

Czech Republic: Integrated planning and assessment of national development plan

*Capacity building for integrated assessment
and planning for sustainable development*



REGIONAL ENVIRONMENTAL CENTER
Czech Republic



THE REGIONAL ENVIRONMENTAL CENTER
for Central and Eastern Europe

Preface

Sustainable development is at the heart of policy. The best way to achieve sustainability is not through disjointed actions in different sectors, but finding an integrated approach that reduces negative impacts and boosts multiple benefits across all three pillars of sustainable development – social, economic and environmental.

The need for comprehensive and coordinated policy-making for sustainable development has been recognized by the international community. The Plan of Implementation by the World Summit on Sustainable Development (WSSD) from Johannesburg in 2002 emphasized the importance of understanding the complex linkages among all three pillars of sustainable development. The Summit also encouraged the design and implementation of integrated policies, plans and programmes.

The Sustainable Development Strategy of the Czech Republic, signed off in December 2004, seeks to promote economic growth and social cohesion without impairing environmental quality. It serves as a framework for the promulgation of additional sectoral strategies and action plans. It is in fact the main document for strategic decisions and stresses inter-ministerial cooperation and public-private sector partnership.

The European Union is giving strong emphasis to sustainable development, which has been acknowledged as a horizontal theme in the new Structural Funds regulations, covering the period 2007-2013. The Czech Republic, as a new member of the European Union, has embraced sustainable development as one of the objectives of the National Development Plan, the key strategic document enabling the country to participate in the EU Structural Funds and Cohesion Fund programmes.

From November 2004 to November 2005, the UNEP sponsored project titled “Integrated Planning and Assessment of National Development Plan of the Czech Republic” was conducted in the country. The goal was to help national policymakers to balance the economic, social and environmental dimensions of sustainable development during policymaking. An element of added value was the creation of platforms to discuss integration of sustainable development considerations into strategic planning and decision-making, as well as platforms for the involvement of major stakeholders in the policy deliberation process.

The project showed that express support for sustainable development policies, including the development of integrated assessment methodologies and tools, is needed for research into sustainable development. The project findings also demonstrated that the adequate tools for an effective sustainability assessment are missing in the Czech Republic, especially when compared to the methods in use for the Strategic Environmental Assessment (SEA) only. Distinct support is needed to develop integrated assessment methodologies and tools to identify the environmental, economic and social costs and benefits of policy and strategy options.

Therefore, the proposal was made to accomplish integrated sustainable assessment in the framework of SEA, since it was already methodologically and legally accepted, and an *ex-ante* socio-economic evaluation.

We hope that this country report will be a main source of information to increase understanding of integrated sustainability assessments for all, including decision-makers, practitioners, stakeholders and others interested in sustainable development.

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Acronyms and abbreviations

CEE	Council for Environmental Education
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DTIE	Division of Technology, Industry and Economics
EFTA	European Free Trade Agreement
EMAS	Eco Management & Audit Scheme
ESC	Economic and Social Committee
ETB	Economics and Trade Branch
EU	European Union
GDP	Gross Domestic Product
GERD	Gross expenses on research and development
IA	Integrated assessment
IAP	Integrated assessment project
ICT	Institute for Creative Technologies
ISO	International Organization for Standardization
MAD	Median absolute deviation
MDS	Multidimensional scaling
MEAs	Multilateral environmental agreements
NCSS	National Council of Social Services
NDP	National Development Plan
NGO	Non-governmental organization
OECD	Organization for Economic Co-operation and Development
OPs	Operational Programmes
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
PSR	Pressure-state-response
REC	Regional Environmental Centre
R&D	Research and development
SBC	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

SEA	Strategic environmental assessment
SMEs	Small and medium-sized enterprises
TEN-T	Trans-European Network for Transport
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WSSD	World Summit on Sustainable Development

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United Nations Environment Programme

The United Nations Environment Programme (UNEP) is the overall coordinating environmental organization of the United Nations system. Its mission is to provide leadership and encourage partnerships in caring for the environment, by inspiring, informing, and enabling nations and people to improve their quality of life without compromising that of future generations. In accordance with its mandate, UNEP works to observe, monitor, and assess the state of the global environment; improve the scientific understanding of how environmental change occurs; and in turn, determine how such change can be managed by action-oriented national policies and international agreements. UNEP's capacity building work thus centres on helping countries strengthen environmental management in diverse areas, which include freshwater and land resource management; the conservation and sustainable use of biodiversity, marine and coastal ecosystem management; and cleaner industrial production and eco-efficiency, among many others.

UNEP, headquartered in Nairobi, Kenya, marked its first 30 years of service in 2002. During this time, in partnership with a global array of collaborating organizations, UNEP achieved major advances in the development of international environmental policy and law, environmental monitoring and assessment, and our understanding of the science of global change. This work also supports the successful development and implementation of the world's major environmental conventions. In parallel, UNEP administers several multilateral environmental agreements (MEAs), including the Vienna Convention's Montreal Protocol on Substances that Deplete the Ozone Layer, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (SBC), the Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention, PIC), the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, and the Stockholm Convention on Persistent Organic Pollutants (POPs).

Division of Technology, Industry and Economics

The mission of the Division of Technology, Industry and Economics (DTIE) is to encourage decision makers in government, local authorities and industry to develop and adopt policies, strategies, and practices that are cleaner and safer, make efficient use of natural resources, ensure environmentally sound management of chemicals, and reduce pollution and risks for humans and the environment. In addition, it seeks to enable implementation of conventions and international agreements and encourage the internalization of environmental costs. UNEP DTIE's strategy in carrying out these objectives is to influence decision-making through partnerships with other international organizations, governmental authorities, business and industry, and NGOs; facilitate knowledge management through networks; support implementation of conventions; and work closely with UNEP regional offices. The Division, with its Director and Division Office in Paris, consists of one centre and five branches located in Paris, Geneva and Osaka.

Economics and Trade Branch

The Economics and Trade Branch (ETB) is one of the five branches of DTIE. Its mission is to enhance the capacities of developing countries and transition economies to integrate environmental considerations into development planning and macroeconomic policies, including trade policies. ETB helps countries develop and use integrated assessment and incentive tools for achieving poverty reduction and sustainable development. The Branch further works to improve our understanding of environmental, social, and economic effects of trade liberalization and the effects of environmental policies on trade, and works to strengthen coherence between Multilateral Environmental Agreements and the World Trade Organization. ETB also helps enhance the role of the financial sector in moving towards sustainability. Through its finance initiatives, ETB also helps enhance the role of the financial sector in moving towards sustainability.

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1. Introduction

The country report summarizes the main findings of the project, “Integrated Assessment of the National Development Plan in the Czech Republic”. The project was conducted as part of the UNEP programme to build capacity leading to sustainable development. The Czech project was implemented by the Regional Environmental Center of the Czech Republic, in cooperation with a team of external experts, within the period of November 2004 to November 2005.

The main purpose of the project was to make recommendations on procedures and methods for integrated assessment of strategic documents. Its findings from assessment of the Czech Republic’s National Development Plan (NDP) may interest countries in Europe who are at a similar stage of economic and social development or have the same structure of public administration and environmental protection.

The report is divided into an introductory part followed by two main sections in a format following the original objectives of the project.

The first main section, or Stage 1, describes processes and key findings from project work to analyse the *ex ante* socio-economic assessment and strategic environmental assessment (SEA) previously performed on the current NDP 2004-2006. The IAP findings are highly useful to improve the next round of SEA for the new NDP of 2007-2013.

The second main section, or Stage 2, summarizes the outcomes from analytical work and proposal on an integrated assessment framework which could be applied to future projects and documents of the EU Structural Funds, beyond the NDP.

2. Project background

2.1 Key objectives of the IAP project

The Czech Republic was among the countries invited to join the global UNEP initiative on integrated assessment. Based on consultations with IAP experts from UNEP, a draft concept of the project was agreed. It would focus on building a common integrated assessment framework that could later be applied to future EU programming documents for all new EU member states. The Ministry for Regional Development and the Ministry of Environment of the Czech Republic were invited to be official partners and supervisors of the project.

The Czech project is unique in that, despite being a UNEP initiative in IAP, it is more an “assessment of an assessment” in Stage 1, since it evaluated the *ex ante* SEA and socio-economic assessments for the current NDP. Project work, therefore, during this Stage focused more on processes and procedural aspects of assessment rather than the content of the NDP. The point of the project taking this approach is to guide and integrate future socio-economic and environmental assessments.

Since there has been very limited application of sustainable development assessments at all levels in the Czech Republic, resulting in a lack of knowledge in this field, it was crucial to begin any IAP document with a thorough analysis of an existing planning and assessment exercise for a strategic document. The key objectives of IAP in Stage 1 of the project are to:

- Undertake detailed *ex post* assessments of both socio-economic and environmental *ex ante* evaluations and examine their mutual relationships and inputs into NDP planning and stakeholder consultations.
- Suggest, based on the findings of this IAP review of earlier assessments, a common integrated assessment framework that could be useful in the future and for other countries.
- Revise previous planning and assessment processes, including the existing legal, institutional and methodological framework, and derive key lessons from the processes.

For Stage 2 of the project, the project team attempted to address key issues in sustainable development and formulate an integrated framework for any assessment. The areas of inquiry are summarized as:

- Clarifying the relationships between integrated assessment and policy planning processes
- Procedural integration of the assessment in terms of sustainable development
- Modelling with the use of cluster analysis
- Recommendations for public involvement.

2.2 Selection of NDP for assessment

The NDP, first prepared in 1999, is the basic strategic document for receiving support from the EU Structural Funds which targets poor and underdeveloped regions in the EU, or so called Objective 1 regions. One of the main objectives of the Structural Funds is to foster sustainable development through concerted interventions.

The main objectives of the NDP are:

- Creating conditions for economic growth by strengthening internal factors.
- Improving the skill level, competitiveness and mobility of the labour force, along with efforts to minimize the impact of economic growth on disadvantaged groups.
- Approximating to EU environmental standards.
- Balanced development of regions.

Correspondingly, it set down Operational Programmes (OPs) for Industry and Enterprise, Human Resources Development, Rural Development and Multi-Functional Agriculture, Infrastructure and a Joint Regional Operational Programme for the period 2004-2006. Approximately €2.3 billion was allocated for their implementation.

The document also prepared the basic strategy for socio-economic development of the cohesion-regions: Central Bohemia; North-West, South-West, North-East, South-East, Central Moravia; and Moravia-Silesia for the period 2004–2006, each of which had a Gross Domestic Product (GDP) per capita below 75 per cent of the EU-15 average and was therefore eligible for support under “Objective 1”¹.

The NDP was drafted based on previous experiences of regional development, but there was limited practical knowledge of:

- Integration of sustainability assessments, including selection of proper tools and methods.
- Complexity of multi-stakeholder participation.
- Communicating and sharing information, know-how and experience.

The next round of NDP which began in early 2005 for the period 2007-2013, was seen as a good opportunity for this IAP project to contribute with its integrated analysis of the first NDP.

Stakeholders in NDP

The NDP was prepared by the Ministry for Regional Development while its financial framework was prepared by the Ministry of Finance. Throughout, the state administration bodies were in close consultation. In fact, the Ministry for Regional Development sought the involvement of the maximum possible number of partners. A National Programming Committee for Economic and Social Cohesion consisting of representatives from all ministries, regional authorities and key social and economic partners was set up.

The public was also consulted in the planning process through workshops, seminars and public hearings. The Ministry for Regional Development established a website and organized seminars in all regions of the Czech Republic. A series of workshops intended for both the general public and experts was held before a final public hearing in November 2002. Information was disseminated through the media, email and partnership

¹ The region of Prague does not fulfil this criterion, and is not addressed with this programme.

arrangements. Objections, questions and proposals raised were dealt with on a continuous basis and reflected in the overall balancing and orientation of the document. However, due to the lack of a developed plan for stakeholder involvement, interest raised among the public and NGOs was not impressive.

2.3 Local context

2.3.1 Current level of socio-economic development

The basic document for socio-economic development at country level in the EU is the Lisbon Strategy. The Lisbon Strategy is a commitment by EU governments to concentrate their efforts on a single overarching goal of economic, social and environmental renewal. The objective is to make the Union “the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion”. Sustainable development was later added to economic and social development as a third area for cooperation. In 2004, the Czech economic policy in response to the Lisbon strategy was announced with four main priorities - competitiveness, employment, sustainability of public finance and sustainable development.

The Czech Republic today scores highly in areas such as new technology and education. When it comes to new technology, 93 per cent of Czech businesses have access to the internet, whereas the average in the EU-15 is 86 per cent. The Czech Republic also has one of the highest proportions of the population who have achieved at least higher secondary education (92 per cent). However, in most other economic and social criteria, the Czech Republic is average compared to the other EU member states.

It also lags behind the other EU member states in areas such as labour productivity, which is only 64 per cent of the EU average. Also, only 11.6 per cent of the population are university educated. Current gross expenses on research and development (GERD) are significantly lower than the EU average. GERD accounted for only 1.3 per cent of GDP in 2001, far below the Lisbon target of 3 per cent.

Other indicators of interest are:

Employment rate and poverty

The total employment rate in the Czech Republic (approximately 65 per cent) slightly exceeds the EU average, but is still below the target of 70 per cent. Poverty risk is very low thanks to the low differentiation in incomes and high share of social transfers. On the other hand there are hidden dangers in structural unemployment. Long-term unemployment accounts for more than 40 per cent of total unemployment.

Income equality

The Czech Republic has a low Gini index, which indicates less social differences in comparison to most developing countries. However, this traditionally egalitarian orientation of the Czech society leads to a costly social state, growing indebtedness of public health care and the pension system, and relatively high taxes. Current political issues related to sustainable development are the balancing of public finance, including lesser taxation, to increase economic growth and competitiveness of the economy.

The Gini index

The Gini Index measures the extent to which the distribution of income (or consumption) among individuals or households within a country deviates from a perfectly equal distribution. A value of 0 represents perfect equality, and a value of 100 perfect inequality. According to the 2003 reports, the Gini index for the Czech Republic is 25.4, a relatively low figure. In comparison, the weighted average for 109 countries is 40.7 (UNDP, 2003).

Competitiveness

The Czech government wants to focus on R&D and one of the main methods is through the promotion of progressive technologies and the provision of support to entrepreneurship and SMEs. In October 2004 it endorsed a new programme to overcome administrative barriers to entrepreneurship.

Employment

The government wants to legislate education and increase levels of employment by investing in human resources and increasing the motivation to work.

Public finances

The deep reforms in this area are crucial for macroeconomic stability, and to meet the Maastricht criteria and the requirements of the Stability and Growth Pact. All the other priorities are probably subordinated to the second stage of public finance reform consisting of the reform of the pension system, modernization of the social security system and tax reforms.

Sustainable development

The European Strategy for Sustainable Development and the Strategy for Food Security will be fully implemented as a main pillar of the NDP.

2.3.2 Major social challenges

The key areas for the push to achieve sustainable development of the Czech Republic's social system include the following:

- Active measures to maintain equal income distribution while decreasing government expenditure and taxation
- Public finance reform, including streamlining public administration
- Reforms of pension, healthcare and social care systems
- Support to families with children as a response to the greying Czech society
- Improvements to labour market flexibility and work force mobility
- Comprehensive employment policy
- Economic development
- Responsible migration policy
- Support for higher institutes of education

A number of reforms, including that of public finances, the pension system and the healthcare system, are considered to be long-term, and only achievable with sustained effort.

2.3.3 Major environmental challenges

The 2005 OECD Environmental Performance Reviews has described the Czech Republic's environmental state as showing substantial improvement in virtually all areas but not fully satisfactory. Environmental conditions still have a negative effect on the physical and mental health of the people.

Furthermore, significant reductions in pollution similar to those of the 1990s are no longer possible and will require comparatively more cost and effort. It is however necessary to continue environmental protection with priority given to nature and global climate. It is also important to improve environmental awareness and education, and generally promote a comprehensive, structural and functional approach to ecosystems. In the long term, the condition of ecosystems within the country is expected to improve.

According to the OECD report, the fact that expenses on the environmental protection measures were growing while environment improvement was declining, showed that efficiency of resources spent had declined.

2.3.4 Sustainable development priorities of the government

The priorities of the Czech Government with respect to sustainable development were explicitly described in the Strategy for Sustainable Development in December 2004. The goals and instruments of the Strategy are aimed to minimize any imbalance of the three economic, environmental and social pillars of sustainability. It wants to ensure the highest attainable quality of life for the present generation and to create positive preconditions for future generations, through some of the following strategic goals:

- Maintain the stability of the economy, ensuring it is resistant to adverse effects.
- Encourage economic development that respects the carrying capacity of the environment and ensures the sustainable funding of public services (sustainable economy).
- Develop and universally support a knowledge-based and skill-based economy, and increase the competitiveness of industry, agriculture and services.
- Safeguard the good quality of all elements of the environment and the functioning of their basic relationships and also preserve to the largest extent acceptable, in economic and social terms, the natural resources of the Czech Republic.
- Minimize conflicts of interests between economic activities and the protection of the environment and cultural heritage.
- Fulfil the Czech Republic's international obligations in the field of sustainable development and contribute to the global search for solutions.
- Preserve appropriate forms of cultural diversity and rural lifestyles, by ensuring the equal rights of communities and the availability of services.
- Allow public participation in the decision-making process and in the drafting of strategies in matters related to sustainable development, and achieve the broadest possible consensus.
- Improve the effectiveness and performance efficiency of public administration in accordance with the requirements of sustainable development.

The documents most often cited as the key policies shaping sustainable development goals are Czech Republic Strategy for Sustainable Development, Strategy of Economic Growth of the Czech Republic, the Lisbon Strategy and the EU Strategy for Sustainable Development.

3. Stage 1 implementation and findings

This chapter presents the outcomes of the first stage of the project study which analyses the *ex ante* socio-economic assessment and strategic environmental assessment (SEA) previously performed on the current NDP.

3.1 Processes and capacity-building activities

The debate on sustainable development in the Czech Republic is limited and informal in most parts of the society, including the political strata. In light of this, the IAP project was a groundbreaking platform to discuss in more concrete terms the integration of sustainable development considerations with strategic planning in the country. Not only were experts from all the three basic pillars of development consulted, the project also built capacity by identifying stakeholders and generated proper assessment methods and processes. At the same time it led to recognition of limitations and difficulties in undertaking an integrated assessment.

The project implementation was built on a few key processes: surveying opinions of main actors involved in *ex ante* assessments of the Czech NDP; review of relevant guidance documents; brainstorming by the project core team; and consultations through open seminars to review key findings. Three workshops were organized in the course of the work, for academics (university), for practitioners (private firms active in the environmental and socio-economic assessments), and for government officials and NGOs.

The Ministry of Regional Development and the Ministry of Environment were highly involved from the beginning. The Department of Strategies of the Czech Ministry of the Environment in particular helped on procedural aspects of the proposed model of the assessment. The Czech Council for Sustainable Development also considered the study an important contribution to future work in this area, including the development of sustainable principles and guidance.

During the project, a detailed assessment of both socio-economic and environmental *ex ante* evaluations was undertaken and the outcomes discussed at a workshop. A strategy for stakeholders' consultations and public participation in the assessment process was delivered. Since the Czech Republic's SEA for the NDP 2007-2013 began in 2005, the IAP project team, who were also involved in the drafting, were able to contribute their IAP findings and recommendations.

3.2 Project activities

A core team consisting of experts in strategic planning, environmental assessment, socio-economic issues, sustainable development and public participation convened for the implementation of the project. The team first met with the Ministry for Regional Development and Ministry of Environment to present and discuss their objectives and expected outcomes of the project.

For the purpose of conducting a detailed assessment of SEA, members of the project team shared their experience from the environmental impact assessment, along experience of the socio-economic assessment of NDP 2004-2006. Relevant documents were collected and discussed.

The analysis later undertaken showed variances and gaps between the two types of assessments. Special attention was given to addressing the issues of sustainability in both assessments. A special web page for the presentation of the project outcomes and results was set up, which can be accessed at the address: http://www.reccr.cz/projektys/sea/sia_unep/uvod.html

A public workshop was organized in March 2005 with members of the government, private institutions (Institute for territorial development and Czech-Invest) and consultancies (City Plan and DHV). The agenda was to discuss key elements of the planning process, role of assessments and ways to incorporate and assess sustainable development.

Based on the work of the project core team, a methodological background for the assessment was developed. The Ministry of Regional Development also incorporated the suggestions for integrated assessment in the guidelines for SEA for the new draft of NDP. Following presentations to the public, part of the project team continued to work on suitable approaches and methods to be used in the integrated assessment, which was summarized and presented at the mid-term review meeting in Geneva in September 2005. A modelling exercise applying the proposed methodology to the draft NDP was then finally conducted.

3.3 The two assessments

The NDP of the Czech Republic 2004-2006 was, in line with EU regulations, subject to two parallel evaluations, a socio-economic assessment and an environmental assessment (SEA). In Stage 1 of this project, a detailed evaluation of the two methods was conducted, including an examination of their influence on NDP and on each other.

The socio-economic assessment

Conducted for the NDP in 2002, the assessment focused on the following issues: interventions of the public sector, consistency of the NDP with external and internal programmes, links to existing ESC policies and horizontal objectives.

In the specific case of the NDP, the assessment considered the following:

- Specification and problem focus of the NDP.
- Adjusting the NDP for a short implementation period (2004–2006) and limited financial resources.
- Relevance of the NDP and the interventions proposed after accession to the EU.
- Consistency of the NDP and links to Operational Programmes.
- The logic and internal connections of proposed public interventions.

Macroeconomic simulations were not prepared as the NDP was to be in effect for a period of only 2.5 years and financial resources allocated were relatively small. Although this assessment was useful to modify the NDP document on objectives, strategies, management and monitoring, no time was given to the sustainable development point of view.

The Strategic Environmental Assessment (SEA)

The SEA had integrated environmental concerns and objectives. It was legally required under S14 of Act No. 244/1992 Coll., Environmental Impact Assessment of Development Concepts and Programmes², as well as Article 42.2(b) of Council Regulation (EC) No. 1260/1999).

During SEA assessment, the project team identified 11 objectives on environmental protection for the NDP:

1. Decrease emissions causing climate changes.
2. Decrease emissions causing air pollution.
3. Limit point pollution of water and soil.
4. Limit area pollution of water and soil.
5. Decrease drawing from non-renewable sources of energy and energy raw materials.
6. Decrease drawing from non-renewable sources of raw materials and minimize waste production and hazards.
7. Preserve the natural diversity of fauna, flora and habitats.
8. Protect and improve the condition and functions of eco-systems.
9. Protect and improve the condition and functions of the cultural landscape.
10. Protect and improve the condition of settlements.
11. Encourage the inhabitants to pursue more environmentally responsible behaviour.

These objectives fully respect the requirements set forth in the relevant regulations and policies of the EU and the Czech Republic. These objectives would later become cross or horizontal objectives for all interventions within the NDP.

3.4 Findings and recommendations

3.4.1 Consultation weaknesses

From the point of view of the NGOs and independent observers, the involvement of the public in preparation and assessment of the NDP was deemed to be neither sufficient nor efficient. The following findings are related to the consultation process:

1. Limited experience of ministries and other institutions to prepare strategic documents.
2. Difficulty of communications with the EC and between ministries.
3. Lack of finance and designated responsibility for public involvement.

² Despite Czech legislation requiring impact assessment for strategic and conceptual documents, these assessments were not, with some rare exceptions, pursued before EU accession. After joining the EU, the SEA has been fully accepted, but experience with this form of assessment remained rather limited.

4. Limited time given for comments handling in later stages.
5. Absence of clear timeline for NDP activities.
6. Final version of NDP was sole responsibility of the Ministry for Regional Development.
7. Poor management of public hearings/workshops (i.e. late invitations, lack of efficient facilitation and poor quality of materials).
8. Involvement of the public only at the final stages of NDP, using only SEA. Not enough tools for public participation were investigated or used.

3.4.2 Stakeholder groups weaknesses

Due to limited experience and insufficient capacity within the Ministry for Regional Development, problems with stakeholder involvement include:

1. Difficulty identifying possible stakeholder groups, and low public interest.
2. The management and coordination committee only worked on partnership principles.
3. Only one NGO representative was allowed on the committee because of the limited number of seats, who was chosen by the Government Council for NGOs with no formal selection process.
4. The business representatives were only notified and invited through commercial chambers, unions etc.
5. Partners from social and economic fields (including NGOs) did not have any real influence over NDP preparation.

Recommendations and a framework for consulting stakeholders and the public is found in Annex II.

3.4.3 Sustainability weaknesses

The IAP analysis carried out showed variances and gaps between these two assessments and within the planning process itself. Both *ex ante* evaluations contributed to several stages of NDP elaboration. Given the time constraints and the lack of coordination between the planning stage and the two subsequent and parallel evaluations, the desired approach of coordination between the two evaluation teams and with the NDP planners was not taken up.

Another problematic area identified was the incompatibility of the assessments used. Both processes differ from the legislative background of the plan. While the SEA, which was coordinated by the Ministry of Environment, benefited from legislation and methodology that partially existed in the Czech Republic, the socio-economic *ex ante* evaluation had not yet been legislated and the team responsible could use only guiding documents developed by the EU. Both teams followed different principles and applied different methodological approaches towards evaluation.

Of the preparation of the NDP and the assessments, only limited practical experience was available, including knowledge of tools and methods such as SWOT. Communication skills and information sharing were poor, given such a complex process involving many parties.

4. Stage 2 implementation and findings

This chapter presents the outcomes of Stage 2 of the project study which built an integrated assessment framework for the NDP of the Czech Republic, and which could be applied to future evaluations of other programming documents for EU Structural Funds.

Any assessment framework in consideration needs to deal with two principal issues: how to address social and economic issues despite the lack of procedures; and how to treat economic, social and environmental issues in an integrated way. Main recommendations and suggestions later devised are summarized as:

- Forge links between the recommended integrated assessment and planning process.
- Integration of the recommended assessment's procedures into the preparation of the NDP.
- Modelling exercise for NDP 2007-2013 with the use of cluster analysis.

A proposal for organizing consultations with key stakeholders and public was worked out as a separate study and recommendations for public involvement in the preparation and integrated assessment of the NDP are summarized in Annex II.

4.1 Summary of key findings

In sustainable development, the three pillars of social, economic and environmental progress and impacts must be assessed in an integrated fashion for any given policy. The Pressure-state-response (PSR) model³ is deemed suitable for assessment of environmental policies. It was first proposed for assessment of environmental policies. The project team now attempted to extend and modify the PSR concept model to include all three areas of economic, social and environmental, with success.

From consultation with a team of experts, the team knew that assessment of a large number of policy measures (over 50) would be difficult. Therefore the conclusion was reached to group the policy measures which would allow the analysis of a small number of causal relationships that were deemed critical. The approach then was to sort the measures of the NDP according to their impact on three main sustainability pillars in each of the three different fields. Within each field, the compromises and possible trade-offs from the inter-relationships of the measures would also be explored.

Following early analytical work, workshop discussions and roundtables, the team discovered that the current socio-economic assessment lacked formal procedures and its handling displayed a lack of experience in sustainability issues. Legal provisions were also not put in place domestically and there was a lack of written documentation with methodologies and guidelines.

³This general model is used by OECD, European Commission and the UN Commission for Sustainable Development.

The planners tended to assess impacts on the three pillars separately. They also perceived environmental protection as a hindrance to economic development and damaging to social issues. The socio-economic assessment focused only on streamlining the social and economic objectives of NDP.

Macroeconomic models were used to a limited extent. However, even with extensive resources and research capacities, quantitative analyses can be difficult and unreliable due to weak links, lack of adequate data and unforeseen developments. Until better models and data are available, and given time and resource limitations, the judgements of experts will serve as predictions of impacts.

Another critical point raised during the expert consultations were the definitions of sustainable development and sustainability for assessment purposes. The team did not believe that the concepts were realised only in mechanical ticking of standardized check lists. The assessed document had to be taken into account. Academic representatives pointed out that for the purpose of assessment, there was always a necessity to define and declare a desired level or strategic model of sustainability. It was the only way to eliminate future misunderstanding. This suggested approach has a direct link to modelling.

In discussions at public workshops, comments were made to recommend safety as a new separate pillar of the sustainable development model. Interesting feedback was gathered which can be used in future debates at national level.

4.2 Links between integrated assessment and planning process

Based on the knowledge of existing concepts, the team built its recommendations mainly from the findings of the SEA followed by the findings from the social-economic evaluation. The team was aware of the merits and limitations of this approach. An integrated assessment valued the overall quality of a strategy plan and needed to expand beyond the narrow scope of environmental protection found in the SEA. An independent team of experts was therefore engaged to conduct a validation of the planning framework from the viewpoint of the overall sustainability. The validation considered:

- Relevance of strategic goals and challenges
- Comprehensiveness of prioritization and representation of issues
- Accuracy of conclusions and situation analysis
- Feasibility from the viewpoint of resources available

4.3 Procedural integration of sustainable development into NDP

Given the lack of formal procedures for the socio-economic assessment, steps were taken by the IAP project team to build documentation. A basic model of assessment with a step-by-step plan was done, based on usual approaches of the SEA. The very elementary model was built with the assumption that, from the procedural point of view, sustainability assessment could be conducted using existing and separate evaluations of socio-economic issues and environmental issues. Teams of both evaluations could work independently and then contribute their inputs to the planning process together after sharing the findings of their “part” analyses. This required close communication between the two assessing teams.

Both “part” evaluations had two purposes: to provide input to the NDP during the initial stages and following analysis; and to conduct analyses of separate components of the Plan, acting as separate corrective mechanisms since they were concerned with possible external implications.

On interaction between the two teams, the following meetings were proposed:

1. Discussion at the earliest stage to agree on expected inputs to planning and outputs from the assessment.
2. Mutual consultations between the policymaking team and the two assessing teams on the inputs for assessment (in the form of meetings, seminars, etc.).
3. A common meeting for all at the end of each assessment stage for the policymaking team to give feedback on the recommendations and conclusions of the partial assessments.
4. Joint consultations with stakeholders carried out at key stages of the plan preparation and assessment.

Using the experience of the project team and current assessment practice, the model was derived from usual approaches used within the SEA. In practice, this new model would allow each team to contribute to the other's work and bridge the principal differences between the two processes.

4.4 Pressure-state-response model

In general, full assessment of a policy can be approached in the following ways:

- **Pressure assessment.** An evaluation of the ways in which the concept influences the factors that fundamentally impact the development in the given sector or territory. These factors can be economic, social or environmental.
- **Impact assessment.** An evaluation of proposed measures in terms of their specific (environmental, social or economic) impact and their mutual effects.
- **Response assessment.** An evaluation of the policy's compliance with relevant (environmental, social, economic) targets that have been determined for the given sector or territory in the relevant strategic documents.

The PSR model builds on the above by assessing:

- The policy's relationship to pressure of development factors or the "efficiency assessment".
- The policy's relationship to the state of the sector following development, or the "impact assessment".
- The policy's relationship to the response of the sector or territory and future interventions needed, or "compliance assessment".

If desirable, the more structured DPSIR model developed by the European Environmental Agency can be used. This model separates driving forces (D), pressures (P), state of the environment (S), impacts (I) and societal response (R).

The questions most frequently asked for the general assessment model are as follows (see Table 1):

Table 1: Questions most frequently asked for policy assessment

Stage of strategic planning	Pressure assessment	Key Questions asked for: Impact assessment	Response assessment
Situation analysis	Which economic, social and environmental factors have had significant influence on development?	Which fundamental economic, social and environmental trends affect sustainability of development in the given sector or territory ?	Which principal objectives have been set for sustainable development of the given sector or territory?
	Which problems can be solved by the policy?	Which trends should be taken into account during implementation and assessment?	How are these objectives being fulfilled?
Proposal for Strategy (i.e. objectives, priorities)	Is the proposed policy focused on influencing the fundamental development factors?	In what ways will the proposed policy influence the fundamental state of the sector?	To what extent does the proposed strategy make provision for the fundamental objectives of sustainable development?
Proposal of measures	How do the proposed measures influence the development factors?	What are the specific impacts of the proposed measures?	To what extent do the proposed measures provide for the fundamental objectives of sustainable development?
	In what ways can these measures be optimized (in terms of their focus)?	In what ways can these measures be optimized (i.e. compensating and mitigating measures)?	

None of the above assessment approaches were seen as optimal. Each had its own limitations (see Table 2). While their benefits could be theoretically maximized, and limitations minimized, this was usually not possible given limited time and resources⁴.

Table 2: Limitations of general assessment approach

Pressure assessment	Impact assessment	Response assessment	
Benefits	It analyses the causes of development.	It analyses the influence on epiphenomenon of development.	It analyses standards reached given the official objectives of sustainable development.
Limitations	System causes of development do not need to be precisely defined or soluble within the concept.	Impact assessment only gives evidence about visible impacts. The assessment addresses only the causal relationships of the impacts.	Level of compliance does not need to be set for sustainable development.
	The assessment does not provide information about specific impacts.		

⁴ Model of “compliance assessment” corresponded to approaches in SEA. This approach was also seen by stakeholders as the most feasible under up-to-day circumstances.

A general model of procedural integration of both the socio-economic and SEA assessment was now proposed (see Figure 1).

Figure 1: Proposed procedural integration of SEA and socio-economic evaluation

1st step: Preparation and initiation

Steps of the IA:

- Determine the reference framework for analysis and evaluation.
- Specify the key economic, social and environmental priorities that give a true picture of the main sustainability problems.

Outputs:

- A common interpretation of the policy in question.
 - A package of key priorities of sustainable development.
-

2nd step: The analysis

Steps of the IA:

- Evaluate completeness and relevance of information for economic, social and environmental priorities.
- Analyse the information.
- Propose to complement the analyses.
- Evaluate completeness, relevance and accuracy of the analysis.
- Common evaluation by both SEA and socio-economic teams.

Key questions:

In pressure assessment

- Which economic, social and environmental factors have a significant influence on development of the sector or territory concerned?
- Which factors can be solved within the concept?

In impact assessment

- Which fundamental economic, social and environmental trends characterize sustainability of development in the given sector or territory?
- Which trends should be taken into account within the concept work-out and assessment?

In response assessment

- Which principal objectives have been set for sustainable development of the given sector or territory?
 - How are these objectives being fulfilled?
-

3rd step: Adjust strategic objectives

Steps of the IA:

- Compare the strategic objectives of the policy and conclusions from analysis. If necessary, strategic objectives can be reset, or an alternative strategy could be proposed
- Joint evaluation by the SEA and socio-economic *ex-ante* teams.

Key questions:

In pressure assessment:

- Is the proposed strategy focused on influencing the fundamental development factors?

In impact assessment:

- In what way will the proposed strategy influence the fundamental phenomena accompanying development?

In response assessment:

- To what extent does the proposed strategy make provision for the fundamental objectives of sustainable development in the given sector or territory?

4th step: Operational priorities

Steps of the IA:

- Revise programme priorities reflecting findings and conclusions of the extent to which goals are fulfilled.
- Common evaluation by the SEA and socio-economic teams.

Key questions:

In pressure assessment:

- How do the proposed measures influence the development factors?
- In what way can these measures be optimized (in terms of their focus)?

In impact assessment:

- What are the specific impacts of the proposed measures?
- In what way can these measures be optimized (through compensating or mitigating measures)?

In response assessment:

- To what extent do the proposed measures make provision for the fundamental objectives of sustainable development?
- In what way can these measures be optimized?

5th step: Adjust implementation system

- Evaluate capacity to carry out assessments and make recommendations to strengthen.

6th step: Financial framework

- Evaluate the proposed financial budget for suitability with the key parameters of sustainable development. That also means putting the most problematic areas first.

5. Modelling with cluster analysis

Sustainability in the three-pillars model of development is based on balanced development of all three fields. For example, economic development must not be at the expense of social development and environmental protection. However, sustainable development is in its nature anthropocentric and this must be respected.

Sustainability is best not enabled in the planning process through the division of the problems into three (or more) categories, but requires problems to be holistically handled. In practice, sustainability is achieved through compromise of often antagonistic goals. Integrated assessment is also markedly different from sustainability assessment. While sustainability assessment is focused on the final planning stages to resolve conflicting goals of one particular pillar, integrated assessment is concerned with the quality control of the entire planning process, and the comprehensive and accurate consideration of all three economic, social and environmental aspects of development.

The complexity of assessing dozens of measures possible in a policy presents a methodological problem. The use of cluster analysis or multidimensional scaling (MDS) is a viable solution.

The team had proposed and tested cluster analysis to work out the trade-offs of the numerous objectives. This method was based on the aggregation of experts' evaluations for relevance of the individual measures proposed in the NDP to the main topics of sustainability. The relationships between these measures were then examined with the view to obtain best sustainability trade-offs.

It was necessary to first create a background reference framework and then classify dozens of measures into smaller numbers of clusters. Also the critical relationships and conflicts within every cluster must be first identified. Then it was possible to examine relationships between clusters. Findings were then passed on to the planning team.

The method as a whole was similar to the technique of conceptual mapping, which had been developed for group planning and assessment. Conceptual mapping is based on the assumption that participatory planning and assessment processes must develop from a structured conceptual frame, to be recognized and accepted before the planning itself. For the IAP project, the team used a combination of two techniques - multidimensional scaling, and cluster analysis⁵.

⁵The authors (Trochim and Linton) noted that the concept map was an open process and not based on any pre-determined hypothesis. Conceptualization is a creative process. Conceptual mapping fits the modern theory of planning where the planning process is as important as the result itself.

5.1 Background principles

Sustainability for this purpose was defined as the optimal level of compromises (trade-offs) among the main environmental, economic and social topics, determined by the conceptual reference framework. Sustainability assessment can be seen as complementary to the process of planning with its focus on identifying coherences within the conceptual frame of sustainability. This implies that the reference framework has to be formulated through a creative process and not predetermined.

The methodology eventually conducted was the result of a political and expert discussion on the assessed document but in principle, would be best discussed by a broad group of people with diverse views. Doing this would help to competently structure the discussion and make it more efficient.

Sustainability is not only about quality of single interventions, but also arises from the inter-relationships among them, and from the structure of the measures as a whole. The mutual effects can be synergic or antagonistic. Sometimes, the adverse effects of one intervention can be compensated by positive effects of another. Only by optimizing these relationships can a team achieve the optimal level of development that can be characterized as sustainable.

5.2 Sustainability assessment reference framework

The reference framework was designed by taking the following steps:

1. Identification and analysis of all key relevant documents.
2. Drawing out main sustainability issues.
3. Aggregation, prioritization and redefining the general set of sustainability fields.

The general reference framework, independent from the assessed document, would enable the experts to make an exogenous appraisal of the relevance of the individual priorities or measures and leave out measures of low or zero relevance⁶.

To create a sustainability reference framework from a hierarchically higher level of information, the project team accessed relevant documents at the level of the European Union, namely the EU Strategy of Sustainable Development and its 2005 evaluation report (EC, 2005). From this, the reference framework was constituted by four global and interconnected sustainability objectives (T1 to T4):

1. **Competitiveness of the economy.** Capability of the national economy to compete on an European and global level (T1).
2. **Social stability.** Political, demographic, health and cultural stability on both European and national levels, and good conditions for stable development (T2).
3. **Resources management.** Use of all raw material and energy resources including soil, water, minerals, fossil fuels, biomass etc. (T3)
4. **Climate change and ecosystems stability.** Potential local and global changes of the environment resulting from pollutant emissions into environmental components, leading to degradation of ecosystems (T4).

⁶ Such as regional or sectoral documents in this case, since the NDP is a national strategy.

Ideally, these topics should be maximally independent of each other and unequivocally described. They must not overlap from the content point of view and must be of a relatively small number so that the clustering of measures generates a manageable structure. Also, the “environmental pillar” implicit in the reference referred to both ecosystems, and global geochemical cycles and sustainable management of raw material and energy resources⁷.

Then priorities and proposed interventions were ordered according to their relevance to these issues. The relevances were scored by experts. Subsequently, the 28 proposed interventions (policies and measures) of the NDP were all given their place in the reference framework. From this, seven crosscutting issues (or groups) in NDP were identified:

1. Nature and natural resources protection, anthropogenic pressures (pollutant emissions) and protection of ecosystems, soil, species and habitats.
2. Education as a precondition for change, adaptability to globalization and lifelong education.
3. Flexibility and organization, labour mobility, entrepreneurship skills, management and ability to use information.
4. Landscape management, landscape protection, landscape fragmentation, nature protection, urbanization and old environmental damage.
5. Social exclusion, unemployment, and all sources of social exclusion and economic competitiveness.
6. Globalization opportunities, clusters research and development to integrate into global markets (production of high added value products).
7. Human health protection and related social and environmental issues.

The above seven issues were further integrated (into a super-group of groups 2, 3 and 6, for example, and another super-group of groups 1, 4, 5 and 7). This framework methodology was aimed at breaking traditional barriers to discussions of specific environmental, social and economic issues which were traditionally antagonistic⁸.

Another method is to use expert knowledge to identify cross-section topics that integrate at least two aspects of sustainable development.

One such attempt was found in the National Strategy for the Sustainable Development of the Czech Republic. It listed cross-cutting issues for each key area of sustainable development (economic, environmental and social). However, as the Strategy is a political document, the issues must be further investigated to get to their root effects (see Annex III).

⁷ The analysis implied that the environment term in NDP was a slightly diffusional term as human health is influenced by our complex artificial environment, including buildings and transport. The impacts of this artificial environment include mental stress, noise and contamination, and so belong to the social pillar.

⁸ The approach was used in SEA and Strategy of Regional Development to broaden assessments of environmental impacts that did not identify possible trade-offs.

5.3 Brief methodology

A detailed methodology of the modelling done can be found in Annex I to the report.

After the measures were given their place in the sustainability reference framework, they were ordered regressively. It was evident that the degrees of relevance varied considerably (see Table 3). Conclusions were that it would be better to reformulate some of the measures or the framework itself to increase their relevance. With the streamlining of the reference system, there would probably be lower differentiability of the measures, and a less defined conceptual map. Safety (T5) is another issue in EU documents that was not included here.

Table 3: Relevance of measures to the sustainability reference framework

Proposed intervention in NDP with article no.	Competitiveness of the economy	Social stability	Resource management	Climate change and ecosystems stability	sum (aggregative relevance)
Support to development of innovations and innovative entrepreneurship, 1.1	2.0	1.0	2.0	1.5	6.5
Human resources development and enhancing qualification of employees in companies, 1.3	2.0	2.0	1.0	1.0	6.0
Reduction of energy consumption in companies by introducing innovations in the production or by substituting ineffective energy sources, 1.5	2.0	0.0	2.0	2.0	6.0
Sustainable development of production and energy consumption (improvement of energy efficiency and use of alternative energy sources), 8.2	2.0	0.0	2.0	2.0	6.0
Development of regional economy, 10.1	2.0	2.0	1.0	1.0	6.0
Support to professional and space mobility of workers and a more intensive emphasis on development of the information society, 4.1	2.0	2.0	1.0	0.5	5.5
Development of regional airports with emphasis on airports of international stature, 9.2	1.0	0.5	2.0	2.0	5.5
Improvement of transport network and reduction of environmental impact, 9.4	1.0	1.0	1.5	2.0	5.5
Development of public transport system that contributes to reduction of the proportion of the individual personal transport, 9.5	0.5	1.0	2.0	2.0	5.5
Development of small and medium-size enterprises with the support from both local and regional governments, 3.5	1.0	2.0	1.5	0.5	5.0
Modernization of educational systems to reflect new conditions in the labour market, enhance professional qualification of individuals by strengthening lifetime learning, 5.1	2.0	2.0	1.0	0.0	5.0

Proposed intervention in NDP with article no.	Competitiveness of the economy	Social stability	Resource management	Climate change and ecosystems stability	Sum (aggregative relevance)
Enhancement of environmental infrastructure, especially with accession to the EU (transitional periods), 8.1	1.0	0.0	2.0	2.0	5.0
Completion of linchpin road network, 9.3	1.0	1.0	1.0	2.0	5.0
Stabilization of settlement in rural areas, sustaining and improving the quality of life of rural population, 11.1	1.0	2.0	1.0	1.0	5.0
Support to diversify economic structure in rural areas, 11.3	2.0	2.0	1.0	0.0	5.0
Prague – improvement of the environment and accessibility, 12.2	1.0	1.0	1.0	2.0	5.0
European cooperation, prevention of risks and integrated water management, 13.3	1.0	0.0	2.0	2.0	5.0
Co-operation between companies and research/scientific institutions, 1.2	2.0	0.0	1.5	1.0	4.5
Development of tourism and health resorts services, 2.1	1.5	1.0	1.0	1.0	4.5
Strengthening the links between educational institutions and the world of labour, research and society, development of a genius for entrepreneurship, 5.3	2.0	1.5	1.0	0.0	4.5
Support to building of regional and local transport and communication systems, improvement of the regions' accessibility, 10.2	1.5	1.0	1.0	1.0	4.5
Support to business activities combating unemployment, 10.6	1.0	2.0	1.0	0.5	4.5
Regeneration of some municipal parts in the area of social and economic issues, urban architecture and the environment, with a special attention on large housing estate areas, 10.7	0.5	2.0	1.0	1.0	4.5
Enhancement of infrastructure for entrepreneurship, 1.4	1.0	1.0	1.0	1.0	4.0
Preservation and renewal of cultural and nature heritage as attractors of tourism, 2.5	1.0	1.0	1.0	1.0	4.0
Interconnection of the labour market's needs and the study programmes of the educational institutions to modernise the study subjects, 4.3	2.0	2.0	0.0	0.0	4.0
Improvement of learning foreign languages, information, mobility and strengthening of European cooperation, 5.4	2.0	2.0	0.0	0.0	4.0
Application of strategic and community planning methods, 7.2	1.0	1.0	1.0	1.0	4.0
Building and modernization of the TEN-T network and related networks, and formation of progressive transport strategies, 9.1	1.0	0.0	1.0	2.0	4.0

Integrated planning and assessment of national development plan

Proposed intervention in NDP with article no.	Competitiveness of the economy	Social stability	Resource management	Climate change and ecosystems stability	Sum (aggregative relevance)
Removal of environmental burdens and care for the environment, 10.3	0.5	0.0	1.5	2.0	4.0
Introduction of modern management forms in public administration, 7.1	1.0	1.5	1.0	0.0	3.5
Municipal infrastructure completion and quality improvement, not only in terms of accessibility but also	0.5	1.0	1.0	1.0	3.5
Development of tourism infrastructure, 2.3	1.0	1.0	0.5	0.5	3.0
Support to infrastructure for production of innovation, technological development, innovative centres, applied research and transfer of technologies, 3.1	1.5	0.0	1.0	0.5	3.0
Human potential development in the areas of research and innovation, 3.3	1.5	1.0	0.5	0.0	3.0
Quality improvement and enlargement of further education, 3.4	1.5	1.0	0.5	0.0	3.0
Support to equal opportunities and integration of groups that are most disadvantaged in the labour market, 4.2	1.0	2.0	0.0	0.0	3.0
Facilitating access to education for all social groups, including marginalized groups, 5.2	1.0	2.0	0.0	0.0	3.0
Social integration of disadvantaged groups, including immigrants, 6.1	1.0	2.0	0.0	0.0	3.0
Support to employment with emphasis on long-term unemployment and unemployment of people who are disadvantaged in the labour market, 6.2	1.0	2.0	0.0	0.0	3.0
Development of the use of information and communication technologies, including access to high-speed internet, 9.6	1.5	1.0	0.5	0.0	3.0
Support to inter-municipal cooperation of small for more effective performance and provision of public administration, 11.4	1.0	1.5	0.5	0.0	3.0
Prague – support to development knowledge society, preventing the negative social and economic trends and phenomena, 12.1	1.0	2.0	0.0	0.0	3.0
Prague – strengthening the social cohesion and adaptability of workers, 12.3	1.0	2.0	0.0	0.0	3.0
European cooperation, development of economic relationships (especially in tourism), accessibility and interconnectedness of small and medium-size enterprises, 13.1	2.0	1.0	0.0	0.0	3.0
Development of accommodation and restaurant services and related infrastructure, 2.2	1.0	1.0	0.5	0.0	2.5
Making the skills and knowledge of ICT work accessible to users in public administration, companies and households, 9.7	1.5	1.0	0.0	0.0	2.5

Proposed intervention in NDP with article no.	Competitiveness of the economy	Social stability	Resource management	Climate change and ecosystems stability	Sum (aggregative relevance)
Solution to social activities on local and regional level, and reduction of the potential for emerging socially pathological phenomena, 10.4	0.5	2.0	0.0	0.0	2.5
Creation of tourism products, focusing especially on strengthening comprehensiveness of the products, 2.4	1.0	1.0	0.0	0.0	2.0
Strengthening the links between research/education centres and the business sphere, 3.2	1.0	0.5	0.5	0.0	2.0
Quality improvement of education and training system in public administration to enhance the administration capacity for development activities, 7.3	1.0	1.0	0.0	0.0	2.0
Improvement of accessibility to public goods and services, 11.2	1.0	1.0	0.0	0.0	2.0
European cooperation in socio-cultural activities, 13.2	0.0	1.5	0.0	0.0	1.5
TOTAL	62.25	63.25	44.5	39.0	-

For the next step of cluster analysis (see Table 4), it was crucial to group measures according to linearly independent and well defined attributes (an example would be global topics T1 to T4). Assessment of T1 was that it was independent to T2 to T4, but T3 and T4 were indirectly dependent ($r_{\text{korrel}} = -0,5197$) and had significant positive correlation ($r_{\text{korrel}} = 0,8248$).

Table 4: Correlation coefficients between global objectives

	T1	T2	T3	T4
T1	1	0.016176	0.130606	-0.08594
T2	0.016176	1	-0.51968	-0.08594
T3	0.130606	-0.51968	1	0.824788
T4	-0.08594	-0.08594	0.824788	1

The team thus saw a stronger relationship between “resource management” and “climate change and ecosystems stability” than the relationship between “resource management” and “competitiveness”. A conclusion of this was that the NDP did not reflect the impact of rising prices of natural resources on the competitiveness of the Czech economy. There was also a strong relationship between “social stability” and “resource management” in that human resource development would have lowered demand for natural resources. In conclusion, it was difficult to define a reference framework where all the correlations of the global fields were statistically insignificant.

In addition, the sums of the scoring for the T1 to T4 were interesting as they served as a rough indicator of the balance of the NDP in meeting economic, social and environmental objectives. It could be seen that the measures were equally strong on economic and social development but weaker on resource management and stability of ecosystems. Therefore, to streamline the framework, a new environmental axis was constructed from T3 and T4. By then, the most relevant pillar was economic (88 points), followed by social pillar (64 points) and environmental pillar (59 points). With this, the trade-offs within the new environmental axis (T3 and T4) must also be assessed.

An ideal structure of entirely separated clusters did not exist. For practicality reasons, the team created ten clusters of groups to make a relatively compact structure of cluster cores. To belong to a cluster core, the basis of probability of a measure belonging to that cluster must be greater than 0.5. Detailed results were entered in the statistical protocol⁹. Measures that had probability lower than 0.2 for all clusters were discarded.

5.4 Method A modelling

In Method A, the team examined relationships of all the measures regardless of their total relevance points to the three pillars. The clusters had their cores formed of measures with a high probability but there were also measures that could not belong to any cluster. For this reason, the team did not classify the measures which did not have probability in any cluster higher than 0.2, which included:

- Development of tourism infrastructure, 2.3
- Support to infrastructure for production of innovations, 3.1
- Support to inter-municipal cooperation of small municipalities, 11.4
- European cooperation, socio-cultural activities, 13.2

Table 5 shows the results from cluster analysis of up to ten clusters:

Table 5: Method A cluster analysis

Number of clusters (n)	Silhouette	Fc(U)	Dc(U)
2	0.446253	0.2208	0.3552
3	0.417932	0.2035	0.4224
4	0.364758	0.2481	0.4187
5	0.430186	0.3025	0.3703
6	0,406003	0.3108	0.3786
7	0.322569	0.3687	0.3876
8	0.341200	0.3926	0.3890
9	0.368713	0.4591	0.3758
10	0.397801	0.4806	0.3543

⁹Fuzzy Clustering Report, NCSS 6.0

Table 6 shows the average relevance of a cluster in relation to the reference framework, and also the coordinates of the cluster's centre (centre of gravity):

Table 6: Method A clusters median values

Cluster no.	Measures in the cluster	Relevance (average)	Cluster (centre of gravity)
A1 Higher value added	Support to development of innovations and innovative entrepreneurship 1.1; Reduction of energy consumption in companies by introducing innovations in the production or by substituting ineffective energy sources 1.5; Sustainable development of production and energy consumption (improvement of energy efficiency and use of alternative energy sources) 8.2; Co-operation between companies and research/scientific institutions 1.2.	5.8	2;0;2;2
A2 Transport	Improvement of the quality of transport network and building of the accompanying devices to reduce environmental impacts (noise prevention walls) and to improve the quality of transport from the user's point of view 9.4; Completion of building of the Czech Republic's linchpin network and connection of the regions to this network as well as interconnections within regions 9.3; Prague – improvement of the environment and accessibility 12.2	5.2	1;1;1;2
A3 Education	Modernisation of educational systems to enable reflection of new conditions in the labour market, enhancement of professional qualification of individuals by strengthening lifetime learning 5.1; Support to diversification of the economic structure in rural areas 11.3; Strengthening the links between educational institutions and the world of labour, research and the whole society, development of a genius for entrepreneurship 5.3; Interconnection of the labour market's needs and the study programmes of the educational institutions in order to modernise the study subjects 4.3; Improvement of learning foreign languages, work with information, mobility enhancement and mutual exchange and strengthening of European co-operation 5.4	4.5	2;2;1;0
A4 Diversity and stability	Development of small and medium-size enterprises with the support from both local / regional and national governments 3.5; Stabilisation of settlement in rural areas, sustaining and improving the quality of life of rural population 11.1; Support to business activities in towns, employment, combating unemployment and social cohesion 10.6; Regeneration of some municipal parts in the area of social and economic issues, urban architecture and the environment, with a special attention to be paid to solutions to problems of large housing estate areas 10.7; Introduction of modern management forms in public administration, application of modern methods of quality and efficiency management, evaluating the impact of regulation, reducing administrative burden 7.1	4.5	1;2;1;0.5

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Cluster no.	Measures in the cluster	Relevance (average)	Cluster Centre of gravity)
A5 Accessibility and attractiveness	Development of tourism and health-resorts services 2.1; Support to building of regional and local transport and communication systems, improvement of the regions' accessibility 10.2; Enhancement of infrastructure for entrepreneurship 1.4; Preservation and renewal of cultural and nature heritage as attractors for tourism 2.5; Application of the strategic planning methods and community planning methods 7.2; Municipal infrastructure, its completion and quality improvement, not only in terms of accessibility but also in terms of environmental protection 10.5	4.1	1;1;1;1
A6 Infrastructure	Development of regional airports with emphasis being put on airports with the international statute 9.2; Development of the public transport system that should contribute to reduction of the proportion of the individual personal transport 9.5; Enhancement of environmental infrastructure, especially in relation to accession to the EU (transitional periods) 8.1; European co-operation, environment, prevention of risks and integrated water management 13.3; Building and modernisation of the TEN-T network and related networks, building and development of lower-grade road network, improvement of transport quality and modern management methods, and formation of progressive transport strategies 9.1; Removal of environmental burdens and care for the environment, solution to locally limited problems 10.3	4.8	1;0;2;2
A7 Innovation and communication	Human potential development in the areas of research and innovations 3.3; Quality improvement and enlargement of further education 3.4; Development of the use of information and communication technologies, including access to high-speed internet 9.6; European co-operation, development of economic relationships (especially in tourism), accessibility of and inter-connectedness of small and medium-size enterprises 13.1; Strengthening the links between research / education centres and the business sphere 3.2	2.8	1.5;1;0.5;0

Cluster no.	Measures in the cluster	Relevance (average)	Cluster (centre of gravity)
A8 Social exclusion	Support to equal opportunities and integration of groups that are most disadvantaged in the labour market, especially graduates, elderly citizens, disabled citizens and members of Romany communities 4.2; Facilitating the access to education for all social groups, including marginalised groups 5.2; Social integration of disadvantaged groups, including immigrants 6.1; Support to employment with emphasis on long-term unemployment and unemployment of people who are disadvantaged in the labour market 6.2; Prague – support to development knowledge society, preventing the negative social and economic trends and phenomena 12.1; Prague – strengthening the social cohesion and adaptability of workers 12.3; Solution to social activities on local and regional level, and reduction of the potential for emerging socially pathological phenomena 10.4	2.9	1;2;0;0
A9 Human resources	Human resources development and enhancing qualification of employees in companies 1.3; Development of regional economy 10.1; Support to professional and space mobility of workers and a more intensive emphasis on development of the information society 4.1	5.8	2;2;1;1
A10 Others	Development of accommodation and restaurant services and related infrastructure 2.2; Making the skills and knowledge of ICT work accessible to users in public administration, companies and households 9.7; Creation of tourism products, focusing especially on strengthening comprehensiveness of the products 2.4; Quality improvement of the education and training system in public administration in order to enhance the administration capacity for the development activities 7.3; Improvement of accessibility of the public goods and services 11.2	2.2	1;1;0;0

Cluster A1: “Higher value added” has a high relevance to sustainability, although it has a limited link to the social area. This cluster is about development of knowledge and reduced energy and raw materials consumption which is only possible through innovation and innovative entrepreneurship as well as cooperation between enterprises and scientific research institutions.

Cluster A2: “Transport” has a high relevance to sustainability, with a strong link to the environment (i.e. negative impacts of transport and urban sprawl). Implementation of the measures should do minimum harm to ecosystems stability and their impact on the climate system must be limited. This is of relevance particularly to the big cities (e.g. Prague).

Cluster A3: “Education” has high relevance to sustainability. Although the cluster’s centre indicates a zero link to “ecosystem stability”, it is possible to suppose that only educated people can guarantee such stability.

Cluster A4: “Diversity and stability” has predominant relevance to social stability. Growth of small and medium-size enterprises and the improvement of the quality of life in large housing estates, small towns and villages have reduced the Czech Republic’s vulnerability to the negative impacts of globalisation. This is also connected to the quality and effectiveness of the public administration.

Cluster A5: “Accessibility and attractiveness” is related to the accessibility of regions and microregions that should not affect ecosystems stability. Attractiveness, which is not limited to culture, is a precondition for reasonable development of tourism and health resorts. With right allocation of sources and selection of projects, the inner conflicts can be sufficiently balanced.

Cluster A6: “Infrastructure” includes measures that have a high relevance to sustainability and are preconditions for economic competitiveness, but at the same time may lead to significant and irreversible damage to the ecosystems and landscape. Here it is necessary to balance the economic positives and environmental negatives. Development of international transit transport should correspond to the needs of the national economy. The Czech Republic should not become a transit territory and a reloading area for the Central and Eastern Europe. This cluster contains inner conflicts and it requires discussion about suitable trade-offs and careful optimization of transport infrastructure.

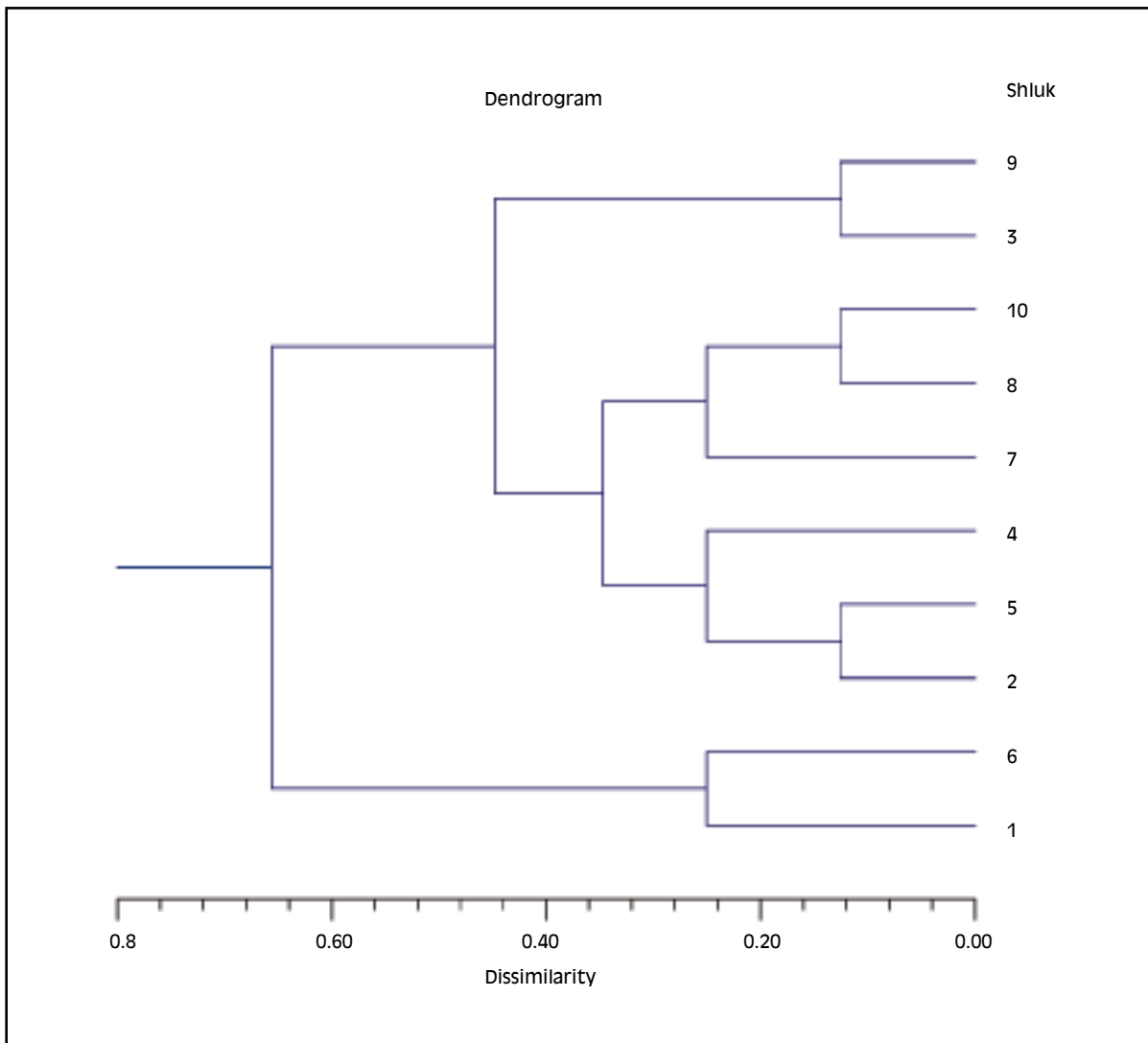
Cluster A7: “Innovation and Communication” is very close to the cluster A1, but with a smaller impact on the areas of resources management and ecosystems stability. This means that the knowledge economy and human resources quality are dominant concerns. Due to the homogenous cluster structure, conflicts were not expected.

Cluster A8: “Social Exclusion” unites measures related predominantly to social stability and prevention of pathological phenomena. In the reference system (T1 to T4), this cluster also has a low relevance to sustainability because it has a negative link to economic competitiveness. The cluster is, despite its cross-section character, homogenous and it does not contain inner conflicts. The search for “trade-offs” among this cluster and the other ones will be of key importance for overall sustainability.

Cluster A9: “Human Resources” has high relevance to sustainability because it proposes a highly qualified, available and mobile workforce not only in Prague and bigger towns. The measures in the cluster are of key importance especially for the development of regional economies and access to information (development of the information society). It has synergy with clusters A1, A A3 and A7.

Cluster A10: “Others” has the smallest relevance to sustainability defined in the three pillars. It contains a rather heterogeneous set of measures. In such a case it is possible to modify the measures.

Organizing the measures into the above clusters, which were more cross-sectional than the original structure of the Czech Republic’s NDP, enables a deeper discussion of synergies and antagonisms among these aggregated policy measures. It was possible to delve deeper by hierarchical clustering, shown graphically here as a dendrogram (see Figure 2). The X axis reflects the distance between clusters’ centres that can be understood as their “dissimilarity” and therefore reflects a weak relationship.

Figure 2: Method A dendrogram of further hierarchical clustering

Higher value added + infrastructure (clusters A1 and A6)

This combination has a very significant relationship to sustainability. A good transport connection to neighbouring countries, i.e. the EU market, may paradoxically alleviate the need to reduce the consumption of raw materials and energy per unit of GDP. Easy freight transport will lead to development of heavy industry and increased export of raw materials. On the contrary, prohibitive transport costs can lead to development of services and production that are less dependent on automobile freight transport (e.g. pharmaceutical industry, specialized engineering, banking industry and tourism, etc.).

Part conclusion: If the Czech Republic is to serve as a transit corridor, reloading area and an assembly hall for imported parts, sustainable development will not be achieved because the impact on the environment and social stability will be very negative (from the negative features of globalization). For these reasons it is more advantageous in the long run to develop the knowledge economy, and research and development as much as possible. Equally important are measures such as development of capacity to protect the environment and infrastructure for innovations, technological development, innovation centres, research applications and technology transfer. The NDP should therefore define clearly on a strategic level the country's future role in transit transport.

“Transport” + “Accessibility and attractiveness” + “Diversity and stability” (clusters A2, A5 and A4)

This combination indicates a principal connection linking completion of local transport infrastructure, accessibility of regions and microregions, and the development of local services and regional economy.

Improvements in transport accessibility increase attractiveness for tourism but also puts pressure on the environment. Another possible negative impact is the increased urban sprawl and the related increase in individual automobile transports. The internal compensation necessarily lies in regeneration and development of medium-sized towns, reconstruction of housing estates and city centres, and also in a consistent application of municipal and territorial plans. It is also possible to include in this combination the infrastructure development for tourism.

Part conclusion: The necessary investments in transport infrastructure have to be balanced by development and regeneration of regional and district centres, protection of natural sites (biodiversity, protection of habitats and migration corridors) and protection of landscapes with historical and cultural value. This requires very high quality spatial planning on national and regional levels.

“Social exclusion” + “Efficient public sector” (clusters A7, A8 and A10)

Both clusters A8 and A10 complement each other well. This means that this wider set of measures should create a sufficient framework for solutions to those problems which are related to social stability.

Part conclusion: Using synergic effects, economical management of the public means should be achieved. A bloated social network, which is financed to the detriment of other needs (e.g. education and retraining) results in communities that are completely dependent on social support (including immigrants). Here it is possible to look for trade-offs through measures that support small and medium-sized enterprises and create jobs even in the economically weak areas.

“Education” + “Human Resources” (clusters A3 and A9)

With globalisation, demand for education and human resources mobility is high. Flexibility of human resources means the worker’s wider ability to accommodate to the labour market. Both clusters’ relevance to sustainability are high and there are positive synergic relations between the measures in both the clusters.

Part conclusion: Without institutions that enable lifelong learning, the skills to receive and process information, and the possibility to use foreign languages, flexibility of human resources will be lacking.

5.5 Method B modelling

In Method B, clustering is only carried out with measures that have total relevance to all fields of sustainability higher or equal to 4. Measures that have lower relevance are considered relatively unimportant to the framework as an assumption.

Quite satisfying results could be obtained for a structure of eight clusters (compared to ten for Method A). In addition, it was possible to create clusters easily. Most of the measures that were previously included in the clusters A7 to A10 for Method A were not included. It became clear that clustering was a robust process in the given conditions, and the clusters’ cores were identical for both Method A and Method B to a wide extent.

Table 7 shows the results from cluster analysis of up to eight clusters:

Table 7: Method B cluster analysis.

Number of clusters (n)	Silhouette	Fc(U)	Dc(U)
2	0.478398	0.2679	0.3401
3	0.464049	0.3221	0.3108
4	0.444787	0.2584	0.3862
5	0.460335	0.3545	0.3121
6	0.385144	0.4124	0.3386
7	0.476963	0.4592	0.2972
8	0.539531	0.4976	0.2743
9	0.445839	0.4924	0.2942
10	0.434795	0.6316	0.2680

Table 8 shows the average relevance of a cluster in relation to the reference framework, and also the coordinates of the cluster's centre (centre of gravity):

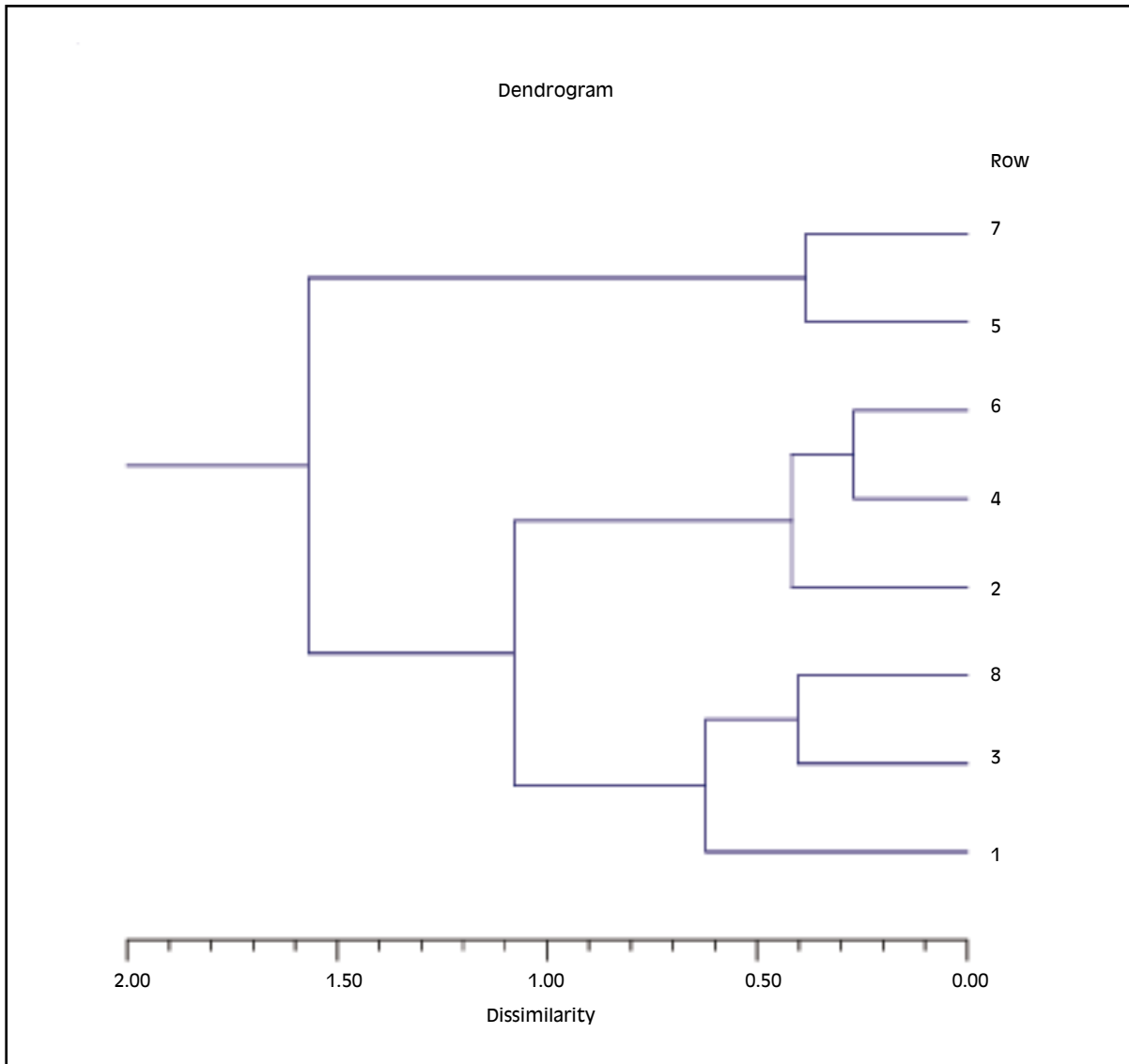
Table 8: Method B clusters median values

Cluster	Proposed intervention	Centre
1B Higher value added	Support to development of innovations and innovative entrepreneurship, 1.1 Reduction of energy consumption in companies by introducing innovations in the production or by substituting ineffective energy sources, 1.5 Sustainable development of production and energy consumption (improvement of energy efficiency and use of alternative energy sources), 8.2 Co-operation between companies and research/scientific institutions 1.2	2;0;2;2
2B Transport	Improvement of the quality of transport network and building of the accompanying devices to reduce environmental impacts (noise prevention walls) and to improve the quality of transport from the user's point of view, 9.4 Completion of building of the Czech Republic's linchpin network and connection of the regions to this network as well as interconnections within regions, 9.3 Prague – improvement of the environment and accessibility, 12.2 Building and modernisation of the TEN-T network and related networks, building and development of lower-grade road network, improvement of transport quality and modern management methods, and formation of progressive transport strategies, 9.1	1;1;1;2
3B Infrastructure (in part)	Development of regional airports with emphasis being put on airports with the international statute, 9.2 Enhancement of environmental infrastructure, especially in relation to accession to the EU (transitional periods), 8.1 European co-operation, environment, prevention of risks and integrated water management, 13.3	1;0;2;2
4B New cluster	Development of tourism and health-resorts services, 2.1 Support to building of regional and local transport and communication systems, improvement of the regions' accessibility, 10.2 Enhancement of infrastructure for entrepreneurship, 1.4 Preservation and renewal of cultural and nature heritage as attractors for tourism, 2.5 Application of the strategic planning methods and community planning methods, 7.2	1;1;1;1

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Cluster	Proposed intervention	Centre
5B Education (in part)	Human resources development and enhancing qualification of employees in companies, 1.3 Development of regional economy, 10.1 Support to professional and space mobility of workers and a more intensive emphasis on development of the information society, 4.1 Modernisation of educational systems to enable reflection of new conditions in the labour market, enhancement of professional qualification of individuals by strengthening lifetime learning, 5.1 Support to diversification of the economic structure in rural areas, 11.3 Strengthening the links between educational institutions and the world of labour, research and the whole society, development of a genius for entrepreneurship, 5.3	2;2;1;0
6B Diversity and stability	Development of small and medium-size enterprises with the support from both local / regional and governments, 3.5 Stabilisation of settlement in rural areas, sustaining and improving the quality of life of rural population, 11.1 Support to business activities in towns, employment, combating unemployment and social cohesion, 10.6 Regeneration of some municipal parts in the area of social and economic issues, urban architecture and the environment, with a special attention to be paid to solutions to problems of large housing estate areas, 10.7	1;2;1;1
7B Education (in part)	Interconnection of the labour market's needs and the study programmes of the educational institutions in order to modernise the study subjects, 4.3 Improvement of learning foreign languages, work with information, mobility enhancement and mutual exchange and strengthening of European co-operation, 5.4	2;2;0;0
8B Infrastructure (in part)	Development of the public transport system that should contribute to reduction of the proportion of the individual personal transport, 9.5 Removal of environmental burdens and care for the environment, solution to locally limited problems, 10.3	0,5;0;1,5;2

As in case of Method A, it was possible in Method B to further aggregate primary clusters and search for interrelations among primary aggregates (see Figure 3).

Figure 3: Method B dendrogram of further hierarchical clustering

This simplified procedure in Method B can bring benefits if used in the initial stages of planning when working with key measures only is desired. In this way, the team can discover essential synergies and compensation effects. In the second phase, it is then possible to revise the appraisal table and accomplish complete assessment according to Method A. For the purposes of SEA only, these methods can also be used by choosing only measures with relevance to the environment.

5.6 Integrated sustainability assessment of NDP

Finally the team carried out integrated assessment of key relationships among the measures and clusters of measures. As the measures had been assessed according to their relevance to the three pillars, those with significant similarity would either cancel each other out or reinforce the effects. It was necessary to examine the relations among the single measures within the clusters first, and to identify those that were critical. We could then strengthen or modify the compensation measures within a cluster or look for similar measures in another cluster that had been assessed as most similar (see Table 9). The measures or their clusters that had the least similarity were the last ones harmonized.

Table 9: Integrated assessment of synergies and trade-offs among clusters

Critical couple	Synergy	Trade-off	Comment
Dematerialized production – Education (human resources)	Positive	Nil	Precondition for post-industrial society.
Transport – Consumption of natural resources and landscape	Negative	Dematerialized production – Education (i.e. change in consumption patterns)	Biodiversity, soil and underground water are considered as non-renewable resources.
Long-distance transport – Social stability (i.e. migration, living space, disparities and	Negative	Dematerialized production - Education	Migration thaws social relationships. Positive correlation social exclusion) exists between migration and long-distance transport. Innovation through education compensates.
Efficient public sector – Social stability	Positive	Nil	This enables “selective” social and immigration policies.
Protection of landscape – Efficient public sector	Positive	Employment – Regional disparity (can be reinforcing or cancelling effect)	Legislation and urbanism.
Transport accessibility – Social stability	Positive	Protection of landscape – Efficient public sector (can be reinforcing or cancelling effect)	Negative impacts on landscape and biodiversity.

5.7 Modelling conclusions

For the NDP, the principal measures that ensure sustainability are investment in innovation, development of new technologies, education, and preparation of human resources. Investments in long-distance (transit) transport are necessary, but they lead to an economy high on energy and raw material use and also high pressure on the natural environment (which can hardly be compensated by end-of-pipe technologies).

An efficient and rational decision-making public administration (in urbanism and legislation enforcement) and the rational allocation of EU funds is very important. Benign forms of tourism, agro-energy biomass, and growth of a knowledge economy can favourably replenish traditional business in rural areas, if the relevant infrastructure is provided. International transit transport; export of energy, raw materials and semi-finished products; an economy with little diversification; and economic immigration seeking benefits from the social state will lead to instability and not sustainable development for the Czech Republic.

Cluster analysis based on conceptual maps for planning and assessment enabled the assessment of individual measures in a rational way from the perspective of synergies, which is the very substance of integrated assessment. However, it was necessary to first create a robust conceptual framework. An unsuitable framework, which can lead to speculative interpretations of the relationships among measures, can be caused by:

- Incorrect choice of the reference fields (T1 to Tn)
- Disagreement in expert assessments and disparity of relevances
- Low relevance of the measures in the first place.

Disagreement in the assessment can be caused by low competence of the expert team or too vague a description of the measures. In such a situation, the experts may project their subjective interpretations and expectations onto the situation. It is however necessary that the experts prepare their initial assessment independently and not influence each other. After that, there should be a discussion about opinions of wide disparity. According to the expert team using this technique experimentally, most of the measures planned in the NDP have a significant relevance to sustainable development. However, the measures need to be, in some cases, defined more precisely and even replenished with a set of conditions for the implementation.

A detailed methodology of the modelling done can be found in Annex I to the report.

6. Gaps, lessons learned and suggestions

The IAP project was the first of its kind to enable discussion throughout a wider spectrum of expertise. Economists, environmentalists and specialists in the area of social issues can now hear the opinions of each other. This project revealed that adequate tools for an effective sustainability assessment are missing, and only comparable with methods used within the strategic environmental assessment (SEA).

The specific objectives of the project were met in general, while there is continuing work for the new NDP 2007-2013. From the procedural point of view a proposal was made to perform integrated assessment incorporating both SEA and socio-economic evaluation for the NDP. There is a tendency by policymakers to limit sustainability assessment to SEA only, due to the prevailing perception that sustainable development is only an environmental corrective for the plans in economic and social areas. This is an undesirable interpretation given the principal understanding of sustainable development as the balance of the three (at least) pillars.

Sustainable development as the priority of the government

The debate on the sustainable development in the Czech Republic is still rather irregular and informal. The National Strategy of Sustainable Development (adopted by the Czech Government in December 2004) has been observed by experts as a political declaration without practical follow-up (e.g. development of an action plan with clear objectives, targets, timelines and responsibilities). In light of this, the IAP project was the first platform to discuss at more concrete level the issues of integration. The project thus generated additional benefit through capacity building. The work also helped to identify potential players and stakeholders in this kind of evaluation. At the same time it led to recognition of limitations and difficulties in undertaking an integrated assessment.

For a discussion of balances and imbalances within the pillars of sustainable development within the NDP, see Annex III.

Follow-up

For practical implementation, the assessment methods must be further tested and developed, with many formal and practical aspects to be processed. A major difference existed between the various methods and tools developed by the researchers and the need for simpler methods required by the practitioners. A position paper, in cooperation with the Ministry of Environment, to outline a strategy for further development of the legal and methodological framework for integrated assessment, should be developed and submitted for consideration to the Government Council for Sustainable Development.

Discussion should also continue among different groups of assessors so that they can learn about each other's methods and their limitations. A crucial limitation was having to define and treat economic and social objectives in a way compatible with the environmental assessment. Such learning discussions will also rationalize the trade-offs among inter-sectoral issues.

Integrated assessment may be applied in the regional context in the future, such as in the Liberec region where simple appraisal techniques for economic, social and environmental impacts of proposed projects already exist.

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Annex I

Detailed methodology of cluster analysis for modelling exercise

Methodology used

The sustainability assessment exercise was done by five members of the project team, most of them participating at the same time in the SEA or socio-economic assessment of the NDP. They were thus familiar with the methodology and the proposal of the reference framework and had worked on the assessments of the relationships of individual measures.

The interventions (measures) that characterize the NDP had been excerpted from the Chapter 3¹⁰ of the draft NDP for 2007-2013. The group of five assessors each gave a score to each measure on their relevance or link to the four global sustainability topics (T1 to T4):

Strength of link

- 0 – there is neither direct nor indirect link
- 1 – there is an indirect or slight direct link
- 2 – there is a strong direct link
- 0.5 and 1.5 are intermediary grades.

What was not evaluated was whether the link was positive or negative. The expert's task was only to judge the strength of the link between the interventions (y axis) and the main sustainability areas (x axis representative of T1 to T4).

Cluster analysis

The experts' scores were transferred into a spreadsheet calculator and interpreted statistically. Medians were used in order to eliminate extreme opinions. Correspondingly, the group consensus was derived from MAD (median absolute deviation), which is a robust analogy to standard deviation.

MAD value

- 0 - at least three experts out of five have the same opinion
- 1 – no consensus or majority opinion
- 0.5 – almost a majority opinion

When there is no majority opinion, the experts participated in collective discussion and individual opinions of were modified on the experts' own will.

An alternative approach is arithmetic mean where marginal views can be shown. This alternative approach leads to coherent scales showing the strength of the relationships and a substantial modification is needed for those measures with no prevailing view. Median or average characteristics of measures obtained in this way were used in the next step for the next step to create a few cross-cutting clusters that contained inter-related measures.

¹⁰ 3.2.4 Priority axes of NDP.

3.2.4.1 PA Strengthening competitiveness of the Czech economy.

3.2.4.2 PA Development of modern and competitive society.

3.2.4.3 PA Environment and accessibility.

The team now created clusters by plotting the centres or the coordinates of their means. This method allowed unbiased discussion about the links (synergic or antagonistic ones) inside large sets of measures. Two methods were used (Methods A and B) to enable fuzzy clustering for different number of clusters ($n= 2$ to 10).

Method A

In this experiment, fuzzy clustering (NCSS 6.0; Cluster analysis; Distance type – Manhattan; Scale type – Range) was applied to the whole set of 53 measures, regardless of their overall relevance to the reference framework. The value of the average silhouettes and parameters, $F_c(U_i)$ should be as big as possible while the values of $D_c(U)$ should be as small as possible

Method B

In this experiment, fuzzy clustering was reserved for those measures with a total relevance higher or equal to 4, which limited the set to 30 measures. Fuzzy clustering (NCSS 6.0; Cluster analysis; Distance type – Manhattan; Scale type – Range) revealed a structure was better defined (with a larger extent of dissimilarity) than that of Method A.

Annex II

Recommendations for public involvement in sustainability assessment

Spirit of Cooperation

Planning processes in public sectors differ from private ones in the level of their openness, because they have a larger number of stakeholders including the public. Therefore, the emphasis is put on communication between the groups of experts that prepare a policy and other expert and consultation groups that are representative of wider societal concerns.

The role of public and interest groups should be active, not as opponents but participants of the planning and assessment process. The spirit of cooperation is important when the individual interest groups may have different concerns.

Key Issues

- A proposal for organizing consultations with key stakeholders and public has the following key issues:
- Compilation of a detailed plan of consultations at the beginning of the process, including, among others: specification of organisations, groups or possibly also individuals concerned; description of usefulness of consultations to the Plan and its integrated assessment; specification of techniques to be used; and individual responsibilities and a schedule.
- Analysing and mapping the interested and concerned groups.
- Suggesting ways of getting the key participants involved.
- Determination of different participation levels and suitable techniques.
- Timing of the consultations, or at what phases of the NDP preparation and its assessment should representatives and the public invited.

Principles of the actual process

- Timely access to information.
- Feasible time framework with respect to the other partners.
- Responsibility of the people in charge to consult their partners as early as possible.
- Rules concerning manipulation and disseminating of information should be specified in advance.

Principles of decision-making

- Where possible, emphasis should be put on consensus and wide acceptance of decisions. This complements the formal approving process.
- The method of deciding the form, content and size of the document should be determined and widely published in advance.

Plan for consultation

At the beginning of the process, a detailed plan has to be compiled to contain the following:

- Specification of the respective interested organisations, groups or possibly also individuals concerned.
- Description of the proposed system of partners consultations and its links to NDP and assessments.
- Steps to be taken when carrying out partnership consultations (conferences, public debates, workshops, inquiries etc.).
- Organizing each step and people in charge.
- Financial budget of the single steps.
- Schedule.

Target groups

- Groups that are directly related to the given document or assessments.
- People taking an active part in programme implementation in practice, such as implementers or direct beneficiaries.
- Groups standing up for the public's interests that are directly related to the programme or assessment (such as environmental or consumer groups).
- People with available necessary expertise, knowledge and competences in the given area.

Way of getting the key participants involved

Ideally, the concerned and interested groups should be involved in all phases of preparation of the NDP and assessments. However, it is advisable, due to time and financial limitations, to select the phases that are most important for the participants' involvement. It is thus necessary to distinguish the levels of involvement for each group:

Delegating decision-making powers to citizens
Common planning or decision-making
Involvement and consulting
Providing information with possible feedback
Providing information

It is recommended to facilitate active participation in the expert working groups as the most appropriate way to involve representatives of the key public government bodies, economic partners and representatives of the civil society. Through these groups they can directly influence the process.

The interested public should be consulted at least in the following phases of the NDP preparation:

- When an analysis or proposal for the strategic goals are finished.
- When a proposal for priorities is finished.
- When a financial plan and implementation scheme are finished.

Consulting the wide interested public serves as an instrument for:

- A wider dialogue about the contents of the programme documents.
- Verification of statements presented by the experts group in a wider session of concerned and interested organizations.

Techniques for consultations with the interested public:

- Opening conference to introduce the process under preparation and explain the purpose, work-out procedures, schedule and possible ways of getting involved, including the system for making comments.
- Public meetings (workshops, roundtables etc.). In each phase, at least two public meetings should be organized.
- Concluding conference when the final results are presented and the ways of managing the programme and getting partners involved are discussed.
- Website and email conferences.

Annex III

Elements of balances and imbalances in NDP

Economic pillar balances

The principal balances in the relationship between the economic pillar and the other pillars which need to be strengthened include:

- A majority consensus in both economic growth and environmental protection.
- The support of research and development with a view to development of new technologies that will help improve the competitiveness of the Czech Republic's economy.
- The increasing willingness of part of the economic sector to engage in voluntary environmental activities (e.g. EMAS, ISO 14 000, the production of environmentally sound products, and voluntary covenants).
- The launch of revenue-neutral environmental tax reform in accordance with the EU, which will support the development of a "value added economy" with low material and energy requirements.
- The development of entrepreneurship in the field of products and services designed to protect the environment, resulting in the creation of new jobs.
- Support for the development of environment-friendly technologies.
- The efficient application of economic instruments in the field of environmental protection (e.g. the elimination of undesirable subsidies, and the initiation of environmental tax reform).
- A majority consensus on the need for further economic growth to satisfy social needs.
- A developed "social infrastructure" (i.e. institutions and mechanisms of health care, social support and pension security).
- A high level of economic activity within the population.

Economic pillar imbalances

The principal elements of imbalance which must be harmonized include:

- A conflict of interests between environmental protection (especially protection of nature and the landscape) and economic development (especially the building of transport infrastructure and commercial buildings), and also between the persistent structure of the economy causing high specific emissions of greenhouse gases and high demand in terms of natural raw materials and the production of waste.
- The radicalisation and polarisation of points of view regarding the relationship between the economy and environmental protection, and the absence of partnership and dialogue.
- The absence of a majority consensus on the need to carry out fundamental reform of social systems.
- The escalation of "internal debt" (e.g. imbalance between the growth of labour productivity and wages).
- Social systems (health care, and pension insurance) are drawing near their economic limits and will cease to be finance-able in the long term.
- The structure of the labour market is not compatible with the needs of the economy (especially the mobility of the work force, flexibility, skills).
- The increase in regional disparities (employment, housing, work force structure, the environment, etc.).
- The preference for a short-term profit-generating services or a processing economy over long-term investments such as investments in the knowledge-based economy.

Environmental pillar balances

The principal balances in the relationship between the environmental pillar and the other pillars which should be strengthened include:

- A majority consensus for both economic growth and environmental protection.
- The development of a “value added economy” with low material and energy inputs.
- The development of businesses in the field of products and services intended for the protection of the environment, resulting in the creation of new jobs, the development and implementation of environmentally sound technology.
- The increasing willingness of a part of the economic sector to engage in voluntary environmental activities (e.g. EMAS, ISO 14 000, the production of environmentally sound products, voluntary covenants).
- An increase in the quality of life by reducing pollution and by active landscaping and “space-shaping” measures (including an improvement in the functions of zoning procedures).
- An intensification of economic incentives for the transition to sustainable patterns of production and consumption.
- The increasing effect of education and training to change patterns of behaviour.

Environmental pillar imbalances

The principal elements of imbalance which must be harmonized include:

- A conflict of interests between environmental protection (especially the protection of nature and the landscape) and economic development (especially the building of transport infrastructure and commercial buildings).
- The radicalisation and polarisation of points of view regarding the relationship between the economy and environmental protection, and the absence of partnership and dialogue.
- A preference for resolving urgent social or economic needs over environmental issues, when the positive effects of resolved environmental issues will become visible after an initial delay.
- Continued lags in modernisation and innovation.

Social pillar balances

The principal elements of balance in the relationship between the social pillar and the other pillars which should be strengthened include:

- The creation of appropriate social and economic conditions for starting and maintaining a family.
- A majority consensus on the need for further economic growth to satisfy social needs.
- Developed social systems (institutions and mechanisms of health care, social assistance and pension security).
- High level of economic activity of the population.
- An increase in the quality of life by reducing environmental pollution and by means of active landscaping and general “space-shaping” measures.
- The development of entrepreneurship in the field of products and services designed to protect the environment, resulting in the creation of new job opportunities (e.g. ecotourism, organic farming).
- The development of rural areas (the development of small business, environmentally sound tourism, reducing the migration of the population to cities).
- An increase in the quality of life by improving the quality and availability of public culture services.

Social pillar imbalances

The principal elements of imbalance which must be harmonized include:

- The economic and social handicap of families with dependent children.
- The absence of a majority consensus on the need for social system reform.
- Social systems (social aid, health care, pension insurance) will approach their economic limits and will cease to be finance-able in the long perspective.
- The labour market does not match economic needs (mainly the mobility, flexibility and skills of the work force).
- The globalization of culture.

IAP team

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