedded (Stormer and Schubert 2007). If this social-learning aspect of stakeholder input can be repeated over time, and if the results of previously developed policies can be assessed, evaluated and communicated, then this extended process of sustainable development has the a long-run potential to change social values (Thierstein and Walser 2007). At its core, this iterative process acknowledges that we have imperfect information and that disagreement is inevitable, but that postulating the impacts of programs, projects and policies in an ex ante manner can serve to implement sustainable development as a dynamic and evolving process.

Ex ante evaluations are to be conducted early in the decision process for project prioritization, allowing for the analysis of strengths, weaknesses and potentials for a region. This provides authorities not only with input relative to policy, program and project priorities, but also presents an opportunity for transparency in the decision-making process (Stormer and Schubert 2007). Ex ante evaluation need to be conducted at the time when discussions and negotiations are underway to set a future programme in motion, often before the program is fully defined. One key aspect is that ex ante evaluation may be done when stakeholders are in position to express desired outcomes and, as such, contribute to the inclusion of revised aspects to projects that may not have been part of an original proposal (Thierstein and Walster 2007).

As Romania is integrated into the European Union, and as proposals are received for projects to promote economic development, a process is needed to evaluate proposals so that development is directed in ways that support community vision for sustainable development. Much of the information gathered by various governmental units, ministries and departments is not shared among units. In addition, long term planning is not done at the local level and is typically not done in an integrated manner. This does not allow for a knowledge-based decision making process and for any feed-back of information from past decisions to be used to improve future decisions. This presents a challenge for both the development and deployment of a decision-support tool for sustainable development.

A central aspect critical to the success of any sustainability plan is the existence of the administrative capacity to gather input from stakeholders regarding visions and problems, to solicit and evaluate project proposals, to implement projects, and then to assess the outcomes of the selected projects. The establishment of a formalized and coordinated infrastructure for handling, processing and interpretation of economic, social, and environmental information related to sustainable development is an essential step in the process (Figure 2.1).
Figure 2.1.1: General framework and protocols for implementing a strategy for sustainable development in Gorj Co., Romania.

A needs and assessment model is necessary to define prioritize individual projects and to establish the logical “step-wise-process” of implementation. It is important to note that for each project there is an important Community/Stakeholder role embedded in steps A and C of the model to ensure that the needs of the public are embraced in the decision process, and in step G to ensure that the project outcomes meet public expectations.

The long-term decision-support system for sustainable development we envision in Gorj County will eventually incorporate seven components (Figure 2.1.1). The components are as follows:

a) The first aspect is the establishment of procedures for Needs Assessment and Priorities. This has been undertaken in Gorj County as part of several projects such as the Planificare Strategică Participativă Pentru Dezvoltarea Socio-Economică a Județului Gorj – Dezvoltarea Culturii Participării 2007 (hereafter referred to as “Gorj County 2007”), and the Targu Jiu Agenda 21 Plan (Targu Jiu 2004). Needs assessment may often be conducted effectively using GIS analysis of geospatial data and with weighting given differentially to the specific needs relating to economic, infrastructure, environmental, and social/cultural data layers. Given the spatial and temporal resolution of the data, a “hot-spot” analysis can serve as a first step in identifying needs and opportunities for public investments to promote private entrepreneurial activities.

b) The second step in the process is the creating a Request for Proposals (RFP) with guidelines, formats, and an online/electronic submittal process for proposals. The RFP serves at least three functions. It establishes the goals for the specific funding cycle/competition, formalizes the criteria that will be used for evaluating proposals, and provides an opportunity for equal access by all applicants to information regarding the competition for funding. The RFP will request information to be provided from applicants, which will support the assessment of proposals. The idea is that criteria specifically related to the sustainability issues identified are incorporated into the selection process.
The third component encompasses Proposal Review, Evaluation and Assessment. This involves the two distinct steps of (1) Impact Assessment using criteria developed for decision-support and (2) Community and Stakeholder Consultation.

a. The first step will develop a series of scoring metrics to be applied to projects in an objective fashion. Separate suites and process will be created to evaluate impacts on:
   1. Economic factors
   2. Social and cultural factors
   3. The natural and built Environment

b. The second step in Proposal Review will be to gather information and develop scoring metrics for relationship of project impacts relative to local (municipal), regional (county), national, and European Union priorities. This will include:
   1. Gather local input regarding perceived impacts / reach of proposed projects
   2. Evaluate “match” between local perception and assessed impacts from step 1
   3. Ground-truth / validate for mismatches

d) The fourth component of the framework will examine suites of projects submitted for Synergistic Effects and Necessary Antecedent Conditions (e.g. infrastructure). This step will rely heavily on geospatial “hot-spot” analyses, sensitivity, uniqueness, economic value, time and spatial reach and duration of impacts. Currently, the data available in GIS format is in its early stages. Over time as this overall process is implemented, greater use of GIS tools will (1) develop procedures to examine and evaluate the linkages among proposed projects, (2) assess spatial connectedness of locations and reach of impacts, (3) construct “critical path” timeline for staging of projects, (4) identify “bottlenecks” and (5) conduct spatial and temporal clustering of project with respect to impacts and rankings to identify probable facilitation of economic development, investment potential, and social & environmental costs/benefits among projects

e) Based upon this clustering and cost-benefit analysis, a Recommended Portfolio of Projects can be assembled and put forth for support and funding assistance. Project awards and verification of applicant information will be conducted in accordance with established Romanian contractual protocols and financial requirements.

f) The sixth component of the framework entails post-award Project Implementation Monitoring and Oversight, assuring adherence to the specific stated project objectives and deliverables. The monitoring needs to be directly linked to the criteria used in the evaluations in step C, thereby allowing for the eventual evaluation of whether or not the project met its expectations.

g) In completing the circle of the administrative structure, a comprehensive and integrated Monitoring of Impacts and Outcomes for social, environmental, and economic indicators must be established which will allow for both the evaluation of implemented projects as well as the baseline for assessment of needs for additional “Request for Proposals (RFP)” cycles.

Included as a component of the general framework (Figure 2.1.2, D) are three functional inputs that further refine, and or assist in characterizing, the opportunities based on urgency related issues. The importance of these functional inputs is to identify and be responsive to Immediate Action Opportunities (Figure 2.1.2, E) that develop during the analysis process of opportunity viability. This is an essential bypass step to address immediate threats to environmental or human health.
Table 2.1.2: The General Framework model has a built in fail-safe loop (E) to accommodate opportunities that are identified that require immediate action, especially if human or further environment health are at risk.

2.2 Methodology Related to Strategic Environmental Assessment (SEA)

The project team learned a great deal about the issues facing Gorj County from the available literature, and stakeholder input during the numerous meetings with various residents and government officials. During the process, the need for a holistic approach to way in which projects are reviewed and prioritized became clear. The need for the process was identified and the team began work on the Indicator Scoring System (ISS). During the development, the team received input from many key stakeholders. Projects were entered and assessed using the ISS.

Based upon discussions with stakeholders, the Project Team decided that research for this project would follow a basic format recommended for Strategic Environmental Assessment (SEA) as outlined in the “Handbook on SEA for Cohesion Policy 2007-2013” (hereinafter GRDP Handbook), and was elaborated within the Interreg IIIC project “Greening Regional Development Programmes”.

The SEA methodology is typically used for evaluation of policies or programs that involve impacts on a wide temporal or spatial scale. SEA assessment fully incorporates the requirements and methodological recommendations contained in the GRDP Handbook and the national SEA requirements in Romania set up by GD no.1076/2004. Based on these requirements, this SEA aimed to:

- determine the key issues that are to be considered during elaboration of the program
- analyse the context of the program and likely future trends if the program is not implemented;
- identify an optimal set of specific development objectives and priorities;
- identify optimal measures which will best enable achievement of the objectives;
- propose an optimal monitoring and management system;
- provide for early and effective consultations with the relevant authorities and the concerned public, including citizens and organized stakeholder groups;
- inform decision makers about the program and its likely impacts;
- notify relevant authorities and the public about the final program and the reasons for its adoption.
An *ex ante* analysis using the SEA approach was adopted for evaluation of the Romanian Sectoral Operational Programmes (SOP) for EU Cohesion Policy in 2007-2013. Assessment of the draft SOP was based on the following steps (NEA 2006):

- Analysis of the main environmental issues and trends in Romania.
- Analysis of relevant environmental plans and programmes and related strategies on international, EU and national levels.
- Determination of the relevant environmental objectives for the SOP.
- Assessment of the descriptive part of SOP – whether it properly reflects the main relevant environmental issues for the SOP.
- Environmental assessment of the SOP strategy (objectives and priority axis).
- Environmental assessment of the priority axes and areas of intervention.
- Proposals for changes in the SOP text, based on the evaluations carried out.
- Proposal for environmental indicators to monitor environmental impacts of the SOP implementation.
- Proposal for environmental criteria for selection of projects.
- Compilation of the draft environmental report.

The key elements of the *ex ante* approach include the development of categories and criteria for assessment of likely impacts of projects. As such, the identification and development of *ex ante* assessment categories and parameters became a primary goal set by the Project Team as part of the stakeholder meetings, environmental, economic and social assessment activities. These parameters would then be adapted and incorporated into the methodology for the ISS database system to be used for project evaluation to be used in steps needs assessment, impact analysis, and examination of synergisms (Figure 2.1 parts a, c and d respectively).

The specific objectives involved 4 steps (Figure 2.2.1). The first step is to develop a matrix for *Scoring Metrics* for projects to be scored by stakeholders. These should include axes related to:

- **Economic Impacts**
  - Labor, Jobs
  - Local and Regional Markets
  - Capital, Financing and Investments
- **Social and Cultural Impacts**
  - Family / Gender / Minorities
  - Health / Education / Social support
  - Heritage and Historical values,
- **Environmental Impacts**
  - Waste / Pollution (Air, Water, Soil)
  - Risk Management (Floods etc)
  - Natural Resources and Biodiversity
- **Infrastructure Impacts** (e.g.)
  - Transportation
  - Energy
  - Water & Waste
  - Social (health, education, banking)
The second step is to evaluate the proposed metrics relative to Local (Municipal), Regional (County), National, and European Union Priorities. This may lead to the possibility for different weightings for different regions. This would be accomplished by gathering local input regarding perceived impacts and the spatial/temporal reach of proposed projects. Lastly, analyses would evaluate “match” between local perception and assessed impacts from Step 1 by ground-truthing to validate the scoring, paying attention for mismatches between Step 1 and Step 2.

The third step is to develop procedures to examine and evaluate the linkages among proposed projects, to assess spatial connectedness of locations and reach of impacts (using GIS), construct “critical path” timeline for staging of projects, to identify “bottlenecks” and to conduct spatial and temporal clustering of project with respect to impacts and rankings created in step 1 and step 2. The goal in this case is to identify probable facilitation of economic development, investment potential, and social & environmental costs and benefits among projects.

The fourth step is to assemble groups of projects and develop procedure for measuring combined impacts of sets of projects from Step 3. This is the stage where financing and investment opportunities are targeted. The portfolio of projects should be presented to stakeholders to collect and incorporate feedback to explore impacts of alternative projects within groups. The final selected portfolio would then be chosen along with the development timelines and budgets.

The scope for this current project report is to develop the methodology for Steps 1 and 2. This serves as the groundwork for Steps 3 and 4 to be done in later projects.
CHAPTER 3: STAKEHOLDER INTERVIEWS, CONCERNS AND NEEDS

A series of meetings were held in Gorj County between November 2006 and March 2008. These meetings included representatives of the Municipalities of Targu Jiu and Motru, the County Council and Prefecture of Gorj County, the village of Baia de Fier, and the Environmental NGO “Go Life”. These representatives also involved other agencies, groups and associations from their area.

3.1 Kick-Off Meeting and Stakeholder Interviews - November 2006

Attendees:
- Ovidius University
- Brancusi University, Tarja Jiu
- Trade Union – Oltenia Mining Co.
- National Lignite Society - Oltenia
- County Prefecture
- President of County Council
- Mayors: Motru, Baia de Fier, Targu Jiu.
- Local Employee Agency
- Regional Office ANDZM
- Chamber Commerce
- Association of Business of People
- Business representatives (3-5)
- Agency for Agriculture (Regional & County)
- Local Agency for Environmental Protection

The Stakeholder kick-off meetings began November 6, 2006, with the first one being held in Bucharest at the offices of ANDZM and the Ministry of Economy and Commerce. The second meeting was held on November 8 in Gorj County at the county seat in Târgu Jiu. The team and the ANDZM agreed to change the Bucharest Stakeholder meeting from two days to one and to expand the Gorj County meetings to 4 days. This modification afforded the team the opportunity to maximize the time dedicated to one-on-one meetings with the regional Stakeholders in Gorj County.

The team met with and arranged to collect data from numerous regional stakeholders, environmental and other national and local agencies, and mining institutes during one-on-one meetings in the Gorj County Region. The team had key one-on-one meetings with the mayors of Baia de Fier and Motru. These meetings provided the opportunity to listen to the environmental, social, economic needs of people in the region as well as understanding their short- and long-term expectations.

The Contractor’s GIS team and primary investigators had the opportunity to take several lengthy field trips throughout the Oltenia region to visually evaluate the regional landscape, infrastructure, environmental stressors, and mine sites. These trips were essential to the team to understand the environment, social and culture and develop the analysis tool.
The team was impressed by the overwhelming needs and challenges that the people of Gorj County face during the next 3-5 years. The team was encouraged by the openness of the Stakeholders in discussions about the project objectives and their willingness to provide essential baseline data.

The team compiled an initial list of redevelopment projects and economic opportunities that were identified during the Gorj County Stakeholder interviews. This list helped the team in developing the assessment tool and testing the projects with the tool. For the purpose of this memorandum, Table 2 below is provided to illustrate the range of ideas and opportunities that were presented to the team by Stakeholders.

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>IDEA/OPTOPUNITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorj County</td>
<td>Create a conservation plan for the county.</td>
</tr>
<tr>
<td>Motru</td>
<td>Create a diversified power industry minimizing dependence on coal power and emphasizes reuse of heat from thermoelectric plant(s).</td>
</tr>
<tr>
<td>Baia deFier</td>
<td>Develop an eco-friendly and economically vibrant tourism industry.</td>
</tr>
<tr>
<td>Gorj County</td>
<td>Establish a retraining institute for conservation and land management that trains displaced coal miners.</td>
</tr>
<tr>
<td>Gorj County</td>
<td>Identify key regions to produce agricultural goods and develop the support services and infrastructure required to bring the goods to market.</td>
</tr>
<tr>
<td>Motru Valley</td>
<td>Develop a reforestation strategy and low-impact timber industry.</td>
</tr>
<tr>
<td>Motru and Baia de Fier</td>
<td>Alternative waste water management strategies using Packaged Treatment Plants and wetlands.</td>
</tr>
<tr>
<td>Cities in Gorj County</td>
<td>Create master plans for municipalities in Gorj County that have not yet prepared plans, then create final Gorj County plan.</td>
</tr>
</tbody>
</table>

Table 3.1.1. Included in the table above are a variety of projects that were identified during the Stakeholder’s Interviews and Conferences conducted in November 2006.

3.2 Stakeholder Meetings and Interviews – November 2007

The project team met with stakeholder representatives comprised of scientists, business community members, educators, leadership from key Gorj communities, and regional policy makers in November of 2007. These meetings were arranged by the Project Team’s Romanian Director, Profesor Lucica Tofan working together with the ANDZM local representative in Gorj County, Gheorghe Popescu. A brief analysis of our findings was presented and the tools developed were explained. The Project
Team together with Mr. Popsecu’s coordination, facilitated interactive meetings with the participants in each regional and community meeting to solicit amendments and augmentations to the information base used by the project, and to gather details on the needs and vision of the participants.

On November 28th, 2007 the project team (Mark O’Leary, Timothy Ehlinger, Lucica Tofan and Jill Enz) met with the stakeholders including: Gorj County officials, the Gorj County president and representatives from Motru, Baia de Fier and Târgu Jiu. Stakeholders were updated on the process, the matrices, the need for input on how to adjust the matrices based on local conditions and needs, how the matrices are a decision support tool, how this tool will be integrated with GIS, and how the process will assist stakeholders in implementing their strategic plans.

The team expressed the need to visit each group during the remainder of the week to discuss the project in greater detail with environmental, social/cultural, infrastructure and economics specialists. Representatives from each group agreed to these meetings and, the consensus opinion was that this product will be a very useful decision making tool.

On November 29th the team met with the Mayor of Motru and his representatives. The mayor expressed that the matrices would be useful in evaluating projects. The main concerns expressed during this meeting included: the limited number of mining jobs, unemployment and the need for retraining and attracting investors. The strengths of Motru area presented during the meeting were the labor force, an area surrounded by forest and therefore timber, proximity to the Danube River, a feasibility study underway for a 880 megawatt electric power plant to replace their existing steam heating plant, and expansion of the technical college. Projects under consideration in Motru that were suggested for consideration included:

- Combined heat-power plant to replace the existing facility;
- Power plant cogeneration to provide heat for greenhouses. The greenhouses could be used for multiple purposes, including small scale agricultural crops, wetland plants for restoration or wastewater treatment and creation of restoration plants for mining;
- Dam to provide potable water facility for Motru and areas to the south, and to reduce the cost of the power plant;
- Available land, adjacent to proposed power plant, existing railway and roadways within municipality for industrial facilities;
- Wastewater treatment facility needs to be replaced;
- Enhanced transportation corridor (railway or highway) between Motru and the Danube River;
- Technical college improvements for retraining of unemployed for possible new industry and waste management.

Mark O’Leary from Applied Ecological Services returned to Motru on November 30th to gather additional details regarding proposed development projects in Motru by the Municipality. The balance of the team met with the city of Târgu Jiu and representatives from the County Council. The city of Târgu Jiu officials were very interested in the matrices and saw many applications for their use, including monitoring of projects and incorporation into their current GIS system. The city of Târgu Jiu would also like to use the economic matrix to better understand the maintenance or life cycle costs of projects. They agreed to test the matrices with a few of their current projects and communicated their findings to the team in February 2008. Projects suggested included:

- Tourism, mainly cultural and historic tourism (Brancusi sculptures);
- Integrated urban greenway system connecting parks;
- Preserving forest that currently surrounds the city to make long term planning decisions;
- Interactive GIS database on a website to integrate different databases of interest to investors and to citizens of Târgu Jiu.

The meeting with the representative from Gorj County Council was led by the Director of European Cooperation and Regional Development. The matrices and GIS integration were discussed with the group. The group perceived that the project tool had the potential to be helpful in attracting investors and assisting in determining if prospective projects are compliant with European Union standards.
Another meeting was set up for December 3rd to discuss the usefulness of the TDA project further. Representatives from Gorj County mentioned the following projects:

- Rehabilitation of the industrial area in Bumbesti Jiu;
- Development of a tourism corridor along the northern sub-mountain portion of the county;
- Finalization of a web-based Guide for Investors in Gorj County.

During the afternoon of November 30th and morning of December 1st, the team met with the Mayor of Baia de Fier and his representatives. An interest was shown in the matrices and many projects were discussed. The opportunities in this region relate to tourism and the greatest concern for the officials is ensuring the protection of the natural and cultural resources on which the tourism is based. Some of the projects discussed included:

- Wastewater treatment facility and collection system for the Municipality;
- Master plan of Baia de Fier that enhances the status of a locally important resort area;
- Development an environmentally sensitive tourism plan focused on the Women’s Cave and surrounding area, including the hotel, café and recreational facilities;
  - Enhance tourist facilities near the cave and assure protection of the cave;
  - Develop cable car connection from cave area to Ranca, to decrease automobile traffic and create a more environmentally sensitive transportation solution;
  - Small winter sports facility including a small ski hill, ice rink, sledding hill, and ski trails located near the exit of the Women’s Cave;
  - Tourist development and creation of a museum in the graphite mine, including environmental management of any existing acid mine drainage from the site into the river.

3.3 Stakeholder meetings in Gorj County, February 2008

Meeting with Municipality of Targu Jiu on February 29, 2008.

Lucica Tofan and Timothy Ehlinger met with Corina Suta, Radul Predescu and two assistants in the conference room in the City Hall. The meeting was a very productive meeting with discussions regarding the state and value of the database tools. It was very clear that they had worked with the matrices and had given significant thought to how it could be useful for them and how it might be revised/refined to better meet their perceived needs.

The Targu Jiu team made several suggestions:

1. Include a “Financial matrix” and better tie-in with Social Costs/benefits
   a. Observation: The economic section/tab includes items and indicators that are valuable for investors and economic development projects. Much of what the municipality must do includes a greater emphasis on Public Administration and the
conduct of cost/benefit analyses relating to valuation (in financial terms) of human activities/impacts (e.g., financial cost a loss due to a day in the hospital due to a car accident on a bad road/intersection). Ms. Suta's a simple spreadsheet that she uses to base her analyses and uses to report to the decision makers. She asked if we could include another “table/tab” for Public Administration indicators/parameters that are important for their operations.

b. **Action Item:** Ms. Suta will email her suggested listing and definitions of parameters that we can consider to include in creating a TAB for entering scores on a new “Public Administration/Institutional” matrix page in the database. This table could then be output the same as the others. The current economic table works well for investment/investors. The new tab would work better for administrators.

2. Variable names and descriptions:
   a. **Observation:** Some of the variable descriptions are slanted toward “mining” impacts. Their team discussed these and they came upon an agreed-upon set of names (with definitions) relating more directly to the City of Targu Jiu (e.g., unemployment vs homes impacted by mining). She said that they could just keep doing it this way. However it is worth considering if future versions of the database should modify the terms used in the database to fit specific usage for each enduser.
   b. **Action Item:** Ms. Suta will email the changes that they made to see if it is possible to modify the database for the final version delivered to TJ.

3. Project Views in Database and GIS/Map linkage
   a. **Observation:** The need to create a “Map-View” for users to see a visual display of where projects are located was discussed. The TJ Municipality thinks that even a simple display of project locations placed on a static (georectified) map would be very beneficial to them and to users/investors. Ms. Suti's suggestion was to create a button in the “View project data” form that would display the location of the project. The need to link this more directly to GIS/GeoMedia systems was discussed. It was decided that this was beyond the current scope of work and could be part of a future project. However, it is necessary to make sure that the outputs of tables will have Lat/Long coordinates so that the data can be easily imported to GIS for visual display (e.g., to display scores by size/color/etc for the different ratings on a map).
   b. **Action Item:** Develop a map display link to put on the view projects forms.

4. Future modifications to database tables/variables
   a. **Observation:** Ms. Suta and her team were enthusiastic about using this program to manage their projects and support decisions at the level of the municipality. They would like to be able to add additional fields to include in the database as their needs develop over time. They were told that someone knowledgeable in ACCESS programming could easily modify the program, and that AES would provide some mechanism to allow them to modify such fields in their version.
   b. **Action Item:** Prepare a set of “Programmers notes” and password that will allow a person already trained in ACCESS to modify data tables and fields in the database.

5. Other Thoughts and Ideas Discussed:
   a. **Observation:** It is possible that the database tool will be used differently for each of the different communities. In the future it may be valuable to create a uniquely-tailored product for each of the different “stakeholders” (County Council, Targu Jiu, Motru, Baia de Fier). The basic program would need to have the same components to provide integration, but the additional field names and needs for each can be accommodated in their version. For example, Motru may be focused more on outside investors whereas TJ may be weighted more toward Public/Urban planning.
b. **Action Item**: Explore ways to generate separate yet integrated versions for each of endusers but at the same time keep a common data dictionary so that data from different users can be incorporated into the county-wide database. By designing the database with this type of structure, it can provide other communities and counties in Romania with a model that can be developed (easily) for their situation.

**Meetings with Go-Life NGO and Baia de Fier on March 2, 2008**

Lucica Tofan and Timothy Ehlinger met with the Mayor of Baia de Fier at the City Hall to discuss the progress of the TDA work and how it can integrate with the planning process of the municipality of Baia de Fier. They were accompanied by Elisabeta Juveloiu, Vice Director of the Gorj Ministry of Environment, and member of the Go-Life NGO (a collaborator on the TDA project).

Professor Tofan quickly summarized and reviewed the items we discussed in the November 30th 2007 meeting with the Mayor and requested the his assistance in completing the MATRIX evaluations for those projects (to be included in the TDA report). The point was made that the "filled-in" matrix evaluations could be useful for 3 purposes: (1) Visualizing impacts and rankings for planning and project management, (2) Identification and marketing of investment opportunities, and (3) Submitting proposals for grants from sources such as the EU.

The group then discussed and decided to prepare and submit a proposal to the EU agency "Natura 2000" to develop an "Integrated Plan for the Tourism, Sustainable Development and Protected Areas" for the Baia de Fier region (including the upper Rau Olteti watershed basin). Ms Juveloiu suggested this proposal be submitted collectively with the Municipality, Go-Life and AES-EE and be prepared in time for the April 15, 2008 deadline. The mayor was very supportive and a detailed discussion of what we need to accomplish in order to submit the proposal was arranged. However, the basic idea includes the integration of the various "sub-projects" either envisioned and/or already started in the Baia de Fier region as part of a community-based geospatial planning process.

Some of the ideas for components to be integrated into the plan could include:

1. Land-use and Transportation analysis for the municipality, in specific relationship to the development of Tourism
   a. Key for maintaining the traditional character and historical uniqueness of the region
   b. Include stakeholder involvement / Community feedback
   c. ID demographic issues / needs (Labor, education etc)
   d. Discuss and identify ways to involve the Rogar/Roma

2. Municipal Water-treatment and wastewater infrastructure rehabilitation for BdF Municipality:
   a. The feasibility study has already been completed and bids being received on April 7, 2008). This will help define the scale of the tourism (tourists per day, per year etc) that the infrastructure can handle. The mayor thinks that a sustainable-development proposal for the Baia de Fier Region will significantly enhance the water treatment/management project and vice-versa.

3. Construct GeoSpatial model for the Olteti watershed to include capability for:
   a. Impact analysis on Protected Areas
   b. River management / Flood Control / Erosion and sediment management
   c. (A plan has been done by Apele Romane that we will need to acquire)
   d. Transportation
   e. Pre-feasibility / sustainability Analysis for key projects already identified plus others identified by stakeholder during the process, e.g.,
      i. Olympic Ice Rink
      ii. Mining Museum

4. Include mine closure and remediation that is mandated by the Ministry of Environment
a. Municipal ski hill near village  
b. Development/expansion of Religious / Monastery and Historical Tourism  
c. Telecabana and cable car to Ranca

5. Relationship of various projects to the upgrading of the road up the valley  
a. Women’s cave education center  
b. Expanded pensions and hotels for tourists  
c. Wood products / Furniture manufacturing  
d. “Fruits of the Forest” products  
e. Aquaculture  
f. Spring water bottling

**Meeting with Municipality of Motru, March 3, 2008**

**Attending:**
- Tim Ehlinger (UWM)  
- Lucica Tofan (OUC)  
- Marian Paun (Motru)  
- Carmen Andelescu (Motru)  
- Two other Assistants (Motru)  
- Radu Predescu (Tj Municipality)  
- Vasili Vacaru (Gorj Prefecture)  
- Mr. Georghe Popescu (ANDZM)

After a short visit with the Mayor of Motru (Mr. Hanu Dorin), a working session with the development office team for Motru was held. Mr. Paun is the team leader and Ms. Andelescu has been responsible for the use of the matrices and for the project scoring.

The Project management database and indicator scoring system were discussed. The Motru team had put significant effort into trying to use and understand the matrices. They had discussed the ins-and-outs of what each metric is attempting to measure, and they had scored almost 30 projects ranging from roads, to water treatment, to industrial parks, to power plants. Besides having the Motru team present, representatives of the Municipality fo Targu Jiu, Prefecture, and ANDZM were participating so that they could both see the process in action and provide input from their perspectives.

After demonstrating the Access Database interface, we worked through the scoring of 2 additional projects. The first was for the new Thermoelectric/Heating power plant (Feasibility study being done now with anticipated construction completion in 6 years). The second was for a possible Industrial Park to be constructed on a currently abandoned location.

From this meeting it is very clear that the Municipalities (Tj and Motru) are engaged with the process and very interested in using the system. A number of suggestions were made regarding potential changes to individual metrics that are confusing and/or difficult to assess. Some of these need to be addressed in the Users Manual, but others may require changing parameters.

Some specific suggestions:

1. Add a “Spatial Attribute Type” to the Project description page (e.g Point, line, area), which then can include some scale (e.g. miles of road or area of restoration or redevelopment).
2. Add text fields for metadata/considerations on each line where scores are entered where comments can be included on how or why the numbers were selected. This can be extremely valuable for documenting the thought process. It is important that the different considerations that brought up during the rating process be recorded.
3. Add a “To be determined in final design” to be either a checkbox or some other field for some of the built environment scores? The reason, often some items (e.g. impact on stormwater or BMPs) can only be assessed when a full plan with drawings is presented.

4. Ownership (in the Economic section) is set to be either 0 or 1. This is not practical and we need to have a -/+ scale like the other parameters.

5. Fix the ‘scroll-down’ that resets to next page … this was a problem as the Romanians worked with the database.

Notes from meeting with Targu Jiu County Council, March 4, 2008

Lucia Toțan and Timothy Ehlinger met with representatives of the County Council on March 4, 2008. The County Council is supportive of the process and see that they can both use database to manage the projects under their domain, as well as keep track of what is going on throughout the county from a planning and management perspectives.

They also indicate that a "public administration" table would be very useful, as well as an enhance financial/budget capability that they could eventually link to integrate various spreadsheets etc that they use. This reinforced the need for a follow-up project to continue to build upon this database tool.

They had some comments on specific fields/parameters. But aside from this they had a couple of other good suggestions for next steps and project proposals. These include:

1. Workshops and training on indicator assessment (e.g. training on how to evaluate projects and indicators that could go into the database).

2. Development of a certification program (in collaboration with Ovidius University) to develop "Certified Project Managers" for administration, management and monitoring of development projects.

3.4 Priority Projects Identified through Stakeholder Meetings

During the team’s meetings with stakeholders numerous projects were suggested, discussed, and evaluated for their potential economic, social, and environmental impacts. During the meetings in March 2008, the project list became more resolved. The following is a list of the projects that were consistently identified as of high priority which at first consideration are consistent with the principles of sustainable business development.

1. Gorj County and Motru: Industrial Development Parks that including environmental remediation of polluted lands and implementation of Best Management Practices (BMPs)

One industrial development park was built in Bumbesti Jiu is a model for other parks. It was built on a brownfield site that needed remediation. It is unclear whether that site implemented bmp’s for remediation during the construction. There are many brownfield sites available within the County and Motru in particular. The types of business that the County and Motru wish to pursue were unclear, however the industrial park could be constructed to provide appropriate locations and work force for industry.


There is remaining coal to be mined in the Motru region but it is a low grade and shipping the raw material is not as cost effective as using it locally in a thermal electric plant. Motru has retained a company to complete a feasibility study for the electric plant. If the electric plant is approved, the excess heat could be captured to heat homes locally, thereby reducing the amount of coal that needs
to be consumed and more electricity could be sold to neighboring towns and villages. Additionally, the excess heat could also be used to operate greenhouses. The greenhouses would grow native plant material that could be used in the surrounding area to support expanded organic produce industry and/or restore abandoned mine sites.

3. Baia de Fier: Establishing a Regional Tourist Zone

The opportunity to develop an integrated plan for sustainable tourism for Baia de Fier was a recurring theme in meetings with stakeholders. The social and cultural resources present in the community in combination with its proximity to the mountains present an opportunity that has been identified in many studies and reports (Gorj County Council, 2007). The feasibility study for water and wastewater management has been completed, which can provide the basis for building an integrated infrastructure. There is an immediate need to balance conflicting demands of increasing tourism and business development with the need to protect the natural environment and surrounding forest. The desire to develop transportation access to Rânea together with the proximity to Natura 2000 Sites makes this type of project even more necessary.

According to the report, "Survey with a View to Capitalizing the Tourist Potential of the County of Gorj", the projects and actions for tourist promotion include:

- Setting up a Tourism Department (A marketing group for tourism that will offer promotional material and reservations. This group should be a partnership with mass media, local tourism facilities, educational institutions and government.)
- Public/Private Partnerships (Organizing dinners or festivities at local hotels, pensions, restaurants, presentations of local craftsmen and folklore)
- Editing Information Material (Brochures, maps should be edited to promote local tourist activities. Information shall be distributed free at hotels, tourist facilities, gas stations.)
- Include Gorj County in the Oltenia tourism information
- Organize Annual Cultural Events
- Organizing Events, Conferences, Seminars, Training Sessions with International Participation (long term goal)
- Participation of Local Authorities with Private Sector in National and International Tourism Fairs
- Installing Road Signs to Facilitate Access to the Main Local Tourist Objectives and Tourist Routes
- Arranging a County Center and Local Centers for Tourist information (Center shall include area for promotional material, items to purchase, postcards, electronic maps and touch screens, staffed with a tourist representative)
- Public posting of Tourist Information
- Tourism web page with direct access from the Gorj web page
- Ecology Actions (preserving green space)
- Supporting and Stimulating Touring Operations to Promote Local Tourism (from Bucharest or other communities)
- Database for all local tourist activities

4. Sustainable Agriculture Infrastructure and Landuse planning for Small Farms and Villages.

Gorj County has a long history and tradition of small animal husbandry, fish culture, orchards, vegetable farms, and bee-keeping. For example, bee keeping is a form of sustainable agriculture and has been locally small scale, providing a few jobs and the sale of honey and related products. However, due to the declining bee population in Europe and the United States exportation of bee hives, queen bees and honey products presents an opportunity for developing a larger scale business. Although the business is currently dominated by Australia, Gorj County could create a bee keeping cooperative and related regulations, guidelines and incentives to market extensively to Western Europe. In order to facilitate sustainable bee keeping, proper land management would be necessary in this region. A similar case can be made for the small-scale agricultural enterprises.
5. Green Space and Park Planning in Targu Jiu

There is a rich forest surrounding Targu Jiu; it is located approximately one mile from the existing city limits. As development around the city continues, the forest is left vulnerable to development. City officials would like to see this forest protected, enhanced and utilized as a community asset. Additionally, existing parks within the city need to be analyzed and connected to each other with pedestrian ways and green space. This would all full visibility of cultural assets within the city (e.g. Brancusi sculptures). Because of its closeness to the mountains and forests, elaborating these components will enhance the ability of Targu Jiu to continue its path toward becoming a ‘destination’ city for attracting businesses and investments.

6. Implementation of a Training Program for Project Management for Sustainable Development:

The implementation of sustainable development planning requires individuals with training across diverse fields such as administration, legal affairs and regulation, business management, monitoring science, information technology, and GIS among others. In order for proper planning efforts to be analyzed in context with other projects and spatial forms, initiatives, funding and education are needed. There are a limited number of trained planners, GIS technicians and IT professionals. It is also very difficult to recruit people with these skills to this area. The program will first need to recruit these types of people and put into place initiatives that would encourage funding to be tied to performance of programs. This is a long-term project, but officials are in need of more data to assist in decision-making. Training for this project will need to include the public officials - specifying what data is necessary and how to implement it in policies. This project would directly involve Brancusi University in Targu Jiu as well as other Romanian educational, agency and business partners.
CHAPTER 4: REGIONAL ENVIRONMENTAL ANALYSIS

4.1 Environmental Overview of Gorj County

Historically, Gorj County was largely agricultural, with little or no mining activities. Târgu Jiu served as a market and administrative center of the region. Beginning in the 1960s, however, the government opened a number of open-pit and underground lignite coal mines and constructed two power plants – Rovinari and Turceni – in the county to convert the lignite to electricity. Workers for the mines immigrated into Gorj County from around the country, attracted by the relatively high wages, subsidized by the government. In addition, a large metal and machinery fabrication and manufacturing industry was developed to support mining activities, and a mining institute was established in Craiova in order to provide engineering and other technical services to the lignite mines. Currently, agriculture comprises forty four percent (44%) of the county land surface area, with row crops and pasture areas both comprising approximately half of this total, with a small portion of the agricultural land in vineyards and orchards. Approximately forty nine percent (49%) of the county is forested area, mainly in the northern portion. (Gorj County Council 2007)

Gorj County, located within the Carpathian Mountain range, offers diverse natural resources, from rich agricultural land in the valleys near the mountain range to woodlands in the mountains (Figure 4.1.2 and Figure 4.1.3). Natural resources can be defined from a resource or raw material perspective (and thus turned into economic growth) or from a natural habitat and environmental standpoint, and many times natural resources are strained because they serve this dual purpose. For example, the areas within the foothills have gravel bottom streams that have been routinely mined in the past; however these foothills are also ideal locations for many tourists’ resorts because of their proximity to mountains, streams and transportation infrastructure. The economic value of the later example is more difficult to quantify, but extremely important in maintaining healthy ecosystems for the health of the population and for attracting people into areas of rich natural resources.

Figure 4.1.1: A stream that is being mined in the background and channelized in the foreground.
Based on the land cover analysis that was completed in GIS, aerial images and visiting various areas of Gorj County, the County is dominated by forested natural areas. The forested natural areas are found in areas with higher elevations. The areas of the county with lower elevations are dominated by agricultural land. Other land uses in the lower elevations consist of disturbed land and some developed land. The largest cluster of disturbed land is located south and southwest of Rovinari, along the Jiu River (Figure 4.1.3). There is a large area of disturbed land, former mine sites, to the southwest of Rovinari, following the road that leads to and includes Motru. The only lakes are large bodies of water created from dammed rivers along the Jiu River. Additionally, there are small areas of wetland adjacent to the Jiu River and many of these wetlands are surrounded by disturbed land.

The northern portions of the county are rich in high quality environmental habitat with great potential for ecotourism. There are two (2) national protected areas within Gorj, The National Park Domogled-Valea Cernei and Defileul Jiului and there are thirty eight (38) county protected areas. The protected areas include a large range of natural areas, including caves, fossils and unique forests.

These areas can also be reviewed by regions, based on the land cover analysis, which may assist in determining the best uses or industries for each of the regions. The areas along the northern boundary of the county have the highest percentage of forested land within the county (Figure 4.1.3). This directly relates to the topography of the region, and indicated that investment in these areas should focus on preserving areas for local, regional or national preserves and based on other infrastructure and clusters of recreationally based natural resources, some of the areas would be ideal for tourism. Areas in eastern and southern portions of the county are primarily dominated by agricultural land; Leiesti, Bumbesti-Pitic and Tintareni have a particularly high percentage of land in agriculture. Rovinari, Matasari, Motru and Calnic have high percentages of land described as disturbed. Târgu Jiu has the largest amount of developed land due to its more urban nature.

The area with the highest number of hectares in farms is Novaci, with between 5001 and 6000 hectares located in the northeastern portion of the county in the foothills of the Carpathian Mountains (Figure 4.1.4). The areas with the lowest, less than 1000 hectares are generally located in the south central area of the county and the areas just to the west of Novaci. If the number of farms based on land total is reviewed (Figure 4.5), the number of farms is much more scattered and not associated with land cover or elevation. For example the number of farms is greatest (between 3 and 3.5%) in the commune directly south of Târgu Jiu and the second highest percentages (between 2.5 and 3%) are located in Târgu Jiu and Novaci. This indicates that there are many smaller farms per hectare in these areas, while the farms in Novaci are larger per farmed hectare. (Gorj County Council 2007)

Water resources are another important natural resource of Gorj County. There is a vast system of streams and rivers, many of them flowing into the Jiu River (Figure 4.1.6). Unfortunately, many the natural stream corridors are being mined for gravel deposits, adjusting stream stability (Figure 4.1.7). These construction materials are found in the northeastern and northwestern portions of the county. Channel modification projects are being undertaken in other stream corridors in attempts to alleviate
flooding problems. The county also has many underground water resources, many of which are at risk due to the mining pollution. Additionally, the underground water resources come to the surface as springs and many firms from outside of the country are very interested in purchasing water rights for bottled water production.

The water resources are often scarce in mining areas due to pollution and pumping of ground water. For example, surface lignite mining is a rich resource in the western portion of the county, such as Motru. This area is also severely limited in potable water resources due in part to the extensive pumping to lower water levels in the open pit mines. Some suggestions for improving drinking water resources include the creation of dams in the upper reaches of the watershed and piping fresh water from the mountains into locations such as Motru. (Gorj County Council 2007)

Areas of groundwater should be considered as a valuable, underutilized asset in Gorj County (Figure 4.1.8). The largest groundwater source is located directly under the mountain range in the northern portion of Gorj County. Smaller groundwater sources can be found under smaller rises in elevation between the stream valleys. The areas, quantities and depth are approximate and unclear. Based on this additional information, it is clear that this natural resource may be very valuable, therefore should be mapped in order to protect quality. This information would also assist in developing a protection plan for incompatible projects that may be proposed for areas that have high groundwater recharge. It is critical to know where groundwater feeds into surface streams, and where surface waters contribute to groundwater recharge.
Figure 4.1.8: Groundwater in Gorj County, Romania
### 4.2 Pollution Sources

Two thermal plants located in Turceni and Rovinari noticeably affect air quality. Some areas of the country were not tested or recorded pollution greater than maximum allowable standards of air quality; those areas included Târgu Jiu, Rovinari, Turceni, Motru, Matpsari, and Seciuri (Institutul National de Statistica 2007).

The large quantities of chemically benign mine overburden that have been generated over the years was previously disposed in floodplains and near villages. These “sterile” deposits are not readily revegetated and the material is susceptible to slope failure when saturated with water. In the recent past this has caused extensive damage when mine waste slope failures blocked highways, partially blocked the Motru River, and destroyed property and homes in nearby villages.

Water quality is generally good; however there are some instances of pollution on the Jiu River. Some of the pollution can be attributed to coal suspensions in the water. The main instances of soil contamination are the result of chemical fertilizers, causing increasing amounts of nitrogen. Those areas with heavy concentrations of coal mining are affected by poor soil fertility (Gorj County Council 2006, 2007).

No definitive comprehensive studies regarding the air, water or soil qualities have been completed within the urban areas. Zoning requirements that protect only complementary adjacent uses is often overlooked and therefore may contribute to many undocumented pollution problems in urban areas. Summary reports published by the Gorj County Council (2006, 2007) indicate that pollution within Gorj County can be attributed to:

- Surface mining and oil exploitation
- Energy production
- Construction material mining
- Agriculture
- Urban Centers
- Automotive traffic
- Domestic and industrial waste

The AJPM Gorj report identified that 79 hectares were affected by pollution in 2002, where the majority (66 hectares) were areas of chemical pollution and 13 hectares were physically polluted. Regionally, Gorj County is one of the main waste producers, producing 899,000 tons of waste each year. Most of the waste is domestic or municipal and not related to construction or heavy industry. Currently, there are eight (8) sanitary landfills and five (5) incinerators. (Gorj County Council 2007).

In the mining basins ROVINARI and MOTRU from GORJ county it is predicted that the total degraded surface by the surface exploitation will exceed 30,000 ha, respective 15% from the arable surface of the county. This is the predicted result of specific consumption of terrain in the 18 big quarries at the rate of 31 ha/1 million tons extracted lignite. As of 2006, the consumption of land has resulted in the need to move over 2200 households, 40 social-cultural buildings, 5 churches, and 6 cemeteries.
4.3 Problems and Opportunities Identified by the Gorj County Strategic Planning Process

The strategic planning process undertaken in Gorj County characterized the range of environmental challenges facing Gorj County (Gorj County Council 2007). These problems reinforce the conclusions from numerous studies and include:

- Protection for the protected areas and natural parks is not enforced adequately.
- The redistribution and establishment of ownership of land following the collapse of the communist regime is not finalized, thereby preventing access to external funds and difficulty in recruiting investments.
- There is no regional program soil stabilization and the prevention of landslides.
- Projects for the restoration of terrain in areas impacted by mines were abandoned after the collapse of the communist regime.
- The river ballast is exploited without management or permits granted by the county environment authorities.
- Lack of waste collection system leads to the blockage of river flows at bridges, pollution and increased flooding and damage.
- River flows controlled by dams are not regulated with any accord for environmental and ecological concerns.
- Natural resources are exploited without effective management.
- Deforestation occurs irrationally and the lack of the restoration projects leads to landslides.
- Industrial pollution of the air from thermal plants (sulfur) results in aesthetic and health impacts.
- There is a need for better management of solid wastes, especially for domestic wastes from the rural localities (collection, transport, final disposal/storage), in addition to urban localities. Missing for domestic wastes are:
  - Selective collection systems (in progress)
  - Transfer stations among rural localities
  - Ecological storage and landfill (placements are not yet established by the Local Council)
- In the water/waste water domain, with regard to sewage and water supply, the infrastructure is not well developed and not in accordance with the European standards.
- Biodiversity
  - Little value and weak capitalization applied to the natural potential
  - Weak involvement of the local authorities
  - Insufficient protection activities in the natural protected areas (mitigation and management of rainfall torrents)

As the same time, the review and analysis conducted by the Gorj County Council identified a series of opportunities to support environmental improvement potential for sustainable development in the county. These opportunities include:

- The presence of historically-important Tourism routes through the County that can be developed to promote cultural tourism.
- Extensive Forests, waters, rivers, and caves that have the potential to be developed for sustainable ecotourism.
- An established system for protected areas and natural parks that can serve to protect the most valuable environmental assets in the County.
- Native trout populations that have the potential to be managed for sustainable harvest.
- A Mediterranean climate that is conducive both for agriculture and tourism.
- Unpolluted mountain habitats with high quality water and air.
- Extensive areas of stone and sand that can be developed as non-polluting construction materials
- Alpine areas with development potential for hunting, ecologically sustainable sheep herds, pensions and cabins for tourists, forest fruits, and therapeutic flora
- Existence of natural resources
  - Petroleum
  - Coal
  - Gas
  - Forestry wood
  - Marble
  - Mineral aggregates for construction materials
- A study for the development of the Ranca Alpine ski resort has been completed.
- Many localities with natural potential and tourism pensions
- Existence of the localities association from the mountains/sub-mountains area in Gorj County
- Sustainable partnerships between Environmental Agencies, Scholars and schools regarding environmental education.
- NGO-s with environmental missions that undertake education and ecological activities
- The existence of efficient Environmental institutions in Gorj County, including:
  - Environmental Fund Administration
  - APIA (The Agency of Payments and Intervention for Agriculture)
  - OJCA (County Office for Agriculture Counselor)
  - OJPDRP (County Office of Payment for Rural Development and Fishing),
  - Salvamont
- The Local Action Plan for Environment (PLAM) and Agenda 21 Plan for Targu Jiu
- A good collaboration between local authorities, public institutions and economic agents, etc
- The availability of the involved actors in PLAM (with regard to measures and actions accomplishment from PLAM)
- For water and waste water the master plan (APAREGIO) is elaborated
- Several projects for selective waste collection have been undertaken including the collection of paper for the Tg Jiu zonal ecological waste deposit
- Human capacity building in the environmental sector that results from the teaching and research at „Constantin Brâncusi” University
4.4 Environmental Program and Project Priorities Identified in the Gorj County Sustainable Development Study

Based upon interviews and surveys from throughout the County, the Gorj County Sustainable Development Plan identified the following Environmental priority areas for attention.

1. The extension of the purifying systems for the waste waters
   a. Integrated management program for the water supply and sewage systems in Gorj County
      i. Rehabilitation and extension of the water supply and treatment system, respective sewage and water treatment plants (for localities with more than 2000 inhabitants)

2. Extension and modernization of the waste management system
   a. Waste Integrated Management program from Gorj County
      i. Wastes selective collection
      ii. The use of sawdust wastes in order to obtain solid fuel
      iii. Use of solid fuel (textiles, wood, rubber, PET, cartoon) in alternative energy production

3. The protection of the biodiversity and the natural habitat and protected areas management
   a. Program for natural habitat protection of Gorj County
      i. Works of arrangement and forestry improvement, including protection in the hall area
      ii. Projects for torrents correction
   b. The protection and capitalization of the natural protected areas (projects developed by custodians and local authorities)
      i. PROJECT: the development of a sustainable tourism
      ii. The constitution of new protected areas and the declaration of new natural monument in order to conserve the biodiversity and the natural habitats at the county's level

4. The infrastructure accomplishment in order to prevent the natural risks and the creation of an integrated monitoring and rapid intervention system in case of natural disasters
   a. Air quality monitoring for Gorj County
   b. Modification of the Gilort River channel, that crosses the Albeni, Tg. Carbunesti, Jupânesti, Barbatesti, Saulesti, Aninoasa, Branesti, Tântareni, Vladimir localities
   c. Pilot study regarding the causes and the evolution of the earth slides from Amaradia, Bustuchin, Berlesti areas
   d. Arrangement and regularization of irrigation channels
   e. Soil stabilization in order to reduce the earth slides and flooding risks
   f. The development of a GIS system for the management of a data base regarding the earth slide and flooding risks

5. Reduce of the negative impact over the environment, generated by economic activities and old technologies, including ecologic reconstruction of the affected sites
   a. Program: the ecological reconstruction of the terrains that were made free by the technological assignments from the mining industry
      i. The framing between the emission limit of the specific pollutants (powders SO2, NOX) resulted from the electric energy production in thermal plants
      ii. The reforestation of the hills and hazards that were abusively exploited
      iii. The ecological reconstruction at abandon sites with a history of hydrocarbon polluted soils
      iv. The landscaping and reuse of the soils that were degraded by the mining industry
      v. The economic reuse of spoils from mining wastes and quarry exploitations
vi. Research project regarding the possibility of treatment of the waters from the aquifers of the Rosia quarry and their use in public and/or private development

6. Programs and projects for the sustainable management of the natural resources
   a. The promotion of a non-aggressive and ecological tourism
      i. The development of Glogova-mezo-thermal as treatment resort/ the development of the geo-thermal deposit
   b. The exploitation of the natural resources (gas, petrol, coal, marble) in a sustainable manner
   c. Community education for the population regarding environmental protection
   d. The improvement of the energy infrastructure and the capitalization of the renewable energy resources
      i. The use of the wind energy for the electric energy production in Bumbesti-Jiu, Novaci
      ii. Expanding the use of renewable fuels (bio-diesel) throughout the county
4.5 Goals for Ex Ante Assessment of Natural Environment Impacts

Based upon the methodological approach established in this program, each potential project must be assessed on the basis of goals related to the preservation, conservation, restoration, and the protecting of the natural environment. The goals and criteria are presented in Table 4.5.1.

The goals considered relate to:

1. Environmental Ethic
2. Air Quality
3. Water Quality
4. Soil Quality
5. Native Flora and Fauna
6. Ecosystem Integrity
7. Unique Landscapes
8. System Interaction

**Goal 1: Environmental Ethic**

This goal considers: (1) preservation of existing natural environments; (2) conservation of utilized natural environments; (3) restoration of plighted natural environments. All of which are subject to European Union standards and regulatory requirements.

1) *Preservation of existing natural environments*

Objective: The project results in a common goal of preserving the natural environment for the benefit of the atmosphere, biosphere, hydrosphere, and lithosphere.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the benefits associated with preserving specific elements of the natural environment. Project scores should consider European Union standards of environmental regulations.

2) *Conservation of utilized natural environments*

Objective: The project results in a common goal of conserving need utilized natural environments for the benefit of the atmosphere, biosphere, hydrosphere, and lithosphere.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of the natural systems associated with the project. Scoring of projects should be based on the degree of benefit to non-natural environment and destruction/consumption of natural environment. Project scores should consider European Union standards of environmental regulations.

3) *Restoration of plighted natural environments*

Objective: The project results in a common goal of restoring plighted areas of natural environments for the benefit of the atmosphere, biosphere, hydrosphere, and lithosphere.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit to the reconstruction/restoration of the natural environment. Project scores should consider European Union standards of environmental regulations.
Goal 2: Air Quality
Objective: The project protects, preserves, and/or enhances the air quality of the natural environment in Gorj County. This goal considers: (1) preserving existing areas of “high/good” air quality; (2) conservation of air quality when utilizing natural environments; (3) restoration of plighted air quality. All of which are subject to European Union standard and regulatory requirements.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit of “high/good” air quality. Higher scores should be given to projects that will cease or decrease the contamination of air.

Goal 3: Water Quality
Objective: The project protects, preserves, and/or enhances the air quality of the natural environment in Gorj County. This goal considers: (1) preserving existing areas of “high/good” water quality; (2) conservation of water quality when utilizing natural environments; (3) restoration of plighted water quality. All of which are subject to European Union standard and regulatory requirements.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit of “high/good” water quality. Higher scores should be given to projects that will cease or decrease the contamination of water.

Goal 4: Soil Quality
Objective: The project protects, preserves, and/or enhances the air quality of the natural environment in Gorj County. This goal considers: (1) preserving existing areas of “high/good” soil quality; (2) conservation of soil quality when utilizing natural environments; (3) restoration of plighted soil quality. All of which are subject to European Union standard and regulatory requirements.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit of “high/good” soil quality. Higher scores should be given to projects that will cease or decrease the contamination of soil.

Goal 5: Native Flora and Fauna
Objective: The project protects, preserves, and/or enhances the native flora and fauna quality of the natural environment in Gorj County. This goal considers: (1) preserving existing areas of “high/good” native flora and fauna quality; (2) conservation of native flora and fauna quality when utilizing natural environments; (3) restoration of plighted native flora and fauna quality. All of which are subject to European Union standard and regulatory requirements.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit of “high/good” native flora and fauna quality. Higher scores should be given to projects that will cease or decrease the influx of non-native/invasive species.

Goal 6: Ecosystem Integrity
Objective: The project protects, preserves, and/or enhances the ecosystem integrity of the natural environment in Gorj County. This goal considers: (1) preserving existing areas of “high/good” ecosystem integrity; (2) conservation of ecosystem integrity when utilizing natural environments; (3) restoration of plighted ecosystem integrity. All of which are subject to European Union standard and regulatory requirements.
Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit of “high/good” ecosystem integrity. Higher scores should be given to projects that will cease or decrease the destruction of ecosystem integrity.

**Goal 7: Unique Landscapes**

Objective: The project protects, preserves, and/or enhances unique landscapes of the natural environment in Gorj County. This goal considers: (1) preserving existing areas of “high/good” landscape uniqueness; (2) conservation of unique landscapes when utilizing natural environments; (3) restoration of plighted unique landscapes. All of which are subject to European Union standard and regulatory requirements.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit of “high/good” landscape uniqueness. Higher scores should be given to projects that will cease or decrease the contamination/ destruction of unique landscapes.

**Goal 8: System Interaction**

Objective: The project protects, preserves, and/or enhances system interaction of the natural environment in Gorj County. This goal considers: (1) preserving existing areas of “high/good” system interaction; (2) conservation of things associated with system interaction when utilizing natural environments; (3) restoration of plighted things associated with system interaction. All of which are subject to European Union standard and regulatory requirements.

Evaluation: Evaluator scores should objectively represent the needs of all inhabitants of natural systems associated with the project. Scoring of projects should be based on the degree of benefit of “high/good” system interaction. Higher scores should be given to projects that promote “high/good” system interaction.
<table>
<thead>
<tr>
<th>Assessment Category</th>
<th>Assessment Question</th>
<th>Environmental Aspect to be Evaluated</th>
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<tbody>
<tr>
<td>Quality</td>
<td>Does the project improve environmental quality as established by community, regional and European Union standards?</td>
<td>Water Quality: Emissions; Exposure or Risk to People; Overall Impact (regional cumulative)</td>
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<td>Air Quality: Emissions; Exposure and/or Risk to Human Population; Overall Impact (regional cumulative)</td>
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<td>Soil / Land Quality: Emissions; Exposure/Risk to Human Population; Overall Impact (regional cumulative)</td>
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<tr>
<td>Quantity</td>
<td>Does the project improve the sustainable supply and/or access to a sustainable supply of environmental resources?</td>
<td>Potable Water: Supply; Increase Availability and Safety; Access; Reuse / conservation</td>
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<td>Water for Agricultural and/or Industrial Use: Supply; Access; Reuse / conservation</td>
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<td>Soils for Agricultural Use: Supply; Access; Reuse / conservation</td>
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<td>Public Access to Green Space, Waterways, and Natural Areas: Supply; Access</td>
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<td>Greenhouse gas emissions (Per capita): Supply; Uptake (sequestration)</td>
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<td>Function</td>
<td>Does the project improve ecological function and preserve land and waterscapes necessary for sustainable resources?</td>
<td>Hydrological cycle functions: Runoff / Infiltration / Flow Regimes (flooding, dams, hydroperiods)</td>
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<td>Soil stability: Erosion / Sediment transport</td>
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<td>Wetland Functions: Recharge / Flood storage / Water quality / Habitat</td>
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<td>Natural Habitat: Corridors / Connectivity / Fragmentation</td>
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<td>Natural Heritage Features: Unique region / global</td>
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<td>Biological Diversity: Endemic / Rare species or communities</td>
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<td>Education Initiatives: Schools / General Public / Tourists</td>
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<td>Monitoring and Assessment: Air / Water / Soil</td>
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4.6 Goals for Ex Ante Assessment of Built Environment Impacts

**Built Environment**

Definition: The built environment refers to the manmade surroundings that provide the setting for human activity, from the largest-scale civic surroundings to the smallest personal place. The built environment consists of cities, suburbs, villages, buildings, and infrastructure (sewer and water, pipelines, and transportation networks), all of which have particular influences on the urban environment. The parameters included in the ex ante assessment of impacts on Built environment and infrastructure are listed in Table 4.6.1 and are described below.

**Assessment of Built Environment Impacts**

Each project should be assessed on the basis of several goals related to the protection, preservation, and enhancement of the built environment. The goals considered relate to:

1. Use and Aesthetics
2. Property
3. Solid Waste
4. Sewage and wastewater
5. Drinking water
6. Stormwater
7. Communication
8. Energy
9. Transportation

**Goal 1: Use and Aesthetics**

The project protects, preserves, and/or enhances the usability and aesthetic characteristics of the built environment in Gorj County. This goal considers: (1) public use and accessibility; (2) Aesthetic impacts; and (3) European Union standards and regulatory requirements.

1) Public Use and Accessibility

Objective: The project results in a common amenity that can be used, enjoyed, and/or benefit all members of the public.

Evaluation: Evaluator scores should consider the proportion of the public (i.e., from 0% to 100%) that will use, enjoy, and/or benefit from the project. The evaluation should consider who the project will benefit and what proportion of the population this group represents. Consideration should also be given to secondary benefits; that is the extent to which the public will benefit from a project aimed at improving the ability of a specific group to carry out a particular function or service.

2) Aesthetic Impact

Objective: The project improves the aesthetic appearance and attractiveness of the built environment of Gorj County.

Evaluation: Evaluator scores should consider the degree to which the project improves the quality and condition of urban buildings, landscapes, and infrastructure elements (lighting, benches, bus stops, streetscapes, parks, etc.). Public art and sculpture must also contribute to this objective.

3) EU Standards and Regulatory Requirements
Objective: The project conforms with regulations and standards put forward by the European Union.

Evaluation: Evaluator scores should be based on whether or not, or to what extent, a project conforms with European Union standards related to the project both directly (e.g. economic) and indirectly (e.g. environmental and social policies).

**Goal 2: Property**

Objective: The project reuses underutilized, blighted and/or brownfields land, as well as promotes the adaptive reuse of existing structures, as opposed to new construction on greenfield land (agricultural land and open space).

Evaluation: Evaluator scores should consider the proportion of the project that is reusing underutilized land, blighted, or brownfields land. Higher scores should be given to projects that will clean contaminated property and make use of existing building stock.

**Goal 3: Solid Waste**

Objective: The project generates little or no solid waste. In cases where solid waste is generated, the proponents have developed procedures for reducing, reusing, and recycling solid waste, as well as for safe and responsible disposal.

Evaluation: Evaluator scores should consider the quantity of waste generated, the characteristics of the waste (hazardous, inert, etc.), and the viability of plans for reuse, recycling, and safe disposal. The evaluators should consider the waste services and facilities being used in terms of their capacity to handle the additional waste, as well as its environmental impact.

**Goal 4: Sewage and Wastewater**

Objective: The project generates little or no solid waste. In cases where wastewater is generated, it is sent to a certified sewage facility or properly managed on site before it is released into waterways.

Evaluation: Evaluator scores should consider the quantity and quality (i.e., Class A thru E) of wastewater generated. The evaluators should consider the sewage services and facilities being used in terms of their capacity to handle the wastewater (i.e., primary thru tertiary treatment), as well as its environmental impact.
<table>
<thead>
<tr>
<th>Assessment Category</th>
<th>Assessment Question</th>
<th>Environmental Aspect to be Evaluated</th>
<th>Goal</th>
<th>Category and Considerations</th>
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<tbody>
<tr>
<td>Quality</td>
<td>Does the project improve environmental quality as established by community, regional and European Union standards?</td>
<td>Use and Aesthetics Integrate with and/or enhance the environment</td>
<td>Public Use and Accessibility</td>
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<td>Aesthetic impact</td>
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<td>EU Standards or Regulatory requirements</td>
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<tr>
<td>Quantity</td>
<td>Does the project improve the sustainable supply and/or access to a sustainable supply of environmental resources?</td>
<td>Property (land)</td>
<td>Reuse or Reclaimed land</td>
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<td>Reuse or Recycling of building materials</td>
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<td>Solid Waste</td>
<td>Generation</td>
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<td>Transfer (handling)</td>
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<td>Disposal (treatment)</td>
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<td>Sewerage (water waste)</td>
<td>Generation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transfer (handling)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Treatment (disposal)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drinking water</td>
<td>Generation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transfer (handling)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Treatment (disposal)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stormwater</td>
<td>Impervious surfaces</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flood / Floodplain management</td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td>Does the project improve ecological function and preserve land and waterscapes necessary for sustainable resources?</td>
<td>Stormwater</td>
<td>Impervious surface and BMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication</td>
<td>Information Technology Infrastructure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sustainable Energy</td>
<td>Clean Energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Renewable Energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Energy Efficiency</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transportation</td>
<td>Infrastructure enhancement (Road, Rail or Air)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Public Transportation Access</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Shipping / Commercial Efficiency</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 5: REGIONAL ECONOMIC ANALYSIS

5.1 Introduction

Sustainable development refers to economic development that can be supported by physical, legal, economic, environmental and social structures in place now or which can be put in place. Often, economic gain is at the cost of natural resources or social justices. The sustainable economy allows for the regeneration of natural resources and social justice at the same time the economy is developing. Sustainable economics is a very specialized growing field that is based in traditional economics. It is important to understand and use these economic principles in reviewing the economic health of Gorj County. For example, a sustainable economy will have many types of industry that are not based on one natural resource. As seen in the downturn of the Gorj County economy over the last few years, an economy that is reliant on one or two large industries such as mining is not sustainable. That does not mean there is no room for mining and power generation in Gorj County. However, it should be recognized that mining and power generation have limited futures. Gorj County now has a few decades, or even one or more centuries, in which to improve current practices to make them more sustainable, but even more important to arrive at sustainable alternatives to mining and power generation. The following chapter will review the current economic indicators of Gorj County, insight into growing a sustainable economy and details on the scoring of the economic portion of the sustainability matrix (ISS).

5.2 Current Economic Status

Data for economic indicators for Gorj County are available; however some are not currently measured, especially at the County level. Some of the information that is not available includes, consumption/spending, detailed pay and benefits, output based on capital and equipment, ownership, unmet customer demand and industry/occupation indices. The data that is available is very detailed and allows stakeholders and businesses to understand the current economic environment of Gorj County.

Inflation
The inflation rate for Gorj County, which is the general rise of prices of goods and services, between December 2005 and 2006, was 4.87%. The monthly inflation rate for 2005 was .7% and .4% in 2006. (Gorj Co., 2007b) There was little variance of the inflation rate, month to month in either 2005 or 2006, but economic changes follow accession to the EU have changed this pattern and inflation has risen.

Unemployment
Although numbers for unemployed people based on occupation was not available, unemployment by age, month and overall is available. Unemployment decreased between 2005 and 2006, from 9.2% to 8.7% and at the same time, the number of available employees increased, as seen in Table 5.1 (Gorj Co., 2007b). There is some uncertainty regarding how workers who have left Romania to work in other countries are counted in the unemployment figures.
Unemployment is also seasonal. The highest level of unemployment occurred in February and the lowest tends to occur during the summer months. Of the unemployed 29% for people between the ages of 30-39, followed by 24% for those 40-49, 29% for people 25-29, 13% for people between the ages of 50-55 and 5% for people over 55 years old. Of the unemployed, those without a high school education account for 79.12%, 17.19% have a high school education and 3.7% have a university degree. The largest numbers of jobs were found due to vacancies of other jobs. A very small amount of jobs were created during the formation of a business. (Gorj Co., 2007b)

**Employment**

Mining is the largest employer and Gorj County remains one of the main energy providers for the country because of its lignite mining, oil production, and electric energy plants. In 2004, coal extracted from Gorj represented 70% of the total extracted coal nationally. Mining and energy production is the main industry in Gorj County. Currently, the mining industry is using many old techniques that may not be efficient. The industry is developing new technologies for more efficient extraction methods that may also decrease pollution. (Pascariu, Dumitrescu, Bogdan, 2007) Another predominant mining based industry in the county is construction materials. If development increases within the region, Gorj is the primary supplier of cement and may look forward to an expanding market.

The area of the largest types of mining and related industries is Rovinari (Figure 5.2.1) and the types include thermal, reservoirs, mining careers, mining and existing sterile areas. Motru, Pesteana and Turceni have two sterile areas relating to former mine sites. Motru and Jilt have areas with two working mine sites. Most of concentrated areas of mining are in the southwestern portion of Gorj.
Figure 5.2.1: Mining reserve locations in Gorj County, Romania

Legend
- Gorj County
- Natural Springs
- Anthracite
- Construction Material
- Lignite
- Reviați
- Zona Apești-Rosia-BustucișCH
- Petroleums
- Ațimpani
- Ticeni
- Turbine/Glider/Caprimi/Carnivores/Logresti

Gorj County, Romania
Locator Map

DATA SOURCES
- USTDA Report, Department of Transportation
Figure 5.2.2: Employment by Industry, overall percentage of those employed. (Pascariu, Dumitrescu, Bogdan, 2007)

<table>
<thead>
<tr>
<th>Activity</th>
<th>No of persons</th>
<th>Proportion at the county level (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, hunting, sylviculture</td>
<td>42,500</td>
<td>29.7</td>
</tr>
<tr>
<td>Overall Industry from which:</td>
<td>44,700</td>
<td>31.4</td>
</tr>
<tr>
<td>Extractive industry</td>
<td>1,800</td>
<td>12.6</td>
</tr>
<tr>
<td>Processing industry</td>
<td>2,200</td>
<td>15.4</td>
</tr>
<tr>
<td>Electric and thermal energy, gas and water</td>
<td>4,700</td>
<td>3.3</td>
</tr>
<tr>
<td>Constructions</td>
<td>8,800</td>
<td>6.2</td>
</tr>
<tr>
<td>Trade, repair of motor vehicles, home goods</td>
<td>12,400</td>
<td>8.7</td>
</tr>
<tr>
<td>Transport, storage, communications</td>
<td>6,100</td>
<td>4.3</td>
</tr>
<tr>
<td>Real transactions and other services</td>
<td>6,600</td>
<td>4.6</td>
</tr>
<tr>
<td>Financial, banking and insurance activities</td>
<td>800</td>
<td>0.6</td>
</tr>
<tr>
<td>Public administration</td>
<td>2,700</td>
<td>1.9</td>
</tr>
<tr>
<td>Education</td>
<td>7,300</td>
<td>5.1</td>
</tr>
<tr>
<td>Health and social protection</td>
<td>5,800</td>
<td>4.1</td>
</tr>
<tr>
<td>Tourism, hotels, restaurants</td>
<td>2,200</td>
<td>1.5</td>
</tr>
<tr>
<td>Other activities</td>
<td>2,700</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>142,400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
County. Smaller mining areas are located in Schela and petroleum mines are located in Albeni and Ticlini. The source materials for the mining operations are documented in Figure 5.2.1. The concentrations of mining in the southwestern portion of the county correspond to the Rovinari lignite reserves. Petroleum reserves run in two parallel lines from the southwest to the north east, the largest being located near Ticleni and Targu Carbunesti. Anthricite is located in the north central area of the county and construction material is located in the foothills of the mountains, in the northwest and northeastern areas. (Pascariu, Dumitrescu, Bogdan, 2007) The construction materials consist of in stream cobbles and limestone.

The second largest industry within Gorj County is agriculture. Agricultural land occupies 43.5% of the available land within the county. Approximately half of the agricultural land that is classified as is arable land, 37% is pasture, 16% is hay production and the remainder is vineyards and orchards. (Economic Profile of Gorj County, 2007)

Recent analysis of the labor force for Romania and the region as a whole indicate that the benefits of low labor costs are no longer a competitive advantage in the market place. Instead the labor force in Romania and within Gorj County has many weak points, including low productivity, old technologies, low entrepreneurial businesses, low research and development initiatives, and low electronic based services. Regionally, Gorj does have a large number of people who are competitive academically (32%), however this percentage is lower than the national average of 38%. (Pascariu, Dumitrescu, Bogdan, 2007)

The amount of small and medium businesses in Gorj County is low relative compared to the national average. In 2005, 38% of the population worked in small and medium business, in urban areas the percentage is 62% and in 17% in rural areas. The breakdown of size and type of small and medium business is shown in Table 5.2.2. The number of small and medium businesses is more prevalent in urban areas such as Târgu Jiu, Motru and Baia de Fier, while decreased numbers of these types of business are seen in areas such as Tismana, Turceni and Ticleni. The large industries in the county remain to be The National Society of Lignite Oltenia and the two large energy companies: Turceni and Rovinari. As economic development is considered, the size and location of investment should be considered based on the areas of large companies, work force and training. (Pascariu, Dumitrescu, Bogdan, 2007)

<table>
<thead>
<tr>
<th>Small &amp; Medium Business (% of population)</th>
<th>Industry (%)</th>
<th>Construction (%)</th>
<th>Services (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorj</td>
<td>28.4</td>
<td>11.7</td>
<td>5.6</td>
</tr>
<tr>
<td>Romania</td>
<td>38.6</td>
<td>13.6</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Table 5.2.2: Small and Medium Businesses and Business Sector. (Pascariu, Dumitrescu, Bogdan, 2007)

**Payment/Benefits**

Monthly average gross income per person in 2006 was 1,325 lei and yearly average income was 15,910 lei. The majority of the incomes came from the industrial sector, followed by the service industry and lastly the agricultural sector. The breakdown is income by sector is found in Table 5.2.3. (Gorj Co., 2007b)

<table>
<thead>
<tr>
<th>2006</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, hunting</td>
<td>545</td>
<td>703</td>
<td>759</td>
<td>716</td>
<td>707</td>
<td>882</td>
<td>744</td>
<td>750</td>
<td>905</td>
<td>719</td>
<td>964</td>
<td>1100</td>
</tr>
<tr>
<td>Industry and Construction</td>
<td>1355</td>
<td>1351</td>
<td>1539</td>
<td>1535</td>
<td>1525</td>
<td>1542</td>
<td>1559</td>
<td>1557</td>
<td>1591</td>
<td>1529</td>
<td>1544</td>
<td>1820</td>
</tr>
<tr>
<td>Service</td>
<td>1187</td>
<td>912</td>
<td>959</td>
<td>969</td>
<td>995</td>
<td>994</td>
<td>977</td>
<td>994</td>
<td>1034</td>
<td>1095</td>
<td>1442</td>
<td>1820</td>
</tr>
<tr>
<td>Average Gross Income</td>
<td>1374</td>
<td>1153</td>
<td>1284</td>
<td>1283</td>
<td>1283</td>
<td>1343</td>
<td>1338</td>
<td>1349</td>
<td>1323</td>
<td>1299</td>
<td>1359</td>
<td>1640</td>
</tr>
</tbody>
</table>

Table 5.2.3: Average Gross Income, 2006. (Gorj Co., 2007b)
Productivity
Workplace productivity 2006 has increased in most major industries 22.6%, from 2005. Between 2005 and 2006, workplace productivity has grown in all sectors as follows (Gorj Co., 2007b):

- thermal electric energy, gases and water: 27%
- manufacturing: 24%
- mining: 11%

However, workplace productivity in the agricultural sector, namely crop production decreased between 2005 and 2006. The largest decreases were noted in oat and spring barley production. The decrease was the result of increased rain; therefore the government offered some compensation for the agricultural producers for the decreased agricultural crops. Livestock production increased slightly during the same time. The majorities of livestock, over 99% are kept by private individuals; therefore contribute little to the overall economy of the region. (Gorj Co., 2007b)

The Tg Jiu forestry fund production of wood decreased slightly between 2005 and 2006. The production is derived from cutting young trees for maintenance and other forest cutting. In 2006, 120 hectares of trees were planted in areas where cutting was performed, on former mine sites and in open spaces. The Tg Jiu forestry fund also provides smaller industry production such as forest fruits, edible mushrooms, trout and osier production. The production of these industries varied based on climate. (Gorj Co., 2007b)

Tourism in Gorj grew slightly between 2005 and 2006. The occupancy level in 2006 was 19.9% compared to 18% in 2005. Tirgu Jiu attracted the largest number of tourist, both foreign and Romanian tourists. Motru, Novaci, Arcani and Polovragi attracted foreign tourists and also had high occupancy levels. (Gorj Co., 2007b)

<table>
<thead>
<tr>
<th>Product</th>
<th>Unit of Measurement</th>
<th>2004 Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric energy total</td>
<td>hundred kWh</td>
<td>11,871,271</td>
</tr>
<tr>
<td>-in thermo-power stations</td>
<td>hundred kWh</td>
<td>11,103,872</td>
</tr>
<tr>
<td>-in hydro-power stations</td>
<td>hundred kWh</td>
<td>567,399</td>
</tr>
<tr>
<td>Net coal</td>
<td>tonnes</td>
<td>23478,2</td>
</tr>
<tr>
<td>Extract de crude oil</td>
<td>tonnes</td>
<td>301,396</td>
</tr>
<tr>
<td>Natural gas</td>
<td>hundred d.c</td>
<td>2229,316</td>
</tr>
<tr>
<td>Tobacco products</td>
<td>tonnes</td>
<td>398</td>
</tr>
<tr>
<td>Textile clothing</td>
<td>million lei</td>
<td>18,819</td>
</tr>
<tr>
<td>Timber</td>
<td>Mc</td>
<td>10,600</td>
</tr>
<tr>
<td>Plywoods</td>
<td>Mc</td>
<td>3,086</td>
</tr>
<tr>
<td>Chips of wood plates</td>
<td>Mp</td>
<td>771,503</td>
</tr>
<tr>
<td>Technical products of rubber</td>
<td>tonnes</td>
<td>20,837</td>
</tr>
<tr>
<td>Cement</td>
<td>tonnes</td>
<td>457,700</td>
</tr>
<tr>
<td>Glassware</td>
<td>tonnes</td>
<td>887</td>
</tr>
<tr>
<td>Reinforced concrete prefabricates</td>
<td>Mc</td>
<td>6,698</td>
</tr>
<tr>
<td>Books and Reasons blocks</td>
<td>thousands pieces</td>
<td>5,379</td>
</tr>
<tr>
<td>Pieces powered from pig iron</td>
<td>tonnes</td>
<td>435</td>
</tr>
<tr>
<td>Furniture</td>
<td>million lei</td>
<td>12,670</td>
</tr>
</tbody>
</table>

Table 5.2.4: Production, by Industry. (Gorj Co., 2007b)

The largest producers in Gorj County involve energy production, mining and wood related products. The net output for production, by industry is illustrated in Table 5.4. The production relates directly to the employment previously discussed and the import and export of the services. The products illustrated here directly relate to the natural resources available in Gorj County.
The export and imports for Gorj County is also an active industry and will assist in growing the region’s economy. In 2006 export and imports grew measuring 31,016,000 and 39,610,000 euro respectively. The largest exported products were from plastic materials, textiles, vegetables and cars and electrical equipment. The largest imported products include textiles, communication, plastic materials, chemical products and cars/machines/electronic equipment. The import and exports, by product are detailed in Table 5.2.5.

<table>
<thead>
<tr>
<th>Product Description</th>
<th>2006 Exports</th>
<th>2006 Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock and animal products</td>
<td>1832</td>
<td>928</td>
</tr>
<tr>
<td>Vegetable products</td>
<td>1347</td>
<td>526</td>
</tr>
<tr>
<td>Food products, beverages, tobacco</td>
<td>-</td>
<td>107</td>
</tr>
<tr>
<td>Mineral products</td>
<td>1</td>
<td>205</td>
</tr>
<tr>
<td>Chemical industry products and connexe industry</td>
<td>3</td>
<td>4454</td>
</tr>
<tr>
<td>Plastic materials, rubber and articles from those</td>
<td>10489</td>
<td>8574</td>
</tr>
<tr>
<td>Wood product, raft and wattle</td>
<td>1219</td>
<td>653</td>
</tr>
<tr>
<td>Tanned hide, flux and related products</td>
<td></td>
<td>288</td>
</tr>
<tr>
<td>Wood paste, paper or cardboard wastes and articles from those</td>
<td>6</td>
<td>221</td>
</tr>
<tr>
<td>Textile products and articles from those</td>
<td>6286</td>
<td>7955</td>
</tr>
<tr>
<td>Footwear, hats, umbrellas and similar articles</td>
<td>0</td>
<td>121</td>
</tr>
<tr>
<td>Stone articles, cement, ceramics, glass and other similar materials</td>
<td>1314</td>
<td>334</td>
</tr>
<tr>
<td>Common metals and articles from those</td>
<td>3914</td>
<td>1666</td>
</tr>
<tr>
<td>Cars, electric equipments, registration device</td>
<td>3782</td>
<td>4717</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>6161</td>
</tr>
<tr>
<td>Instruments and optical, photography, cinema, measurement, control or precise cameras</td>
<td>59</td>
<td>210</td>
</tr>
<tr>
<td>Goods and diverse products</td>
<td>762</td>
<td>2400</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>TOTAL GORJ COUNTY</td>
<td>31016</td>
<td>39610</td>
</tr>
</tbody>
</table>

Table 5.2.5: Imports and Exports. (Gorj Co., 2007b)

5.3 How Economies Grow

The economy of an area (generically referred to as a “region”) grows when new revenue is paid to businesses located inside the area from people and businesses outside the area (“exogenous sources”). The important sectors and businesses that bring in outside revenue are commonly referred to as the “economic base.” Revenues coming into an area are referred to as “regional income.” As businesses are paid revenue from exogenous sources, they in turn buy what they need to produce their output: labor (paid in wages), rent or mortgages on equipment and land, advertising and other business services, and intermediate inputs that depend upon the product they are producing (agricultural products, for example, for food processing companies; software in the case of marketing firms).

The term “regional income” refers to the sum of all monies paid to businesses located in an area. It is not synonymous with what we popularly refer to as “income” when we speak about personal income (as in the income a household reports to the federal government, or family income levels reported by the federal government).
Note that a business does not have to physically export its goods or services in order to bring in exogenous regional income. All transactions may be done electronically, for example; or the business may be tourist-based so that the exogenous buyers are actually traveling to the area to spend money locally. The important determinant of regional income is that the buyer is an entity not located in the region. Business sells its product or service one of two ways in order to gain exogenous regional income: they either export goods or services outside the area, or customers travel to the area and spend money inside the region on food, entertainment, or other goods or services (destination spending).

A region’s economic base is that set of industries (and specific businesses within the industries) that brings in the majority of regional income. These are sometimes referred to as the region’s “primary sectors” or “drivers” (these terms are synonymous with “economic base”). Examples: The primary sectors in Gorj County were, and to a certain extent still are, the mining and machinery industries; the primary sector in Las Vegas is gambling and entertainment.

Note: There is a special source of regional income that does not depend on the exogenous sale of goods and services. This is when local residents receive supplemental income either through transfer payments by the national government (e.g., income supports such as “welfare” or “negative income tax” — called the Earned Income Tax Credit in the U.S.) or sent from family members working outside the area (repatriated funds). In this case an exogenous source of income is paid directly to people, not to businesses.

As regional income comes in through the sale of goods and services from regional business entities, that income is distributed to the business’ suppliers and to its workers. The workers in turn buy life’s essentials and pleasures: housing, food, clothing, heating fuel, education, doctors, dentists, entertainment, etc. Thus, the retail and consumer services sectors of an economy are tied to the health of the economic base. They are typically not base industries, they are secondary sectors. (In the case where an entertainment or shopping district attracts tourists or other destination spenders, they are a primary sector, as noted above.)

In addition to a secondary sector that supports workers and people, there are secondary businesses that sell to businesses in the primary sector. For example, a machinery plant needs to buy intermediate products such as metal and wiring, but also services such as advertising, shipping, etc.; and government services (including taxes).

The multiplier. The extent to which regional income supports the secondary sector within the region depends upon how much is available to buy locally. For example, if profits and salaries are paid to and spent by local citizens, the new income has more effect than if the profit is sent abroad or if the income is spent on imports. If a business pays its mortgage to a local bank, employs local labor and buys all its intermediate products locally, then the regional income it brings in has a larger local impact than if it has to import goods and services. For example, if a mining company buys its equipment from a regional producer of mining trucks, or conveyor belts, etc., then its revenues support local businesses. If there is no local producer of mining equipment, and the business needs to import such equipment, then their revenue is “leaking out” of the local economy.

There is a way for economists to measure what this impact is for sectors and businesses within a sector. This measure is termed the “multiplier.” Higher multipliers mean that the business is better “integrated” locally—spending more of its money in the secondary sector within the region—and it makes for a more robust regional economy. Lower multipliers mean that regional income is coming into but then leaving the region.

Although not a common practice among economists, one might argue that the multiplier can be used as a tool by which to talk about sustainability. The larger the secondary sector, the more sustainable is the local economy. The existence of a large secondary sector suggests that the local economy can support
both businesses and workers no matter what the primary sector may be. The existence of a large secondary sector can be used to attract additional primary businesses so that the local economy is not dependent upon one or two primary industries—an unsustainable situation in the long-run. It is also better for the environment, within certain constraints, if goods and services are available locally rather than having to be “trucked in.”

The process by which economic base industries (the primary sector) bring in regional income and how this income supports the secondary sector through the multiplier is illustrated in figure 5.3.

**Figure 5.3.1. Economic base, primary and secondary sectors**

**Economic Base**

*Where does Gorj County Income Come From?*

- **Rest of World**
  - Business sells goods or services outside county, or attract spenders to county (e.g., tourism)
  - $ Business gets dollars from sales

- **Gorj County Businesses – The Economic Base**
  - Business hires workers
  - (SECONDARY sector) Business buys business services (advertising, judicial services, paper, loans, shipping)

- **This is the PRIMARY source of all county income**

- **(SECONDARY sector)**
  - Workers buy household goods, housing, retail, entertainment and personal services

**What is the proper Public Sector role in Economic Development?**

In the past, government subsidized economically inefficient mining, thus artificially inflating the “Business gets dollars from sales” component of Figure 5.3.1. When this subsidy got smaller, the county began to suffer from unemployment and all related problems. This has been partially overcome with overseas workers sending money back to Gorj and other government subsidies. As the economy grows, care must be taken to ensure that the growth is sustainable, or that it makes progress toward a sustainable economy (including serving as a short-term bridge that gives time for more sustainable development). With this in mind, the goal of economic development policy is to facilitate the growth and diversification of the
economic base, thus increasing regional income; and to use the regional income generated by the economic base to grow the secondary sector throughout the region.

The public sector facilitates growth by providing 1) economic public goods\(^1\) and 2) economic policies that minimize risk for private sector investment. Such public sector investments and policies, to be effective, must recognize the economic strengths and opportunities of different regions, cities, and neighborhoods; and the role each plays in the overall functioning of the economy.

Economic public goods include:
- reliable and adequate energy
- clean and affordable land
- a national network for the distribution of goods and the movement of people (transportation)
- information technology infrastructure
- water and waste disposal systems
- investment in large-scale research and development
- banking and credit system
- educational systems
- housing and neighborhoods of choice

Economic public policies include:
- secure systems for property ownership and transfer
- land use policy
- secure systems for licensing and permitting of businesses
- appropriate price supports and protections for emerging economic sectors

**Development of Criteria**

The criteria below thus are based on:
- an understanding of the way economies grow (net new income and import substitution) and the role different “geographies” might play in the creation of a regional economy
- an understanding of how and where public sector investments in assets and policy can improve the conditions for private-sector investment
- a need for the public sector to deliver the results of those investments to the most local citizens

**Criteria**

Based on an initial review of the geographic, physical, and legacy economic assets of the three main areas under consideration in Gorj County, the criteria below designates Targu Jiu a center for corporate headquarters, new technologies, and other “new service” companies (thus growing the primary base). Motru’s assets are best developed to serve as a production center for primary manufactured exports and secondary services for Targu Jiu. Baia de Fier should be developed as a destination spending place (tourism) for both a national and international audience.

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\(^1\) A good which, which once provided to one user must be provided in the same amount to all users due to its non-rival and non-excludable nature, is called a public good. It is a public good in part because the public sector must provide it, because there is no market mechanism for its production (because of its non-rival and non-excludable nature). An example is national defense. If the federal government provides it, I cannot stop you from benefiting from it (non-excludable), nor does my “consumption” of it exclude you from consuming it as well (non-rival). Therefore, there is no reason for me to pay for it and thus there is no market for it.
1. Address transportation systems for the movement of goods and people into and out of Gorj county, for tourism in Baia de Fier (destination spending) and to develop Targu Jiu in particular as a city of choice for professional-service export industries
2. Address the need for transportation systems to aid the in the collection and distribution-to-market of locally produced agri-products in Motru (an export industry)
3. Identify and strengthen the links between the production of local agriculture and high-value products in pharmaceuticals, cosmetics, glass and ceramics (develop and support an export industry through research and production) – link Motru products to national food and pharmaceutical industries, and target Targu Jiu as a location for the headquarters of these industries.
4. Develop banking and credit availability for small business (encourage innovation and development of new exports and new import-substitute goods)
5. Ensure the continued viability and innovation of the machine tools industry in Motru (builds on existing exports; fits with local skills)
6. Develop waste disposal systems to make tourism-targeted cities “places of choice” (tourism is an on-site industry, Targu Jiu and Baia de Fier need to develop neighborhoods of choice for high-skilled workers in service industries).
7. Build new sectors in materials-related industries, for example renewable energy equipment (Motru, builds on existing skills)
9. Secure reliable and affordable energy for all three areas.

5.4 Guide to Using the Economic Evaluation Matrix

Location Quotient (LQ)
The LQ is a measure of the competitive advantage of economic sectors within a local area (LA). By measuring the relative concentration of a variable which indicates economic activity within sectors, such as employment, output or sales to a reference area (RA); it indicates the extent to which more of the LA resources are devoted to production with that sector. The interpretation is that therefore, since there is more relative employment/activity, then the sector must be export-oriented and thus “catalytic”. If there are more workers employed in production, then the assumption is that there is relatively more being produced; the “extra” gets exported.

Employment is the most common variable used because it is the most widely available measure and is easily compared across geographies. Whereas output or sales, as measured in currencies, are subject to exchange rate interpretations and inflation adjustments; an employed worker is one person no matter where in the world you happen to be.

\[
LQ_{LA} = \frac{E_{sLA}/E_{tLA}}{E_{sRA}/E_{tRA}}
\]

Where
\[E = \text{Employment}\]
\[s = \text{sector}\]
\[t = \text{total}\]

Interpreting the LQ
An LQ less than 1 indicates that there is relatively less employment (as a percent of total employment) in the LA dedicated to the production of the good or service than in the reference area. Thus, an LQ less than one indicates that the sector is import-oriented and not catalytic. An LQ greater than 1 indicates that
there is relatively more employment in the LA dedicated to the production of the good or service than in the RA, and thus is catalytic.

Relative employment in sectors might differ among geographic reasons for a number of reasons which do no correlate with the amount of production and thus the interpretation of the LQ must be tempered. The two major reasons are:

- Capital and equipment in one area might be relatively more sophisticated, meaning that fewer workers are needed. Gorj may be producing the same output with more workers than the sector in Romania as a whole, but that might be only because other firms in Romania have better equipment and can produce more with fewer workers.
- The consumption of the product might not be uniform across the reference area. Gorj may be producing more mining equipment, for example, than the EU in general, but if all of the mining equipment is being consumed in Gorj, then “mining equipment” is not an export industry for Romania.

In practice, a sector with an LQ of less than .5 is generally considered non-competitive and import-oriented. A sector with an LQ of more than 1.2 is generally considered export-oriented. One may also look at how the LQ has changed over time. If the LQ has increased, that means that the sector is becoming more important; more competitive. If the LQ has decreased, we might assume the opposite.

The strategic choice is to continue to support industries whose export-orientation are promising and growing; and to develop local industries which can produce the products that are now imported. Other strategies are possible; for example, to concentrate resources heavily on large catalytic sectors (LQ greater than 1.8 for example) in the short run for a quick economic “jump start.”

The choice of the reference area indicates the geographic scope of export and is important to determining whether the economic sector is a national leader or a European leader. For example, if the RA is Romania and the LA is Gorj county, then the measure indicates how concentrated the activity is in Gorj county relative to the country of Romania – thus, a national “catalytic area.” We can assume that the sector exports to Romania. (It may in fact export outside Romania, but we cannot assume that if the reference area only takes us to Romania.) On the other hand, if the RA is the European Union as a whole and the LA is Gorj county, then the measure indicates how concentrated the activity is in Gorj (and in Romania) relative to the EU – and thus we may assume that the sector exports to the EU. Thus the sector is a national catalytic sector, and inasmuch as it is located in Gorj, bodes well for the future of the Gorj economy.

**Data Needed**

Historical employment by economic sector for both the LA and the RA.

**Ownership**

Firms which are owned Romanian nationals are preferred for two reasons.

First, nationally-owned firms are more likely to buy and sell their upstream and buy their downstream products from other national firms and thus have a larger effect on the Romanian economy than non-national firms. National firms are more likely to buy inputs such as advertising, legal services, financial services, and other raw products from local firms, thus giving markets and opportunities to local firms. They are also more likely to keep profits in the country and pay taxes, while reinvesting in local plant, equipment, and labor force.

One obstacle Romania faces is its historical lack of a capitalist class; we encourage the formation of local capital so that the country is in a position to be a full player in the EU.
**Cost of Business / National Purchasing Coefficient**

The national purchasing coefficient (NPC) is the amount of inputs needed by local firms met by local production. For example, if the cosmetics industry needs X amount of fresh herbal produce for its production producing face creams, how much of X is met by local production? In other words, how much of its total need for herbs is the cosmetic industry able to buy locally?

Like the LQ discussed above, the NPC identifies potential new markets for Romanian initiatives by indicating what products are currently being imported. However, the NPC goes a step further by pinpointing those imports that are particularly needed by Romanian companies. It is a better measure of import-substitution potential than is the LQ and indicates firm-to-firm linkages that could be strengthened.

**Data Needed**

Historical input/output matrix, measured in currencies, at the national or regional level.

**Consumer Activity / Housing / Unmet Consumer Demand**

Consumers use their dollars to buy housing, food, clothing, entertainment, utilities and the like. Market opportunities exist where these needs are not met locally and consumers have to either travel outside their community or have needed goods shipped in by relatives, shop via the internet, or go without.

By measuring the amount of money consumers have, in aggregate, available for particular goods and balancing that aggregate demand against the number and size of shops that sell those goods (output), one may measure where unmet demand exists locally.

A “retail market analysis” thus involves measuring the potential spending power and comparing that to the sales power of local shops.

**Data Needed**

To measure spending power: local income (income per capita*number of persons, or an aggregate measure) and a consumer expenditure survey (indicating the average percent of a typical person’s income spent on various goods).

To measure output of shops: a survey or census of retail trade and businesses in the local area, including number, type of product and sales per square foot.

**Worker’s Skills / Industry/Occupation Matrix**

An industry/occupation matrix (IOM) indicates the occupational breakdown of employment within industrial sectors. For example, an IOM would tell you that of the 100% of persons employed by cosmetics production, 10% are sales executives, and 20% are production workers, etc. By taking a count of the number and occupational skills of an unemployed population, one may use the IOM to identify industrial sectors likely to employ the unemployed. Industrial recruitment or entrepreneurial resources can be targeted to firms in these sectors.

**Data Needed:**

An industry/occupation matrix. Usually only available at the national level.
<table>
<thead>
<tr>
<th>Assessment Category</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Economic Growth / Markets</td>
<td>Grows promising primary sector</td>
</tr>
<tr>
<td></td>
<td>Fills new national niche</td>
</tr>
<tr>
<td></td>
<td>Fills new international market niche</td>
</tr>
<tr>
<td>Ownership</td>
<td>Grows national ownership of means of production</td>
</tr>
<tr>
<td>Secondary Economic Sectors</td>
<td>Fits with needed industrial secondary sector activity</td>
</tr>
<tr>
<td></td>
<td>Fits with needed consumer secondary sector activity - retail</td>
</tr>
<tr>
<td>Worker Skills</td>
<td>Fits with existing worker skills</td>
</tr>
<tr>
<td>Consumer Activity / Housing</td>
<td>Fits with needed consumer secondary sector activity - housing</td>
</tr>
<tr>
<td>Transportation / Movement</td>
<td>Facilitates movement of goods regionally</td>
</tr>
<tr>
<td></td>
<td>Facilitates movement of tourists</td>
</tr>
<tr>
<td></td>
<td>Facilitates movement of workers</td>
</tr>
<tr>
<td>Cost of Business</td>
<td>Lowers cost of doing business - energy</td>
</tr>
</tbody>
</table>
CHAPTER 6: SOCIAL AND CULTURAL ANALYSIS

6.1 Background

A 2007 UNDP report states that the majority of social factors relevant to Gorj County are very similar to the country overall. The report presented information on life span and educational rate. Gorj County has a life expectancy of 72 years; the life expectancy for Romania is 71.8 years. Gorj County has a 70.1% educational inclusion rate and Romania has a 72.9% rate. The unemployment rate, as reported in 2003-2004 is much higher than the national average, with a rate of 9.3%, compared to a national average of 5.9%. The majority of the unemployed are women and the work choices are limited. It is unclear whether women within Gorj County choose to stay at home and therefore classified as unemployed and if education is provided for jobs outside of the more typical professions, see table 6.1.1.

<table>
<thead>
<tr>
<th></th>
<th>Life Expectancy</th>
<th>Unemployment</th>
<th>Education</th>
<th>Health</th>
<th>Parliament</th>
<th>Public Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorj</td>
<td>75.7</td>
<td>43.1</td>
<td>71</td>
<td>76.8</td>
<td>NA</td>
<td>58.6</td>
</tr>
<tr>
<td>Romania</td>
<td>75.5</td>
<td>41.9</td>
<td>66.6</td>
<td>78.8</td>
<td>10.5</td>
<td>58.3</td>
</tr>
</tbody>
</table>

Table 6.1.1: Life expectancy, unemployment rates and primary careers for women (percent of industry dominated by women). (HDR, 2007)

Another social factor for Romania and Gorj County is the decline in population forecasted in the future. According to the Statistical Office of the European Communities, there will be a decline in the fertility rate, an increase in migration and an increase in the average age of the population. Following 1990 and the lifting of the ban on migration, there was internal migration consisting of many younger people relocating to the urban centers while older residents with newly appropriated rural land relocated back to rural areas. Based on this, much of the economic information discussed in the last chapter indicates that a lot of the economic resources are found in urban areas. The urban areas are and will remain centers characterized by population with higher education, younger populations, lower unemployment and better health care (Eurostat, 1999). The urban center of Târgu Jiu has 40% of the counties population, or 160,000 people. In the past development patterns followed rivers and other natural resources, the development pattern for Gorj County with increasing urbanization is more closely based on transportation infrastructure. As the urban areas continue to develop and funding is focused on the larger densities of people, the cycle of poverty that exists in rural areas will need to be evaluated and the current agriculture structure may need to change. These trends will continue and change based on socio-economic factors.

Within Gorj County, the population decreased by 13,700 since 1990. Within the southwest region, Gorj has the lowest rate of declining population. Similar to the rest of the country, the population decline is strongest in the rural areas. This is due to the declining fertility rate and rising mortality rate, as seen in Table 6.1.2. In rural areas population declined by -5.1 %, while urban areas increased by 1.7%. The largest population declines are located in the southwestern, north central and southeastern areas of Gorj, including the area near Motru. These population changes were a result of a restructuring and dismissal process that started in 1997. (Gorj County 2007b)
Although the population of Gorj County is declining the average age of the majority of the residents is young. The overall percentages of people younger than 14 is 16.9%, higher than the national average of 15.6%. The percentage of people over 65 in Gorj County is smaller than the national average of 14.7%; additionally, the infant mortality rate is lower (13.8%) than the national average of 15%. The number of the population that is eligible for work (15-64 years old) is good in urban centers such as Târgu Jiu, Motru and Bumbest. The working population is decreasing in the south and southeastern portions of the county.

<table>
<thead>
<tr>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorj</td>
<td>384.9</td>
<td>-1 %</td>
<td>9.4 %</td>
<td>11.1 %</td>
<td>-1.7 %</td>
</tr>
<tr>
<td>Romania</td>
<td>21623.8</td>
<td>-5 %</td>
<td>10.2 %</td>
<td>12.1 %</td>
<td>-1.9 %</td>
</tr>
</tbody>
</table>

Table 6.1.2: Population demographic for Gorj and Romania, indicating higher mortality rates than birth rates. (HDR, 2007)

The unemployment rate for Gorj in 2004 was 8% which is higher than national average of 6.3%. In 2005-2006, the unemployment rate in urban areas was under 6% in urban areas and in rural areas 7.4%. Areas such as Motru had much higher unemployment rates. This is related to the restructuring of the mining industry and the trend for these areas continues to be higher than the county or national average. Additionally, women and younger workers had much higher rates of unemployment, similar to the national average.

The culture of Romania and Gorj County needs to be considered when sustainability is considered. Religion plays a critical role in Romania although it is a secular state. The dominate religion is Romanian Orthodox, which comprises 86.7% of the population. Other religions include Roman Catholicism, Protestantism, Pentecostal denominations and Roman Greek-Catholic. Many monasteries are located within Gorj County and small churches are prevalent throughout the region. The Romanian Orthodox church calendar dictates much of the timing of holidays and government.

There is a rich tradition of folk crafts in various locations throughout Gorj. For example there are many skilled weavers who make ornate wool rugs, especially those located at Tismana. Târgu Jiu is the location of many famous sculptures by Constantin Brânuşi, who is internationally known. Brânuşi was born in Hobita, Gorj located near Târgu Jiu. This area of Gorj is known for wooden sculptures done by local craftsman. There are three Brânuşi sculptures located in Târgu Jiu: the “Endless Column”, “Table of Silence” and “Gate of the Kiss”. All of these sculptures were done near the end of his career and commemorate World War I.

During the stakeholder meetings and smaller work sessions with representatives of each target area, the team developed a better understanding of the social and cultural issues within each region or target community. The following is a summary of some of this more detailed information.
6.2 Criteria for best practice in social sustainability

The following indicators should be used to assess and rank projects according to their potential to fulfil the goals of the World Bank programme administered by ANDZM in Gorj County, Romania, to mitigate the environmental and socio-economic impacts of mining and mine closures, and regenerate balanced patterns of development, from the perspective of social and cultural sustainability.

Social Stability Indicators, including the capacity of projects to replace incomes lost as a result of mine closures, reflect predefined programme goals. However, assessment reports for previous initiatives to mitigate the impacts of mine closures confirm that funding strategies must be broadened to facilitate more complex economic systems at the local and regional level, and overall community development for the areas most affected (World Bank 2005:ix-x; Haney and Shkaratan 2003:62-64). It is the onus of the project proposers to demonstrate evidence that positive outcomes can be expected in any particular category, and they should be encouraged to do so. However, other evidence not provided by the project proposal may be taken into account, and should be sought out by the project evaluation team.

The project evaluation team should provide qualitative summary explanations of rankings assigned to projects in each of the five general categories in the socio-cultural “matrix” for assessment. Where available data is considered insufficient basis for evaluation, recommendations should be made for appropriate consultation with experts, or the permanent improvement of the database. Where criteria for evaluation must be adapted or modified by a local evaluation team to uphold the spirit of the assessment, these must be consistently applied to all project evaluations generated from a given call for proposals, and a detailed report of modifications must be provided on record. Where the evaluation team sees the potential for a viable project to improve its contribution to any of the major goals described here, directions and suggestions should be provided on record in the context of the qualitative summary evaluations.

In many cases, the assessment of best practice with regard to social sustainability is necessarily based in the exercise of qualitative judgement. This is disciplined by the collective objectivity and expert knowledge of the team charged with assessment. Individuals should be selected for their understanding of both the local area and the distinctive challenges associated with the implementation of development projects in the region. They should declare any material or personal conflicts of interest, and be prepared to recuse themselves from committee deliberations where appropriate. To assure both fiscal responsibility and the overall integrity of design implementation, follow up assessment of sociocultural impacts of funded projects should be undertaken by an outside party.

6.3 Evaluating social and cultural sustainability

Social Stability

The Social Stability Indicators are intended to assess which projects best fulfil programme goals of mitigating the socio-economic impacts related to mine closures. The difference between indicators of Social Stability and indicators used for the Economic Evaluation Matrix is a fundamental difference of perspective and scale: we look at how investments actually serve families, households and communities in the most disadvantaged areas of Gorj, rather than abstract measures of economic growth at the county level.

2 It is recommended that Social Stability Indicators be weighted at 25% of the value assigned to the Socio-Cultural Evaluation Matrix, while all other factors should be equally weighted at 19% each.
The first goal contributing to Social Stability in Gorj County is **Assistance to individuals and households affected by mine closures.** This is assessed primarily in terms of sustainable job creation. In order to obtain a positive score, these jobs must be targeted directly to (a) the same individuals and (b) the same family units affected by mine closures. Targeted jobs may be assessed by skill sets and minimum qualifications with respect to former positions, in addition to close proximity of the displaced labor force.

Effective and efficient use of funds to provide assistance to individuals and households affected by mine closures must also be taken into account. Small-scale projects directly targeted to generate sustainable, full-time jobs for former mine employees and members of their households may therefore score very high, for example, while large-scale projects that generate jobs unlikely to be filled by miners or family members (because they require significantly different skills and qualifications, or because they are located beyond commuting range [within one hour’s travel] of the displaced labor force, for example) may score poorly. Projects may also score poorly if jobs created are inherently short-term (3 years or less), part-time, or seasonal.

The second goal relates to **Investment in communities most affected by mine closures.** This should be assessed primarily by proximity to population centers and rural areas most affected by mine closures, and only secondarily according to whether proposed projects conform to the types of investment that have been prioritized by local administrations as most urgent and desirable.

- A positive evaluation of impacts should reflect immediate proximity to population centers most affected by mine closures as well as the strength of investment contributing positive impacts in each category: (1) entrepreneurial activities (2) prevention of significant labor displacements (3) improved fulfilment of basic human needs.

- A negative evaluation results where investments are made elsewhere in the county, according to distance from population centers determined to be most affected by mine closures.

**Social Equity & Human Development**

Indicators of Social Equity and Human Development are intended to assess the expected socio-economic distribution of benefits resulting from project investments. Rather than expecting the economic benefits of investment to simply “trickle down” to the most vulnerable and marginal sectors of the county, use of these indicators recognizes that greater social equity and fulfilment of basic human needs for everyone constitutes a key factor of sustainability.

The first goal related to the measurement of human development adopts international standards as a referent. The World Bank has specified a range of Millennium Development Goals that guide its investments in developing areas. These broadly include:

1. Decrease abject poverty and hunger
2. Decrease child mortality/improve maternal health
3. Decrease incidence of major diseases
4. Improve public health/decrease significant environmental health risks
5. Improve lives of slum dwellers

To address these goals in the context of Gorj County requires the continuing assessment of the most urgent needs and how to achieve them. Investments in the public health system, in sanitation infrastructures, in food production and distribution, and in housing projects may contribute to achievements in human development, for example. Ongoing consultation with local government agencies and NGOs should guide evaluation of how well proposed projects address these goals.
The second major goal of this assessment evaluates how effectively the proposed project will support and enhance social equity and human development. In particular, it targets (1) the most needy segments of the population (2) gender equality and empowerment of women. Many projects that appear worthy on the basis of the potential for economic growth may actually erode the livelihoods of those who live below or close to the poverty line, or reinstate gender inequalities. This tool provides a means to reflect upon whether outcomes of this investment are likely to be positive or negative. In many cases, the judgement of the assessment team with experience of administering social programs in the local area will be called for.

Social Inclusion
The goal of this aspect of assessment is to assure that local investments assist to mitigate and prevent the social exclusion of minority groups on the basis of religion, race, ethnicity, or culture. While indicators of social equity and human development primarily target problems related to poverty and seek to optimize the distribution of social benefits to promote sustainability, indicators of social inclusion are primarily concerned with the status of visible minorities. For such minorities, economic disparities are often conjoined with negative stereotypes that are historically embedded in institutional, political and media discourses (Verdery 1996:83, 90, 97-99). Cultural prejudice may sometimes amplify the marginality and vulnerability associated with class or gender, further undermining social justice and sustainability. It can also undermine economic growth by promoting patterns of distrust and negative reciprocity that increase the risks and uncertainty associated with entrepreneurial leadership. Progress towards the social inclusion of minorities is necessary to minimize social and political tensions associated with ongoing European transitions, and support sustainable development in Gorj County.

Three aspects of social inclusion should be evaluated with respect to local minorities in Gorj. First, the economic impacts on visible minorities. This includes not only the availability of jobs, but also the overall availability of resources and sites for the generation of income. Since some minority groups are so far largely dependent upon the informal economy for the generation of income (Verdery 1996:98), efforts at evaluation must attempt to take into account impacts in the informal economy. Where proposed projects might displace certain economic activities currently dependent upon the informal economy, negative impacts may be experienced. Where the project supports transitions from the informal to the formal economy, by creating job opportunities for minority candidates, for example, the economic impacts may be judged favourable. Data for such analysis may be usefully supplied from focus groups drawn from identified minorities, representatives of minority organizations or communities, ethnographic studies, and the long-term experience of administrators familiar with local demographics and social services. Diverse perspectives should be carefully and conscientiously compared by objective evaluators.

Second, the potential impact of projects on the ability of minority stakeholders to maintain their cultural and economic activities while participating in public life and integrating within institutions should be evaluated. Where proposed projects may create the potential to inflame stereotypes and social tensions, negative impacts on social inclusion may be experienced. For example, tourism or ecotourism development in the immediate vicinity of Roma settlements may raise the stakes for contested resources, heighten antagonisms or lead to displacement, unless positive forms of inclusion in the development process can be negotiated. This amplifies the importance of participation by minority stakeholders in the early stages of the development process, including initial decision-making and planning.

Third, assessment must evaluate the potential impact of projects on housing and services available to minority stakeholders. In particular, the location of proposed projects should actively avoid displacement of established households and settlements wherever possible. If such displacement is unavoidable, evidence should be presented to explain and justify it, and plans to mitigate negative impacts should be included.
The socio-economic marginalization of the Roma has been identified as a key problem of social exclusion across the European Union, and Eastern European countries in particular. Gorj County has a relatively large Roma minority, which should constitute a primary focus of evaluation in this category. While other World Bank and European Union funding initiatives target the social inclusion of the Roma deliberately, it is nevertheless critical to ensure that such local investments are mutually supportive, and benefit overarching goals of sustainability. Roma communities must therefore be considered as important stakeholders across Gorj County.

**Community Capacity**

This part of the sociocultural assessment considers how well a proposed project would enhance the capacity of the community to identify, organize and achieve sustainable development goals in the future. The assessment team will be required to exercise professional judgement to determine and weigh a range of relevant issues, based on knowledge of the local area and their understanding of the character and needs of the community in question.

The first object of community capacity building is to support the development and implementation of community-led projects. One test of this goal is that projects should be envisioned and designed as much as possible “from the bottom up”. High levels of community participation in the early stages of project proposal and planning improve levels of local commitment to carry the project through. It also exercises and builds skills of collaboration, public debate, and consensus-building that is necessary to the successful completion of projects as well as ongoing community planning activities. It broadly supports the development of democratic institutions and civil society. Appropriate forms of participation are described in the ANDZM handbook for participatory project planning.

Very positive evaluations should be assigned only on the basis of strong evidence that the project supports community participation in all aspects of project planning & design, implementation and ongoing assessment. Negative evaluations must be submitted where the project has failed to self-consciously incorporate opportunities for community participation. The strongest negative scores must be assigned where the expected investment and impacts associated with the project are greatest.

A second test of how well the project serves the first goal is the question of whether it can support and facilitate the transition of local economic activities from informal to the formal economy. Because many of the self-help strategies of the poorest sectors of society are strongly dependent upon economic activities based partly or entirely in the informal sector, projects that enable this transition are important to building local capacity for sustainable development. Improving local participation in the formal economy cannot be equated with actions intended to simply eradicate or displace certain informal income generating activities. Rather, the test of a positive transition is that incomes, resources and opportunities available as a result of activities in the informal economy can, in practice, be replaced and improved by entering the formal economy.

Positive assessment should reflect evidence of conscious design to support transitions from the informal to formal economy. The highest positive scores should be allocated not for job creation, but for projects that provide sustained services and support to enable existing self-help networks to move into entrepreneurial activities. Justification and explanation for the decision should be given. Where a project seems likely to displace existing informal economic activities without creating new resources available to the same self-help networks, or where a project seems likely to create new displacements from the formal into the informal economy, a negative assessment must be submitted.

The third test examines the scale and effectiveness of the project. Typically, development fund dispersal tends to favor large, politically visible projects designed by administrators or experts, rather than small-scale projects that originate with local people themselves. Critical approaches to development have recognized that support for small, “bottom-up” initiatives can often have significant positive
impacts. The average scale of the project proposals returned from a given call for proposals should be
determined for the purpose of comparisons. The highest positive scores should be awarded for the
smallest projects demonstrating the capacity for effective and efficient use of funds. The projects requiring
most intensive investments on a large scale should be ranked lowest.

The second object of community capacity building is to support the successful implementation,
completion and future development of community-led projects. The following categories must be
comparatively assessed according to the expertise and knowledge available to the evaluation team:

1. How well the project incorporates measures to account for the distribution and use of funds
2. How well the project incorporates participatory methods for ongoing assessment, as outlined in
   the ANDZM handbook of participatory methods
3. How well the project is likely to support and develop civil society in Gorj County
4. How well the project supports and improves the capacity for local institutes, agencies and/or
   organizations to work together
5. How well the project contributes to training and support for the development of new proposals
to be submitted to other funding sources

Cultural Resources
This component of assessment considers how well a project protects, manages and enhances the
 cultural resources available to a community. Cultural resources can include a variety of resources such
 as important landscapes, historical sites, material culture, artistic traditions, skills, local knowledge and
 intangible cultural heritage. In many cases, such cultural resources can provide an important platform for
 ecodevelopment, and reaffirm the positive importance of community. Relevant cultural resources should
 be identified, and project proposals invited to discuss the potential to preserve, enhance, or develop them.

The first goal associated with this is to improve cultural resources that may be economically useful
for tourism and the community. In connection with this, the socio-cultural project assessment team
should draw upon the expertise and knowledge available to it, and apply a scale of +3 to -3 to assess the
following questions:

1. How well does a project develop cultural resources or improve the management of cultural or
   historical sites?
2. To what degree does the project improve local capacity for sustainable tourism development?

Negative assessments reflect the potential for a project to undermine specific cultural resources or destroy
heritage sites, for example. Full explanations should be provided for both positive and negative
assessments.

The second goal focuses on the conservation and enhancement of cultural resources with prominent
symbolic value, which may act as a catalyst for positive community development and sustainability. In
connection with this, the socio-cultural project assessment team should draw upon the expertise and
knowledge available to it, and apply a scale of +3 to -3 to assess the following questions:

1. How well does the project support the maintenance, transmission, or revitalization of culturally
   important skills and knowledge?
2. To what degree does the project appear to be consistent with historical landuse, past occupational
   patterns, or ties to the landscape?
3. How well does the project support local initiatives to enhance and market regional products,
   services, or identity?
The assessment of these categories is fundamentally qualitative. It is the responsibility of the assessment team to provide an explanation of the reasoning applied. It may be appropriate to seek out local consultation, or a balance of interpretive viewpoints. All consultations should be recorded in the statement of assessment.

Table 6.2.1: Social and Cultural *ex ante* Assessment Parameters

<table>
<thead>
<tr>
<th>Assessment Category</th>
<th>Assessment Question</th>
<th>Sociocultural Aspect to be Evaluated</th>
<th>Category and Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social stability</td>
<td>Does the project mitigate socio-economic impacts related to mine closures?</td>
<td>Assistance to individuals and households affected by mine closures</td>
<td>Unemployed Adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unemployment: Families</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investment in communities affected by mine closures</td>
<td>Directly support entrepreneurial activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Help prevent or mitigate outward labor migration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Directly support improved fulfillment of basic human needs</td>
</tr>
<tr>
<td>Social equity and human development</td>
<td>Does the project promote social equity and human development in Gorj County?</td>
<td>Support UN Millennium Development Goals in Gorj County</td>
<td>Poverty and hunger</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Child mortality / maternal health</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Incidence of major diseases</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Public health and/or environmental health risks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support disadvantaged groups</td>
<td>Target the most needy segments of the population</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gender equality and empower women</td>
</tr>
<tr>
<td>Social inclusion</td>
<td>Does the project adequately support the social inclusion of cultural, religious or ethnic minorities?</td>
<td>Include cultural, religious or ethnic minorities as stakeholders</td>
<td>Economic impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Impact on social inclusion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Impact on housing/services</td>
</tr>
<tr>
<td>Community capacity</td>
<td>Does the project enhance the capacity of the local community to identify, organize and achieve sustainable development goals in the future?</td>
<td>Support development of community-led projects</td>
<td>Support participation of stakeholders in its design and process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support development of community-led projects</td>
<td>Support and facilitate transition of local economic activities from informal to the formal economy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support development of community-led projects</td>
<td>Support small-scale “bottom up” initiatives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support implementation and completion of community-led projects</td>
<td>Incorporate measures to account for the distribution and use of funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Incorporate participatory methods of ongoing impact assessment</td>
</tr>
</tbody>
</table>
### Cultural resources

<table>
<thead>
<tr>
<th>Does the project enhance and develop cultural resources of the local community?</th>
<th>Improve cultural resources for tourism and the community</th>
<th>Develop cultural resources/Improve management of cultural or historical sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support individual and community cultural resource goals</td>
<td>Improve local capacity for tourism eco-development</td>
<td>Support maintenance, transmission, or revitalization of culturally important skills and knowledge</td>
</tr>
<tr>
<td>Consistent with historical landuse, past occupational patterns, ties to the landscape</td>
<td>Support local initiatives to enhance and market regional products, services, or identity</td>
<td></td>
</tr>
</tbody>
</table>

### 6.4 Notes on current qualitative research, by target city:

**Motru**

Motru and its hinterlands were previously dependent on a mono-economy related to mining activities, and support systems related to these. We note that according to the results of earlier World Bank reports (Dani et al. 2006; World Bank 2005; Haney and Shkaratan 2003) and ethnographic studies (Kideckel 2008; Kideckel 2004), residents of towns like these are the ones most vulnerable to mine closures. People in Motru and surrounding rural villages now face poverty, environmental health impacts, family crises (cf. Friedman 2007), patron-client politics and social disparities that are the legacy of history together with the acute new economic pressures (see also Verdery 1996). The “trickle-down” economic benefits of development elsewhere in Gorj County cannot be depended upon to remediate the difficulties that these people must confront. Socio-cultural considerations therefore dictate that these people should be privileged in the distribution of funds.

Our study of Motru and its environs included background research, exploratory visits, a meeting with town council, dialogue with key informants from the town, consultation with academic colleagues, and a brief period of ethnographic observation undertaken by graduate student assistants in spring 2007. In the Motru area, there were a total of five underground lignite coal mines operating during the 1980s. Three of these have been closed, one has been turned into an open pit mine. A second open pit mine has also been opened. Some people are also employed to clean up the closed mines. However, further mine closures are expected.

There have been three rounds of lay-offs associated with mine closures in Motru since the mid-1990s. The first miners to be laid off were given severance pay equal to one year’s salary in addition to one year’s unemployment benefits. Many miners’ wives who worked at the mine (usually as secretaries) were also among the first to be discharged. Subsequent lay-offs did not carry the same severance pay, but discharged miners were eligible for targeted socio-economic development funds in addition to one year’s worth of...
unemployment benefits. Miners have retained pension benefits accrued during their earlier employment service.\(^3\) Although apparently, the government’s plan had been for the discharged miners to use their severance pay and special funds to open new businesses (thus creating an entrepreneurial middle class), many newly unemployed miners actually used these funds to buy newly available Western consumer goods (particularly modern appliances and electronics) for their homes. Eventually, many families had to sell items they had purchased because money ran out.

Social changes in Motru were significant after the mine closures. Many women previously occupied with home-making had to look for jobs to make ends meet. Many men continued to spend time in public establishments, further straining their relationships with their wives and leading to some separations and divorces. Some women began to look for temporary employment abroad in the service industry (particularly as domestic maids in Italy and Spain), and when they returned they found that their husbands were still unemployed, which led to high tensions within families. Results from other studies in the Jiu Valley indicate that in towns like Motru, men’s networks of friendship and social support were deeply undermined by the loss of connection to mining teams, and domestic violence increased after mine closures (Kideckel 2008:64-5, 80, 142; Kideckel 2004:51, 54). The comments of local informants bear out the hypothesis that this has happened in Gorj County. Women’s networks appear to have been a significant source of mutual support and self-help, but have also been affected by economic tensions that generate gossip and envy.

Because most of the miners had migrated (or had been forced to move) from other areas of the country, many moved back to their previous hometowns after they were discharged. Others migrated abroad to find work (cf. Sandu 2005; Soros Foundation Romania 2008a). Local informants have estimated that as many as 150 families have moved out of town, while about 50 households established by “imported” miners remain (some these miners are still employed, but others are unemployed). Many unemployed miners originally from the Motru hinterlands have moved back to their village homes to live off the land (practicing subsistence agriculture) with assistance from their social payments or retirement benefits. Most agricultural plots are relatively small, of perhaps one hectare, or fragmented. It should be noted, however, that these have been an important and crucial resource for families struggling to help themselves during a period of transition.

Transportation infrastructure and services are minimal, inhibiting a transition from subsistence-oriented agricultural production to market-oriented agriculture. Unemployed miners do seem to have access to credit, and many have taken out loans to buy cars and other consumer goods. Growing indebtedness may become a problem, as informants indicate that they have become experienced in shifting loans from one bank to another to find lower interest rates. Access to services such as health care (including medical attention from doctors and allocation of medicines) typically requires the offer of private, informal gifts. In addition to material difficulties, former miners may also confront formidable negative social stereotypes in post-socialist Romania (Kideckel 2008:8-11). As the erstwhile vanguard of an ideologically privileged working class prior to 1989, they are often viewed with some ambivalence by progressive, and particularly by urban, compatriots. Although some high ranking members of mining corporations may enjoy special privileges associated with embedded political patronage networks, others who are less well connected may have more limited access to services, jobs, social investment funds and other opportunities as a result of negatively charged social perceptions (cf. Friedman 2007). Reciprocal stereotypes and social gaps perceived to endure between rural and urban populations may also account for the poor level of success in retraining programs targeted to former miners.

\(^3\) These pensions may be claimed at age 45 by those who worked in the more dangerous underground mines. Open pit miners may claim benefits at circa 62 (depending on number of years in the mine), and women may do so at age 58.
The mayor of Motru expressed a vision of development that involved a transformation of mining and establishment of a power-generating industry, as well as investment in local infrastructures. The concern to implement a major employment scheme was evident. The skills and inclinations of the existing residents seem to indicate that the creation of manufacturing or industrial jobs may be well received, particularly if they assist to support and reconstitute social support networks that have been undermined by the dissolution of mining teams. The potential for co-generating electricity production should be evaluated not only in terms of overall economic and environmental impact, but also in terms of Romania’s new role in the European Union energy strategy, to reduce carbon dioxide emissions and create efficient and sustainable energy markets. Given the striking number of households that have disconnected their Motru apartments from the centralized heating system, not only systems of energy production but also systems of energy distribution and use should be taken into consideration. Any plan for large-scale development should be fully detailed and then subjected to public debate (adopting guidelines for participatory development outlined in the ANDZM handbook prepared in compliance with World Bank standards) prior to allocation of investment funds. Town meetings, ethnographic research, and focus groups involving former miners or their wives would be particularly appropriate. Such plans should take pains to avoid forced relocation of either small farmers or Roma communities; if any such relocations are envisioned, the burden of proof that these are both unavoidable and adequately compensated should rest with both the developer and local authorities. If possible, the creation of new jobs should be targeted to both former miners and their spouses in Motru and its environs.

Brownfield reclamation and environmental restoration projects should be a good opportunity to both provide urgently needed temporary employment and provide new land-use options. Issues of public health and safety indicate that further investments in waste management and water management are appropriate. In general, restoration, construction and development projects may help ease the transition away from a mining mono-economy. These, however, are insufficient in themselves to generate sustainable development, and could reinforce systems of patronage and corruption mediating access to short-term jobs and social funds. They might also fail to create employment options for women, many of whom have had to leave their children in the charge of grandparents in order to migrate abroad and earn wage incomes.

A number of small-scale projects and multiple local organizations should be encouraged in this area, in order to diversify the economic base, ensure widespread benefits and equity of development, support civil society, regenerate social networks, develop community capacity and enhance cultural resources. Investment in the provision of agricultural services and distribution networks for those who have returned to the land may support a transition to market-oriented production and a stronger formal economy. Rebuilding the agricultural sector and establishing a value-added food processing system in the Motru area may also support food security and the emerging hospitality industry in other parts of the county. Care must be taken to enable fledgling small to medium-sized enterprises to participate in the agricultural production and processing system. Development of light infrastructure such as internet capacity may enable virtual service industries, enabling young people to put their education and skills in mathematics, computers and languages to use. Some very limited development of religious and cultural tourism may also highlight existing cultural patrimony and revitalize links between history and landscape.

Târgu Jiu
The municipality of Târgu Jiu is the administrative center and largest population center in Gorj County. The Lignite National Mine is located in the city, together with some related industrial business such as the production and repair of equipment components. The local economy is already diverse, however, and mining-related activities constitute a very small component of economic activity, as well as a relatively small proportion of available employment. Since the economic, institutional and cultural resources available in Târgu Jiu constitute a key factor in the socio-economic health of the County as a whole, some investment in Târgu Jiu would nevertheless assist in mitigating the overall impacts of mine closures across...
the County. Provided improved roads and transportation services, a daily commute between Motru and Târgu Jiu, for example, would be feasible, enabling residents of Motru to participate in opportunities afforded by the city.\textsuperscript{4} The city could also provide a natural point of migration for former miners or their children from across the County, close enough to home to maintain ties of family, community and mutual aid.

Under the auspices of the UNDP Local Agenda 21 initiative, Târgu Jiu articulated a detailed sustainable development plan in 2004. This vision unites expert assessment of natural, anthropogenic and social capital with high quality participatory consultation in defining development objectives, and should guide new investments. High priorities agreed upon in the medium term include the expansion and upgrading of water purification systems, creation of an ecological landfill for regional waste, improved systems for the provision of drinking water and the establishment of a viable commercial center. The Local Agenda 21 vision also foresees the establishment of a recreational centre, improved systems of online city administration, improved services to families with disabled children, and the restoration of hospitals as priority projects.

Development plans for Târgu Jiu should take into account the expansion of the protected area included in the Jiu Valley National Park in the northern part of Gorj, particularly in the context of European Union integration. Since a relatively large minority of Roma are found in and around the city, development projects should also seek to support—and not undermine—initiatives for the social integration of the Roma.\textsuperscript{5}

\textbf{Baia de Fier}

The mayor of Baia de Fier has put together a coherent project for ecotourism development north of the town. Investments necessary for the success of this project include the rehabilitation of an abandoned mine, and the improvement of roads through the protected area. Two major concerns include the potential impact of ecotourism development with regard to social inclusion and welfare of the Roma community on the edge of town, and the overall impact of tourism on both the town and the environment.

Although “ecotourism” is often touted as a win-win prospect for both community development and environmental protection, it is rarely a simple matter to generate a truly sustainable tourism industry within a framework of social justice. To the extent that local initiatives in this direction can be supported and integrated with the larger development plans of Gorj County and the Oltenia region, investments may prove to be of lasting value. It is recommended, however, that plans proceed with caution, and privilege direct participation of the Roma community sited on the border of Baia de Fier. If possible, cooperative projects may be designed on the basis of the World Bank funds for social inclusion of the Roma, in conjunction with investments made through funds designed for the mitigation of social impacts related to mine closures.

Prior to any plans for development being implemented, areas that may have persisted as “common lands”, such as pastures and collective access resources, should be considered for their ongoing contributions to survival strategies of marginal families and traditional ecological adaptations. Given the limited provisions made for primary research, it was not possible to gather reliable information regarding the current formal

\textsuperscript{4} Travel between Motru and Târgu Jiu is currently dependent upon access to personal transportation, although an informal taxi service is available for those who know how to find and use it (some unemployed miners participate in this). Given the current condition of roads, this trip generally takes over an hour and a half.

\textsuperscript{5} For extensive discussion of Roma issues see Konstantino et al. (1998); Open Society Institute (2001); Ringold et al. (2005); UNDP 2007; Soros Foundation Romania (2007, 2008); European Union Information Campaign “For Diversity, Against Discrimination” (2007); Fleck et al. (2008);
and informal disposition of resources in this part of Gorj. Initial observations suggest, however, that customary or informal landuses may be extremely important to take account of here. It would be useful to sponsor ethnographic research and direct consultation with community members to this end.

**Modeling and testing projects**

The guidelines here provide a general model that can be used to assess the comparative socio-cultural impacts of proposed projects. Data made available to us can support only a partial assessment. The best resources available are in the form of policy evaluations at the country level (particularly World Bank assessments), in conjunction with specific case studies carried out by social scientists working elsewhere in the Oltenia region on a variety of projects. Specific data for Gorj County is inconsistently rendered, and is beyond the feasible scope of this project to fully consolidate and analyze.
CHAPTER 7: FINANCIAL ANALYSIS

7.1 Introduction

In order to fully determine the sustainability of a project it is necessary to conduct a financial analysis of the project and how it relates to other areas in the county. The financial analysis should start with a feasibility study that will highlight key components of the project for use in the proposal phase of the project and could save a company or investor from financial ruin. Although most of the information presented in this chapter is not integrated into the Indicator Scoring System, the importance of a rigorous financial analysis cannot be overstated.

The financial analysis presented here focuses on the costs associated with the start up. It is assumed that during pre-feasibility study and feasibility study a performa or income analysis will be done to determine the potential return on investment. Additionally, depending on the scope of the project, costs and income should be reviewed in short, medium and longer time frames. Sustainable projects also attempt to determine life cycle costs for many of the design components. Many times, an initial higher investment in a more sustainable component will be outweighed by higher long-term life cycle costs of a less sustainable component. Thus, the feasibility studies need to evaluate the sustainability aspects of a project from a sustainability perspective, including all life cycle costs. The project costs could be roughly broken down into consulting, environmental, engineering and construction costs. Funding sources for all of these components must be explored and may include grants, public funding or private investment.

7.2 Project Context

It is important to consider some of the long term interactions of a project that are not considered in the social, environmental or economic scoring. Some overarching questions should be explored as a potential project is considered. Many of these questions are qualitative, therefore will not show in the overall sustainability score, however many are good indicators of the sustainability of the project and provides a context to understand the scoring.

Additional sustainable analysis should be conducted to include the longer term and life cycle costs of a project prior to initiating funding or construction. Some questions that are relevant include:

- How will the project be maintained, and who will maintain it?
- What are the maintenance costs? Where will the funding for maintenance come from? Is the funding source guaranteed? What if this funding source fails or falls short in some way?
- What is the evidence that the project is in demand?
- Is the project linked to other projects that are local, regional, or national? Does this project relate to Strategic Plans outlined by different agencies?
- How will the project measure success?
- Have the proper permits or approvals been received from local, regional or national agencies, or can they be received?
- Does the project promote sustainability, innovation, creativity, or best management practices?
- Does the project bring organizations toward a common goal?
Additionally these sustainability questions should be reviewed at each scale of the design and construction process. For example, green building techniques could be integrated into a manufacturing facility and many of the aforementioned questions would take on a different and more complex meaning.

### 7.3 Project Cost Estimates

This section describes the six projects discussed during the feedback sessions. The projects vary considerably by type, size and scope. Each is described below with a range of costs (low and high). The costs associated with these projects are conceptual in nature and outline assumed project parameters, phasing and potential tasks to consider. Assumptions are made for each of the six projects and should be taken into consideration when reviewing the costs. All monetary assumptions are in the thousands. A full range of feasibility studies should be performed prior to pursuing any projects in order to understand the required tasks and costs in greater detail. These studies should go beyond the level of required for applications to funding agencies and include many aspects of sustainability, as described throughout this document.

**Industrial Parks**

A number of potential industrial park sites have been identified near Motru and within Gorj County. Most of these sites are brownfield sites that hosted industrial activities in the past and may be contaminated or otherwise of limited use at present. The following costs estimate is intended to cover the costs to design and build the infrastructure for the industrial parks. It is assumed that businesses interested in locating in Gorj County will purchase developed sites and the cost to build industrial facilities will be borne by the company. The County can consider a series of potential incentives to businesses to locate in Gorj County, including tax incentives, employee training, selling lots in the industrial park below cost, and assistance to companies in their relocation efforts.

The site or individual lots can be sold to a private developer or business at any time during this process. Each phase of the process will add value and reduce risk for the buyer and therefore increase the price buyer(s) are willing to pay. This cost estimate assumes that the cost to construct the commercial or industrial facilities will be paid by the purchaser of the building site.
Table 7.3.1: Industrial Parks
Location: 50-hectare site in Brownfield Area

Project: Plan and develop industrial park infrastructure

<table>
<thead>
<tr>
<th>Phases</th>
<th>Tasks</th>
<th>Low (000)</th>
<th>High (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility</td>
<td>Market Study</td>
<td>20 €</td>
<td>40 €</td>
</tr>
<tr>
<td></td>
<td>Contamination Study (Ph I &amp; II)</td>
<td>50 €</td>
<td>100 €</td>
</tr>
<tr>
<td></td>
<td>Remediation Plan</td>
<td>400 €</td>
<td>700 €</td>
</tr>
<tr>
<td></td>
<td>Remediation Implementation</td>
<td>500 €</td>
<td>3,000 €</td>
</tr>
<tr>
<td>Remediation</td>
<td>Master Planning and Permitting</td>
<td>200 €</td>
<td>350 €</td>
</tr>
<tr>
<td></td>
<td>Construction Drawings, Bid, Oversight</td>
<td>300 €</td>
<td>500 €</td>
</tr>
<tr>
<td>Planning</td>
<td>Surveying &amp; Layout</td>
<td>100 €</td>
<td>200 €</td>
</tr>
<tr>
<td></td>
<td>Roads, Sewers, Utilities</td>
<td>2,500 €</td>
<td>3,500 €</td>
</tr>
<tr>
<td></td>
<td>Sustainable Design Components</td>
<td>400 €</td>
<td>1,500 €</td>
</tr>
<tr>
<td></td>
<td>Landscaping</td>
<td>500 €</td>
<td>1,000 €</td>
</tr>
<tr>
<td>Construction</td>
<td>Site sales, administration</td>
<td>500 €</td>
<td>1,000 €</td>
</tr>
<tr>
<td>Close Out</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>5,450 €</strong></td>
<td><strong>11,850 €</strong></td>
</tr>
</tbody>
</table>

Feasibility
Market Study: The County should engage a qualified real estate development consultant to identify the needs of potential buyers or occupants. This is particularly important in the development of a sustainable infrastructure. The market study should identify complementary industries where one industry may be able to use the waste products of another. Other issues like lot size, utility needs, and amenities should be identified in this study.

- **Low**: Minimal detail
- **High**: Substantial detail

Remediation
Contamination Study: Initial ground work, soil sampling, and historical research to determine likelihood of contamination.

- **Low**: Simple site with easily documented history
- **High**: Complex site with uncertain history or known contamination

Remediation Plan: Plan to remove, isolate, or control contaminated soil and water

- **Low**: Contamination Study suggests minimal contamination
- **High**: Contamination Study suggests moderate contamination

Remediation Implementation: Removal or isolation of contaminated soil and water

- **Low**: Minimal contamination with local or on site disposal of contaminates
- **High**: Moderate contamination with regional disposal of contaminates

Planning
Master Planning and Permitting: Design plan for industrial lots with potential end users in mind. Incorporate sustainable attributes like complementary industries, stormwater management, and public transportation of workers to and from site.
Low: High quality design process with minimal public interaction and input. Permitting process is predictable and clear. Ownership of land is clear and simple.

High: High quality design process with substantial public interaction and input. Permitting process is unpredictable and unclear. Ownership of land is unclear or complicated.

Construction drawings, bid process, and oversight: A consulting firm will finalize all engineering and design drawings and specifications so that construction firms can provide proposals or bids. Consulting firm will manage the proposal or bid process and oversee construction of roads, utilities, and other aspects of the project.

Low: Simple project
High: Complex project

Construction
Surveying and Layout: Identify locations of property boundaries, roads, trails, walks, lots, and other site features.

Low: Simple project
High: Complex project

Roads, Sewers and Utilities: Overlot grading, installation of roads, sewers and utilities, and clean up.

Low: Simple Project with no rail or public spaces
High: Complex project that may include rail and public spaces

Sustainable Design Components: Passive stormwater treatment, inclusion of retail and possibly residential development, integration of industrial uses so that waste from one source and be used as material, fuel, or energy in another industry; optimal energy efficiency construction materials and designs;

Low: Minimal sustainable components
High: Substantial sustainable components

Landscaping: Entry features, integrated stormwater features, public spaces.

Low: Minimal landscaping
High: Substantial landscaping

Close Out
Site sales and administration: Until all industrial sites are sold, the owner will maintain and market the unsold sites. The park will have to be administered by the local government or some other accountable entity. This will require substantial time and money from the owner.

Motru Electric Co-generation, Waste Heat Resource

A planned electric co-generation plant will produce ample waste heat that can be used to heat a series of greenhouses throughout the year, beyond providing steam heat for residents of Motru. The cost estimate below identifies the major cost elements to develop the infrastructure for greenhouse operations. It does not include the cost to operate the greenhouses once they are built, nor does it include profits or losses that result from greenhouse production.

The cost estimate also assumes that the project sponsor will retain ownership of the greenhouses. Alternatively, the project sponsor could sell the greenhouses after completion if the agreement with the utility allows it to do so.
If the project sponsor retains ownership, rent will be charged to the operator(s). The rent charged would be approximately 12 € to 18 € per square meter annually.

**Table 7.3.2: Motru Electric Co-generation**

Waste Heat Resource

<table>
<thead>
<tr>
<th>Phases</th>
<th>Tasks</th>
<th>Low (000)</th>
<th>High (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility</td>
<td>Review proposed plan</td>
<td>10 €</td>
<td>30 €</td>
</tr>
<tr>
<td></td>
<td>Develop Cost Estimates</td>
<td>15 €</td>
<td>25 €</td>
</tr>
<tr>
<td></td>
<td>Negotiate agreement with Utility</td>
<td>30 €</td>
<td>50 €</td>
</tr>
<tr>
<td>Planning</td>
<td>Master Planning and Permitting</td>
<td>50 €</td>
<td>75 €</td>
</tr>
<tr>
<td></td>
<td>Finalize Construction Plans</td>
<td>25 €</td>
<td>50 €</td>
</tr>
<tr>
<td>Implementation</td>
<td>Water, sewer, electrical, heating systems</td>
<td>50 €</td>
<td>500 €</td>
</tr>
<tr>
<td></td>
<td>Earthwork and Roads</td>
<td>75 €</td>
<td>400 €</td>
</tr>
<tr>
<td></td>
<td>Greenhouses</td>
<td>100 €</td>
<td>750 €</td>
</tr>
<tr>
<td></td>
<td>Office Building</td>
<td>150 €</td>
<td>350 €</td>
</tr>
<tr>
<td>Administration</td>
<td>Contract with Operator</td>
<td>20 €</td>
<td>50 €</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>525 €</strong></td>
<td><strong>2,280 €</strong></td>
</tr>
</tbody>
</table>

**Feasibility**

Review Proposed Plan: a qualified engineer will review the power plant plan to determine the availability of waste heat.
- Low: Most data available for analysis
- High: Some data must be developed for analysis

Develop Cost Estimates: Based on the information developed in the previous task, the engineer will design the greenhouse facility and provide cost estimates for its construction.
- Low: Modest greenhouse facilities (less than 2,500 sq meters)
- High: Larger greenhouse facilities (5,000 to 10,000 sq meters)

Negotiate Agreement with Utility: The project sponsor will meet with utility officials to execute an agreement to utilize waste heat. This could include elements of profit- or cost-sharing.
- Low: Utility plays an active role in negotiations
- High: Utility does not plan an active role in negotiations

**Planning**

Master Planning and Permitting: An engineer will site the greenhouses, design the layout, utilities, parking, and other necessary elements.
- Low: Modest greenhouse facilities (less than 2,500 sq meters)
- High: Larger greenhouse facilities (5,000 to 10,000 sq meters)

Finalize Construction Plans: An engineer will develop detailed construction plans for the work and request bids for construction.
- Low: Modest greenhouse facilities (less than 2,500 sq meters)
- High: Larger greenhouse facilities (5,000 to 10,000 sq meters)
Implementation
All tasks are dependent on the size of the planned facility.

Low: Modest greenhouse facilities (less than 2,500 sq meters)
High: Larger greenhouse facilities (5,000 to 10,000 sq meters)

Administration
Contract with Operator: This assumes that the project sponsor will maintain ownership of the greenhouse facility. It is recommended that the sponsor issue an open-competition RFP and allow prospective operators write proposals to use the facility. The project sponsor could allow multiple users, although this would require additional administrative time and cost.

Low: One operator, modest greenhouse size
High: Multiple operators, larger greenhouse size

Baía de Fier Tourism Development

Baía de Fier has great potential as a tourism destination. World class caving, beautiful scenery, winter and summer sports, and resort development opportunities are apparent. The level of investment required to develop the tourism industry can vary widely depending on how important the community leaders think tourism is to the future of the region. It will not be enough to simply attract tourists. The infrastructure and facilities must be in place in order to accommodate that and ensure that they return. It is equally important that proper planning ensure that the components of the environment that make the area attractive are not compromised.

The cost estimate below begins with the assumption that a strategic plan for tourism is necessary. Of course, community leaders can simply hire a tourism director and start advertising. However, a more sophisticated approach is necessary to ensure any development is sustainable and will continue to yield excellent results in the long term. This has to be an iterative process, since the environmental attributes that serve to attract people to the area are the limiting factors. For example, the amount of drinking water available, and the ability of local water bodies to accept treated wastewater, is likely to limit the size of any drinking water or wastewater treatment plants, and the size of the plants, in turn, will limit the number of tourists who can be accommodated in any particular location. Thus, planners cannot begin with the number of tourists that are desired; rather, they must determine what the maximum “carrying capacity” is and proceed with plans using that approach.
Table 7.3.3: Tourism
Location: Baia de Fier

Develop tourism facility and plan for outreach
First Year Budget

<table>
<thead>
<tr>
<th>Phases</th>
<th>Tasks</th>
<th>Low (000)</th>
<th>High (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility &amp; Planning</td>
<td>Inventory of Tourism Opportunities</td>
<td>30 €</td>
<td>150 €</td>
</tr>
<tr>
<td></td>
<td>Market Analysis</td>
<td>40 €</td>
<td>70 €</td>
</tr>
<tr>
<td></td>
<td>Programming Needs</td>
<td>30 €</td>
<td>150 €</td>
</tr>
<tr>
<td></td>
<td>Master Plan</td>
<td>40 €</td>
<td>60 €</td>
</tr>
<tr>
<td>Facilities</td>
<td>Building Acquisition</td>
<td>200 €</td>
<td>800 €</td>
</tr>
<tr>
<td></td>
<td>Renovation</td>
<td>100 €</td>
<td>600 €</td>
</tr>
<tr>
<td></td>
<td>Utilities and Expenses</td>
<td>15 €</td>
<td>25 €</td>
</tr>
<tr>
<td></td>
<td>Kiosks (3)</td>
<td>15 €</td>
<td>80 €</td>
</tr>
<tr>
<td>Marketing</td>
<td>Consulting</td>
<td>50 €</td>
<td>250 €</td>
</tr>
<tr>
<td></td>
<td>Publications</td>
<td>15 €</td>
<td>75 €</td>
</tr>
<tr>
<td></td>
<td>Website</td>
<td>70 €</td>
<td>150 €</td>
</tr>
<tr>
<td></td>
<td>Signs</td>
<td>40 €</td>
<td>200 €</td>
</tr>
<tr>
<td></td>
<td>Advertising</td>
<td>100 €</td>
<td>500 €</td>
</tr>
<tr>
<td></td>
<td>Promotions</td>
<td>50 €</td>
<td>150 €</td>
</tr>
<tr>
<td>Staffing</td>
<td>Director</td>
<td>80 €</td>
<td>150 €</td>
</tr>
<tr>
<td></td>
<td>Receptionist</td>
<td>20 €</td>
<td>35 €</td>
</tr>
<tr>
<td></td>
<td>Event Coordinator</td>
<td>25 €</td>
<td>35 €</td>
</tr>
<tr>
<td></td>
<td>Guides (under contract)</td>
<td>15 €</td>
<td>35 €</td>
</tr>
<tr>
<td></td>
<td>Seasonal Staff</td>
<td>0 €</td>
<td>70 €</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>935 €</td>
<td>3,585 €</td>
</tr>
</tbody>
</table>

Feasibility and Planning
Inventory of Tourism Opportunities: This process is necessary even if the community leaders feel they already know what the opportunities are. A consultant who specializes in tourism will look at the area with a different perspective. Once the obvious and primary tourism opportunities are identified, an expert can help the community plan for secondary opportunities. For instance, if tourists come to see caves, might those same tourists pay to visit a spelunking museum, or a graphite mine tour? Might they also be interested in particular types of shops and restaurants? Identifying the full range of opportunities is critical for good planning.

Low: basic study with limited surveying or field studies
High: full study including surveys and field studies

Market Analysis: Given the opportunities identified in the Inventory process, a market analysis will help identify the size of the potential markets for each opportunity and help prioritize investment towards the markets that are most important to the community. This
kind of market analysis requires very specialized expertise and knowledge of both Romanian and pan-European tourist economies.

Low: research using on minimal opportunities identified above
High: research on more opportunities identified above

Programming Needs: Based upon the inventory and analysis tasks above, this task seeks to identify the resources needed to fully develop a master plan for tourism. It will identify in general terms, the items that will be included in the master plan. This task can be a long and challenging task. It is recommended that multiple meetings with community leaders and regular citizens be held. This will minimize resistance to the significant changes that will happen in the community and will maximize the enthusiasm for the tourism industry.

Low: minimal public participation
High: significant public participation

Master Plan: The master plan takes the programmed items identified above and sets forth a vision for the tourism industry in Baia de Fier. It identifies specific infrastructure, staffing and other needs. It sets forth a timeline and budget for all remaining tasks.

Low: Minimal programming elements included
High: Significant programming elements included

Facilities

The remaining portion of the cost estimate is based on certain assumptions that will arise out of the feasibility and planning phase.

Building Acquisition: It is assumed that the tourism department will purchase a building that will become the tourism center for the city. The building will contain offices, restrooms, a conference room, and a room for displays.

Low: 400 sq. meter building with in good condition
High: 600 sq. meter building in very good condition

Renovation: The building will likely require substantial modifications in order to meet the needs of the tourism department.

Low: Modest renovations
High: Substantial renovations

Utilities and Expenses: This is the estimated cost to operate the building annually.

Low: Smaller building
High: Larger building

Kiosks: The tourism department should consider locating kiosks in strategic locations in the city. The kiosks should contain a map, brochures, current activities and perhaps some advertising.

Low: Small kiosks, inexpensive materials
High: Large kiosks, expensive materials

Marketing

Consulting: Hire an experienced tourism marketing consultant to develop the marketing plan for tourism. The marketing plan will develop marketing themes, graphics, logos, publications, press releases, advertising and other key components. The amount of money spent on this process will have a direct effect on the level of sophistication and quality of the marketing components.

Low: Minimal consulting, modest graphics and themes
High: Substantial consulting, high quality graphics and themes

Publications: Brochures, maps, photographic books and other key publications should be produced in multiple languages. This budget is intended only to cover some initial publications within a year of the beginning of this phase.
   Low: Few, small publications
   High: Many publications including books

Website: A good website is critical for modern marketing. Many tourists will look to the internet first. How a website is constructed and designed is critical to ensuring the maximum number of hits.
   Low: Modest quality site
   High: High quality site

Signs: Tourists rely on signs to find their way and to understand what the community and region have to offer. The type and design of signs will be identified in the marketing plan.
   Low: Few signs, modest quality
   High: More signs, higher quality

Advertising: The marketing plan developed by the consultant should provide clear direction for advertising. The costs vary widely depending on the medium used and how widespread the effort.
   Low: Print and internet advertising
   High: Radio and television advertising

Promotions: Generally, promotions are prizes like a free night at a hotel or a gift with a logo. They are something that will “promote” talk among a desired audience. They are most effective when they can remind someone of a place or experience and make them want to return.
   Low: Modest quality promotions with limited distribution
   High: Higher quality promotions distributed widely

Staffing
Director: as the leader of the tourism effort in Baia de Fier, the person hired must reflect the values of the community and the goals of the master plan. They must believe in it and be willing to carry it out tirelessly. A tourism director must be willing to work unusual hours and spend time interacting with tourists in order to contribute fully.

Receptionist: this person will often be the first person that a tourist meets in the community. The receptionist must be able to speak a number of languages and be attractive and friendly.

Event coordinator: this person must be highly organized and energetic. Events such as festivals, concerts, and lectures can make the difference between a great tourist experience that makes someone return, and one that does not.

Guides: We recommend that guides come from the local population. Guides can be hired on a part time basis or they can be employees of a separate company that specializes in guiding tourists.

Seasonal Staff: Hiring young people from the region or even from other countries adds vibrancy to the community that will bring people back. During the busiest season, seasonal staff will help keep tourists from getting frustrated when regular full time staff are busy.
**Sustainable Agriculture – Bee and Honey Production**

Honey and bees can be produced efficiently on a small scale with limited capital investment. The major cost of producing bees and honey for sale is the capital investment needed to establish the processing facility. The facility must meet all EU standards in order for the product to be saleable.

The cost estimate below is based on the assumption that a cooperative would be created. Honey producers would own a substantial portion of the facility.

**Table 7.3.4: Sustainable Agriculture**

**Bee Keeping Cooperative**

Establish cooperative organization to promote and facilitate local beekeeping

**First Year Budget**

<table>
<thead>
<tr>
<th>Phases</th>
<th>Tasks</th>
<th>Low (000)</th>
<th>High (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility</td>
<td>Market Study</td>
<td>15 €</td>
<td>40 €</td>
</tr>
<tr>
<td></td>
<td>Master Plan</td>
<td>25 €</td>
<td>40 €</td>
</tr>
<tr>
<td>Facilities</td>
<td>Office, Processing Facility, and Warehouse</td>
<td>300 €</td>
<td>700 €</td>
</tr>
<tr>
<td></td>
<td>Trucks &amp; Forklift</td>
<td>150 €</td>
<td>300 €</td>
</tr>
<tr>
<td></td>
<td>Computers, office furniture</td>
<td>20 €</td>
<td>30 €</td>
</tr>
<tr>
<td></td>
<td>Utilities and Expenses</td>
<td>25 €</td>
<td>35 €</td>
</tr>
<tr>
<td></td>
<td>Processing Equipment</td>
<td>35 €</td>
<td>75 €</td>
</tr>
<tr>
<td></td>
<td>Packaging Inventory</td>
<td>35 €</td>
<td>50 €</td>
</tr>
<tr>
<td></td>
<td>Bee Keeping Equipment Inventory</td>
<td>50 €</td>
<td>100 €</td>
</tr>
<tr>
<td>Marketing</td>
<td>Consulting</td>
<td>25 €</td>
<td>150 €</td>
</tr>
<tr>
<td></td>
<td>Publications</td>
<td>15 €</td>
<td>40 €</td>
</tr>
<tr>
<td></td>
<td>Advertising</td>
<td>100 €</td>
<td>300 €</td>
</tr>
<tr>
<td></td>
<td>Promotions</td>
<td>50 €</td>
<td>150 €</td>
</tr>
<tr>
<td>Staffing</td>
<td>Director</td>
<td>80 €</td>
<td>150 €</td>
</tr>
<tr>
<td></td>
<td>Receptionist</td>
<td>20 €</td>
<td>35 €</td>
</tr>
<tr>
<td></td>
<td>Production Staff</td>
<td>200 €</td>
<td>300 €</td>
</tr>
<tr>
<td></td>
<td>Training (contract)</td>
<td>150 €</td>
<td>200 €</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1,255 €</td>
<td>2,615 €</td>
</tr>
</tbody>
</table>

**Feasibility**

Market Study: A market study will determine the size of the market for bees and honey produced in Gorj County. It will also assess the interest in Gorj County residents in becoming part of the cooperative. The market study will be used in the next task to determine the size of the facility needed. The cost will depend on the expectations for the scale of the beekeeping initiative. (It should be noted that this project could be associated with the combined heat and power plant for Motru.)

Low: Modest expectations
High: High expectations
Master Plan: The master plan will determine the size of the facility needed, the number of participants required, the regulatory requirements for setting up the facility, and a plan for marketing and selling bees and honey produced.

- Low: Modest expectations
- High: High expectations

Facilities
Offices, Processing Facility, and Warehouse: This space will include all cooperative employees. The size of the facility will depend on the findings of the feasibility phase.

- Low: Smaller facility (1,000-2,000 sq meter)
- High: Larger facility (3,000-4,000 sq meter)

Trucks: A number of trucks and at least one forklift will be required to operate. Trucks will move hives too and from the cooperatives fields. The forklift will move hives and packaging materials within the warehouse. Some hives will be relocated annually to warmer climates if possible.

- Low: Two trucks and one forklift
- High: Four Trucks, one forklift, one tractor

Computers and Office Furniture: The administrative needs for this facility will be modest.

- Low: Smaller facility
- High: Larger facility

Utilities and Expenses: This is an annual estimate for electricity, water, telephone, building maintenance and other expenses.

- Low: Smaller facility
- High: Larger facility

Processing Equipment: This cost is based on estimates by US based honey processing dealers and is directly related to the size of the facility.

- Low: Smaller facility
- High: Larger facility

Packaging Inventory: This is the cost for bottles, labels, boxes and other items necessary to package the honey for sale.

- Low: Smaller facility
- High: Larger facility

Bee Keeping Equipment Inventory: The cooperative can buy equipment in large quantities directly from manufacturers. Beekeepers can than purchase the equipment from the cooperative.

- Low: Smaller number of beekeepers (10-15)
- High: Larger number of beekeepers (20-30)

Marketing
Consulting: It is assumed that the cooperative will hire a marketing consultant to design a brand concept, logo, and marketing plan.

- Low: Modest regional sales expectations
- High: High national or EU sales expectations

Publications: The cooperative will print brochures, business cards, and other marketing literature to promote the product.

- Low: Modest regional sales expectations
- High: High national or EU sales expectations
Advertising: A strong initial advertising campaign is recommended to ensure that the market for the cooperatives' honey develops quickly.
   - Low: Modest regional sales expectations
   - High: High national or EU sales expectations

Promotions: A variety of possible promotional activities would help drive the initial sales of the cooperative’s honey.
   - Low: Modest regional sales expectations
   - High: High national or EU sales expectations

Staffing
Director: the director must first understand that his/her primary responsibility is to the cooperative members. The person hired must understand basic food manufacturing processes and be capable of consensus-driven leadership.

Receptionist: the receptionist may be a part time position.

Production Staff: These employees would operate the equipment. It is possible that cooperative members could be hired.

Training: Cooperative employees and other contract trainers will show new beekeepers proper bee husbandry techniques, provide assistance with bee diseases or other production problems, and provide safety training.
**Targu Jiu Green Space and Park Planning**

The region surrounding Targu Jiu has many opportunities for the protection and restoration of natural open space as well as active use parks. The cost estimate assumes that spatial data for the parks is available and can be used to create a detailed GIS database that can be used as a foundation for parks planning.

The cost estimate is intended to provide a framework for decision making for many years to come. The costs to acquire land, build park elements, or restore natural habitats are not included.

**Table 7.3.5: Green Space and Park Planning**

<table>
<thead>
<tr>
<th>Phases</th>
<th>Tasks</th>
<th>Low (000)</th>
<th>High (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Resources Inventory</td>
<td>Data Gathering &amp; Base Map Development</td>
<td>20 €</td>
<td>35 €</td>
</tr>
<tr>
<td></td>
<td>Field Study (Inventory)</td>
<td>30 €</td>
<td>50 €</td>
</tr>
<tr>
<td></td>
<td>Mapping of Field Data</td>
<td>20 €</td>
<td>40 €</td>
</tr>
<tr>
<td></td>
<td>Training, Hardware, Software</td>
<td>50 €</td>
<td>300 €</td>
</tr>
<tr>
<td></td>
<td>Final Report</td>
<td>15 €</td>
<td>25 €</td>
</tr>
<tr>
<td>Design</td>
<td>Conceptual Design</td>
<td>50 €</td>
<td>100 €</td>
</tr>
<tr>
<td></td>
<td>Charette with Public Officials</td>
<td>20 €</td>
<td>40 €</td>
</tr>
<tr>
<td></td>
<td>Design Development</td>
<td>100 €</td>
<td>300 €</td>
</tr>
<tr>
<td></td>
<td>Public Presentations</td>
<td>50 €</td>
<td>100 €</td>
</tr>
<tr>
<td></td>
<td>Final Master Plan</td>
<td>150 €</td>
<td>250 €</td>
</tr>
<tr>
<td>Legal</td>
<td>Surveying</td>
<td>0 €</td>
<td>500 €</td>
</tr>
<tr>
<td></td>
<td>Entitlement of Lands</td>
<td>0 €</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
<td>505 €</td>
<td>2,440 €</td>
</tr>
</tbody>
</table>

Natural Resources Inventory:
Data Gathering & Base Map Development: Using existing aerial photography and mapping information, a base map will be developed. The base map will include roads, rail lines, land use, property boundaries, water features, and other existing data.
  - Low: Most data available in digital form
  - High: Less data available in digital form

Field Study: Scientists will visit open space sites to determine the current condition of the land. This will assist the community in deciding where open space should be protected.
  - Low: 200 hectares or less
  - High: 500 to 1,000 hectares

Mapping Field Data: The findings of the field study task will be analyzed and mapped.
  - Low: 200 hectares or less
  - High: 500 to 1,000 hectares
Training, Hardware, Software: The tasks above are assumed to be provided by consultants. When the local administrator takes over control of the data, substantial investment in training, hardware and software may be required.

- Low: Training, hardware and software already exist
- High: New training, hardware and software required

Final Report: A comprehensive report on the existing resources that can be used in the design of the green space plan.

- Low: 200 hectares or less
- High: 500 to 1,000 hectares

Design
Programming: A consultant working with local officials will conduct a study to determine the needs of the community. The study will include surveys, review of the natural resources inventory phase, and interviews with officials.

- Low: Basic plan with few elements
- High: Complex plan with many elements

Conceptual Design: A consultant will create a series of conceptual master plans for open space development.

- Low: Basic plan with few elements
- High: Complex plan with many elements

Charette with Public Officials: The consultants will present their conceptual ideas to public officials and seek their input.

- Low: One charette with few officials
- High: Two charettes with many officials

Design Development: Using the input from public officials, the consultant will refine the concept to address all of the community’s goals.

- Low: Basic plan with few elements
- High: Complex plan with many elements

Public Presentation: The consultant will present the open space concepts to local community organizations.

- Low: Two presentations
- High: Six presentations

Final Master Plan: The consultant will develop a final plan that can be used by the community to identify and prioritize green space planning and development.

- Low: Basic plan with few elements
- High: Complex plan with many elements

Legal
Surveying: Key parcels may have uncertain ownership or boundaries.

- Low: Ownership clear in all cases
- High: Ownership unclear in many cases

Entitlement: The legal costs to clarify ownership and boundaries

- Low: Ownership and boundaries clear in all cases
- High: Ownership and boundaries unclear in many cases
Gorj County Spatial Data Management

This cost estimate is for the development of a governmental entity that is dedicated to creating and managing spatial data for all other governmental entities in Gorj County (and also providing data to private parties at a cost). This study and others have provided a solid foundation for spatial data that can be used effectively for future planning in Gorj County. However, in order for this data to be used most effectively, it will be necessary for the county to have resources available internally.

Table 7.3.6: Spatial Data Development and Management
Gorj County Governmental Data Resource Department

<table>
<thead>
<tr>
<th>Phases</th>
<th>Tasks</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish Governmental</td>
<td>Written description of purpose</td>
<td>5 €</td>
<td>10 €</td>
</tr>
<tr>
<td>Body</td>
<td>Establish committee of officials</td>
<td>2 €</td>
<td>10 €</td>
</tr>
<tr>
<td></td>
<td>Hold Committee Meeting to Establish</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Process</td>
<td>2 €</td>
<td>10 €</td>
</tr>
<tr>
<td></td>
<td>Identify Alternatives</td>
<td>10 €</td>
<td>20 €</td>
</tr>
<tr>
<td></td>
<td>Committee Meetings to Build Consensus</td>
<td>2 €</td>
<td>10 €</td>
</tr>
<tr>
<td></td>
<td>Finalize governmental body</td>
<td>50 €</td>
<td>100 €</td>
</tr>
<tr>
<td>Staff</td>
<td>Director</td>
<td>40 €</td>
<td>60 €</td>
</tr>
<tr>
<td></td>
<td>GIS Technician</td>
<td>25 €</td>
<td>35 €</td>
</tr>
<tr>
<td></td>
<td>Data Manager</td>
<td>15 €</td>
<td>25 €</td>
</tr>
<tr>
<td></td>
<td>Temporary Consultant</td>
<td>100 €</td>
<td>200 €</td>
</tr>
<tr>
<td>Purchases</td>
<td>Hardware and Software</td>
<td>150 €</td>
<td>250 €</td>
</tr>
<tr>
<td></td>
<td>Other Equipment</td>
<td>100 €</td>
<td>500 €</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>501 €</td>
<td>1,230 €</td>
</tr>
</tbody>
</table>

Establish Governmental Body
Estimated costs include travel expenses and other minor costs. The time and salaries of governmental employees is not included.

Written description of purpose: This document will establish the role of the new governmental body. This should clearly describe the costs and benefits of establishing a data management center.

Establish Committee of Officials: Identify key officials that will use the spatial data.

Hold Committee Meeting to Establish Process: The committee must decide how to proceed toward meeting the final goal of establishing a new governmental body. In particular, the committee must determine which official will have the responsibility for managing spatial data function.

Identify and Study Alternatives: The number of possible alternatives explored will directly affect costs. It is assumed that some outside consultants will be retained to assist.

Committee Meeting to Build Consensus: In order to maximize the effectiveness of the spatial data function, all potential users of spatial data must be in agreement on the process and policies.
Finalize Governmental Body: A written policy manual will be developed to govern the actions of the new governmental body.

Staff
This is an estimate of the staff required, but the actual staff hired and their duties will be determined in the first phase above.

Equipment Purchases
Hardware and Software: The cost of hardware is directly related to the amount of data that will be managed and the number of people using the database. It is recommended that a consultant be hired to design the most efficient system.

Other Equipment: This may include a vehicle, survey equipment, desks, chairs, plan holders, paper, ink cartridges, and many other smaller items. The cost will be directly related to the number of people in the department.

7.4 Summary and Conclusions
There are many project opportunities that have been identified and will be identified as the process begun with this study continues. Cost estimates such as these are the very first step and are intended to encourage questions and testing of assumptions.

It is also important that each opportunity be tested for sustainability and considered in the context of the vision for Gorj County that continues to evolve.
CHAPTER 8: INFRASTRUCTURE NEEDS ANALYSIS

Many elements of public infrastructure of Gorj County have deteriorated in recent years due to neglect, in part due to inadequate funding, and to overuse. To attract private investment funds, many aspects of infrastructure will need to be upgraded. This chapter describes the current status of several key elements of existing infrastructure and the extent to which they may require changes or upgrades in order to support the projects put forward in this report or other sustainable development projects. The first subsection provides an overview of key infrastructure elements and a (largely subjective) evaluation of their current state, all based on various reports and on observations made in 2006 and 2007. Infrastructure elements that are described include drinking water treatment and distribution, sanitary wastewater conveyance and treatment, storm water management, solid waste management, transportation, and electrical power generation and distribution. The second subsection then provides a conceptual overview of the extent to which the sustainable development projects recommended in this report would place demands on infrastructure, and upgrades that would be necessary for the projects to go forward.

8.1 Current Status

Drinking water treatment and distribution

According to the 2013 Strategic Plan (Phare Report of County Counsel in Gorj, 2007), the highest priority related to waste and water issues includes creating drinking water facilities in the Gilort River basin. It also includes providing alternative water supplies for the Albeni, Vladimir, Saulesti areas because the wells are drawing down the water table.

As of 2006, there were drinking water treatment and supply systems in Târgu Jiu, Motru, Rovinari, Bumbești Jiu, Târgu Carbunești, Novați, and Ticleni. About 75 percent of the county’s population is served by groundwater sources (private and communal wells), with the remainder (mostly in Târgu Jiu) by surface water. Concessionaires operate the water plants in Târgu Jiu, Motru, and Rovinari under contract, while the communal services directorates operate the others. As of late 2005, the concessionaire in Târgu Jiu was in liquidation and the city was operating the facilities pending formation of a new company. (MVV/Sher 2006). Tariffs charged by water systems were reported to be far below those of other Romanian municipalities, which may limit future public investment or adequate maintenance.

In general, water treatment capacity was reported to be adequate for at least the near term. However, water treatment facilities in Târgu Jiu were reported to be poor condition, with further deterioration expected without significant investment. Besides the condition of facilities, major limitations of water supplies and supply systems include (MVV/Sher, 2006):

- Water loss (reported to be over 40% in Târgu Jiu),
- Lack of metering (25% in Târgu Jiu, 32% in Motru).
- Poor water quality (water in Târgu Jiu, for example, does not meet EU or Romanian standards),
- Inadequate data.

The 2006 Master Plan (MVV/Sher 2006) called for a total investment of over 75 million euros for wastewater from 2007 to 2026.
Sanitary Wastewater Conveyance and Treatment

According to the 2013 Strategic Plan (Phare Report of County Counsel in Gorj, 2007) among the highest priorities related to wastewater was creating replacing wastewater treatment facilities in the Gilort River basin. Another priority was the improvement of sewage networks, specifically the creation of modular systems of biological (that is, so-called “secondary” treatment systems) waste treatment facilities. The improvement of the existing infrastructure of sewer networks, including sewer and stormwater is also necessary.

As of 2006, there were wastewater treatment plants in Târgu Jiu (mechanical, biological, and sludge treatment), Motru (mechanical and biological), and Târgu Carbunești (mechanical). Novași also had a mechanical plant but it had never operated. Except for coarse screening at the Târgu Jiu plant, none of the plants were in operation as of 2005-2006. As a result, sanitary sewage was discharged directly to the various receiving waters (Motru River for Motru, Tismana River for Rovinari, Gilort River for Novași and Târgu Carbunești, Jiu River for Târgu Jiu, etc.).

The 2006 Master Plan (MVV/Sher 2006) called for a total investment of 88.9 million euros for wastewater from 2007 to 2026.

Stormwater Management

The wastewater master plan (MVV/Sher, 2006) reported that there were significant areas of Târgu Jiu with a combined stormwater and sanitary sewer system, with “significant polluting impact” on the Jiu River. Although Motru has a separate stormwater collection system, there are “several connections between the sewer and the rain drainage, with significant polluting impact” on the Motru River. The other urban areas with sewer systems (Rovinari, Bumbești Jiu, Târgu Carbunești, Novași, and Ticleni) do not segregate stormwater and sewage.

The various projects that have been developed for sanitary wastewater (see above) may include provisions for separate storm and sanitary sewer collection systems.

Solid Waste Management

Improving solid waste management was a high priority in the 2013 Strategic Plan (Phare Report of County Counsel in Gorj, 2007). Solid waste in Gorj County was reported by Ecorem (2008) to be disposed in “many dumping sites and 9 main landfills lacking any kind of isolation or safety measures.” The landfills presumably serve Târgu Jiu, Motru and other population centers, with dumps serving villages and the rural population. During visits to the county, it could be observed that small streams had served as dumps for village household waste, with various plastics particularly evident. In addition, abundant plastic containers were in the water reservoir in Târgu Jiu.

In general, existing waste management in Gorj County does not meet EU or Romanian standards. Following the development of a county-wide Integrated Waste Management Plan in 2006, Motru as well as several towns and villages applied for and were granted Phare funding for waste management facilities. These facilities were not necessarily consistent with the 2006 Plan. Under a cooperative program between Flanders and Romania, the Gorj County Council in 2008 updated the 2006 Plan to make it consistent with approved funding (Ecorem, 2008).

The 2008 plan describes how previously approved and funded projects should be integrated into a coherent county-wide program of waste management, including collection, transport, separation of waste streams (recyclable, biodegradable, etc.), and ultimate disposal, composting, or recycling. Overall, the plan described the following components of the future county waste management system:
• Construction of a regional landfill near Târgu Jiu. This was reportedly under construction as of early 2008. In addition, there was to be waste collection and separation in Târgu Jiu and surrounding areas.
• Construction of collection/transfer stations in Motru (funded at least in part under Phare 2004), Rovinari (Phare 2004) and Târgu Carbunești (funding uncertain). As of 2008, Turceni also had received Phare 2004 funding for a collection/transfer station.
• Construction of a micro-station in Novaci, funded under the Phare program. Baia de Fier is within the Novaci collection area.
• Construction of pre-collection platforms at unspecified locations. Many or most of these are presumably in the Phare-funded projects.
• Closure of existing dumps and disposal sites that do not meet standards, presumably the reported nine existing landfills and “many” dumping sites. Closure would be to EU and Romanian standards.

For planning purposes, waste generation by Ecorem (2008) was based on anticipated population in 2013. It is not clear if tourist or other visitor populations were included in the current or projected population.

Transportation
There are no airports in the county. The nearest airports with commercial service are in Craiova (about 100km from Târgu Jiu, with connections to Timisoara and Constanța), Sibiu (150km, with connections to several Romanian and European cities) and Timisoara (300km distant, with connections to many Romanian and European cities).

Rail service. There are at least 3 direct trains from București Nord to Târgu Jiu daily (by way of Craiova, and many other connecting trains to București and other Romanian cities).

The road system in Gorj County includes 356.12 kilometers of national roads and 1,843.28 kilometers of county and municipal roads. All the national roads are concrete or asphalt-concrete. Of the county roads, 21 percent are concrete-asphalt, 14 percent are concrete, 44 percent are light asphalt, 19 percent are gravel, and 2 percent are earthen.

In general, most or all roads are in various states of disrepair. High-speed travel is generally not possible for other than short distances on the major highways, and not at all on minor roads. The first item outlined in the Strategic Plan (Phare Report of County Counsel in Gorj, 2007) is the modernization and development of roads. The first transportation priority is the modernization of regional transportation infrastructure, including the upgrade and integration of road between the aerodrome from Stanesti and the improvement of the roads near the future highways. (Figure 8.1.2) The second priority is the improvement of the county and inter-county roadways. The corridors for improvement are roadways between Petroșani, Târgu Jiu, Filiași, Craiova and Drobeta - Tr.Severein, Târgu Jiu, Rimnicu Valcea and county roads 675B, 661,662 and the improvement of AJ063 Dragutestin, Danesti, Scoarta. The third priority is the improvement of smaller transportation routes that allow for intra-county transportation). Additionally, the county is interested in adding lighting to the improved roadways.
Figure 8.1.2: Transportation Logistics around Gorj County, Romania

Legend:
- Gorj County
- Zone of Development
  - Agriculture
  - Culture/ Administrative
  - Industrial
  - Tourism


The Gorj region, characterized by polycentric transport networks, is well-served by road and rail connections. The railway network connects the county with Bucharest and other major cities, providing efficient transportation routes. The road network is dense, facilitating easy access to various locations within the county and beyond.

Key Points:
1. The county is bordered by several other counties, including Hunedoara, Salonta, and other neighboring regions.
2. Major towns such as Targu-Jiu, Sfântu Gheorghe, and Suceava are significant hubs within the county.
3. Agriculture is a major economic activity, with significant production areas highlighted on the map.
4. Cultural and administrative zones are well-defined, indicating areas of governmental and local governance.
5. Industrial zones are strategically located to support economic development and attract investments.
6. Tourism areas are indicated to boost local economies and attract visitors.

This map provides a comprehensive view of the transportation infrastructure and development zones within Gorj County, highlighting key regions and their interconnections.
The county reported that it had sought funding of nearly €6,000,000 euros to rehabilitate and modernize county road 665 to provide improved access to tourist zones in mountainous northeast, including Baia de Fier. Other projects to rehabilitate county roads included over €5,000,000 for road 673 in the west portion of the county from Cuperceni to below Turçeni, over €10,000,000 for road 674 from above Turçeni south to the county line, over €15,000,000 for road 661 that runs north and south through Târgu Carbunești, over €12,000,000 for road 671 and 671B, which runs from the northwest part of the county through Motru to the county line south of Motru. Information on investments to national roads in the county was not obtained.

**Power Generation and Distribution**

According to the Romanian Ministry of Economy and Commerce (2003), electricity production from lignite is expected to grow by about 20 percent from 2005 through 2015. However, production from lignite-fired power stations is expected to remain relatively constant, with predicted increases in generation capacity to come from other sources.

Gorj County hosts two of the country’s lignite-fired power stations, Rovinari and Turçeni. The Turçeni station is the largest in Romania and has nearly 2,000MW of installed capacity, which is equivalent to about 10 percent of national demand. Neither the plant’s emissions nor ash management comply with EU or Romanian standards. However, the facility has plans for a €500,000,000 upgrade to the facility, which will enhance efficiency and bring it closer to environmental compliance. Lignite for the plant is mined in western Gorj County and transported to Turçeni by rail. Waste ash is managed near the power station.

The Rovinari station is located near the town of the same name, and adjacent to the lignite mines that supply the station. Rovinari is about 25 kilometers southwest of Târgu Jiu. The power station has installed capacity over 1,000MW. As of late 2006, the station estimated that at least US$300,000,000 was needed to install flue-gas desulfurization units to meet EU standards, US$760,000,000 for a new power unit, and over US$150,000,000 to rehabilitate power generation and mining equipment. Additional investments of uncertain amount would be necessary to allow the facility to meet EU and national standards for particulate matter and for ash management.

Power is distributed from the power stations to the national grid via privately owned transmission lines. Their adequacy is not known.

### 8.2 Demands on Infrastructure by Proposed Projects

This section provides an overview of the magnitude of demands that may be placed on the various elements of infrastructure by the projects described in Chapter 2, and the limitations that infrastructure may place on implementation of the projects.

**Industrial parks**

This project would include one or more industrial development parks in Motru and elsewhere in Gorj, preferably located in previously industrialized areas. Pending the identification of the location(s) of the development areas and the types of industry to be attracted, it is not possible to characterize demands on infrastructure. Key considerations would include, for infrastructure elements:

*Drinking water treatment and distribution* Any industry that required potable water would increase the demand on existing drinking water sources. Because capacity is currently sufficient, this should not be a limiting factor unless the industry used large amounts of water. However, any such industry
would have to be able to use chlorinated water. If the development area was not already served by a water distribution system, the existing system (if any) would have to be extended.

**Sanitary wastewater collection and treatment.** The nature of businesses attracted to an industrial park would drive the demand for wastewater services. Food processing or other businesses that used organic materials could be a valuable addition to a wastewater system by providing organic matter to the plant. An industry that generated non-biodegradable waste products, however, would generally be limited in the amount it could discharge to public water systems and would likely have to treat its water separately. Any storage of wastewater on-site would have to meet EU and Romanian standards, which would emphasize containment and careful planning.

Regardless of the location of type of business, the existing wastewater treatment is not adequate and would have to be substantially upgraded before it could receive additional wastewater. Even then, any discharge to a public water treatment system would have to meet EU standards for industrial discharges to sewers.

**Stormwater management.** A new industrial park should not use existing infrastructure for stormwater management unless it is a system separate from sanitary wastewater. In general, any new industrial park should include provisions to manage stormwater in a way that emphasizes re-use and re-infiltration rather than collection and discharge. If the area to be developed previously supported other industrial activities, construction and stormwater management will have to account for any residual contamination so that stormwater management does not mobilize or otherwise make contaminants available for exposure.

**Solid waste management.** In general, occupants of one or more business parks would send solid wastes to the new county waste management system for recycling or disposal. Only if an industrial park generated large amounts of benign nonhazardous waste would they be allowed to develop an independent waste management solution (industrial waste landfill, for example) subject to Romanian law. If wastes were sent to the county system, the generator would have to comply with EU and Romanian requirements concerning waste testing and classification to ensure proper handling and management.

In locating an industrial park, planners will need to evaluate waste collection routes and transfer stations. Ideally, wastes would not need to be transported great distances. If the industrial park is not on one of the planned collection routes, authorities would have to modify routes or require the occupants to develop their own means of transporting wastes to collection centers.

**Transportation.** One of the factors used in selecting the location of a business or industrial park will need to be the proximity and adequacy of transportation, whether for workers, supplies, or products. The adequacy of existing rail service to handle additional passenger or freight traffic was not evaluated, but would need to be examined as part of the planning process. Rail service should be preferred over road transportation if that is at all feasible.

In general, roads are not adequate to handle any significant addition to freight traffic to transporting supplies or products. In addition, it is not clear if existing roads, or planned modernization and rehabilitation, are constructed so as to support additional truck traffic.

**Electrical power generation and distribution.** In general, existing generation capacity should be adequate to handle new demand from one or more industrial parks. As noted, however, generating stations in Gorj County need heavy investment to allow both improvements in operational efficiency and progress toward compliance with EU and Romanian environmental requirements. Transmission lines may need to be constructed or upgraded depending on the location of the industrial park(s).
Motru combined heat-power station

**Drinking water treatment and distribution.** The new plant will likely provide its own water non-potable supply and rely on the Motru water system only for potable water for workers. This would require only an extension of the distribution system.

**Sanitary wastewater collection and treatment.** The new station would generate small amounts of domestic wastewater from workers. Depending on the plant's location, a sewer line could connect to the municipal system. As noted above, the Motru treatment plant is not effective in treating sewage, which as a result is discharged untreated to the Motru River. Thus, the plant will need to be upgraded before a new power plant could discharge additional wastewater into the system.

The new plant would use relatively large volumes of water for cooling water, either surface water from the Motru River or groundwater. If groundwater, it would be appropriate to use groundwater pumped as part of the mine dewatering system rather than from additional new wells.

Any excess heat generated by the new plant should be considered a resource rather than a waste product. Re-use of the heat should be evaluated as part of the feasibility study for the plant, or in separate studies. Indeed, the power station could likely provide heat to one or more nearby industrial parks or even greenhouses (for growing, for example, high-value fruits and/or vegetables, or native vegetation for mine reclamation).

**Stormwater management.** A new plant would not use existing infrastructure for stormwater management. In general, most areas of a new plant should be designed to emphasize re-use and re-infiltration of stormwater rather than collection and discharge. In general, stormwater is managed so as to avoid contact with ash. If the new plant is constructed on the site of the existing plant or in another area that previously supported industrial activity, construction and stormwater management will have to account for any residual contamination so that stormwater management does not mobilize or otherwise make contaminants available for exposure.

**Solid waste management.** A lignite-fired plant will generate large quantities of ash, which will be managed on or near the site. Ash management will have to comply with EU and Romanian standards, which emphasize protection of groundwater and surface water. It may be beneficial to consider disposing ash in any nearby mine workings, if groundwater can be protected. In addition, beneficial re-use of ash (generally within a stable matrix) should be considered, possibly as a component of cement or other construction material.

It is likely the new station would construct and operate its own small industrial waste landfill for nonhazardous solid waste, and ship hazardous wastes to a suitable off-site location. Whether going to an on-site unit or to the county’s system, wastes will need to be properly tested before recycling or disposal.

**Transportation.** A new power station should place few long-term demands on local transportation systems. Initially, and occasionally thereafter, supplies and equipment would be brought in by rail or road. Existing systems should be sufficient. Over time, the only demands would be by commuting workers. Existing roads would be sufficient, although their relatively poor condition would cause lengthier commutes.

**Electrical power generation and distribution.** This new plant would replace the antiquated steam plant that current serves the population of Motru, but would be much larger and would produce electricity for the national grid. It is not clear if the additional electrical generating capacity would add to existing capacity at Rovinari or Turțeni stations (or Craiova station) or would replace closed units at those
locations. Similarly, it is not clear whether lignite would come from new or existing mines near Motru. If replacing existing mining and/or generating capacity, there could be some displacement of workers, since a modern mine and power station would need many fewer workers to achieve the same production.

It is also recommended that designing the closure of the existing steam plant should be an integral part of the designing the new plant. Areas where ash is managed, in particular, will need to be closed carefully to avoid both fugitive dust problems as well as long-term contamination of ground water.

**Baia de Fier Tourism Zone**
The Baia de Fier area reportedly hosts up to 10,000 tourists for day-long or other visits. These were said to be nearly all Romanian tourists, although their region or city of origin is unknown. As noted elsewhere, opportunities abound for all-season tourism; the area has the potential for much wider fame.

*Drinking water treatment and distribution.* Information was not acquired on how current residents and tourists in the Baia de Fier are provided with drinking water. As a result, the adequacy for future increases in tourism cannot be evaluated. It is likely, though, that any increase in tourist traffic to Baia de Fier or other areas in the tourist zone will require additional drinking water capacity. Planning for tourist development will need to consider potential sources of drinking water; the lack of sufficient surface water or groundwater in these headwater areas may be a limiting factor on future development, or on the density or intensity of development. Should importing water from another watershed be an option, planning should consider both the ability of existing surface water features (streams, ponds) to accept the additional water, which would be used, treated, and then discharged in the importing watershed, and the ability of the exporting watershed to sustain its own surface water features after losing some portion of its flows.

*Sanitary wastewater collection and treatment.* Wastewater is believed to be handled in septic systems or in small biological treatment units. These are clearly not sufficient in Râna, where there were reported to be open flows of sewage from villas and some hotels following snowmelt in spring. Sewer systems and treatment plants will have to be planned and constructed, based on careful planning of tourist and residential demand. In fact, planning future tourist and residential capacity of the area will need to consider the ability of area surface waters and land surface to assimilate nutrient-rich discharges of treated wastewater. This may be a major limiting factor, especially in winter months.

*Stormwater management.* The Baia de Fier area is subject to flash-flooding, as witnessed by the washed-out bridge observed in 2007. The approach to stormwater management to date appears to be largely structural, emphasizing collection and conveyance of stormwater flows around or past sensitive or valuable areas. Further development of the area, which will increase impermeable areas and place more amenities and structures in the narrow floodplains of the headwaters of these watersheds, will further overload the channelized streams and cause massive erosion when constructed controls inevitably fail. Overall planning for the tourist zone will need to take a watershed-based approach to stormwater planning. Otherwise, actions taken by individual developers (for example, by channelizing small streams or paving large areas) can threaten all downstream developments and the integrity of the entire tourist zone.

*Solid waste management.* Existing waste management is not adequate. However, there are planned improvements in solid waste collection and management that will alleviate the problem. It is noted, however, that large-scale construction will result in fairly large volumes of demolition and construction debris, which could overtax waste management facilities unless planning takes it into account. Tourist zone planning will need to provide guidance on waste management by developers and construction workers.
Transportation. Transportation is currently insufficient to support an expanded tourist population. Both county and national roads in and leading to the tourist zone are in various states of disrepair, and are likely to serve as an impediment to attracting Romanian and other tourists. As noted above, the county planned to rehabilitate and modernize the road that traverses the tourist zone, although the timing of that was uncertain. This rehabilitation and modernization is a prerequisite even to maintaining the area as a tourist destination, which would quite possibly decline in importance without improvements.

If the newly established tourist planning authorities hope to attract international visitors, there will have to be much better access to Gorj County, and this will be largely beyond the control of Gorj authorities. For example, national roads that lead to Gorj County from distant population centers (e.g., Craiova, București, Sibiu) are in some disrepair in neighboring counties as well as in Gorj, so they will need rehabilitation throughout the country.

Travelers by train would need to disembark in Târgu Jiu and travel by road the remaining distance. International train travelers would have to make multiple stops and changes to reach Târgu Jiu, so perhaps expeditionary trains would be considered to increase tourism. Air travelers would face the same difficulty in reaching Gorj County, and then the tourist zone, as described above.

Electrical power generation and distribution. It is likely, but uncertain, that existing generation capacity is sufficient to support expanded tourism in the Baia de Fier area. It is also likely that transmission lines will need to be upgraded or expanded.

Sustainable Agriculture: Beekeeping

The various elements of Gorj County infrastructure are sufficient to support beekeeping, which should place few or no demands on infrastructure.

Târgu Jiu Green Space/Park Planning

Drinking water treatment and distribution. This project should have no significant effect on drinking water systems other than possibly adding a few public water outlets.

Sanitary wastewater collection and treatment. This project should place few or no demands on sewage systems.

Stormwater management. This project could improve the city’s stormwater management by enhancing infiltration and natural flows rather than collection and discharge. Planning will need to include provisions for improving stormwater management and for minimizing run-off and erosion using natural methods rather than paving or rip-rap.

Solid waste management. This project should place few burdens on solid waste management. Management of the green spaces and parks will need to include provisions for frequent cleanups, whether by volunteers or paid employees, since plastics will tend to accumulate. Public areas will need trash receptacles that are emptied frequently. In addition, management will need to be alert and take action to deal with areas where dumping occurs. All of this must be included in planning these parks and green spaces.

Transportation. Visitor transportation to and from green spaces and parks should be included in all planning, and sufficient off-road parking should be provided to avoid interference with roadway traffic. Impervious areas should be kept to a minimum, with designs accounting for erosion control.
Electrical power generation and distribution. This project should have little or no effect on power generation or distribution.

Data Analysis - Monitoring, Management
The various elements of Gorj County infrastructure is sufficient to support enhanced and improved monitoring, data collection, and data analysis, which should place few or no demands on infrastructure.

8.3 Conclusions

Tables 8-1 summarizes the extent to which each of the proposed projects will require the services of the various elements of public infrastructure. For example, the table shows that a drinking water treatment and distribution system would be critical to the development of a tourism zone in Baia de Fier, whereas it would not be important at all beekeeping. Table 8-2 then shows the relative adequacy of the existing infrastructure for these projects. It is emphasized that these evaluations are subjective, and based on the discussions above. In addition, information on recent and planned investments in infrastructure improvements and upgrades are likely to have made the evaluation of adequacy somewhat dated. Regardless, this kind of evaluation is important to make in evaluating any project or projects.

<table>
<thead>
<tr>
<th>Proposed project</th>
<th>Industrial park(s)</th>
<th>Motru Combined Heat &amp; Power Plant</th>
<th>Baia de Fier Tourism Zone</th>
<th>Sustainable Agriculture -- Beekeeping</th>
<th>Târgu Jiu Greenspace/ Park planning</th>
<th>Data Monitoring, Collection, Analysis</th>
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<tbody>
<tr>
<td>Drinking water treatment and distribution</td>
<td>L-H</td>
<td>L</td>
<td>H</td>
<td>N</td>
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<td>Sanitary wastewater collection and treatment</td>
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<td>Stormwater management</td>
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<td>Solid waste management</td>
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<td>Transportation</td>
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Key:
N - no demand on public infrastructure
L - low demand. Public infrastructure would be lightly used but is not critically important to project.
M - medium demand. Public infrastructure needed for success of project.
H - critical demand. Public infrastructure must be available to support project

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<td>Stormwater management</td>
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Key:
- **n/a**: Public infrastructure not needed for this project
- **N-**: Not adequate at present, no known investments planned
- **N+**: Public infrastructure not adequate at present, but at least some improvements are planned
- **A**: Public infrastructure presently adequate for project development
CHAPTER 9: RECOMMENDED PROJECTS AND PRIORITIZATION

9.1 Project Evaluation Process

Initial data collection and development tasks for this study focused on the compilation of projects and project data in order to prioritize these via sustainable development criteria. As this task evolved it became apparent that developing a prioritized list would be very difficult because of the following components:

- **Data Availability**: The overall process to gather data was very time consuming, unorganized and laborious. Specific data necessary for project evaluation was often unavailable, inadequate and/or out of date.
- **Data Consistency**: Data pertaining to projects lacked consistency. In order to evaluate and prioritize projects similar parameters, measures and information must be available. Depending upon the source of project information and data pertaining to a project; information varied in formats, parameters and type. This inconsistency existed not only within agencies, at an intra-agency level; it also existed between agencies at the inter-agency level.
- **Project Tracking**: Timing, status, agency involvement/contribution and other basic administrative information pertaining to specific projects were unavailable and disorganized. It was very difficult to understand where a project was in the planning process, which agencies had been involved, if a project was on track for a feasibility study and when a project would be implemented.

All of these challenges pointed to the need for a standardized project management and data organization system that would offer data collection standards and allow administrators the ability to manage, track, evaluate, prioritize and visualize information as it applies to their specific needs and interests.

Four general recommendation types are presented in this section, the first (1) provides a conceptual outline that would minimize many of the challenges described above and the other three (2-4) identify specific projects and evaluations for identified projects. The four recommendations are: 1) Integration and refinement of the proposed project management and process framework (described in Chapter 2). This framework will provide a method and process for project identification, evaluation, tracking and prioritization, 2) Project list and compiled score results of the Indicator Scoring System applied to existing Gorj County projects, and 3) Other region specific “on-the-ground” projects of importance. List of projects identified via stakeholder meetings and primary research, and 4) Important methods for implementing sustainable design consisting of general guidelines for project implementation and important sustainable components to be included in the planning process.

This recommendation is to further develop, refine, and implement the project management process, outlined and described in detail in Chapter 2, to fit the detailed needs of Gorj County. While this project has drafted the first version of the application it is the responsibility of Gorj County to implement the process and to continue to develop and refine the details in order to enhance its functionality. The overall process is designed to encourage public participation, provide unbiased quantitative and qualitative evaluation, integrated agency database compilation and provide data analysis tools/techniques and viewing applications. The schematic is a graphic representation of the
overall conceptual framework of the needed process, means of evaluation, and examples of applicable evaluation tools to be integrated into the overall process. Various components of this process have been developed to demonstrate the applicability and usefulness of the overall system and how data, tools and processes can all working in unison.

**Data Standardization: Collection, Compilation, Organization and Dissemination:**
As an integral part of the overall planning process time must be spent understanding the specific role, function and application of data to the overall planning process. A key component to the overall utilization of information is a result of standardization. Standards must be established that address all aspects of data, detailing which data are to be collected, how they are collected, managed, utilized, updated, and distributed. As part of the standardization additional quality assurance and quality control methods must be integrated in order to evaluate the efficiencies and qualities of the data steps.

**Data Collection:**
Understanding the appropriate data needed for proper evaluation is an important step to moving the process forward. Often the lack of data can be a major constraint to the use of new and innovated planning techniques and technologies. A good example of this constraint is often found when utilizing technologies such as GIS. While such a system is very capable of analyzing information at a very complex level, tools, models and analysis are limited to the quality of data available. The project team has identified the following key GIS data gaps in Gorj County:

- Census data and GIS linkages
- Annual land use/land cover
- Annual parcel boundaries or ownership divides
- Annual aerial photography
- High resolution topography
- Soils

Data should be collected in a fashion that will contribute to multi-facets of project design by maximizing key data linkages. An example of such a linkage would be the integration of tabular data with associated geographic data. By integrating the key linkage between tabular and geographic information all data is spatially visualized and application of the data is drastically compounded via utilization in a GIS system. Additionally, information should seamlessly fit into tools and forms of analysis.

Understanding how data will be utilized in the overall process is critical to proper data collection. Looking at Chapter 2 Figure 2.1.1, the schematic steps (c), (d) and (g) are data collected and created in order to maintain or drive the overall planning and evaluation process. For example interested parties pursuing a project are collecting data in order to fill in the appropriate environmental, social and economic scores in the decision support system. Data contributing to these evaluations must be collected and managed and eventually used by others. Specific data are needed to properly answer and evaluate the question the environmental, economic and social questions. These data are being compiled and scores generated to provide new prioritization data that will feed analysis in step (d).

In contrast to steps (c), (d) and (e) step (g)’s data collection is more of a monitoring approach in which data will be used to assess the progress of implemented policy and projects. The primary role of collecting the appropriate data at this level is to be able to evaluate the effectiveness of the assessment process and eventually contribute to steps (c), (d) and (e). An example of utilizing this type of data would be to compare land use change over a 5 year span to see if the county has
minimize the acres of disturbed land. By setting up appropriate data collection updates one can evaluate the progress of land use change and the degree of progress or regress.

**Integration, Analysis and Tools for Data Crunching:**
Standardized methods of data analysis should be created and formatted in a user-friendly operation that will allow trained individual to perform complex calculations and evaluations. Decision Support Systems (ISS) are computer-based systems used to assist and aid decision makers in their decision

The project team created the Indicator Scoring and Decision Support System: Is an Access database tool that integrates a GIS interface that will allow multi-agency input of consistent project parameters allowing for efficient and accurate project tracking, management, evaluation and spatial projects. This system integrates GIS technologies for spatial analysis and representation of information.

Other applications that would greatly enhance the efficiencies of data dissemination would be:

- **Access to Key Technologies:** Often software, equipment and IT infrastructure can be very expensive and require major monetary investments from agencies involved. Key investments must be made in computer and IT technologies that allow users access to the internet and other software that utilize the standardized data being developed.

- **Web Mapping Tools:** Web mapping sites can allow land planners access to critical spatial data for a specific area of interest without the expensive investment in GIS software. An example of such a tool would be Google Earth. Applications similar to this one with a focus on regional data can make the planning process very efficient allowing user the ability to view and overlay various GIS data created by other professionals.

- **GIS Data Clearinghouse:** This would be a centralize depository of regional data that users can search, upload and download GIS data layers. Such a data depository does not have to be strictly limited to GIS data but will allow interested parties immediate access to critical data needs. Access of users to the appropriate software.

- **Customized GIS Toolbox:** Tools and models can be developed to analyze data in a systematic repeatable fashion. Once a model or tool is created by experts, analysis can be repeated very efficiently by less skilled users. Another advantage to using tools and models is that updated or comparable data sets can be rerun through the same tool or model and comparison evaluations and results can be generated. Such tools can offer a user to play out planning scenarios to quickly evaluate potential options.

An example of a GIS model application was performed by the project team. On the figure below is a GIS Hotspot Analysis, which was a generalized way to assess land functionality values as they may apply to potential development projects. While the example model has many limitations and built in assumptions it is a legitimate example of an evaluation model. This analysis uses distance and proximity to provide a geographic value for assistance with evaluating and prioritizing existing and/or proposed projects. Model variables used in this model consist of:

- Tourism
- Open water
- Rivers
- Localities
- County Protected Areas
- Nationally Protected Areas
- All Roads
- National Roads
• Rail Roads
• Mines and Dumps
• EIS Sites
• ANDZM Sites
• Both Sites
• Water
• Population
• Slope
• Land Use: Disturbed areas, Developed lands, Ag lands, Open lands, Non-forested lands, Forested lands and Wetlands

Methods included the creation of a proximity buffer to each data type which was normalized and classified into 10 classes based upon distance to or distance from a particular feature. For example, land in closest proximity to a national highway would have a higher functionality value than one further. Thus distance buffers (grids) would be classified with a value of 10 (highest value) to 0 (being no value) with closest proximity to a desired feature receiving a 10 and further proximity receiving a 1 (>15 KM received a 0). Each data layer listed above was given a buffer proximity classification, normalized to 10 and all layers were weighted equally at 0.0667. All spatial grids (1-17) were summed via map algebra in ArcGIS with the total value being identified.

9.2 Example: Geospatial Hot Spot Data Analysis

Introduction
Project team used GIS (ESRI’s Spatial Analyst and map algebra) to evaluate and score lands by creating a land functionality model for sustainable development. The purpose of this analysis is to provide an objective, spatially-tied method for evaluating the “functionality” of lands for sustainable development and to help prioritize locations for appropriate projects. It is critically important to note that this process is not meant to determine which locations are more or less suited for development, but rather provides insights into the factor that can promote or constrain sustainable development.

The objectives of this section are to:

• Create an example GIS application that can demonstrate a logic process that may be used for Gorj and other counties in Romania
• Objectively identify key locations where to focus appropriate redevelopment strategies
• Better understand the geographic logistics and relationships between areas within Gorj County
• Create a method of evaluation that can be modified to incorporate new spatial extents, new data types and updated or higher resolved data.

This model was developed to demonstrate the use of GIS to evaluate lands in order to make more informed land management decisions. “Hotspot” locations were derived using an additive modeling approach. Utilizing map algebra, scored overlays were added together to generate a mathematical sum. Areas with a high sum value would represent “hotspots” or areas of spatial clustering and centralize proximity to input data. Fifteen inputs, representing variables from land use, land protection, transportation, tourism and topography, were put into the model. Model results were summarized by commune showing Rovinari, Telesti, Calnic, Targu Jiu and Balesti having the top statistical mean values. Scores for these areas were influenced by the presence of mining activity as well as centralized population and transportation networks within the county.
Methods

Inputs
A GIS database was put together from the following sources: County Council, Cadastral Office, City of Targu Jiu, Romanian Environmental Protection Agency and United States Geological Survey (USGS). In addition to the above data sources, the project team created a number of data sets via spatial analysis and/or digitization in order to fill necessary data gaps. In order to determine if data was to be included into the model, information was evaluated for appropriate resolution, completeness, accuracy, precision and the ability to act as a surrogate for various components of sustainable development.

Data Assimilation
Value classes for each input data layer were determined by two methods; 1) distance/proximity from a mapped feature or 2) by the ability of a feature or feature attribute to contribute to components of sustainable development. When determining the distance/proximity score of a data layer, buffered distances were calculated, using “Euclidean distance tool”, and put into 10 classes every 15 km. Ten distance classes were valued 0-10 with 10 being the highest and nearest in proximity to the feature of interest. Distances greater than 150 km were reclassified with a value of 0.

1. Scores on the following data layers were based upon distance and proximity from mapped features (highest values are given to areas at or nearest to the mapped feature) (see the associated graphic for an example).
   - Tourism locations were mapped using gathered hard copy maps which were georeferenced and digitized as point locations. These points represent areas of interest to a tourist for example monuments, hotel, gas station, museum, etc. Tourism points were included because these locations are key areas for economic growth, environmental protection, social interaction and infrastructure development.
   - Open water includes lakes and large rivers which are both key attractions and resources which enhance everyday life and require environmental management.
   - Rivers include linear waterways that are a key means of water conveyance requiring environmental protection and act as a means of transportation, sustenance and/or recreation.
   - County protected lands are natural resources that necessitate protection and serve as wildlife habitat and recreation.
   - Nationally protected areas are significant natural resource areas that have been prioritized for protection.
   - All roads provide public access and serve as means for social interaction. Roads act as key surrogates for economic and social development.
   - National roads provide public access and serve as a significant means of social and economic interaction within the county as well as throughout the nation.
   - Railroads provide public access and serve as a significant means of social and economic interaction with adjacent regions and throughout the nation.

Figure 9.2.1: Data Layers
• Mines and dumps represent key areas that require restoration and intense environmental management. Often these are locations of intense environmental hazards that can have catastrophic impacts to human health.

• EIS sites are areas of interest or locations that have already been identified for financial assistance and intervention by Environmental Impact.

• ANDZM sites are areas of interest or locations that have already been identified for financial assistance and intervention by Redevelopment of Mining Zones.

• Both sites are areas of interest or locations that have already been identified for financial assistance and intervention by EI and ANDZM.

2. Scores on the following data layers were done by classification values and professional judgment of a feature or its attributes to measure sustainable redevelopment components.

• Population was generated by interpolating population data per locality and is representative of where the majority of social, economic and environmental interactions occur. Population also identifies areas where the most people can benefit from services as well as where people have the greatest impacts on their resources. Areas with the highest population density were given a 10 and areas of lowest population given a 0.

• Slope was generated using an 80m DEM grid that was acquired from the USGS. Slopes were classified into 0-10 classes, 0 identifying the highest sloped areas and areas most susceptible to degradation and impacts from development. A 10 was given to flat areas that would most adequately support development.

• Land use was acquired from the CORINE dataset with a generalized classification scheme used in the model. Cover types were ranked by classes appropriate for development. The following values and classes were used in the model: Disturbed land (10), Developed Lands (9), Agriculture (8), Open Lands (Nonforested) (7), Natural Lands (Nonforested) (6), Natural Lands (Forested) (5), Wetland (4), and Water (3).
Scores for each data layer were summed and normalized using ArcGIS map algebra (see associated graphic showing grid operations and expression format). The following equation was used in ArcGIS' map calculator to compile the summarization of all 15 data layers. This equation normalizes each input and sums the final value to be 0-10.

\[
(allroads_recl \times 0.0667) + (landzm_recl \times 0.0667) + (coprotemed_recl \times 0.667) + (eis_recl \times 0.0667) + (lake_recl \times 0.0667) + (landcov_recl \times 0.0667) + (minedum_recl \times 0.0667) + (napark_recl \times 0.0667) + (natroad_recl \times 0.0667) + (pop_recl \times 0.0667) + (rail_recl \times 0.0667) + (redboth_recl \times 0.0667) + (river_recl \times 0.0667) + (slope_recl \times 0.0667) + (tourism_recl \times 0.0667)
\]

**Results**

Results from the model can be seen on the figure to the right (Results of Hotspot Analysis in Gorj County, Romania) with the highest values being represented by the “hotter” colors, red, orange, and yellow. On this map, Rovinari, Telesi and Calnic stand out as the centralized hotspot within Gorj County. A secondary hotspot can be seen just north of this area around Targu Jiu. Generally higher values within the county take on an upside down “L” shape spanning east to west from Baia de Faier, Novaci, Bumbesti-Jiu, Targu Jiu to Rovinari. From Rovinari higher values run southeast following the national highway, rail and river to Turceni. Smaller hotspot patches can also be observed around Motru as well as near Bumbesti-Jiu.

In order to better understand the modeling trends, we used a GIS statistical calculation to summarized hotspot results by commune jurisdictions. This can be seen on Figure 9.2.4: Summarized Land Cover & Functionality Data of Gorj County, Romania. On this figure mean values were mapped per commune and overlaid with the land cover compositional pie chart. The summarized numerical statistical Mean, Minimum, Maximum, Range, Standard Deviation, and Sum can be seen in the Appendix C and the land cover percentages on Table 9.2.1. The table and map identify mean values in order of highest to lowest: Rovinari (8.6), Telesi (8.2), Calnic (8.1), Targu Jiu (8.0), Balesti (7.9), Arcani (7.8), Lelesi (7.8), Draguiesti (7.5), Ciupercei (7.5), Godinesti (7.4), Turcinei (7.4) and Faracasesti (7.2). By looking at the pie chart and land use table one can identify dominant land use development and strategy opportunities per cover type composition. Preliminary mapping results would show:
Table 9.2.1: Land Use Percentages per Commune

<table>
<thead>
<tr>
<th>Commune</th>
<th>Hectares</th>
<th>Ag</th>
<th>Developed</th>
<th>Disturbed</th>
<th>NL Forest</th>
<th>NL Open</th>
<th>Open</th>
<th>Water</th>
<th>Wetland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turciniesti</td>
<td>3045.9</td>
<td>53.7</td>
<td>7.5</td>
<td>0.0</td>
<td>34.5</td>
<td>2.0</td>
<td>0.0</td>
<td>2.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Ciuperceni</td>
<td>7009.0</td>
<td>28.6</td>
<td>5.9</td>
<td>2.6</td>
<td>62.7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Calnic</td>
<td>6424.1</td>
<td>29.9</td>
<td>5.4</td>
<td>16.1</td>
<td>46.8</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Rovinari</td>
<td>3207.6</td>
<td>13.9</td>
<td>8.3</td>
<td>64.5</td>
<td>1.6</td>
<td>0.0</td>
<td>0.0</td>
<td>3.1</td>
<td>8.5</td>
</tr>
<tr>
<td>Farcasesti</td>
<td>8252.9</td>
<td>14.5</td>
<td>6.4</td>
<td>18.9</td>
<td>55.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>4.7</td>
</tr>
<tr>
<td>Godinesti</td>
<td>5129.5</td>
<td>51.8</td>
<td>6.7</td>
<td>0.0</td>
<td>40.3</td>
<td>0.0</td>
<td>0.0</td>
<td>1.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Dragutesti</td>
<td>6180.5</td>
<td>40.7</td>
<td>10.6</td>
<td>1.3</td>
<td>40.8</td>
<td>0.7</td>
<td>0.0</td>
<td>1.4</td>
<td>4.6</td>
</tr>
<tr>
<td>Telesti</td>
<td>4480.0</td>
<td>62.5</td>
<td>7.0</td>
<td>0.0</td>
<td>26.4</td>
<td>0.0</td>
<td>0.0</td>
<td>1.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Balesti</td>
<td>7875.2</td>
<td>64.3</td>
<td>7.9</td>
<td>0.0</td>
<td>19.2</td>
<td>0.1</td>
<td>0.0</td>
<td>0.6</td>
<td>7.8</td>
</tr>
<tr>
<td>Arcani</td>
<td>2697.0</td>
<td>55.2</td>
<td>7.0</td>
<td>0.0</td>
<td>37.0</td>
<td>0.7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Lelesti</td>
<td>3020.5</td>
<td>76.0</td>
<td>5.7</td>
<td>0.0</td>
<td>18.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Targu Jiu</td>
<td>10261.5</td>
<td>61.9</td>
<td>20.5</td>
<td>0.4</td>
<td>13.6</td>
<td>0.4</td>
<td>0.2</td>
<td>2.2</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Conclusions

The top five hotspot commune values are: Rovinari, Telesti, Calnic, Targu Jiu and Balesti. Areas with the highest percentage of land disturbance are: Rovinari, Farcasesti and Calnic. Based upon this model, these communes warrant further investigation to better understand the specific land use composition, as well as, development treatments that can be applied to the specific land use classes. Some specific projects are recommended for these areas in the overall text of this project in Chapter 9.

Limitations

Limitations of this model are: 1) Data is limited to Gorj County and does not account for regional influences from other areas of Romania, 2) All input layers were weighted equally, layers of most interest and/or importance to a specific task can be weighted higher or differently, 3) Data availability limits the types of variables to be included in the analysis and 4) Field data are needed to properly calibrate, confirm and further refine model findings.

Recommendations

1. Further development of appropriate GIS based data is necessary to continue to develop, refine and improve overall quality of GIS models.
2. Model should be refined to include new and improved data as well as an integration of field work and findings in order to confirm, calibrate and refine model results.
3. Other GIS based models should be used in combination with this one to improve findings. For example a model that could identify and prioritize environmental constraints of Gorj County could be used in unison with this one.
4. Refined model should be used in combination with decision support system developed for this project. Potential project locations and scores should be mapped and overlaid onto model in order to identify a sustainable functionality score for a project location.
9.3 Evaluation of Results from Stakeholder Ex Ante Assessments

A pilot project was conducted to evaluate the effectiveness of the ISS matrix. The purpose of this study was to see if the matrix database tool, if used by the stakeholders in Gorj County, would be able to provide relevant information applicable to an ex ante assessment of likely sustainable development impacts for projects. This application of the ISS tool was intended only to get feedback from stakeholders about the utility of the database tool, and to evaluate if they metrics and parameters evaluated were able to assess the important components of sustainable development relevant to the stakeholders of Gorj County. It is important to emphasize that the results of this exercise were not intended for use in “prioritizing” projects. The use for the ISS tool for prioritization would require input from a wider range of citizens and stakeholders than occurred in this pilot study.

In this case, only a subset of likely end-users of the data from the municipalities of Motru, Targu Jiu, Baia de Fier, and the Gorj County Council used the ISS matrix to score a total of 33 projects (see section 3.3 above). Projects were evaluated on the ex ante criteria established for (1) Natural Environment, (2) Built Environment, (3) Economic, and (4) Social impact. Projects were scored with values ranging from negative 3 (strong negative impact) to positive 3 (strong positive impact). The detailed assessment methodology and scoring criteria are presented in the ISS Users manual (Appendix 3).

The projects were selected for evaluation by the stakeholders to be representative of the array of projects being suggested in their domain, and included 3 related to drinking water, 2 in the energy sector, 2 related to education, 2 industrial parks, 1 urban plaza, 13 roads, 5 related to social-related structures, 1 for sports, and 4 related to waste management.

A radar graph of the total ex ante scores for the 4 categories of indicators are presented in Figure 9.2.1. These scores show that the Built Environment (red) and Economic (green) impacts for the projects tended to be consistently rated higher than the Social (purple) or Environmental (blue) impacts. The exceptions include the 3 water projects, which scored high for positive environmental, and 2 social infrastructure projects that scored higher for positive social impacts. This pattern is likely due to the specific projects selected by the stakeholders, which tended to emphasize construction activity for.
economic development. However this pattern it points to the need to gather additional stakeholder feedback to adequately ensure that the environmental and social scoring in the ISS are properly weighted.

In order to remove weighting bias and to better visualize contributions to scoring among proposed projects, scores were standardized within each of the 4 sub-component categories using a z-score transformation (subtracting the mean score then dividing the standard deviation), producing a mean score of 0 and standard variance for each of the 4 component scores. As such, negative values indicate that the evaluation score for a project was less than the mean score for all projects. Similarly, a positive score indicates that the score for the project was above the average for all projects.

The raw and transformed data are presented in Figure 9.2.2b. These charts reveal the relative contributions of natural environment, built environment, economic, and social components to the \textit{ex ante} total scoring.

The charts show that the highest environmental scores were given to projects related to drinking water. The highest built scores were given to road constructions. The highest economic scores were for a thermo-electric plant and an industrial park. The highest social scores were for the social services infrastructure projects. The road projects score similarly across categories.

Another method to examine the similarities and differences among projects is to use clustering algorithms on standardized data. A k-means clustering using was conducted using Jmp software (SAS Inc. 2007). The results of the clustering are presented in Figure 9.2.3. This analysis identified 4 groups of projects that shared similar scoring patterns. These project share similar \textit{ex ante} impacts, as evaluated by the participants in the stakeholder evaluation process. This clustering method is the next step in evaluating the relationships among projects and using the \textit{ex ante} assessments.

Figure 9.2.2. Sub-component contribution for \textit{ex ante} assessment scores for 33 projects evaluated in Gorj County in a pilot project to evaluate the ISS program (a) Raw scores, (B) z-score standardized (by sub-component)
Figure 9.2.3. K-means clustering dendrogram for 33 projects scored as part of an *ex ante* analysis in Gorj County for Environmental, Social, Built Environment and Economic Impacts. Numbers to the left indicate the project number in the database.
CHAPTER 10: CONCLUSION

Sustainable development is a long-term process, in which decisions focusing on the economic, environmental, and social/cultural assessment are based on the best available information and coordinated at the local, regional, and global levels. Sustainable development brings these three vital assessment categories into balance with each other and negotiates among the interest groups and stakeholders involved in the process. It requires the consideration of disparities in spatial and temporal scales, and an understanding of the intricate interdependence between the economic, environmental, and social/cultural factors (Campbell 1995).

This project assisted in the development of a decision-support process for implementing sustainable development in Gorj County. This was done through stakeholder interviews conducted during the formulation of an Indicator Support System (ISS) tool, feedback exchanges with key stakeholders, and data analysis. Although one of the original goals for this project was to provide a prioritized list of key projects, it became clear immediately that the data necessary to fully understand the projects were not available. Furthermore, there were no organizational or analytical tools in place to collect and rank project data. As such, the project goals were modified toward creating a tool to assist in project evaluation. Sustainability and the processes that surround the balancing of economic development with natural resources and social goals are dynamic. The ISS tool produced through this study attempts to incorporate the need for this dynamic and adaptive process in the operationalization of sustainability.

As the process of sustainable development advances, it will be important to look to model projects to energize and spark ideas for sustainability. Many discussions occurred concerning future projects in Gorj and the direction of Gorj County during the stakeholder meetings. In September of this year, a group of Gorj County officials traveled to the United States and toured project sites. The delegation represented ANDZM (general manager Mr Candido Domenico and the head of office from Tg Jiu, Mr Gheorghe Popescu), Gorj Prefecture (sub-prefect Mr Constantin Dumitrescu), and the OUC (Dr. Lucica Tofan, director of project in Romania).

An ancillary outcome of this project was the discussion concerning the future projects in Gorj and the direction of Gorj County. During this visit, many of the projects strongly corresponded with potential sustainable development projects in Gorj. As Gorj County looks to the future, many of the projects presented can become models and provide additional ideas for officials to consider.

The group visited a large brownfield remediation site along the Milwaukee River in Milwaukee. This model project could be applied to Gorj County, where many buildings have been abandoned following closures. These buildings and property can be reused in a sustainable way for new work spaces. To achieve this type of redevelopment, public-private partnerships are necessary. Draft redevelopment must be decided in a sustainable way, based on a long-term strategy, which correspond to the interests of public and private. Gorj initiated such projects for the establishment of centers of consulting and training to initiate new business (Leorda-Motru) and develop industrial parks (Bumbesti Jiu).

A former mine site was also visited. The group toured the Jackson County mine and were given a presentation of Flambeau Mine, both very good examples for the mine closure of Gorj, where bioengineering and native plant technology can be applied to the restoration of areas damaged by mining. These images on the following page illustrate existing open pit mine sites in Motru and images of park areas in the Chicago, Illinois area that were former mine sites. Hopefully through the use of the ISS tool, the images presented below will be similar to future restored mine sites in Motru.
Figure 10.1: Open pit mines in Motru.

Figure 10.1: Restored mines in Illinois.
(http://www.lcfpd.org/preserves/index.cfm?fuseaction=home.view&object_id=201&type=P)
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## APPENDIX B: Contacts

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**APPENDIX C: Hot Spot Analysis Numeric Scores**

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Appendix D: Example Project Information

Lakewood
(http://www.lcfpd.org/preserves/index.cfm?fuseaction=home.view&object_id=201&type=P)

Lakewood is Lake County's largest forest preserve. This site is home to the Lake County Discovery Museum and Curt Teich Postcard Archives, and serves as home base for our maintenance crews and other operations staff. This preserve features dedicated equestrian trails, an off-leash dog exercise area, five picnic shelters, a variety of fishing ponds and trails for hiking and cross-country skiing. From roughly 1835 to 1865, this site's forested areas were divided into 5- and 10-acre parcels used by local farmers as a source of firewood and lumber. After the Civil War, small farms dominated the property.

In 1937, Malcolm Boyle, a general contractor from Chicago, made his first of many purchases here and created Lakewood Farms, a country estate. Over the next 20 years, his farm became one of Lake County's largest, with livestock, orchards, gardens and crops. Boyle landscaped the ponds, dug Banana Lake and built 16 major buildings.

In 1961, Howard Quinn purchased the 1,250-acre farm and converted it into a large dairy ranch, which operated until 1965. In 1968, our acquisition at Lakewood began and has continued in stages for more than 30 years. You can still identify the large show barn, the chicken coop and the bull barn that are part of the Museum complex. Lakewood is home to 17 endangered species, many of which reside in a remote 70-acre bog on the preserve's western side. Wauconda Bog, ringed by poison sumac and a natural moat, is so ecologically valuable it is designated as a National Natural Landmark and an Illinois Nature Preserve. Another area of note is Broberg Marsh, one of the best breeding spots in the county for birds.

This landscape is a mixture of oak woods, wetlands and fields. You'll also find farmlands and groves of evergreens. A lot of wildlife lives here and if you're lucky, you may even spot one of the bats from the colony living near Shelter E. These shy mammals sleep while picnickers have their fun, and then awake at dusk to eat thousands of mosquitoes and other bugs.
Prairie Crossing (http://www.prairiecrossing.com/pc/site/index.html)

Prairie Crossing is a critically-acclaimed conservation community that was designed to combine responsible development, the preservation of open land and easy commuting by rail. The community offers a variety of housing options, including 359 single family homes and 36 condominiums, all designed in Midwestern vernacular architecture and built to the highest standards of energy efficiency. The single family homes are sold out, but a limited number of condominiums are still available! Please explore our website for information about the Organic Farm, shops and restaurants, Metra commuter rail service, Charter School, and our restored natural areas, as well as the

Guiding Principles underlying the community:

Ten important principles established by the community's founders have guided Prairie Crossing since its inception. Together, these Guiding Principles provide the framework for a way of life that respects the environment and enables residents to experience a strong connection between community and the land.

Environmental protection and enhancement
Prairie Crossing's land was purchased to safeguard its open spaces. 350 of its acres are legally protected from development. Prairie Crossing is part of the Liberty Prairie Reserve, over 5,000 acres of publicly and privately held land that includes nature and forest preserves, farms and trails. At Prairie Crossing itself, greenways have been constructed and houses placed to protect the environment, native vegetation and wildlife of the Midwest.

A healthy lifestyle
More than ten miles of trails, a stable, and a large lake with beach and dock provide opportunities for healthy outdoor exercise. The farm supplies fresh organic vegetables, flowers, and fruits to the community. Individual garden plots are available at a small cost. Lake Forest Hospital has built a new facility at Prairie Crossing.

A sense of place
Prairie Crossing is squarely rooted in its central Lake County location. Landscape and architecture are inspired by the prairies, marshes, and farms of the area. Streets are named after prairie plants and early settlers who frequented the site. A palette of rich house colors derives from the warm tones of the native landscape. The community buildings - an historic barn, a schoolhouse, and a farmhouse -
remind us that others have lived on this land before, and that others, to whom we have responsibility, will live here after us.

**A sense of community**

In the belief that community and conservation can go hand in hand, the trails and gardens of Prairie Crossing are designed to be places where people can meet to enjoy and care for the land. The Homeowners Association has taken responsibility for the community amenities, design review, and other aspects of community life at Prairie Crossing. Volunteer stewardship activities are organized by the Liberty Prairie Conservancy, which conducts environmental programs throughout the Liberty Prairie Reserve. From the outset Prairie Crossing has sought to work collaboratively with its neighbors, seeking to achieve unusual synergies with homeowner associations, public officials, and local businesses.

**Economic and racial diversity**

Prairie Crossing welcomes residents of all races. Its founders believe that a mix of incomes and races is essential to the future of our society. They have attempted to keep costs and prices down so that some homes will be within the range of families needing affordable housing in Lake County.

**Convenient and efficient transportation**

Prairie Crossing is approximately an hour from Chicago by train or car. There is rail service to Chicago and O'Hare Airport from two stations adjoining the site. Prairie Crossing lies within a triangle of three major roads: Routes 45, 137, and 120. Trails lead to the train station, the College of Lake County, the University Center of Lake County, the Liberty Prairie Reserve, Grayslake High School, and local stores and restaurants.

**Energy conservation**

Homes at Prairie Crossing have been constructed with techniques that reduce energy consumption by approximately 50 percent in comparison to new homes in the area. Community-wide recycling and composting programs are in effect. Prairie Crossing is designed to encourage walking and biking as alternatives to short trips by automobile. A wind turbine provides power to the farm. The new buildings of the Prairie Crossing Charter School are designed to Leadership in Energy and Environmental Design (LEED) standards.

**Lifelong learning and education**

The Prairie Crossing Charter School offers elementary education based on an environmental curriculum to children from two local school districts. Informal learning takes place at the Liberty Prairie Conservancy, the Prairie Crossing Institute, the Farm and the Byron Colby Barn community center. The College of Lake County and the University Center of Lake County are both located within two miles.
Aesthetic design and high-quality construction
Professionals who are highly accomplished in their fields have been responsible for land planning and architecture. High standards of design and execution throughout Prairie Crossing are a priority. Prairie Crossing has received national attention for its beauty and design that combines town and landscape planning.

Economic viability
Prairie Crossing is being developed by families who wish to see the conservation community concept replicated elsewhere. They have made every effort to ensure that the project is economically feasible and have carefully budgeted for long-term success.
Once an abandoned building surrounded by seven stories of illegally dumped debris, the award-winning Chicago Center for Green Technology is now a nationally recognized green building with a platinum LEED rating.

As lead designer, WRD created the front landscape and two demonstration gardens, emphasizing native Midwest plants, which promote sustainability. In front, re-used debris from the site becomes focal points and signage. A solar-powered fountain uses rainwater collected from the building’s roof, contributing to the site's water management.

To further help create an identity for the building, we designed colorful banners on special poles topped with symbols from the Chicago Green Tech logo. Raised planting beds accent the poles and grace them with flowering vines.

Database User Manual

Overview

The methodology, scoring methods and detailed scoring considerations are located within their appropriate chapters within the report. Please review these when projects are scored.

The database is located on a CD in the back of the report. Just as in many programs today there are a few items to note that can help the use move within the program faster. The <tab> key can be used to move from field to field. If an item is highlighted in some way, the <enter> key can be used to select the button or choice. If you wish to erase the entry that you just made, you can either back space through it, or use the <cntl> <z> keys. Use the “back to main menu” buttons to return to your previous screen within the database.

Installation

There is no installation for the database, instead make sure you have Microsoft Access on your computer and you have installed Map Windows (see GIS section below). The database file is simply copied from the CD onto your hard drive (“c” drive). See Figure 1.

Figure 1: Copy the file onto the hard drive (c).
Launching the Program

The program can be launched by double clicking on the “SecureRomania.mdb”. See Figure 2. This is a secure shortcut file. If desired this shortcut can be copied onto your desktop for easier launching of the program.

Figure 2: Lunch the program using the “SecureRomania.mdb” shortcut.

A login screen will appear. See Figure 3. The user name is: “administrator”. The password is: “4r0mani4”. Please keep in mind that the “o” in Romania is a zero (0). There are also available 3 other users, Supervisor – to be able to edit projects ((password: Romania)), Database User – to be able to enter projects ((password: Romania)) and Guest User – to be able to view data ((password: temp)).

Figure 3: Logon screen.

A splash screen will appear with the name of the database and acknowledgements. See Figure 4. Select the “Enter Database” button to start working in the database.
**Viewing, Editing and Adding Data to the Database**

Whether you are adding, viewing or editing projects, all of the page layouts are the same. The only difference will be the data that is entered for each project. Therefore the example screens that are shown only include viewing an existing project. As you are working in the database, it is encouraged that all possible tabs and fields be used. This will ensure that the database is useful for many projects, project management and project tracking. See Figure 5.

If you want to enter project data, select the “Enter Project Data” button. If you would like to edit an existing project data, select the “Edit Existing Project” button. See Figure 6.

The project window will appear. Across the top of the screen, pertinent information concerning the project is entered, including the project name, location, description, contact information and evaluation status. In the lower half of the screen is a series of tabs: location, project description, environmental, built, social, economics, financial/budget and additional project information. See Figure 7. The location tab is integrated with GIS and this is described in a later section of this manual. The project description allows the user to enter additional detailed text about the project. The built, social, environmental and economic tabs are scoring worksheets that allow the user to enter numbers from +3 to -3 and notes for each section. These numbers become the overall “sustainable” score. These are discussed in more detail in the report. The financial/budget tab allows the user to enter their own information and the additional project information prompts the user to enter information that is necessary for overall project viability and EU grant funding.

When new projects are added, a new number is created. This is located in the upper left corner of the page. The page back is located in the upper right corner. The record number is located in the bottom left corner. This allows the user to scroll through projects. See Figure 7.
Figure 5: Select the “Enter Project Data” button.

Figure 6: Select either the “Enter Project Data” or the “Edit Existing Project” button.
Figure 6: Tabs for project details and scoring.

Figure 7: Notice the project number, page back and record number.
The project status and evaluation status are drop down boxes that can be accessed by the arrow on the side of the entry. See Figure 8.

Figure 8: Project and evaluation status are drop down menus.

To move through the tabs, click on the tab heading and new pages will appear. The Project Description tab allows for input of the project description, if there is a web site – a URL, the date and the person who entered the information. See Figure 9.

Figure 9: Project Description Tab.
The environmental, built, social and economics tabs all function in a similar manner. The scores are entered via pull down menus and the range is +3 to -3 and NA for not applicable. See Figure 10. If help is needed in the tab, there is a “Scoring help” button. See Figure 11.

Figure 10: Scores are entered with a pull down menu. Notes for each sub-heading can be entered to the right.

Figure 11: The Help button offers scoring help.
The financial/budget tab allows space for the user to enter notes, who entered the notes and when this area was last updated. See Figure 12.

Figure 12: Financial/budget tab.

The additional Project information tab allows users to answer a series of questions relevant to the project. Many of these questions are relevant for submittals to the European Union. See Figure 13.

Figure 13: Additional Project Information.
Viewing Project Data

If you want to view the details of a particular project, view project scores, by scores by type or overall scores, go to the “View Project Data” button. See Figure 14.

Figure 14: Options for Viewing Project Data.

To view a specific project, select the “View Specific Project” button. There is a pull down box in the middle of the screen that allows the user to look up the project number. If the project number is known, that can be entered in the space. Once the project is located, the Open Form button opens the main page of the project.

Figure 15: Specific Project View, drop down menu.
To view projects by Score, select the “View Projects by Evaluation Criteria”. Projects can then be viewed by environmental, built, social or economic scores. See Figure 16.

![Figure 16: Environmental Score summary, each project is listed on the form](image1)

Projects can also be summarized in a report form by category, score, region, project status or project from the “View Final Scores” button. See Figure 17.

![Figure 17: “Final Scores” button allows the user to run reports for different summaries.](image2)
Managing Projects

From the main menu, the user can manage projects by selecting the “Manage Projects” button. This area of the database allows the user to delete projects in the database and export tables into GIS and Excel. See Figure 18.

Figure 18: “Manage Project” button.

In order to delete a project, the project first must be located and then the items within the database deleted prior to the record being deleted. See Figure 19.

Figure 19: “Delete Project” screen.
Project data can be manipulated in Excel, Access or GIS when project data is exported in any of the “export” buttons. A screen will appear asking the user to locate where the project should be saved to. See Figure 20. If the all tables button is selected, exports will be done for a specific project for each table.

Figure 20: Export Screen

Exiting the Database
To exit the program, return to the main menu and select the “Exit Database” button. See Figure 21. Once the database is closed, exit Access.

Figure 21: Exiting the database.
GIS Component
Basic GIS mapping capabilities are provided within the Decision Support System (ISS) through MapWindows GIS freeware (which must be installed on the user’s machine). This software in combination with ActiveX provide the internal mapping capabilities for the ISS Access tool. In addition to the ISS, a stand alone copy of MapWindows is provided and also downloadable for free via the internet.

This section is designed to walk the user through the internal ISS GIS tool capabilities, limitations and operating procedures. In addition it will provide procedures for integrating the ISS with MapWindows. While the process is not seamless, great steps have been taken to integrate the database applications of the ISS with a free, easily distributable GIS system. For a free copy, recent updates or more details pertaining to MapWindows go to: http://www.mapwindow.org/.

Capabilities and Procedures
The GIS component within the Gorj County ISS can be found in two locations:

1. Internal ISS/GIS Viewing Tool: Can be found when following the description below:

   - View Project Data
   - Manage Database
   - Exit Database

   NOTE: x, y locations must be found using the MapWindows method (MapWindows GIS) and not via the internal viewer. The Function of the viewer is to quickly identify locations of previous mapped projects.

2. MapWindows GIS: The second integration of GIS is a link to MapWindows where a user can perform all of necessary GIS capabilities as well as identify the specific x, y coordinate location of a specific project.

   This will take user to MapWindows which will look like this (below).
Internal ISS/GIS Viewing Tool

The following buttons and tools are available in the map display window.

- Add Commune Data as well as refresh previously drawn features
- Overlay locations to the map
- Overlay roads to the map
- Overlay rivers to the map
- Overlay project point file that are represented in the database folder and path: C:\05-0833 - Romania, Gorg Cty project\Romania DB\MapWindowGIS\MapWindowGIS\shapefiles “Projects_02June2008.shp”

When clicking through the above toggles the map should change accordingly:

- Communes
- Communes/Localities
- Communes/Localities/Roads/Projects

In order to add an additional shapefile that is not provided as a quick toggle a user can type in the path name and shapefile in the space provided and click the “Add New Shapefile” button. Here is an example of the usage for the previously described utility.

Note: the new shapefile must be referenced to the following coordinate system in order for the data to be displayed appropriately on the map.

**Horizontal coordinate system**

Projected coordinate system name: Stereo_70
Geographic coordinate system name:
GCS_Dealul_Piscului_1970

Details
Map Projection Name: Double
Stereographic
Longitude of Projection Center: 25.000000
Latitude of Projection Center: 46.000000
Scale Factor at Projection Origin: 0.999750
False Easting: 500000.000000
False Northing: 500000.000000

Planar Coordinate Information
Planar Distance Units: meters
Coordinate Encoding Method: coordinate pair
Coordinate Representation
Abscissa Resolution: 0.000000
Ordinate Resolution: 0.000000

Geodetic Model
Horizontal Datum Name:
D_Dealul_Piscului_1970
Ellipsoid Name: Krasovsky_1940
Semi-major Axis: 6378245.000000
Denominator of Flattening Ratio: 298.300000

Bounding coordinates
Horizontal
In decimal degrees
West: 22.647473
East: 23.863322
North: 45.340994
South: 44.557691
In projected or local coordinates
Left: 315604.550521
Right: 409726.438260
Top: 427420.311826
Bottom: 342389.261234

Navigation
Navigation on the map can be done using the following tools:

Zoom and pan when cursor is in display window. Click button and move the cursor to map display, zoom tool will appear as a magnifying glass. By clicking the button again, tool will change a hand and the pan feature will become activated.

Zoom extents will center Gorj County in the map window.
**MapWindows GIS**

Prior to tool use, user must install MapWindows. Access MapWindows via the button in the ISS. Once MapWindows program opens go to File\Open and browse to C: AESromania\01GISDATA\basemap_gorjco.mwprj

Open basemap_gorjco.mwprj and the MapWindows project with associated data should open in the application.

Properties allow user to change how layers are displayed.

Attribute table allows users to view associated feature class attributes. Each record is link to a geographic feature. Selections are linked graphically between table and map.
Evaluated database projects can be brought into MapWindows by exporting Access dbf files to .csv. Using the csv to shapefile pulldown (user may need to turn the converter on by choosing “Plugins” pull down and checking csv to Shapefile Converter) user must browse to the file of interest, specify field delimited variables and appropriate the correct column for x and y. Tabular file will then be converted to a shapefile and viewable in MapWindows. Once information is in GIS, data can be viewed and overlaid with other geographic data and incorporated into various geospatial analyses. Once updated projects are converted to a shapefile they can also be added to the internal ISS/GIS viewer by using the button. Data can also be set up to permanently be a part of the toggle project buttons by replacing:
C:\ROMANIADATABASE\shapefiles\Projects_02June2008.shp
with the new shapefile. The new shapefile must be located in the folder shown above and given the identical name. User should be careful that a copy of the old Projects_02June2008.shp is made and archived appropriately.

Steps would include:
1. browse to C:\ROMANIADATABASE\shapefiles\ 
2. Create new folder with today’s date: 10Oct2008 
4. browse to the location of your new project points. Copy and paste all associated files that have the name “newprojects”, there should be between 3 and 6 files to paste into 
C:\ROMANIADATABASE\shapefiles\ 
5. Rename all pasted files to: Projects_02June2008 while maintaining the existing file extensions.

GIS data for MapWindows is provided in ESRI’s shapefile, Grid and Mr.SID format and are made available through the data gathering process of this project. Data can be found on the project CD at: AESromania\01GISDATA\. The following data layers were provided: Gorj County, County Mask, Gorj Roads, Railroad, Commune, rivers, localities, Landsat, hotspot analysis, and land cover. These or other data can be added to MapWindows via the button and browsing to the folder location of the data.

For more information pertaining to MapWindows go to: http://www.mapwindow.org/.