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The social dimension of green growth in the Republic of Macedonia
The social dimension of green growth in the Republic of Macedonia

Ben Kamphuis
René Verburg
Tom Kuhlman
Floor Brouwer
Jolanda van den Berg
Lazo Dimitrov

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Preface

Green growth is a strategy of many countries around the globe to maximise economic growth and development, while reducing pressure on the environment. The concept of green growth aims at promoting the use of green technologies and providing jobs for future generations. However, while green growth strategies aim at sustainable economic growth from an environmental perspective, social impacts might be overlooked. This concern is expressed by the World Bank Report *Inclusive Green Growth; The Pathway to Sustainable Development*, stating that green growth is not inherently socially inclusive. The report, therefore, recommends that green growth policies should not only be economically and environmentally sound, but also inclusive so as to be sustainable.

The Former Yugoslav Republic of Macedonia sets out a roadmap towards sustainable development and the World Bank is supporting the Macedonian government through the ‘FYR Macedonia Green Growth and Climate Change Analytic and Advisory Support Programme’. The programme includes several technical and thematic modules. The World Bank commissioned the Social Module to LEI (Contract 7162070). This module is aimed at analysing the social dimension of Green Growth and raising awareness on this topic among local stakeholders (civil society, municipality agencies, etc.). For that purpose LEI organised a number of Participatory Scenario Development Workshops.

A team of researchers was composed at LEI with expertise in economics, climate change, green growth, rural development and participatory research to prepare and implement the workshops, in cooperation with its Macedonian project partner Terra Consulting.

The current report and related documents on green growth in the Republic of Macedonia will hopefully support the next steps to be taken in this country, and also be a model for other countries to implement inclusive green growth strategies.

L.C. van Staalduinen MSc
Managing Director LEI Wageningen UR
Acknowledgments

This report was written by a joint team from LEI Wageningen UR in the Netherlands and Terra Consulting in the Republic of Macedonia. The LEI team was led by Floor Brouwer, the work in the field was carried out by Ben Kamphuis from LEI and Lazo Dimitrov from Terra Consulting.

Besides the project team, many other persons contributed to the project, and a few words of thanks are called for. The report presents the results of the Social Module of the ‘FYR Macedonia Green Growth and Climate Change Analytic and Advisory Support Programme’ of the World Bank under the leadership of Erika A. Jorgensen, Economic Adviser Poverty Reduction and Economic Management at the World Bank. The authors were grateful to use the draft background papers produced by the research teams of the other project modules.

Furthermore, we gratefully acknowledge the comments and advice provided by World Bank staff, in particular Nicolas Perrin, senior social development specialist and Robin Mearns, cluster leader social resilience.

We also wish to express our thanks to the World Bank Office in Skopje, which, under the direction of Bekim Imeri, organised the inception and national workshops; and also to CeProSARD (Center for Promotion of Sustainable Agricultural Practices and Rural Development) and FFRM (Federation of Farmers in the Republic of Macedonia), which, together with Terra Consulting, organised the regional workshops.

Last but not least, we appreciate the valuable contributions made during the workshops by representatives of regional and national governments, NGOs, local industry, education and research institutes. Without their commitment and open discussions this report could not have been written.
Summary

A green growth strategy in the Republic of Macedonia will have winners and losers across different population groups. Participatory scenario development workshops were held to explore the social dimension of green growth in Macedonia, and to identify measures to cope with them. The work resulted in the following key findings and recommendations.

Key findings (Section 6.6)
- Stricter environmental regulations as part of a green growth strategy will improve the quality of air and water, enhance food safety and hence have a positive impact on the quality of life and health in the Republic of Macedonia.
- A transition towards a green economy will improve working conditions and create new job opportunities.
- Negative effects of changes due to green growth and climate change will be felt most by vulnerable groups such as the elderly, the disabled, women and children and some ethnic minorities.
- Green growth measures increase unemployment in some sectors and push out of workers with a weak position in the labour market. This includes in particular older employees as well as less educated young people, because they may lack the necessary knowledge, skills or flexibility to adapt to the changing conditions in society.
- In a large part of the Republic of Macedonia agriculture remains the major source of employment and income. Farmers are likely to be heavily affected by climate change.

Major policy recommendations (Section 7.1 and 7.2)
- For inclusive green growth, creating employment and decreasing income disparities are imperative.
- Lack of awareness around the green growth concept is a major obstacle for designing and implementing green growth strategies. Sound and timely information is crucial for a successful implementation of green growth strategies.
- In order to motivate society and get the green growth process in motion, the strategy needs to be translated into clearly defined actions in terms of time, costs, benefits and responsibilities.
- A successful introduction of green growth measures requires coherent planning, capacity building and consultation of the relevant public and private stakeholders at local and national level.

**Major recommendations on methodology (Section 7.3)**

- Awareness and understanding of the green growth concept requires the establishment of a platform that allows representatives from various governmental and non-governmental organisations as well as private companies to discuss different options for future development from different perspectives in an open atmosphere.

- The participatory scenario development approach as adopted in this project, is very useful for consultations with key stakeholders at national and local level on strategy development and for translating generic policies into specific measures.

- It is questionable whether this approach is the most suitable method for a public awareness campaign about climate change and green growth, because other methods and media have a much wider reach.

The above findings and recommendations are based on five workshops in the Republic of Macedonia in 2012. The workshops’ results are not necessarily representative for the Republic of Macedonia as a whole, because of the large diversity in climatic, geographic, economic, social and cultural conditions of the country. They provide, however, clear indications of important social aspects to take into account when designing and implementing a green growth strategy for the Republic of Macedonia.

**Climate change and green growth in the Republic of Macedonia**

The Republic of Macedonia is one of the poorer countries in Europe and there are large differences in income, with many Macedonians living in poverty (Section 3.1). Moreover, the country has to cope with climate change (Section 3.3). To address these problems, the government of the Republic of Macedonia is setting out a Green Growth strategy. This strategy is targeted at advancing economic growth without further contributing to climate change, environmental degradation and unsustainable use of natural resources. An essential component of green growth is the social dimension. People react differently to changes in living conditions, due to differences in social, cultural and economic background and their experiences, perceptions and expectations. Inclusive green growth policies take these differences into account. They are not only about employment, income and health for different groups in society, but also
about governance and the role that different social actors should play in advocacy, negotiation and decision-making (Section 6.1).

The World Bank supports the Macedonian government through the ‘FYR Macedonia Green Growth and Climate Change Analytic and Advisory Support Programme’ (hereafter referred to as WB GG Programme). Besides technical and economic modules, the WB GG Programme includes a Social Module aimed at analysing the social dimension of a green growth strategy in the Republic of Macedonia and raising awareness of this topic (Section 1.1).

**Participatory Scenario Development Workshops**

The main goal of the social module of the WB GG Programme was (a) to involve local and regional stakeholders in identifying the major challenges related to climate change and environment in their region, (b) to identify the most vulnerable groups in the community and (c) to jointly explore future development and policy options for a transition from a business-as-usual to a green growth strategy. The project was furthermore aimed at developing and testing a suitable participatory approach for raising awareness about these topics in the Republic of Macedonia (Section 2.1).

For that purpose four participatory workshops were organised, including three regional Participatory Scenario Development (PSD) workshops and a concluding national workshop. An inception workshop preceded these workshops in order to plan the work. Representatives of different organisations and groups in regional society participated in the workshops, including representatives of municipal authorities, local public organisations, trade and industry, business associations, social and cultural organisations, education, research and (inter)national development organisations. At the inception workshop a number of socio-geographic ‘hotspots’ were identified (Section 2.2). In consultation with the World Bank three sites were selected for the regional PSD workshops:
- Municipality of Ilinden, with a focus on transport and energy services
- Municipality of Probistip, with a focus on industry, agriculture and water
- Municipality of Gostivar, with a focus on waste management

**Participatory methods and tools**

The Participatory Scenario Development workshops included four successive steps (Section 2.4):

A. Informing the participants on climate change and green growth.
   - Introduction on the major aspects of climate change and green growth by means of two distinct scenarios.
B. Examining the (social) impact of climate change and green growth in the respective region.
   Elaborating the two scenarios as to their impact in the region, in particular the social impact.
C. Exploring options to cope with negative effects of climate change and green growth measures.
   Searching for viable solutions to mitigate negative effects of climate change and green growth measures.
D. Assessing the feasibility of proposed options and recommendations.
   Formulating recommendations for implementation in the short and medium term by government at different levels.

Two scenarios: from business-as-usual towards green growth (Chapter 4 and 5)
To clarify the rationale and objectives of the green growth measures to the participants of the PSD workshops, two scenarios were presented, viz. a Business-As-Usual (BAU) scenario and a Green Growth scenario. Under the Green scenario, the Republic Macedonia joins the European Union and, therefore, will implement the green growth policies of the EU, which include measures to improve resource efficiency. This is not the case in the BAU scenario. In order to make the scenarios even more distinct, the BAU scenario does not consider any green growth measures. This simplification of possible options for the future into only two scenarios was deemed necessary to stimulate discussions on the social dimensions of green growth and to prevent detailed and time-consuming debates on green growth alternatives. The scenarios used in the social module do not fully coincide with the sector scenarios built in the other modules of the WB GG Programme, because these were still under construction when the social module started. Hence, the LEI research team built provisional scenarios for the relevant sectors, based on the available information from the other teams and using their expertise on green growth and climate change.
Samenvatting

De sociale dimensie van groene groei in de Republiek Macedonië

De introductie van een en groene groeistrategie in de Republiek Macedonië zal onder de verschillende bevolkingsgroepen zowel winnaars als verliezers kennen. Om de sociale dimensie van groene groei in Macedonië te onderzoeken, zijn een aantal workshops georganiseerd. Deze hebben geresulteerd in de volgende uitkomsten en aanbevelingen.

Belangrijkste uitkomsten
- Strengere milieuregelgeving als onderdeel van een groene groeistrategie zal leiden tot een verbetering van de lucht- en waterkwaliteit, een vergroting van de voedselveiligheid, en daarmee een positieve uitwerking hebben op de levenskwaliteit en gezondheid van de inwoners van de Republiek Macedonië.
- De overgang naar een groene economie zal de arbeidsomstandigheden verbeteren en meer banen creëren.
- Kwetsbare groepen, zoals ouderen, gehandicapten, vrouwen, kinderen en bepaalde etnische minderheden, zullen het hardst worden getroffen door de negatieve effecten van groene groei en klimaatverandering.
- De groene groeimaatregelen verhogen de werkloosheid in bepaalde sectoren en verdrijven werknemers met een zwakke positie uit de arbeidsmarkt. Het gaat daarbij vooral om oudere werknemers en laag opgeleide jongeren omdat deze vaak niet over de benodigde kennis en vaardigheden beschikken en zich minder goed kunnen aanpassen aan veranderende omstandigheden.
- In een groot deel van de Republiek Macedonië is landbouw de belangrijkste bron van werk en inkomen. Klimaatverandering zal waarschijnlijk van grote invloed zijn op de landbouw.

Belangrijkste beleidsaanbevelingen
- Om groene groei ook sociaal verantwoord te maken, is het van groot belang om werkgelegenheid te creëren en inkomensverschillen te beperken.
- Een gebrek aan kennis over het concept groene groei kan tot problemen leiden bij het ontwikkelen en implementeren van groene groeistrategieën. Om groene groeistrategieën op een succesvolle manier te implementeren, is een duidelijke en tijdige uitwisseling van informatie cruciaal.
Om de bevolking te motiveren en het groene groeiproces in gang te zetten, is het nodig dat de strategie wordt vertaald in acties waarvan tijdsplanning, kosten, baten en verantwoordelijkheden duidelijk zijn omschreven. Een succesvolle introductie van groene groeimaatregelen vereist een coherente planning, capaciteitsopbouw en overleg tussen relevante publieke en private belanghebbenden op lokaal en nationaal niveau.

**Belangrijkste methodologische aanbevelingen**
- Om het bewustzijn over en de kennis van het groene groeiconcept te verbeteren, is het aan te bevelen om een platform te vormen waar vertegenwoordigers van diverse overheidsorganisaties, ngo’s en private ondernemingen in een open atmosfeer van gedachten kunnen wisselen over mogelijke strategiegewijze voor de toekomst.
- De participatieve benadering, zoals in dit project is toegepast, is zeer nuttig voor overleg tussen sleutelfiguren op nationaal en lokaal niveau over strategieontwikkeling, en voor het vertalen van generieke beleidsmaatregelen naar specifieke maatregelen.
- Deze aanpak is waarschijnlijk minder geschikt voor bewustwordingscampagnes rondom klimaatverandering en groene groei, omdat andere methodes en media een veel groter bereik hebben.

De bovengenoemde uitkomsten en aanbevelingen zijn gebaseerd op vijf workshops in de Republiek Macedonië. Omdat het land grote klimatologische, geografische, economische, sociale en culturele verschillen kent, zijn de resultaten van deze workshops niet representatief voor de Republiek Macedonië als geheel. Ze geven echter wel een duidelijke indicatie van belangrijke sociale aspecten waarmee rekening moet worden gehouden bij het ontwikkelen en implementeren van een groene groeistrategie voor de Republiek Macedonië.

**Klimaatverandering en groene groei in de Republiek Macedonië**
De Republiek Macedonië is een van de armere landen in Europa met grote verschillen in inkomen. Veel Macedoniërs leven in armoede. Het land heeft verder te maken met de effecten van klimaatverandering. Om deze problemen aan te pakken, is de Macedonische regering bezig met het ontwikkelen van een groene groeistrategie. Het doel van deze strategie is de economische groei te bevorderen zonder dat dat bijdraagt aan klimaatverandering, aantasting van het milieu en uitputting van natuurlijke hulpbronnen. Een belangrijk aspect van groene groei is de sociale dimensie: mensen reageren verschillend op veranderingen in hun levensomstandigheden, afhankelijk van hun sociale, culturele en economi-
sche achtergrond en van hun ervaringen, percepties en verwachtingen. Dit soort verschillen dienen te worden meegenomen in het beleid ten aanzien van groene groei. Daarbij gaat het niet alleen om werkgelegenheid, inkomen en gezondheid binnen verschillende groepen in de samenleving, maar ook om hun rol in overleg en besluitvorming.

De Wereldbank steunt de Macedonische overheid middels het ‘FYR Macedonia Green Growth and Climate Change Analytic and Advisory Support Programme’ (hierna ‘WB GG Programme’ genoemd). Het WB GG Programme omvat naast technische en economische modules ook een sociale module, die is bedoeld om de sociale dimensie van een groene groeistrategie in de Republiek Macedonië te analyseren en het bewustzijn over dit onderwerp te vergroten.

Workshops voor participatieve scenario-ontwikkeling
De sociale module van het WB GG Programme had als hoofddoel (a) lokale en regionale belanghebbenden te betrekken bij het identificeren van de uitdagingen met betrekking tot klimaatverandering en milieu in hun regio, (b) de meest kwetsbare groepen in de samenleving te identificeren en (c) de toekomstige ontwikkelingen en beleidsopties voor een overgang van een Business-As-Usual-strategie naar een Groene Groeistrategie te onderzoeken. Verder was het project bedoeld om een geschikte participatieve aanpak te ontwikkelen om de bevolking van de Republiek Macedonië meer bewust te maken van deze problematiek.

Om deze doelen te bereiken, werden er vier workshops georganiseerd: drie regionale workshops en één afsluitende landelijke workshop. Daaraan vooraf werd een workshop gehouden over de aanpak en de planning van het project. Aan de workshops namen vertegenwoordigers van verschillende organisaties en groepen uit de regionale samenleving deel. Zo waren er vertegenwoordigers van gemeentelijke overheden, lokale nutsvoorzieningen, bedrijven, sociale en culturele organisaties, onderwijsinstellingen en van organisaties die zich richten op onderzoek en internationale samenwerking en ontwikkeling. Tijdens de eerste workshop werden een aantal sociaalgeografische ‘probleemgebieden’ in Macedonië geïdentificeerd waar de drie geplande regionale workshops zouden kunnen worden gehouden. In overleg met de Wereldbank zijn de volgende drie locaties geselecteerd:
- Gemeente Ilinden, gericht op transport en energie.
- Gemeente Probistip, gericht op industrie, landbouw en water.
- Gemeente Gostivar, gericht op afvalverwerking.
Participatieve methoden
De workshops bestonden uit de volgende vier onderdelen:

A. De deelnemers informeren over klimaatverandering en groene groei.
   Inleiding over de belangrijkste aspecten van klimaatverandering en groene
groei aan de hand van twee scenario's.

B. De (sociale) impact van klimaatverandering en groene groei in de betreffen-
de regio onderzoeken.
   De twee scenario's verder uitwerken voor de effecten ervan voor de betref-
fende regio, met nadruk op de sociale implicaties.

C. Onderzoeken van de mogelijkheden om verwachte negatieve effecten het
   hoofd te bieden.
   Zoeken naar duurzame oplossingen om de negatieve effecten van klimaat-
verandering en groene groeimaatregelen te beperken.

D. De haalbaarheid van de voorgestelde mogelijkheden en aanbevelingen be-
   oordelen.
   Het formuleren van aanbevelingen voor beleidsmaatregelen op de korte en
   middellange termijn door de overheid op verschillende niveaus.

Twee scenario's: van Business-As-Usual naar groene groei
Tijdens de regionale workshops werden de achtergrond en de doelstellingen van
de groene groeistrategie uitgelegd aan de hand van twee scenario's: een Business-As-Usual-scenario (BAU) en een groene groeiscenario. In het groene groeiscenario wordt de Republiek Macedonië lid van de Europese Unie en geeft dan ook uitvoering aan het groene groeibeleid van de EU. Dit is niet het geval in het BAU-scenario. Om de verschillen tussen de scenario's nog groter te maken,
worden er in het BAU-scenario helemaal geen groene groeimaatregelen getrof-
fen. De vereenvoudiging van de toekomstige ontwikkelingen tot slechts twee
scenario's werd nodig geacht, om de discussies in de workshops over de socia-
le dimensie van groene groei te bevorderen en te voorkomen dat er tijdrovende
debatten over alternatieven zouden worden gevoerd. De in de sociale module
toegepaste scenario's komen niet geheel overeen met de scenario's uit de an-
dere modules van het WB GG Programme, omdat er nog aan deze scenario's
werd gewerkt toen de sociale module van start ging. Daarom heeft het onder-
zoeksteam van het LEI voorlopige scenario's opgesteld voor de relevante secto-
ren. Deze voorlopige scenario's zijn gebaseerd op beschikbare informatie van
de andere teams en de expertise van het onderzoeksteam op het gebied van
groene groei en klimaatverandering.
<table>
<thead>
<tr>
<th>Milieutechnische hotspots</th>
<th>Economische hotspots</th>
<th>Sociale hotspots</th>
<th>Beste plaatsen om te wonen</th>
</tr>
</thead>
</table>

A – Landbouw
E – Energie
T – Transport
I – Industrie
U – Stedelijke gebieden
R – Rurale gebieden
BD – Biodiversiteit
1 Introduction

1.1 Background and purpose of the project

Climate change has a direct impact on people, in their daily work and life. To mitigate the impact of climate change and to support the development of a green economy, the government of the Former Yugoslav Republic of Macedonia (hereafter referred to as the Republic of Macedonia) has set out a roadmap towards sustainable development. The World Bank is supporting the Macedonian government through the ‘FYR Macedonia Green Growth and Climate Change Analytic and Advisory Support Programme’ (hereafter named WB GG Programme). This programme is also supported by the Governments of Sweden and Norway and provides analytic work and non-lending technical assistance.

The WB GG Programme’s objective is to support the Government of the Republic of Macedonia in:

a. assessing the economic costs and benefits of a shift to greener growth, taking into account projected climate change, and

b. prioritising actions identified in the National Strategy for Sustainable Development (NSSD) supplemented by the Programme’s recommendations.

The WB GG Programme is an umbrella programme and covers the following sectors and themes:

- Macro-economic analysis
- Agriculture
- Energy
- Transport
- Water
- Air
- Social dimensions
- Urban issues

More information on the programme can be found on the programmes’ website at www.worldbank.org.mk.

The Social Module of the WB GG Programme is aimed at analysing the social dimension of a green growth strategy in the Republic of Macedonia and raising awareness on this topic. People react differently to changes in living conditions, due to differences in social, cultural and economic background and their experiences, perceptions and expectations. Inclusive green growth policies take these differences into account. It is not only about employment, income and health for different groups in society, but also about governance and the role of different
social actors in advocacy, negotiation and decision-making. The Social Module tried to provide answers on questions such as:

- Which groups in society are most affected by climate change and green growth measures?
- How do they perceive these changes?
- What actions do they take, or are they willing to take, to adapt their living and working situation to the changing conditions?
- What policy measures do they expect from local and national government?

Besides raising awareness and discussing the actual situation in the respective regions, the Social Module of the WB GG Programme was also aimed at testing the suitability of a participatory approach for discussing green growth challenges and options with a large number of stakeholders.

The Social Module has been developed and implemented by a project team from LEI Wageningen UR in the Netherlands, in close cooperation with its Macedonian partner Terra-Consulting and NGOs in the Republic of Macedonia.¹

1.2 Project approach

The Social Module project consisted of a number of subsequent steps: the project started with a review of background information followed by an inception workshop to determine the next steps in the project, in particular the selection of preferable locations for three regional workshops on green growth. The main results of the three regional workshops were presented and discussed in a national workshop. The principal goal of these Participatory Scenario Development (PSD) workshops was to involve local and national stakeholders in identifying the major challenges related to climate change and environment in the Republic of Macedonia and to jointly explore future developments and policy options for a transition from a business-as-usual to a green growth strategy. The timeline of the project activities is sketched in Figure 1.1.

¹ Technical assistance was provided by CeProSARD, Center for promotion of sustainable agricultural practices and rural development, and FFRM, Federation of Farmers in the Republic of Macedonia, Skopje, Macedonia.
1.3 Contents of the report

The PSD methodology used in the Social Module is described in Chapter 2. Chapter 3 provides a summary of the major challenges the Republic of Macedonia is facing with respect to social-economic development, demographic development and climate change. In Chapter 4, the two scenarios that formed the starting point for the discussions in the workshops are described, followed by scenario storylines for the WB GG Programme themes, agriculture, industry, water, energy, transport, waste management, urban issues and rural issues in Chapter 5. Chapter 6 provides a description of the social dimension of climate change and green growth as resulting from the discussion at the PSD workshops. The major recommendations with respect to green growth strategy development and methodology are formulated in Chapter 7.
Participatory Scenario Development

2.1 Methodology

The main goal of the Social Module was to involve national and local stakeholders in the development of a green growth strategy for the Republic of Macedonia. For that purpose Participatory Scenario Development (PSD) workshops were organised, following the methodology described in the World Bank Discussion Paper no. 19, December 2010 ‘Participatory Scenario Development; Approaches for identifying pro-poor adaptation options: Capacity Development Manual’. In this manual, Participatory Scenario Development is defined as:

'a process that involves the participation of stakeholders to explore the future in a creative and policy-relevant way. PSD is used (a) to identify the effects of alternative responses to emerging challenges, (b) to determine how different groups of stakeholders view the range of possible policy and management options available to them, and (c) to identify appropriate public policies and investment support necessary to facilitate effective future actions.'

In an ideal situation, stakeholders’ participation in scenario development is aimed at assessing the assumptions and outcomes of the scenarios as part of a recurrent feedback process to build scenarios that are tuned to the specific features of the region concerned. The social module of the Macedonian Green Growth and Climate Change Programme, however, had a more modest objective, viz. to analyse the social impact of climate change and green growth measures and to explore possible solutions to mitigate negative effects in dialogue with major stakeholders at regional level.

For that purpose five workshops were organised, including an inception workshop, three regional workshops and a concluding national workshop. Representatives of different organisations and groups in the society participated in the workshops, including representatives of municipalities and national government, public organisations, trade and industry, business associations, social and cultural organisations, research and (inter)national development organisations.

The results of the discussions in the workshops are described in Chapter 3 and further. In this chapter, the methodology used in the project is described. In Section 2.2 the methodology for the selection of PSD sites is summarised.
Thereafter, the preparation of the workshops (Section 2.30) the workshops' agenda (Section 2.4) and the methodology (Section 2.5) are described. Recommendations with respect to the PSD methodology are presented in Section 7.3.

2.2 Identification of PSD workshop sites

Macedonia has large regional diversity in climatic, geographic, economic, social and cultural characteristics, which requires quite a number of workshops to provide representative results for the country as a whole. In the framework of the Social Module of the WB GG Programme only three regional PSD workshops were organised. It was important to select the locations of these workshops carefully in order to achieve meaningful results. The selection was carried out in three subsequent steps. The first step was made during the inception workshop in May 2012. This workshop was attended by representatives of various government and non-government organisations. During the workshop, the participants discussed the key economic, social and environmental issues in the Republic of Macedonia, aided by the background material and scenarios developed by the LEI project team. After these thematic discussions, in separate groups and in a plenary meeting, the participants in the inception workshop were asked to mark the environmental, economic and social hotspots in the country on a map. Every group made its own map, based on the knowledge and professional expertise of the participants in the group. This activity resulted in a large number of hotspots spread all over the country. In a plenary session, the group results were discussed in order to identify the main hotspots. Figure 6.1 shows the consolidated results from both the group and plenary mapping sessions.

This map was the starting point for the second step, consisting of further research and consultations by the project team to identify possible locations for the three regional PSD workshops. The project team selected six locations suitable for a PSD workshop. In consultation with the WB project team three sites were selected, in the municipalities of Probistip, Ilinden and Gostivar (see summary in section 6.2).
2.3 Preparation of the PSD workshops

After the PSD workshop sites were selected, the LEI team, jointly with the Macedonian project partner, started preparing the workshops, including the following activities:

1. Contacting relevant NGOs for collaboration in the workshops;
2. Contacting the respective municipal authorities to get their support for the workshops;
3. Selecting facilitators for the workshops;
4. Collecting additional (economic and environmental) information on the municipalities;
5. Developing scenario story lines relevant to the selected sites;
6. Designing the workshop approach, agenda and participatory tools to use;
7. Preparing required workshop materials, including PowerPoint presentations;
8. Making arrangements for meeting rooms, including facilities and catering;
9. Identifying and inviting possible participants, relevant to the central issues of the workshop;
10. Training of facilitators and other co-workers in the workshop.

While the workshops were being prepared, Chapter 4 of the aforementioned WB Manual was used as a guideline and Appendix 2 as a checklist. The time frame for preparing the workshops, however, was much shorter than the time schedule in Table 4.1 in that manual.
Contrary to the approach in the WB Manual, the training of facilitators did not take place several weeks but only a few days before the workshops. In fact, both the LEI experts and the selected Macedonian facilitators had quite some experience in participatory rural development projects. Rather than training, the joint meetings were focused on organising and preparing the workshops under the lead of the LEI expert.

2.4 Workshop duration, agenda and methodology

Workshop duration
The LEI team followed the WB Manual for participatory scenario development. The regional workshops and national workshop, however, were more condensed than the condensed approach presented in the manual. According to the LEI team, a full-day workshop puts people off from participating and requires quite some perseverance from those who are willing to participate. Therefore the workshop duration was reduced to a maximum of six hours, instead of a full-day or two-day workshop as proposed in the WB manual. This allowed for sufficient participation from different groups.

The workshops, then, started at about 9:00 a.m. and were concluded by 16:00 p.m. at the latest. This approach required careful preparation of the event and professional facilitation of the activities during the workshop.

Workshop agenda and methodology
The experiences during the inception workshop taught that it is best to straightforwardly focus the attention during the workshops on the social dimensions of the green growth scenarios in order to prevent the discussions from spreading out in all directions of (current) problems and solutions. In order to involve all people present at the workshop as much as possible in the discussions, an intensive participatory approach was followed, with short introductions by the experts in the Macedonian language followed by group sessions in small groups and feedback meetings. The process was intensively guided by a minimum of three Macedonian facilitators led by a LEI expert.

The sequence of activities and methods was adapted to the topics of the respective workshops. In general the workshops consisted of four successive steps:
A. Informing the participants on climate change and green growth
The project team presented the major aspects of climate change and green growth to the participants by means of two distinctive scenarios, which are explained in Chapter 4. The differences between the two scenarios were illustrated by graphs, timelines and impact chains. Examples of the graphs and impact chains are presented in Section 2.5.

B. Examining the (social) impact of climate change and green growth
The scenarios, explained at national level, were further explored by the participants as to the impact on their region. For that purpose they were asked to draw timelines for possible social, economic and environmental developments under different assumptions. Mind-mapping was used for identifying the social groups that will be affected by these developments and the type of impact. This part of the workshop consisted of one or two sessions in which the participants worked together in groups of about six people, followed by a plenary feedback session to combine the various results of the working groups.
C. Exploring options to cope with negative effects of climate change and green growth measures

After a plenary feedback session to prioritise the negative effects of climate change and green growth measures for specific groups in the region, the participants returned to working in small groups to identify viable solutions to mitigate negative effects of climate change and green growth measures. Brainstorming and mind-mapping were tools used in this session.

D. Assessing feasibility of proposed options and recommendations

In a plenary session, after preparation in working groups, the participants discussed the feasibility of the various options proposed to improve the situation in the region. Ranking methods were used to prioritise the identified problems and proposed solutions. One method was scoring the possible solutions on a combined cost and complexity scale, as presented in Figure 2.3. The problems and solutions were prioritised and integrated into recommendations for the short and medium term for government at different levels.

2.5 Participatory methods and tools

As described above, various methods were used to stimulate the discussions among the participants and to focus the attention on the topic at hand. Well-known tools were used, such as mind-mapping, brainstorming and matrix ranking. In this section three tools are described in more detail, viz. trend lines, impact chains and ranking based on costs and complexity of measures.

I. Trend lines

During the workshop the possible future developments of the Republic of Macedonia were projected in only two scenarios. The LEI team felt this simplification necessary in order (a) to be able to clearly point out the rationale and objectives of the green growth measures to the workshop participants, (b) to stimulate discussions on the social dimensions of green growth and (c) to prevent detailed and time-consuming discussions on various green growth scenarios. To illustrate the differences between the two scenarios, a series of trend lines were presented by the project team, showing the expected developments of various aspects under the different assumptions of the scenarios.

Figure 2.1 shows the trend lines for economic development as presented at the workshop in Probistip and a drawing of one of the working groups. The trend lines show that in the business-as-usual scenario it is assumed that the
mining and heavy industry will continue to grow because of increasing demand and will not be hampered by strict environmental regulations, while investments in the other sectors will decline. In the green growth scenario the mining and heavy industry is expected to slow down and the other sectors will grow as a result of investment in green technology and climate-smart high-quality agriculture.

**Figure 2.1 Example of trend lines for economic development in Probistip**

These trend lines are evidence-based for the developments in the past, but roughly estimated for the future. It is obvious that it is much better to use results of scientific research for this purpose, but these results were not available yet when starting the workshops. Similar graphs have been drawn for many other relevant aspects such as pollution, population growth and migration. The graphs were used as starting point for discussions in the working groups. This approach worked well. At the PSD workshop in Probistip the participants sketched, for instance, trend lines to illustrate their own view on different future developments and as a starting point for discussions on social problems and solutions.
II. Impact chains

Besides understanding the differences between the scenarios, the workshop participants also needed to be aware of the possible impact of climate change and green growth on various aspects of life. For that purpose the impact chains were presented as shown in Figure 2.2. The impact chains also made it possible to structure the workshop discussions.

The impact chain in Figure 2.2 shows that the mining industry in Probistip - and other mining areas - discharges waste water in basins. Contaminated water from these so-called tailings flows into surface water or leaches into the subsoil. In some cases highly polluted water is directly discharged into surface water. These practices lead to high levels of pollutants in rivers in these regions, which are used as sources for drinking and irrigation water. Agriculture itself also contributes to the contamination of ground and surface water as a result of inappropriate farming practices. The health situation in these regions is not only negatively affected through the food chain, but often also directly by unsafe working conditions in industry and agriculture. Besides the health impact chain, this figure shows the employment and income chain. By means of the impact chain, the impact of green growth can be illustrated, on the one hand, by the positive consequences of environmental measures to reduce emissions on water quality, and hence on health, and, on the other hand, by the negative impact on employment and income in case plants need to be closed as a result of these stricter environmental regulations.
Figure 2.2  Example of an impact chain on mining and agriculture in Probistip

Related economy

Mining & Industry

Tailings

Effluents

Sewage systems

Drinking water

Surface water

Groundwater

Irrigation water

Agriculture

Land use

Food product quality

Related economy

Employment

Income

Health

Land use

Related economy

Income
III. Ranking in a four-quadrant cost-complexity diagram

In order to prioritise green growth measures identified by the participants, a two-dimensional scale of complexity and costs was used. ‘Complexity’ refers to the difficulty of implementing the respective measures, while ‘costs’ refers to the investments needed for these measures. In Figure 2.3 a selection of green growth measures is presented in a four-quadrant cost-complexity diagram. The explanation of this diagram is provided in Section 6.4 based on the discussions at the workshop in Ilinden on energy-saving measures. In Section 7.1 the same type of diagram is used for formulating recommendations on green growth strategy development.

<table>
<thead>
<tr>
<th>Easy to implement</th>
<th>Most expensive, need for financial support</th>
<th>Hard to implement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using public transport, cycling and walking</td>
<td>Utilisation of solar energy</td>
<td>Capacity building</td>
</tr>
<tr>
<td>Saving energy (turning off appliances)</td>
<td>Utilisation of renewable energy sources</td>
<td>Revision of education system</td>
</tr>
<tr>
<td>Awareness raising campaigns on climate change, environment and green growth</td>
<td>Thermal insulation of buildings</td>
<td>Changing legislation</td>
</tr>
<tr>
<td></td>
<td>Utilisation of energy saving sensors</td>
<td>Law enforcement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 2.3** Example of a four-quadrant cost-complexity diagram for energy saving measures

Less expensive, no need for financial support
3 The Republic of Macedonia: Current situation and major challenges for the future

3.1 Social and economic development

*National income (GDP)*
The Republic of Macedonia is one of the poorer countries in Europe, with a GDP of about €3,400 per capita in 2010, which is lower than any EU member state but comparable with neighbouring non-EU countries. After the country became independent, its economy initially experienced a steep decline: in 1996, GDP was about 21% lower than in 1990. However, since the late 1990s growth has been fairly substantial, reaching 5% per year in real terms in the years before the global crisis of 2008/09 struck. Since then, the economy is recovering, with growth reaching 4.5% again in the first half of 2011 (World Bank, 2011).

![Annual economic growth of the Republic of Macedonia](image)

**Figure 3.1 Annual economic growth of the Republic of Macedonia**

Source: Eurostat.
Gross fixed capital formation, a measure of efforts directed towards economic growth, has gradually risen from 15% to 20% of GDP during 2000-2007, a respectable figure (State Statistical Office, 2010). Foreign direct investment has also picked up strongly again after the dip in 2009.

Compared with most EU countries, the primary sector is relatively important in the Republic of Macedonia, with 11% of GDP in 2009; most of this came from agriculture, whereas 1% came from mining. The secondary sector takes up 23%, of which 14% is manufacturing.

**Foreign trade**
Macedonia, as befits a small country, has a rather open economy, with 39% of GDP being exported. Exports have performed well, having increased by 22% between 2009 and 2010 (Statistical Yearbook, 2011). The most important trading partners are other countries within the Balkan region, especially neighbouring Bulgaria, Serbia and Greece. Outside this region, Germany is the largest importer of Macedonian products. Nearly all Macedonian exports go to other European countries.

In addition to exports, revenue from transfers by Macedonians abroad are also significant. The current account of the balance of payments runs a modest deficit, which is expected to amount to 5% of GDP over the next few years. Official foreign-currency reserves stand at over 4 months of imports in 2011 (World Bank, 2011). The deficit is financed mainly by foreign direct investment, which has been doing well in recent years - although the current crisis of the eurozone leads to uncertainty in this regard.

**Monetary and financial health**
Both the monetary authority (the central bank) and the fiscal authority (the Treasury) have followed a cautious policy over the years. This has resulted in reasonably low inflation (3.8% per year), and a stable currency: the Macedonian denar was worth 61.5 to the euro in 2009, compared with 61.0 in 1998 (Statistical Yearbook, 2011). The banking sector, too, is in good health: since the banks rely mainly on local depositors, they have weathered the 2008 crisis well (World Bank, 2011). Moreover, the government deficit is very low: in 2010 it was only 2.5% of GDP and is expected to decline further in 2011. In line with the low government deficit, public debt is also moderate: it is expected to increase slightly until 2015, but still remain below 30% of GDP (ibid.). Government expenditure takes up one-third of GDP, which is not excessive by international standards. Reforms are ongoing to improve the efficiency of public spending and therewith its contribution to economic growth. At the same
time, revenues are increasing thanks to improved efforts at tax collection. About 10% of total expenditure consists of capital investment, and there are plans to increase this to 15% in the next few years, thanks to savings from the aforementioned reforms (ibid.).

*Macro-economic prospects*
Due to macro-economic policies followed, the economy is quite healthy. However, with the crisis in the eurozone and the bad economic situation in neighbouring Greece and Serbia (important trading partners), the short-term prospects are highly uncertain. For the longer term, the World Bank has projected an annual growth of 4%. However, any projections beyond 10 years or so cannot be more than informed guesses.

*Income situation*
In sharp contrast to the healthy state of the economic ‘fundamentals’ described above stands the social situation in the Republic of Macedonia. A large and increasing part of the Macedonian population lives in poverty. In 2009 around 27% of the households in the country live below the poverty line of €60 per month for a household of 4 persons; in 2006 that figure was 19% (World Bank, FYR Macedonia Partnership Country Programme Snapshot, 2012). Poverty is higher in rural than in urban areas, as is shown in Figure 3.2.
Income inequality is also very high: the Gini coefficient, which is used as a measure of income inequality, is 0.44 - higher than any other European country, and increasing (Figure 3.3).
Employment

The most important determinant of income is employment. No less than 32% of the Macedonian labour force were unemployed in 2009, a slight decline compared with a few years ago (State Statistical Office: Sustainable development, 2010). Figure 3.4 shows the large discrepancy in unemployment rates between the Republic of Macedonia and the European Union. Unemployment among young people is one of the highest worldwide: at 53.7% in 2010 it is nearly twice the unemployment rate for all ages. Hence, youth employment has become a national priority. This extremely high unemployment is the main factor that causes many Macedonians to seek jobs abroad.

Since the Republic of Macedonia is both an agricultural and an industrial country, these two sectors represent a large share of total employment as compared with many other European countries: 11% and 20%, respectively. Another 9% work in construction and public utilities, whereas the other 60% are employed in services: 22% in trade, transport and catering, 20% in public services and the remainder in other services.

![Figure 3.4 Unemployment rates in the Republic of Macedonia as compared with the EU](image-url)

Economic structure by region
Macedonia is divided into eight regions (see Figure 3.5). There is a movement from the thinly populated regions (Vardar, East and Pelagonija) to the more densely populated ones (Skopje and Polog). Table 3.1 shows the regional economic structure. The Southeast region is the most agricultural one and is dominated by arable farming and vineyards; it is also the region with the most pronounced Mediterranean climate influence. Vardar, East and Pelagonija regions have the most outspoken industrial character, whereas Skopje is dominated by services. There are quite large differences in income between regions: Skopje is by far the wealthiest, whereas the northernmost regions are the poorest, especially the Albanian-dominated Polog region. Growth is highest in the East region, in Vardar and Skopje, and lowest in the Northeast and Southwest regions.

Skopje is the economic engine of the Republic of Macedonia, with about 29% of the total working population in the country (Table 3.2), but that engine does not provide sufficient employment (Table 3.2). Unemployment in Skopje is higher than the Macedonian average of about 34%. In the Northeast region unemployment is even 58%. Unemployment rates are the lowest in the Southeast and East regions.
### Table 3.1: Regional economic characteristics

<table>
<thead>
<tr>
<th>Regions</th>
<th>agriculture &amp; forestry</th>
<th>mining, manufacturing &amp; construction</th>
<th>trade, catering &amp; transport</th>
<th>other services</th>
<th>GDP/capita (1,000 denar)</th>
<th>GDP growth 2000-2009 (% per year) a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vardar</td>
<td>15.5</td>
<td>38.1</td>
<td>18.9</td>
<td>27.5</td>
<td>170</td>
<td>7.6</td>
</tr>
<tr>
<td>Eastern</td>
<td>14.4</td>
<td>38.4</td>
<td>15.0</td>
<td>32.2</td>
<td>149</td>
<td>7.8</td>
</tr>
<tr>
<td>Southwest</td>
<td>8.9</td>
<td>26.4</td>
<td>24.8</td>
<td>39.9</td>
<td>122</td>
<td>5.1</td>
</tr>
<tr>
<td>Southeast</td>
<td>37.9</td>
<td>22.3</td>
<td>16.6</td>
<td>23.1</td>
<td>166</td>
<td>7.9</td>
</tr>
<tr>
<td>Pelagonija</td>
<td>20.1</td>
<td>38.4</td>
<td>14.2</td>
<td>27.3</td>
<td>192</td>
<td>5.9</td>
</tr>
<tr>
<td>Polog</td>
<td>17.0</td>
<td>19.3</td>
<td>18.7</td>
<td>45.1</td>
<td>82</td>
<td>6.5</td>
</tr>
<tr>
<td>Northeast</td>
<td>16.6</td>
<td>27.5</td>
<td>19.1</td>
<td>36.9</td>
<td>92</td>
<td>4.5</td>
</tr>
<tr>
<td>Skopje</td>
<td>1.8</td>
<td>23.3</td>
<td>34.3</td>
<td>40.6</td>
<td>274</td>
<td>7.4</td>
</tr>
<tr>
<td>Total Macedonia</td>
<td>11.2</td>
<td>27.5</td>
<td>25.3</td>
<td>36.1</td>
<td>175</td>
<td>6.9</td>
</tr>
</tbody>
</table>

a) the growth rates are nominal ones, not corrected for inflation.

Source: State Statistical Office, 2010

### Table 3.2: Activity rates for the population aged 15 years and more by region in 2008

<table>
<thead>
<tr>
<th>Working population (15 years and older)</th>
<th>Macedonia</th>
<th>Vardar</th>
<th>East</th>
<th>Southwest</th>
<th>Southeast</th>
<th>Pelagonija</th>
<th>Polog</th>
<th>Northeast</th>
<th>Skopje</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of persons</td>
<td>1,633,341</td>
<td>122,138</td>
<td>152,504</td>
<td>176,191</td>
<td>141,859</td>
<td>195,363</td>
<td>234,365</td>
<td>137,773</td>
<td>473,148</td>
</tr>
<tr>
<td>Participation rate</td>
<td>56.3</td>
<td>57.9</td>
<td>59.2</td>
<td>55.5</td>
<td>70.5</td>
<td>63.6</td>
<td>43.9</td>
<td>59.5</td>
<td>53.1</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>33.8</td>
<td>43.6</td>
<td>20.0</td>
<td>39.3</td>
<td>11.7</td>
<td>34.5</td>
<td>26.4</td>
<td>58.0</td>
<td>37.3</td>
</tr>
</tbody>
</table>

Summary
- Macedonia is one of the poorer countries in Europe, with an average GDP of €3,400 per capita in 2010;
- Around one in five households lives below the poverty line (i.e. €60 per month for a household of 4 persons);
- About one-third of the Macedonian labour force was unemployed in 2009;
- The short-term economic prospects are highly uncertain, due to the Eurozone crisis and the bad economic situation in neighbouring Greece and Serbia;
- For the longer term, the World Bank projects an annual growth of 4%;
- There are substantial regional differences.

3.2 Demographic development

Current state
The current population of the Republic of Macedonia is about 2.1 million people. The demographic situation is relatively favourable, with 71% of the population being of working age, and only 12% over 65 (Statistical Yearbook, 2011). The population is still growing, albeit very slowly at less than 0.2% per year and a decrease in population size is foreseen after 2030 (see Figure 3.6). Since 1990
there has been significant net emigration from the Republic of Macedonia: almost 0.5% of the population per year, which is about 400,000 people. In recent years, emigration has slowed down, albeit only a few thousand people per year (Figures calculated from Statistical Yearbook, 2011). Population growth is therefore at present only slightly lower than natural growth, which, in turn, is determined by three factors:
- total fertility rate (i.e. the number of children born per woman)
- life expectancy
- age structure.

The total fertility rate hovers around 1.5 children per woman at present, which is well below the replacement rate of 2.1 but comparable with neighbouring countries; however, the decline in fertility rate seems to have halted in recent years, after a continuous decline from 4.1 in 1960 to 1.5 in 2004. Life expectancy at birth is 74.6 years, which is lower than in richer countries in Europe (about 78). This means life expectancy is likely to rise further (it has risen from just over 60 years in 1960).

As for the age structure, the population is getting older, which means that in the long term, with fewer women in the fertile age groups, a stable total fertility rate, a slowly increasing life expectancy and a slight migration deficit, population decline is bound to set in.
Concerning the age structure, it may be remarked that as the number of children per woman declines, the dependency ratio (the number of dependents per working person) also goes down, creating an economically favourable situation. The Republic of Macedonia is presently in that position, although not benefiting from it in view of the high unemployment rate. This favourable window of opportunity will close, however, as the number of aged people increases.

*Projection*

The population structure may drastically change in the near future. While the median age was 35 years in 2007, this figure will rise to 45 by 2050. Simultaneously, the fraction of people older than 65 years will increase as well. In 2010 this fraction was about 12%; it will increase to 25% in 2050 (Figure 3.7).

![Projected population structure in the Republic of Macedonia](image)

Summary
- The population of the Republic of Macedonia is expected to stabilise in the coming decades at around 2.1 million people, and to start to decline after 2030;
- Life expectancy at birth is about 75 years, which is lower than in richer countries in Europe (about 78) and is expected to rise;
- Around 70% of the current population is of working age, which is favourable for economic development, but will decline in the future;
- The fraction of people older than 65 years will increase from only 12% in 2010 towards almost 25% in 2050;

3.3 Climate change

Current state
Macedonia has mostly a moderate continental climate, with warm, dry summers and fairly cold winters with occasional snowfall. Average temperature in Skopje is 0.3°C in January and 22.2°C in July. Rain falls throughout the year, with the lowest precipitation in the summer months and the highest in autumn and spring. The country is situated on the boundary between the Mediterranean and the continental climate zones. This, combined with the highly differentiated relief, leads to a number of different climate zones, determined mostly by altitude. The three major climate types are the aforementioned moderate continental climate in most of the country, a mountain climate primarily in the west and a sub-Mediterranean climate in the south-eastern plains. The mountains have cold winters with heavy snowfall and cool summers. The Mediterranean zone has long, dry summers and rainy, mild winters. The boundaries between these zones are fluid, of course, with the Vardar valley experiencing the strongest Mediterranean influence while the continental character increases as one moves from the southeast towards the west and north. Total precipitation is highest in the western mountains and declines towards the southeast. Annual rainfall at Skopje varies from 400 to 600 mm per year. In the mountains the figure is between 900 and 1,300 mm and in the Mediterranean zone it is between 400 and 700 mm (Ristevski, 2010).
Climate projections

Climate change projections depend on the socio-economic scenarios used and assumptions that underlie different climate change models. Hence, there is not one single trajectory for climate change, but a range of possible projections. The IPCC (Intergovernmental Panel on Climate Change) developed four different global scenarios of future change. These so-called SRES scenarios (Special Report on Emissions Scenarios) are briefly described in Appendix 2. These scenarios operate at a global scale, and do not imply a particular development in the Republic of Macedonia or any other single country. They can, however, be used to illustrate what could happen and are therefore used in this analysis, to depict the range of possible changes in temperature and precipitation in the future.

Temperature

In all SRES scenarios, the yearly average temperature will rise. The average temperature increase for 2030 will be between 1.34 and 1.48 °C, depending on the models used and the SRES scenario. This is a much faster increase than has
been observed in recent decades. The average temperature increase differs by season. The largest deviation is found in July and August, where all models in all SRES scenarios project a larger temperature increase than in other months.

Another indicator for the expected climate change is the period (in days) with maximum temperature higher than 35 °C. Figure 3.9 depicts the number of days above 35 °C in the A2 SRES scenario for the time period from 2071 to 2100 in the upper graphs and the difference in these days compared with the historic trend in the lower graphs. The figure shows that, compared with the historic trend, the Republic of Macedonia will face an increase in heat waves, most notably in August. Although the spatial resolution of the graphs is insufficiently
precise to make regional predictions in Macedonia, the change mostly occurs in the central part of the country.

Precipitation
The change in precipitation is much more uncertain than the change in temperature. However, generally speaking the climate models predict for the Balkan, and by implication for the Republic of Macedonia, less precipitation between May and September, less precipitation in autumn and more precipitation between February and April. As a result of climate change, the Republic of Macedonia will face longer and stronger summer precipitation deficits (see right part of Figure 3.10) compared with the deficit that the region is already facing (see left part of Figure 3.10). This figure illustrates a long-term projection for the second half of the 21st century, but shorter-term patterns also show summer rainfall deficits.

The combination of less rainfall and prolonged and more intense heat waves during summer will lead to larger water deficits in summer with negative effects not only during this season but also for building up water reservoirs throughout the year.
the year. Consequently the Republic of Macedonia can expect serious water problems that coincide with higher summer temperatures. This will have an effect on all (economic) sectors and civil society.

Summary
- Macedonia is situated in the transition zone between the Mediterranean and the continental climate zones, which in combination with the highly differentiated relief leads to a number of different climate zones, determined mostly by altitude.
- The average temperature is expected to increase by 1.5 to 2.0 °C in the coming decades (until 2050), depending on the assumptions in the different climate scenarios.
- The number of hot days (maximum temperature higher than 35 °C) will increase substantially (more than 15 days extra), most notably in July and August.
- Macedonia already faces rainfall deficits during summer and these deficits will increase in all climate scenarios because precipitation in the summer period will decrease.
- The combination of higher temperature and less rainfall will cause serious water problems directly during the growing season as well as for building up water reservoirs throughout the year.
- However, higher temperatures and higher precipitation in the spring season may benefit early spring vegetables.
4 Two scenarios for future development

4.1 Introduction

Projections on future developments are highly dependent on knowledge concerning uncertainties of drivers, social changes, consumer behaviour, institutional and policy developments as well as of uncertainties with respect to the physical environment, biodiversity and climate change. This makes clear projections of future changes very difficult, but the available knowledge and expertise makes a structured exploration of various options within certain boundaries possible, preventing unrestrained speculations on future developments (Figure 4.1). In order to combine what is known and what is not, 'storylines' rather than fixed deterministic scenarios are used to present and discuss long-term future developments. In such storylines the major aspects under discussion are worked out, based on the available data and various policy targets, leading to different scenarios for future development.

Source: Monika B. Zurek, Thomas Henrichs (adapted).
The WB GG Social Module project started with desk research, collecting quantitative data to understand the specific social, economic, environmental and climatic situation in the Republic of Macedonia. Detailed quantitative analyses, however, were beyond the scope of this study. For the implementation of the Participatory Scenario Development workshops, it was necessary to have available different scenarios on future development. The PSD workshops were expected to start with a session on challenges caused by climate change and different options for green growth followed by sessions on the social dimensions of these options. In that way the participants in the workshops should be made aware of the challenges caused by climate change and the options for green growth they may think of during the workshop. However, at the start of the workshops, the different sector scenarios of the WB GG Programme were still under construction and an overarching vision was not available either. In order to start the Social Module workshops, the LEI researchers built provisional scenarios for the relevant sectors, based on the available information from the other teams and using their expertise on green growth and climate change. Because of time and budget constraints, the proposed scenarios are not based on extensive use of quantitative data and models. These analyses have resulted in two qualitative lines for the future, a Business-as-Usual scenario (BAU) and a Green Growth scenario, the last one including the EU 2020 policies. This simplification into only two scenarios was deemed necessary (a) to clarify the rationale and objectives of the green growth measures to the participants of the PSD workshops, (b) to stimulate the discussions on the social dimensions of green growth and (c) to prevent detailed and time-consuming discussions on various green growth scenarios at the workshops.

Under the Green scenario, the Republic of Macedonia joins the EU and will, therefore, implement the green growth policies of the EU, which includes measures to improve resource efficiency. This is not the case in the BAU scenario. In order to make the scenarios even more distinct, it is assumed that the BAU scenario does not include any green growth measures, while these are emphasised in the Green scenario. Both scenarios include degrees of uncertainty regarding drivers and developments. The scenarios are not meant to be plausible in themselves, but to clearly represent different pathways for the future, with different policy objectives and measures that appeared useful as starting-points for the discussions in the workshops. For that purpose, the scenarios have been elaborated in storylines for the different sectors and themes of the WB GG Programme to illustrate the impact of a transition towards green growth policies to the participants in the workshops. These storylines are presented in the following chapter.
4.2 Business-as-usual scenario

In the business-as-usual scenario a development is assumed in which no new (significant) green growth policies and measures are undertaken and no adaptation measures on climate change. In summary this scenario includes the following developments:

- The current development of sectors is linearly extended to the future;
- The expected exogenous challenges, such as climate change, energy demand, and demography are included;
- No additional policies are assumed or included, only those presently in force;
- Investments for renewal or replacement in the energy, construction and transport sector are based on conventional technology only;
- No specific green investments are foreseen;
- Accession to the EU, with additional policy demands on the Republic of Macedonia, is not anticipated.

4.3 Green growth scenario

The concept of green growth aims at long-term economic development without aggravating climate change, environmental degradation and unsustainable use of natural resources. The green growth strategy is aimed at adapting to a changing climate, reducing greenhouse gas (GHG) emissions and other pollutants, promoting efficient use of natural resources and preserving biodiversity, and at the same time promoting green innovation and jobs and increasing the role of the biobased economy, i.e. processing agro-raw material for biofuels, pharmaceutics, textile and new bio-medical material. The green growth scenario involves major investments in a ‘cleaner’ economy.

The Green Growth scenario assumes that the Republic of Macedonia will enter the European Union and will implement the EU green growth strategy for 2020. The priorities of this strategy are:

a. Smart growth: improving the performance in education, research and innovation, and digital society.

b. Sustainable growth: building a more competitive low-carbon economy, protecting the environment, developing new green technologies and production methods, improving the business environment and helping consumers to make well-informed decisions.
c. Inclusive growth: developing a high-employment economy, ensuring economic, social and territorial cohesion, creating more and better jobs and modernising labour markets and welfare systems.

These priorities have been elaborated in EU targets and translated into national targets for the member states. In this analysis the targets for the Republic of Macedonia are assumed to be roughly similar to those for the EU:

1. The 20/20/20 climate and energy targets should be met:
   - greenhouse gas emissions should be at least 20% lower than in 1990;
   - renewable resources should provide 20% of the total energy consumption in the EU;
   - the primary energy use should be reduced by a 20% increase in energy efficiency;

2. The unemployment rate in 2020 should be halved, i.e. for the Republic of Macedonia to around 15%; or 75% of the population aged 20-64 years should be employed;

3. The proportion of early school leavers should be under 10%, at least 40% of 30-40-year-olds should have completed a tertiary or equivalent education;

4. The number of inhabitants in the EU at risk of poverty and exclusion should be reduced by 20 million. For Macedonia the percentage of households below the poverty line should then be reduced from 27% to 15%;

5. 3% of GDP should be invested in R&D.

Macedonia has already made significant progress in the direction of greening the economy, as can be illustrated by the following examples:
   - Improvement and extension of water supplies in urban areas, connection of rural settlements to regional and local water supplies;
   - Construction and extension of wastewater collection systems in urban areas and construction of sewerage networks in rural areas;
   - Construction of wastewater collection and treatment in the areas of the three natural lakes, Ohrid, Prespa and Dojran;
   - Establishment of organised waste collection at the municipal level in most urban areas.

However, large investments are required to bring the environmental infrastructure up to the average EU level. For the sake of stimulating the discussions at the PSD workshops, it is assumed that green growth measures are (almost) absent in the BAU scenario, while these are emphasised in the Green scenario.
5 Scenario breakdown by sector

To show the workshop participants the impact of green growth policies, the two scenarios have been elaborated in storylines for the major themes of the WB GG Programme. The following sections start with a short description of the current situation in the respective theme or sector, followed by an outlook under the assumptions of the Business-As-Usual Scenario (BAU scenario) and the Green Growth Scenario (Green scenario). The descriptions and outlooks relate to the situation in the Republic of Macedonia in general and are for a major part formulated in qualitative terms.

5.1 Socio-economic development

As described in Section 3.1, the Republic of Macedonia is one of the poorer countries in Europe. The short-term economic prospects are highly uncertain, due to the Eurozone crisis and the bad economic situation in neighbouring Greece and Serbia, but for the medium term, the World Bank projects an annual growth of 4%. The preliminary findings of the WB GG macro-economic modelling team show a moderating growth to less than 3% towards the end of the period 2010-2050. The real income per capita in the Republic of Macedonia is projected to catch up with EU levels.

Compared with most EU countries, the primary sector is relatively important in the Republic of Macedonia, with 11% of GDP in 2009, in particular agriculture and to a lesser extent mining. The secondary sector takes up 23%, of which 14% is manufacturing. The country will gradually move towards the economic structure of the average EU country, implying a shift from the primary and secondary sectors towards services. Productivity, in particular labour productivity, will increase, amongst other things because the Republic of Macedonia is a technology taker and will benefit from a (global) diffusion of technological progress.

The transport and industry sectors, including the mining industry, are expected to grow, because of a growing regional and worldwide demand. As a result, the socio-economic situation in the East and West regions will improve. However, unemployment will stay relatively high in some regions.

In the BAU scenario, investments will focus on the industrial sector, in particular mining and manufacturing. The growing energy demand will be met by
the construction of conventional coal- or oil-fuelled power plants. Measures will be taken to liberalise the labour market.

In the Green scenario, investments will shift towards renewable energy, energy-saving measures and upgrading of public services, such as public transport, water supply and waste management. There will also be more money available for improving the education system in order to help the young people to develop the competences needed in the green economy and to make education accessible for all population groups, in urban and rural areas as well. This shift towards a more green economy requires structural changes, which will take time, hence leading to a loss of employment in the traditional industries. However, it is expected that in the long term, employment in the Green scenario will increase more than in the BAU scenario.

Green growth, while bringing many advantages, is not without its cost. Because the policies are not aimed single-mindedly at maximising GDP growth in the short term, the increase in GDP is likely to be somewhat lower in this scenario. The investments in this scenario in public services (education, urban planning, public transport) yield their returns over the long haul and moreover induce a deadweight effect which acts as a break on aggregate growth. On the other hand, there are growth-stimulating effects in the green growth scenario as well: reforms which make markets more efficient, in addition to the benefits accruing to participation in the European economic zone. Most importantly, however, a green growth scenario can provide a solid basis for sustainable growth in years to come.

5.2 Agriculture

Agriculture is a very important sector in the Macedonian economy: it accounts for almost 10% of its GDP (compared with 1.4% for the EU). The sector (including agro-industry) occupies 20% of the employed labour force. According to official statistics, there are almost 200,000 farms with about 1.1 million ha of farm land, 500,000 for crops and 600,000 for pasture. In terms of area, the largest crop is wheat, with about 100,000 ha. Other cereals (mainly maize and barley, also some rice) occupy another 100,000 ha. Around 43,000 farmers are growing tobacco, which is the most important export crop. It covers 19,000 ha and the trend in area and production as well is upwards. Wine is the second largest export crop and is grown on about 28,000 ha, mostly in the Vardar and Southeast regions. Vegetable production is also significant: mostly beans and potatoes in open fields (42,000 ha) and tomatoes and cucumbers in plastic tun-
nels and under glass (4,000 ha), mainly for export. Fruits are also grown for export, mainly in hilly areas, at altitudes between 300 and 800 m; they occupy about 14,000 ha. Apples are by far the most important, followed by plums, sour cherries and peaches.

Livestock is mainly kept on small farms, often for subsistence. There is an upward trend in the number of cattle, but the numbers of sheep and poultry are declining.

The expected increase of employment opportunities outside farming will attract labour from the agricultural sector. This will not have a negative impact on agricultural production, because productivity in agriculture is expected to increase too. A possible exodus from agriculture provides even options for benefiting from economics of scale in the sector, creating possibilities for farm enlargement. As a result of the increased farm size and productivity the smaller numbers of farms will be more productive and profitable, leading to higher income for the remaining agricultural households.

It is expected that total agricultural production will expand, in particular the production of tobacco, wine, early vegetables, fruits and dairy. Other products, such as cereals and sheep-rearing, may stagnate or even decline due to their low competitiveness. In the longer term, however, agricultural production will be vulnerable to climate change, especially tobacco, but also irrigated potatoes and tomatoes.

One of the major challenges of the agricultural sector in the Republic of Macedonia is the growing need for irrigation, caused by the expected increasing temperature and decreasing precipitation. There are large irrigation systems in some regions, built in the past, but only a small part is still functioning, due to neglected maintenance. Some regions will face increasing problems with water supply, which will be aggravated by the growing demand from other sectors.

In the BAU scenario, it is assumed that investments in irrigation systems will not get sufficient priority and that the agricultural sector will not take sufficient measures to substantially increase water use efficiency, for instance by renovating irrigation systems and using innovative forms of precision irrigation. The production of some crops (notably tobacco and fruit) will be negatively affected by water shortages.

In the BAU scenario, few restrictions are assumed to be imposed on the use of fertilisers, pesticides and other agro-chemicals, which will lead to increasing pollution of soil, water and air. Biodiversity will be negatively affected by agriculture in this scenario and there are no measures to prevent substantial changes in the landscape.
In the Green scenario, the negative impact of agriculture on the environment will be minimised by promoting erosion control, integrated pest management and drip irrigation, which also allows a more precise targeting of the application of fertiliser and pesticides. These innovations require more efforts in agricultural extension, particularly aimed at small farmers. This will promote the spread of, for instance, good agricultural practices, improved chain management and organic farming.

In the Green scenario, more is invested in the rehabilitation and construction of irrigation systems, as well as in land consolidation programmes to achieve economies of scale in land use and higher productivity, in particular in those areas where small farmers and their children stop farming for a job in the city.

As a result, it is expected that in the Green scenario agriculture in the Republic of Macedonia is moving more towards quality-based agriculture, partly organic agriculture, with better export opportunities than in the BAU scenario. In both scenarios, employment in agriculture will decrease, but in the BAU scenario more than in the Green scenario. However, the transition from the current agricultural practices towards the more green quality-based agriculture requires significant investments in irrigation and land consolidation, in education and extension; this transition also requires strong commitment from the farmers community.

5.3 Manufacturing industry

As mentioned above, the non-agricultural sectors in the Republic of Macedonia are expected to grow in the coming decades. In particular the mining industry has good perspectives, because of a growing regional and worldwide demand. Mining will therefore provide additional employment and income opportunities in the relevant regions. With economic development, the services sector is expected to expand its share of total employment.

In the BAU scenario it is assumed that the regulations against industrial pollution will not be overly strict. As a consequence greenhouse gas emissions and air pollution will increase as well as soil and water pollution by effluents and waste disposal. This can have a negative effect on the health of the local population, directly via contact with dangerous substances, but also indirectly via residues in drinking water and food.

In some areas landscape and biodiversity will be negatively affected by the increase in industrial activities.
In the Green scenario, the industrial sector will be induced to spend more attention (and money) on green growth measures, leading to lower GHG emissions and less pollution.

5.4 Water

In a growing economy, as it is expected for the Republic of Macedonia, the demand for water for all purposes will increase: for domestic and industrial use, hydro-electricity and cooling of other power plants, and irrigation in agriculture. Neglected investments in municipal infrastructure for water supply are driving up the operating cost of these services and this leads to high technical losses in water supply systems, which are among the highest in the region. The water system network in Skopje is losing around 40% of water due to technical and distribution losses.

At the national scale, the water resource appears sufficient for the cooling needs of the energy sector. However, locally stress may occur, particularly at the largest existing thermo-electric plant, at Bitola - and moreover an expansion is planned there (Neumann, 2012).

In the BAU scenario, it is assumed that the investments in water supply systems will not be enough to upgrade the systems sufficiently. With the expected urban expansion this may result in water shortages, especially during predicted heat waves caused by climate change.

In the Green scenario, urban planning is assumed to improve and public services such as water supply will be sufficient to meet the demand of the growing urban population. Maintenance and rehabilitation of existing systems will get priority in order to prevent water loss in the system. In addition measures will be taken to encourage economic use of water in households and industries. For cooling at power plants and industries, this will require closed-cycle systems. Industries will reuse water as much as possible and improve the treatment of wastewater.

As precipitation is likely to decline over the coming decades (particularly in the summer season), water stress in agriculture will become more frequent - the more so since rising temperatures will also increase evapotranspiration. This will lead to an increased demand for irrigation. In the past extensive irrigation systems have been built in the Republic of Macedonia, covering around 124,000 ha, but presently only 22,000 ha are irrigated, because of lagging investments in maintenance of the systems. It is planned to add more than 6,000 ha to the irrigated area by 2030, and almost 30,000 ha more by 2050; howev-
er, irrigation schemes will experience water stress, particularly in the region of Pelagonia (Neumann, 2012).

In the BAU scenario, it is assumed that only part of the irrigation systems will be rehabilitated, resulting in negative impact on the yields, especially for tobacco, fruits and to a lesser extent vegetables.

In the Green scenario, rehabilitation and expansion of irrigation systems will get high priority, in combination with the introduction of irrigation techniques that minimise water use (drip irrigation). The latter measure will be highly necessary in view of the shortage of irrigation alluded to above.

5.5 Energy

The current electricity supply in the Republic of Macedonia is provided primarily by lignite-fired plants (55%), hydro-power (22%) and imports (21%). The larger part of the current power generation capacity needs to be replaced or rehabilitated in the coming years. In addition, an increase of the total primary energy consumption of about 70% is projected towards the year 2050 (WB). The transport, industrial and to a lesser extent the commercial sector show the largest growth of energy demand. The growing demand and replacement of old power plants in the coming years makes a substantial change in the energy supply mix possible. The USAID report Macedonia energy efficiency and renewable energy assessment from 2009 states that the Republic of Macedonia has promising indigenous renewable energy resources. These include hydropower, geothermal energy, biomass energy, solar and wind energy. Existing use of renewable resources in the Republic of Macedonia includes large hydro-electric plants, biomass in the form of firewood and briquettes for household heating, geothermal energy for heating greenhouses, and solar energy for hot water in households.

Macedonia currently has 9 hydropower plants with an installed capacity of 560 MW. Until 2030, 4 more plants with a total capacity of 674 MW are to be built. However, the productivity of this capacity is expected to be 10-15% lower by 2030 (Neumann, 2012). The current low electricity prices fail to fully recover the costs and, therefore, discourage both energy saving by consumers and the use of alternative heat supplies. More rational electricity prices can be implemented only in association with a social safety net for the poor so as to compensate high electricity costs for low-income families.
In the **BAU scenario**, it is assumed that investments in renewable energy sources, such as hydro, solar, wind and biomass, will be limited and the major part of the energy will still be provided by conventional coal-fired power plants, although hydro-power will remain an important energy source, as it is now. This choice will further increase GHG emissions in the Republic of Macedonia.

In the **Green scenario**, the contribution of renewable energy sources will increase, in particular by investments in hydroelectric power plants, leading to a decrease in the use of coal. It is possible that the construction of new hydro-power plants will be hampered by the growing competition for water caused by climate change. The energy policy in the Green scenario will, however, not only focus on large power plants, but also on small-scale energy production, such as energy from biomass and solar energy. With solar panels it is possible to bring energy production into the city and also into the more remote rural areas, by installing solar panels on roofs of houses and other buildings. Raising electricity prices to market level will make the price of renewable energy, such as solar, competitive with fossil fuel prices and will encourage private investment in energy production. Specific policies are needed to make this transition a success, such as feed-in tariffs and other adaptations of the local grid. In the Green scenario the Republic of Macedonia will fully comply with the EU target of 20% energy from renewable sources; this includes all energy, not only electricity.

### 5.6 Transport

Public transport in the Republic of Macedonia has seen a dramatic drop during the transition years, from 164m passengers in 1988 to around 64m today. At the same time, private car movements have increased, contributing to the congestion of city streets and sidewalks (parking). Most cities have not invested in public transport for years, resulting in a depleted public transport fleet and an obsolete infrastructure. In some cities, notably Skopje, significant improvements have been made in recent years, but overall, large investments are needed to upgrade the public transport system.

The limited public transport has a negative impact on the mobility of people, in particular in suburbs and remote rural areas, hampering people in these areas to benefit from employment growth in the cities. In particular the young, the elderly, and the poor who cannot afford private transport are affected by insufficient public transport.

In the **BAU scenario**, it is assumed that investment in the public infrastructure will not be sufficient for meeting the demand. Given the expanding urban
areas, the use of private cars will accelerate. This will lead to significant costs to both the economy and the environment: increase in transportation time, increasing greenhouse gas emissions and air pollution.

In the Green scenario, new investments are made in public transport. The old petrol- and diesel-fuelled public buses are replaced by modern vehicles using electricity or hydrogen power as their energy source. This will reduce emissions and local pollutants considerably. To promote further use of the public transport system, new lines will be opened to connect all parts of the country, including suburbs and remote rural areas.

5.7 Waste management

Municipal solid waste management in the Republic of Macedonia is highly fragmented and inefficient, with a high fixed-cost ratio, low or no profitability, and negative health impact on the public. Running landfills more efficiently from an environmental perspective could translate into greater efficiency from an economic perspective as well. Separation of different types of waste is rare, even hazardous waste is mostly not separately collected and there are no facilities for treating hazardous waste in the Republic of Macedonia either. Medical waste, for instance, is mixed with other waste from hospitals. All types of waste and rubbish are transported to dumpsites all over the country. There is virtually no recycling of waste; around 90% of the waste that enters the municipal waste management systems is dumped at legal or illegal landfills. There is no formal recycling system in place, but there is a burgeoning informal system.

Currently, only 5% of the population in the Republic of Macedonia are connected to a functioning wastewater treatment plant. Most notably Skopje lacks such a system altogether, and raw sewage is simply discharged into the Vardar River. Sewage systems developed before 1990, which are the majority, require major overhauls.

In the BAU scenario, the solid waste management system will not improve much, because of lagging investments in the collection and processing infrastructure. As a result the number of legal and illegal landfills is likely to expand further, with negative effects on greenhouse gases (methane emissions from landfills), continuing pollution of soil and water, resulting in negative health effects for the population in the surrounding area as well as negative effects on ecosystems. In the BAU scenario some investments are expected in sewage treatment, but these are probably not sufficient to reduce waste water flowing directly into rivers.
In the *Green scenario*, it is assumed that solid waste management is improved by recycling and reducing waste volumes. Recycling requires changes in behaviour. With rising prices of many resources, separation of waste materials becomes profitable. In many EU countries such separation is accepted policy, leading to distinct ‘waste lines’ of paper, plastics, metals and organic waste. The latter could be used for power generation as it can be co-fired. Waste management therefore requires a new waste infrastructure with minimal use of landfills. This also leads to lower methane emissions and lower local soil and water pollution. Sewage systems will also be improved, so that less sewage will be discharged untreated into surface water. At the same time, measures will be taken to reduce water use and water losses in households and industries, as discussed above.

### 5.8 Urban issues

According to the TRACE Study (World Bank, 2012), urban areas in the Republic of Macedonia, Skopje in particular, are sprawling, thereby declining in density and coherence. The increase in the number of dwellings is about three times as high as the increase in the number of households, and most new dwellings are single detached homes of four rooms or more. This unplanned sprawling of urban land use, for industries as well as for housing, costs valuable agricultural land and nature areas. It drives up the cost of public service provision, such as water supply and sanitation, public transport, garbage collection and street lighting. As a result these provisions are often inadequate or even absent, in particular in the poorer outskirts of the towns.

In the *BAU scenario*, it is assumed that urban planning will continue to be almost non-existent. The combination of heat waves caused by expected climate change, urban water shortage, insufficient sewage systems and increased private transportation will lead to deteriorating living conditions and health in Macedonia’s urban areas. In particular elderly people will be affected. Since the average age is increasing in the Republic of Macedonia, more people will suffer from these effects in the near future.

In the *Green scenario*, urban planning will get more priority, including the construction of public services such as water and electricity, sewage and water drainage and street lighting. Waste recycling and reduction of wastewater discharge to rivers will get priority in the Green scenario. Improvement of living conditions can be achieved through mitigation of high temperatures during heat waves by green infrastructure within city areas such as trees and parks that
help cooling down local climate conditions. Such areas are also more capable of taking up large quantities of water caused by heavy rains in autumn and melting snow in spring.

## 5.9 Rural issues

Living conditions in the rural areas are closely connected with agriculture. The majority of rural households have a farm or are involved in farm-related activities. Agricultural production in most areas in the Republic of Macedonia will increase, due to new investments and opportunities for upscaling production. Employment in agriculture will decrease, but incomes of rural households will increase - both those remaining as farmers and those finding alternative sources of income. This will result in improved socio-economic circumstances for the rural population. However, new employment will mainly emerge in the urban centres of the Republic of Macedonia, so that people living in the rural areas have to commute or move to the urban centres. Insufficient public transport can, therefore, hamper economic development in the rural areas, in particular the more remote areas.

In general, public services in rural areas such as (drinking) water and power supply, solid and liquid waste management, public transport, health, social services, education and cultural services, are lagging far behind the services in urban areas. In many villages in the Republic of Macedonia, there is no public water service for safe drinking water. The local people depend on surface water or wells, which is not a problem as such, but could be a problem where the water quality is endangered by pollutants from mining, manufacturing or agricultural activities. Often, villages do not have a fully functioning waste management system, leading to illegal dumpsites with negative effects on nature, landscape and the environment. Economic growth will help the national and local governments to invest more in these services in the rural areas.

The health and living situations in some rural areas in the Republic of Macedonia are negatively affected by emissions and effluents from mining and other industries as well as from agriculture. In particular in mining districts, emissions of pollutants have a direct influence on the health of the workers in these industries and the people living in the surrounding areas.

In the BAU scenario, it is assumed that investment in public transport will not be sufficient to meet the demand, so that the rural population has to rely on private transport or needs to move to the cities, in particular Skopje, being the economic engine of the Republic of Macedonia. In particular the poorer people
and the young people have limited possibilities for commuting, so they will stay in their home area or move to the cities. As a result, the remote rural areas of the Republic of Macedonia will benefit less from the expected general economic growth in the country. Consequently, local authorities will have less money for the necessary investments in public services.

In addition the people living in the mining areas or near waste dumps will continue to suffer from pollution of air, water and soil.

In the Green scenario, it is assumed that the government will spend more money on public transport, in order to prevent further migration from the rural areas to the larger cities in the Republic of Macedonia, in particular Skopje. Support to public services in the smaller cities and villages will also help to keep the (younger) people in these areas.

The green waste management approach, as described above, and the stricter regulations for mining and other industries will lead to a reduction in pollutants and contribute to a healthier environment for the rural population.
### 5.10 Summary of scenario story lines

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Climate change impacts</th>
<th>Business as usual</th>
<th>Green growth</th>
</tr>
</thead>
</table>
| Agriculture    | - Growing need for irrigation, caused by the expected increasing temperature and decreasing precipitation  
                   - Negative impact on tobacco, fruits and to a lesser extent vegetables; no negative impact on cereals and potatoes, and effect on wine will be limited; | - Economic growth will probably lead to fewer and larger farms  
                   - Smaller number of farms, higher production of competitive crops, stagnation in other areas  
                   - Insufficient investments in irrigation systems  
                   - Problems in tobacco and fruit sector | - Investment in efficient irrigation systems  
                   - Investment in integrated pest control and efficient use of fertilisers  
                   - Promote legumes in agricultural systems  
                   - Soil and water conservation on rain fed lands  
                   - Land consolidation plans  
                   - Improved agricultural education and extension |
| Manufacturing Industry | - Possible water shortage                                                               | - Increasing employment in industrial and mining activities  
                   - Continuing emissions of pollutants | - Stricter environmental policies leading to closure of polluting industries or installation of pollution-control devices  
                   - Increasing employment in green activities |
| Water          | - Less rainfall and higher evaporation leads to decreasing water reserves  
                   - Increasing demand for water for households, industry and (most of all) agriculture | - Insufficient investments in water reservoirs  
                   - Neglected water losses in water supply systems | - Investments in water reservoirs and water conservation  
                   - Rehabilitation of water supply systems  
                   - Measures for water use reductions in industry and households |
| Energy         | - Less water for hydropower, higher demand for air conditioning | - Replacement of obsolete power stations to conventional coal, new hydro-power plants | - Focus of investments in renewable energies  
                   - Measures for energy saving in industry and households |
<table>
<thead>
<tr>
<th>Sectors</th>
<th>Climate change impacts</th>
<th>Business as usual</th>
<th>Green growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>- None</td>
<td>- Reduction of public transport, increase of private cars</td>
<td>- Investment in new transport system: electric or hydrogen power operated public busses</td>
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<td></td>
<td></td>
<td></td>
<td>- Opening of new bus lines to suburbs and rural areas</td>
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<td></td>
<td></td>
<td></td>
<td>- Measures to support low energy cars</td>
</tr>
<tr>
<td>Waste management</td>
<td></td>
<td>- Lagging investments in solid waste management and sewage system</td>
<td>- More investment in waste recycling and waste reduction</td>
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<tr>
<td></td>
<td></td>
<td>- Continuing pollution of ecosystems</td>
<td>- Decreasing number of landfills</td>
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<td></td>
<td></td>
<td></td>
<td>- Measures to reduce emissions from landfills</td>
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<td></td>
<td></td>
<td></td>
<td>- Improved sewage systems</td>
</tr>
<tr>
<td>Urban issues</td>
<td>- More heat waves in urban areas leading to</td>
<td>- Sprawling of Skopje and lower density</td>
<td>- Control of urban development through urban planning</td>
</tr>
<tr>
<td></td>
<td>- Increasing mortality (the elderly),</td>
<td>- Insufficient and costly public services (water, energy, street lights, waste)</td>
<td>- Investments in waste water treatment,</td>
</tr>
<tr>
<td></td>
<td>- Higher water demand</td>
<td>- Expansion of landfills for solid waste</td>
<td>- Reduction and recycling of solid waste</td>
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<td></td>
<td>- Increased risk of diseases</td>
<td>- Insufficient sewage systems</td>
<td>- Greening city area to reduce heat wave effects</td>
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<tr>
<td>Rural issues</td>
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<tr>
<td></td>
<td></td>
<td>- Declining mobility</td>
<td>- Improved public transport</td>
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<td></td>
<td>- Continuing migration to cities</td>
<td>- Improved public services</td>
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<tr>
<td></td>
<td></td>
<td>- Decreasing (economic) capacity for villages to survive</td>
<td>- Decreasing rural-urban migration</td>
</tr>
</tbody>
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6 Social dimension of green growth

6.1 Introduction

The social dimension of development is an essential component of sustainable green growth. It has two principal aspects, namely (a) a concern for the impact of green growth on different groups within society and (b) the acceptability of the green growth strategy by the public. Aggregate figures on growth hide what may happen to specific groups. Attention is needed for what happens to vulnerable groups, in particular people with low incomes and/or less opportunities for employment. Such groups include some ethnic communities (e.g. Roma), the elderly, the disabled, women and (in some cases) youth. Green growth will not be considered successful if it leaves vulnerable groups worse off. This is why green growth must be inclusive growth: offering opportunities for people to participate in the economy.

The acceptability of green growth strategies is partly a function of their impact on vulnerable groups, but it is also a matter of involving different groups in the decision-making process, and communicating adequately to various layers of society. This is where the methodology of Participatory Scenario Development fits in. It helps to identify the impact of different scenarios on vulnerable groups and to formulate measures that will ensure that those groups will not be negatively affected by green growth. This approach also contributes to the acceptability of green growth strategies by the public.

The scenarios and storylines described in chapter 4 and 5 were used as starting points for discussions and consultations in the project workshops. Five workshops were organised, including an inception workshop, three regional Participatory Scenario Development workshops and a final (concluding) national workshop. Representatives of different organisations and groups in the society participated in these workshops, including representatives of municipalities and national government, public organisations, trade and industry, business associations, social and cultural organisations, research and (inter)national development organisations.

The purpose of these workshops was to involve local and regional stakeholders in:
- identifying the major challenges related to climate change and environment in the region;
- exploring green growth options and solutions;
identifying the key social issues and the most vulnerable groups related to green growth;
- identifying obstacles on the green growth pathways; and
- formulating recommendations for national governmental institutions.

The results of the workshops are summarised in the following sections.

### 6.2 Selection of sites for regional workshops

The project started with an inception workshop to identify the key environmental, economic and social issues in the Republic of Macedonia and possible sites for the regional workshops (May 2012). Representatives of various government and non-government organisations took part in the discussions. The major results are summarised in Table 6.1. The participants identified a number of regions, spread over the country, that have severe environmental, economic and social problems as shown in Figure 6.1.

In consultation with the World Bank team three sites were selected for the implementation of the regional PSD workshops, viz. the municipalities of Probistip, Ilinden and Gostivar, which are marked on the map.

- **Probistip** is a municipality in the Northeast region with about 16,000 inhabitants. This site was selected because of the combination of lack of water for irrigation in agriculture and contamination of water sources by the mining and manufacturing industry.

- The municipality of **Ilinden** is a suburb of the City of Skopje with a population of about 16,000 inhabitants. Ilinden was selected for social issues related to energy availability and public transport.

- **Gostivar** is situated in the western part of the Republic of Macedonia. The number of inhabitants is around 81,000, of whom 67% are Albanian, 20% Macedonian and 10% Turkish. Around two-thirds of the labour force are unemployed. The PSD workshop in Gostivar was focused on the social aspects of waste management.

The PSD workshops in these municipalities were organised in August and September 2012. The results were discussed at a national concluding workshop held in Skopje in November 2012.
<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Environmental dimension</th>
<th>Economic dimension</th>
<th>Social dimension</th>
</tr>
</thead>
</table>
| Agriculture | - Inefficient water use  
- Erosion  
- Decreasing yields  
- Soil & water pollution  
- Decreasing biodiversity  
- GHG emissions | - Many small farms  
- Fragmented farms  
- Insufficient investments  
- (including irrigation systems)  
- Inefficient land use  
- Low income  
- Hidden unemployment | - Age structure  
- Poverty  
- Health problems  
- Social/ethnic tensions |
| Energy | - GHG emissions  
- Air pollution  
- Landscape destruction through open-pit mining | - Outdated power plants  
- Inefficient use of resources  
- Energy prices not market driven | - Dependence on subsidies |
| Transport | - Air pollution  
- GHG emissions | - Declining public transport  
- Increasing private transport (cars) | - Declining access to public transport  
- Increasing isolation of low income groups  
- Health problems |
| Urban issues | - Water scarcity  
- Lack of wastewater treatment  
- Inefficient sanitation services  
- Urban sprawl | - High cost of solid waste management  
- High cost of infrastructure | - Health problems  
- Social/ethnic tensions |
6.3 Workshop Probistip: industry, agriculture and water

**Main characteristics of Probistip**

The Municipality of Probistip is located in the Northeast region of the Republic of Macedonia in the Kratovsko-Zletovska District, at the foot of Osogovo Mountains and close to Zletovska River. It includes 36 cities and settlements with a population of about 16,200 living in 5,100 households.

The most important economic activities in Probistip are mining, a battery industry, clothing industry and agriculture. Because of the mining and manufacturing industry, the employment situation in the municipality of Probistip is positive compared with other regions in the Republic of Macedonia. In 2002, about two-thirds of the total workforce of around 6,400 were employed (66%). The situation with respect to unemployment of young people is also relatively good, but still 26% of the young people between 15 and 30 are unemployed.
The total area of cultivated agricultural land in Probistip is declining. In 2007 it was 8,600 ha and in 2011 it amounted to 6,800 ha. Most of the farms are mixed farms with crop and livestock production. The average farm size is between 1 and 3 ha, often fragmented in a number of small parcels.

Water in Probistip is provided through a central water supply system built more than thirty years ago. In summer, there is often a lack of clean drinking water, caused by the small capacity of the well system, defects in the infrastructure, excessive use and illegal connections.

Irrigation of agricultural land is necessary because of the total rainfall in this region is very low, 460 litre/m². The main source of irrigation water is the Pisca reservoir and the river Zletovica River. The total capacity is not sufficient for irrigating all land.

A major environmental problem in Probistip is the pollution of soil and water with heavy metals caused by the mining and manufacturing industry. The old and new tailing dumps of the mining industry are leaching contaminated water into the underground and surface water. Agricultural land in the villages of Strmos, Neokazi, Petrsino and Buciste is found to have high contents of lead, zinc, copper cadmium and manganese.

Untreated sewage from the towns and villages contributes to the pollution of the rivers in the Municipality, leading to high concentrations of heavy metals and flotation reagents in these rivers. Water from these rivers is used for irrigation of agricultural land. Lead residues in wheat exceed the standard limits for the Republic of Macedonia in 36% of the samples in 2006 and 22% of the samples in 2007.

PSD Workshop results
The workshop in Probistip was held in August 2012 and attended by 28 people, representing different sectors and institutions: agriculture, industry, rural tourism, renewable energy, health, municipality government, ministry of agriculture, forestry and water economy, national extension services and local non-governmental organisations.

The discussions were using an environmental and social impact chain as depicted in Figure 6.2. This diagram shows in what way the mining and manufacturing industry and agriculture influences the health, employment and income of the local population.

The workshop participants discussed the major challenges that the municipality of Probistip is facing and came to the conclusion that without major policy changes, as assumed in the Business-as-Usual scenario, the following developments will take place in Probistip municipality:
- The mining and heavy industry will continue to grow;
- Agriculture production will decline due to higher temperatures, drought, water shortages and decreasing water quality;
- Because of land erosion and soil degradation the agricultural land area will decrease;
- Distortion of biodiversity will lead to further extinction of rare plant and animal species;
- The demand for water will increase, while inefficient use of water will continue;
- The quality of drinking and irrigation water will decline, because of continuation of pollution by the heavy industry and agriculture;
- Health problems will increase because of contaminated drinking irrigation water;
- Average household income and quality of life will decline;
- Consequently, migration will intensify and lead to depopulation in the municipality.
Figure 6.2  Probistip: Social impact chain for agriculture and industry

- Related economy
- Mining & Industry
  - Tailings
  - Effluents
    - Sewage systems
      - Drinking water
      - Surface water
        - Irrigation water
          - Food product quality
  - Employment
    - Income
  - Agriculture
    - Land use
      - Related economy
Using trend lines, as presented in Figure 6.3, the workshop participants discussed various options for future development with respect to economic development, impact on environment and social aspects such as employment, health and migration.

According to the participants the introduction of green growth measures will indeed lead to decreasing pollution by industry and agriculture, to improved quality of drinking and irrigation water and, hence, to fewer health problems. They doubt, however, whether a transition towards a ‘green’ industry can be made, because of the needed funds for investments and required level of knowledge and skills. It is, therefore, uncertain whether employment and income opportunities will increase.

The current workers in the mining and manufacturing industry will be affected by a transition towards a green economy, because they often lack adequate qualifications for the ‘greener’ industry. Additional vocational education and training will be required to support these people in finding new employment in case the current mining and manufacturing plants will be closed down because of stricter environmental rules. In particular elderly employed people (over 50-year-olds) were seen as vulnerable to changes, because they are the first to be fired and they will have difficulties in finding new employment because of inadequate
education, limited knowledge and because they lack the skills required for the new jobs as well as having a low interest in additional training. Young people will also be affected by the assumed changes in a green growth scenario, but the workshop participants expect that they have the knowledge and flexibility to adjust to the new challenges, whether in Probistip, Skopje or somewhere else in the Republic of Macedonia or abroad.

Increasing migration, however, will lead to further depopulation of the municipality, which is considered to aggravate the economic and social problems in the municipality. To prevent such a development, it will be necessary to increase employment opportunities in agriculture and (green) industry.

Agriculture can, indeed, play an increasing role for employment and income generation, assuming that sufficient clean irrigation water will become available to make a shift towards high quality agriculture. However, the workshop participants expect that small-scale farmers are not able to make the transition towards high quality agriculture. They do not have the funds for investments and often lack the required knowledge and skills for good agricultural practices. Additional education, training and knowledge exchange with other countries are ways to adjust farming practices.

Furthermore, rural women were identified as a vulnerable social group in the green growth scenario, in particular because they have less access to jobs than men, partly because of lower education levels but also because of gender inequalities.

In general, poor people were identified at the workshop as a cross-cutting category of people who lack the money to invest in green growth measures and also the attitude and flexibility to adjust to new living conditions.

In the following table, the responsibilities identified during the workshop of national government, municipality government and NGOs as well as of individuals are summarised.
<table>
<thead>
<tr>
<th>Responsible Body/people</th>
<th>Recommended actions/activities on</th>
<th>Medium term (within about two years)</th>
<th>Long term (within about five years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>Promoting campaigns in order to raise awareness of all (vulnerable) groups on climate change, on threats and possibilities for adaptation, and to introduce new green technologies. - Enhancing green growth knowledge through regular and informal education.</td>
<td>- Analysis of green growth scenarios and possible investments in line with it. - Designing a strategy for adaptation of people and sectors to green growth policies. - Designing a support programme for setting up businesses associated with green growth. - Creating financial support for farmers especially for small farmers for adaptation to green growth. - Creating a credit policy favourable for investments linked to green growth. - Tax incentives for new jobs associated with the green growth. - Creating incentives for increasing women’s involvement in green businesses.</td>
<td>- Introducing incentives for the implementing new green growth measures. - Implementing green growth programmes in the educational system. - Financial support to farmers for growing crops that improve soil conditions. - Supporting municipalities in analyses of the local situation and providing assistance in financial support schemes for farmers.</td>
</tr>
<tr>
<td>Responsible Body/people</td>
<td>Short term (starting as soon as possible)</td>
<td>Medium term (within about two years)</td>
<td>Long term (within about five years)</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Municipality            | - Promotion campaign in order to raise awareness of all (vulnerable) groups on climate change, on threats and possibilities for adaptation, and to introduce new green technologies.  
- Appointing specialised staff for promoting green business investments. | - Analysis of green growth scenarios and possible investments in line with it.  
- Designing a strategy for the development of agriculture in Probistip in line with the green growth strategy.  
- Investments in increasing the supply of water for irrigation.  
- Investments in the supply of quality drinking water.  
- Investments in increased rainwater storage capacity to respond to the droughts.  
- Creating incentives for increasing women’s involvement in green businesses. | - Creating investment opportunities in the frame of the green growth strategy.  
- Improving the infrastructure in Probistip.  
- Supporting farmers in settling their problems with respect to land ownership. |
| Individual persons & NGOs | - Promotion campaign in order to raise awareness of all (vulnerable) groups on climate change, on threats and possibilities for adaptation, and to introduce new green technologies.  
- Exchange of experiences with countries with good examples of green growth measures.  
- Making use of advisory services (farmers).  
- Adopting practices and technologies for more efficient irrigation. | - Establishing a Rural Women’s Clubs or other forms of women association.  
- Establishing economic associations of farmers, such as cooperatives and producer groups. | - Growing crops that improve soil pollution.  
- Introducing new varieties that are more resistant to higher temperatures and droughts. |
6.4 Workshop Ilinden: transport and energy

Main characteristics of Ilinden

The Municipality of Ilinden is a suburb of the City of Skopje and consists of twelve settlements with a population of about 16,600 people (2010). Almost 90% of the inhabitants are Macedonian. Although near to Skopje, unemployment in Ilinden is high: about one-third of the working population over 15 years old is unemployed. The construction industry provides most employed (over 50%), followed by the industry (35%). Agriculture provides employment for 5% of the working population of Ilinden.

The income situation in Ilinden as part of the Skopje metropolitan area is high compared with the country average, but lower than the average of Skopje city: in 2009, GDP PPP per capita in Ilinden was USD12,000; in the Republic of Macedonia it was USD6,900 and in Skopje USD15,400.

About 90% of its area is in use for agriculture (9,400 ha), of which about 75% is arable land and 25% pastures and meadows. In recent years the built-up area has been sprawling into the rural area, costing valuable agricultural land and nature area. Part of the change from rural to urban land is planned, but there are many buildings without proper permissions. The declining density and coherence of the new built-up areas raise the costs of public service provision, such as water and energy supply, public transport, sanitation, garbage collection and street lighting. As a result, these provisions are often inadequate, in particular in the poorer outskirts of the towns. The municipality government is changing the practice through new legislation and procedures enabling investors to proceed faster with construction plans and preventing incoherent planning at the same time.

The municipality is well connected with other parts of the country and internationally as well. It is crossed by two international highways and some major domestic roads as well. The main railway line Belgrade-Skopje-Athens passes through the municipality and there are two railway stations in Ilinden. The International Airport ‘Alexander the Great’ is also located in the territory of Ilinden Municipality.

Generally speaking, the public transport system in Ilinden is at an acceptable level. Besides city public buses, there are private bus lines connecting the major parts of the Municipality with Skopje centre and the rest of the country. Only some remote parts of settlements are not within reach of public transport.

The electricity supply in the Republic of Macedonia is provided primarily by lignite-fired plants (55%), hydro-power (22%) and import (21%). The grid covers the entire municipality of Ilinden. There are 5,600 registered connections. The
municipality of Ilinden does not have a public heating supply company. The main sources for heating are wood and oil.

For the water supply the municipality mainly uses a regional water supply system from different wells in the region. Some settlements use local wells. In order to improve the water supply services, a communal enterprise was established in 2008.

**PSD workshop results**
The workshop in Ilinden was held in August 2012 and attended by around 26 people, representing different sectors and institutions: municipality government and public enterprises, national energy agency, private companies and education institutions. The workshop was focused on energy and transport, in particular on the social impact of reducing the use of fossil fuels for energy and transport in order to achieve a reduction in greenhouse gas emissions.

Starting from the storylines presented by the project team, the participants constructed a long list of measures that can help decreasing GHG emission produced with fossil fuel in energy and transport in the municipality of Ilinden, in their everyday life (homes, offices, businesses, industry/factories, public sector, etc). In order to prioritise these green growth measures, they ranked them on a two-dimensional scale of complexity and costs. ‘Complexity’ refers to the difficulty of implementing the respective measures, while ‘costs’ refers to the investments needed for these measures. In Figure 6.4 a selection of green growth measures is presented in a four-quadrant cost-complexity diagram, which should be interpreted as follows.
The easiest and cheapest solutions are the day-by-day green growth activities that people themselves can start immediately, such as walking and cycling instead of taking the car, turning off the light, selection of waste, rational use of water etc. In this category are also awareness raising campaigns that could be initiated by governmental and non-governmental institutions. The second set of measures is also rather easy to implement, but needs intensive investments and financial support, such as thermal isolation of buildings and the installation of solar energy panels. The third set of measures includes a set of solutions which are hard to implement and expensive, such as the construction of solar and wind power centrals and the introduction of electric or hybrid transport means. In order to achieve sustainable results, an integrated approach is necessary with participation of all stakeholders. This fourth set of measures includes capacity building at all levels, measures that need time to change the mindset, the attitude, knowledge and skills of people, as well as the introduction of new legislation and law enforcement.

With respect to the social dimensions of green growth, the workshop participants did not foresee many problems with respect to green adjustments in the public transport system. They expect that the public transport system will be available and (financially) affordable for all groups.

Green energy for electricity and heating, on the other hand, may cause considerable problems for some groups in society, in particular people with a low income, whether unemployed, retired or other people depending on social security services. They cannot afford high energy prices for electricity and heating,
which are expected in the Green Growth scenario as a result of a development
towards market led energy prices aimed at promoting more efficient energy use
and healthy public finance as well. In addition these poor people often live in old
houses or apartments, with obsolete heating systems, which need to be re-
placed by more efficient systems. They need public financial support.

However, the participants in the Ilinden workshop did not only look for financial
solutions, they also asked attention for the low education level of many of
these people. Improved education, vocational training, workshops and public
campaigns are required to support people to find new jobs and to adapt to the
changing situation.

Appropriate support by local and national authorities is absolutely needed for
successful implementation of proposed measures for green growth, regardless
of whether they are aiming at the short, medium or long term.

Information is believed to be crucial for success. Everyone should have easy
access to relevant information on green growth measures, e.g. in education and
public awareness campaigns. Timely information is needed on the benefits of
available funds aimed at promoting green growth measures. For that purpose,
the workshop participants noted that training of municipality staff is required so
that they are capable of informing local people about the possible green growth
measures, related costs and benefits and possible financial support.

The participants in the workshop underlined the need for organised action of
all entities at local level involved in the process for promoting green economy in
order to ensure social cohesion, good governance and the involvement of the
various social actors in the decision making process. Only in that way it will be
possible to implement the green growth agenda at local level in the Republic of
Macedonia.

6.5 Workshop Gostivar: waste management

Main characteristics of Gostivar

The Municipality of Gostivar is situated in the western part of the Republic of
Macedonia, in the upper part of Polog Valley. The municipality consist of one
town and 30 villages. The number of inhabitants is around 81,000, of which
67% are Albanians, 20% Macedonian and 10% Turks. According to the official
statistics, around two-thirds of the working population of around 50,000 people
do not have regular employment. About one-third of the unemployed are young-
er than 30 years old. In 2010, the average GDP per capita in Gostivar was
about half of the average Macedonian income of €3,400. Because of the lacking employment opportunities many citizens of Gostivar live and work abroad.

The economy in Gostivar is characterised by small and medium enterprises. There are only a few companies with more than a hundred employees and around fifty with more than ten employees.

The most important employers are the municipality administration and enterprises, in particular the municipality hospital and communal enterprise 'Komunalec', and the hydro-power plant 'Mavrovo'. Another source of employment is tourism. Gostivar municipality is located in a mountainous area. The area around the Mavrovo lake, which was created in 1947 to produce hydro energy, is a National park and a well-known tourist resort with skiing facilities in winter.

Although the Field Polog is a fertile plain, agriculture is a very small part of the local economy. The total utilised agricultural area in Gostivar is about 5,100 ha of which 3,500 ha for crop production, mainly for cereals (1,900 ha) and fodder crops (800 ha), and 1,600 ha of meadows and pastures.

The most important transit traffic connections are the main road Skopje-Ohrid (M-4), the regional road Gostivar-Debar-Ohrid and the railroad Skopje-Kicevo. Skopje Airport is at about 90 km and Ohrid Airport at approximately 90 km. Generally speaking, the public transport system in Gostivar is at an acceptable level. Gostivar has frequent bus connections with Ohrid and Skopje. Some remote settlements are not within reach of public transport.

The weak local economy is the main reason for the poor infrastructure and public services in the municipality. The road network is not well maintained, sewage systems are absent or not well functioning in some areas and the waste disposal system does not function well.

Waste disposal in Gostivar is governed by the municipal company, PE Komunalec-Gostivar, which collects the solid waste in the municipality. Seven villages are not serviced, due to lack of collecting vehicles and the limited ability in these villages to pay the required fees. Only about 50% of the users of the services for waste disposal pay fees, resulting in lacking maintenance and replacement of facilities and vehicles. Approximately 70% of the households are included in the collection system. Solid waste from schools is collected two times per week and medical waste from the hospital daily. Medical waste, including infectious waste, is not separated; all rubbish from the hospital goes to the landfill near the town and is buried there.

Except for PET plastic bottles, there is no organised collection of sorted waste materials in Gostivar. There is, however a fairly extensive informal recycling sector in operation, mostly run by Roma. They collect plastics, paper,
cardboard, metals, appliances etc. along the streets and sell the stuff to scrapyards or private companies.

The sewage network in the town of Gostivar is a mixed system, built between 1968 and 1970. It consists of around 33 km of pipes. About 65% of the households and other buildings are connected to the network. The sewage, however, is discharged untreated in the Vardar as it is all over the Republic of Macedonia, including Skopje.

PSD workshop results
The workshop in Gostivar was held in September 2012 and attended by around 20 people, mainly representing the municipality administration, the municipality enterprise Komunalec and private recycling companies, since the workshop was focused on solid waste management.

The discussions were held using an impact chain as depicted in Figure 6.5.

This diagram shows in what way the rubbish and sewage water from households and industry, as well as manure and other pollutants from agriculture, influences the health, employment and income of the local population.

The workshop participants identified numerous problems with respect to the waste management system in Gostivar: it does not cover the entire municipality; all rubbish is dumped unsorted and untreated in the nearby landfill; no measures are taken to prevent soil, air and water pollution; transport means are obsolete; legislation is not up to date and education is missing. The major cause is lack of finance.
Figure 6.5: Social impact chain for waste management

- **Drinking water**
- **Irrigation water**
- **Product quality**
- **Surface water**
- **Groundwater**
- **Effluents**
- **Waste water sewage systems**
- **Sanitation services**
- **Employment**
- **Income**
- **Health**
- **Agriculture**
- **Rubbish to dump sites**
- **Manure etc.**

- **Drinking water** leads to **Product quality**
- **Irrigation water** leads to **Surface water** and **Groundwater**
- **Surface water** leads to **Effluents**
- **Effluents** lead to **Waste water sewage systems**
- **Sanitation services** connects to **Employment** and **Income**
- **Health** connects to **Employment** and **Income**
- **Agriculture** connects to **Sanitation services**

The diagram illustrates the social impact chain of waste management, showing how different factors are interconnected.
During the following sessions, the workshop participants identified many options for improvement making use of the waste management pyramid as depicted in Figure 6.6. The situation in Gostivar is actually that bad that, according to the workshop participants, large investments are needed to solve the problems, such as new trucks and new facilities at the dumpsite. They also mentioned measures that do not need much financial support, such as the promotion of reducing, reusing and recycling waste, for instance through lessons at primary and secondary schools and public campaigns. An example is the project ‘We Are All In The Circle!, a PET selection and collection project at high schools in Gostivar.

Figure 6.6 Waste management pyramid

During the workshop, there was not much attention for the social aspects of improving the waste management system in Gostivar. According to the participants, all inhabitants of Gostivar will enjoy the benefits of an improved waste management system in their municipality, although there are some issues that need attention. Some people and businesses will have financial benefits through improved recycling activities, but it is expected that the people who are currently sorting and collecting material, such as plastics, paper and metals, for reuse or recycling, will lose their income source, when recycling becomes a formal
business operation. It is also expected that the inhabitants of Gostivar need to pay higher fees for the improved waste management system, which may cause problems for poor people. As many people in Gostivar have no regular job or other source of income, the increasing costs may jeopardise the introduction of improved waste management. Additional funding is required.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Recommendation</th>
<th>Responsible body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear situation with respect to responsibility of different public</td>
<td>- Introduction of clear regulations and measures, including good technical documentation</td>
<td>- The Government</td>
</tr>
<tr>
<td>agencies regarding local infrastructure</td>
<td></td>
<td>- Municipalities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Public enterprises</td>
</tr>
<tr>
<td>Lack of adequate knowledge and skills of staff of public enterprises</td>
<td>- Improvements in related legislation</td>
<td>- Public enterprises</td>
</tr>
<tr>
<td></td>
<td>- Training and knowledge transfer from more experienced enterprises</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Introduction of competition by private enterprises</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Liaison of public and private enterprises (Public Private Partnership)</td>
<td></td>
</tr>
<tr>
<td>Insufficient (financial) support from the Ministry of Environment and</td>
<td>- Improvement of communication among MOEPP, municipalities and business sector</td>
<td>- Municipalities</td>
</tr>
<tr>
<td>Physical Planning (MOEPP)</td>
<td></td>
<td>- MOEPP</td>
</tr>
<tr>
<td>Poor enforcement of regulations for waste management</td>
<td>- Improved communication with the public, including promotion activities, incentives, awards and stricter</td>
<td>- Municipality</td>
</tr>
<tr>
<td></td>
<td>control as well</td>
<td></td>
</tr>
<tr>
<td>Lack of mechanisation and equipment in waste management</td>
<td>- Procurement of necessary equipment</td>
<td>- Municipality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Public enterprise</td>
</tr>
<tr>
<td>Lack of awareness of the benefits of waste reduction, reuse and</td>
<td>- Raising public awareness (e.g. via a recycling park)</td>
<td>- Municipality</td>
</tr>
<tr>
<td>recycling</td>
<td></td>
<td>- NGOs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Schools/kinder gardens</td>
</tr>
</tbody>
</table>
The workshop concluded with formulating a number of recommendations with respect to the most pressing issues according to the participants, such as unclear defined responsibilities of different public agencies, lack of knowledge and skills, financial problems, weak law enforcement and lack of awareness. The recommendations are described in Table 6.4.

6.6 Synthesis of workshop results

In this section the results of the project workshops are integrated. Besides the above reported results of the three regional PSD workshops, the results of the national concluding workshop are incorporated. The national workshop was held in Skopje in November 2012. The specific goal of the national workshop was to validate the results of the regional workshops and to assess the sustainability of the green growth options and solutions that have been put forward in the regional workshops.

It might be clear that five workshops cannot provide representative results for the entire Republic of Macedonia, because of the large diversity in climatic, geographic, economic, social and cultural characteristics of the country. Furthermore, the PSD process has limitations of its own, due to the interactive approach in which participants and facilitators are influencing each other’s opinions and preferences. However, the findings of the workshops described below provide clear indications on which social aspects to take into account when designing and implementing a green growth strategy for the Republic of Macedonia. The related policy recommendations formulated at the workshops are included in the following chapter.

Negative effects of changes due to climate change and green growth measures will be felt strongest by vulnerable groups such as the elderly, the disabled, women and children and some ethnic minorities. In most cases these people have a low income, often depending on social security services. This group has a high share of unemployment, among them in particular some ethnic minorities, such as the Roma, and rural women as they have less access to jobs, partly because of lower education levels, but also because of ethnic and gender inequalities.

Upgraded public services, as foreseen in the green growth scenario, may cause considerable problems for these groups of people, because they cannot afford higher energy prices for electricity and heating, or higher public transport fees. They often live in old houses or apartments, with obsolete heating sys-
tems with relatively high heating costs. They do not have the resources to change towards alternatives such as energy saving appliances. Consequently, these groups will be affected negatively by the introduction of a green economy, which is aimed at promoting both efficient energy use, public transport and waste management and healthy public finance as well, through market-led pricing. According to the workshop participants, these groups need public support, directly by increased welfare benefits or other compensatory measures.

Stricter regulations to reduce GHG emissions and other pollutants, as inherent in a green economy, will enhance quality of life in the Republic of Macedonia. One of the issues discussed in the PSD workshops was waste management. Municipal solid waste management in the Republic of Macedonia is highly fragmented and inefficient. Separation of different types of waste is rare; even hazardous waste is usually not collected separately and there are no facilities for treating hazardous waste in the Republic of Macedonia either. Medical waste, for instance, is mixed with other waste from hospitals. All types of waste and rubbish are transported to dumpsites all over the country, both legal and illegal. Most landfills are below the level of environmental standards and are a threat to the environment, through pollutants directly running off into surface water or leaching into underground water. The quality of surface water is furthermore affected by the fact that almost all sewage water is directly, without any treatment, discharged into surface water.

In some regions of the Republic of Macedonia, such as the municipality of Probistip, the situation is even worse, due to the mining and manufacturing industry. Contaminated water is directly discharged in surface water or is leaching from dumpsites (tailings) into the underground water, resulting in high concentrations of heavy metals and flotation reagents in the rivers in this region. Water from these rivers is used for irrigation of agricultural land, leading to high contents of lead, zinc, copper, cadmium and manganese in the soil. High levels of lead residues are observed in wheat from this region. In the Green scenario, it is assumed that solid waste management will improve by reducing waste volumes, separation of different materials, recycling, etc. Improved waste management infrastructure with minimal use of landfills will lead to lower methane emissions and lower local soil and water pollution. Sewage systems are expected to be improved, leading to less sewage being discharged untreated in surface water.

For the participants in the workshops, stricter environmental regulations as foreseen in a green economy will eventually lead to improved air and water qual-
ity, to increased food safety and hence have a positive impact on the quality of life and health in the Republic of Macedonia.

**Green growth measures will lead to increasing unemployment in some sectors and push out of workers with a weak position on the labour market.**

Stricter environmental policies are expected to lead to closure of part of the mining and manufacturing industries and, consequently, to increasing unemployment in some regions in the Republic of Macedonia and probably to increasing migration to the city of Skopje or abroad. In particular the older employed people (over 50-year-olds) in the mining and manufacturing industry will be affected by the changes towards a green economy. They are the first to lose their job and the last to find a new job, because of inadequate education, limited knowledge and because they lack the skills required for new jobs in more advanced industries. Besides the older people, women and ethnic minorities are among those who have a big chance to be pushed out of employment. It is, for instance, expected that the people who are currently sorting and collecting material, such as plastics, paper and metals, for reuse or recycling, will lose their income source when recycling becomes a formal business operation. Targeted actions are needed to prevent these negative effects of a transition to a green economy.

Some regions and towns in the Republic of Macedonia have only few employment opportunities, resulting in many people not having a regular job or other source of income. In such situations, the participants expect that additional funding by the national government is required to make a change to a green economy possible.

**Green growth strategy may create new employment opportunities in the ‘greener’ industry in the medium to long term. This requires new knowledge, skills and flexibility to adapt to the new conditions.**

In particular young people are expected to be able to grasp the new opportunities, whether in their own region, in Skopje, elsewhere in the Republic of Macedonia or abroad. Capacity building programmes, education and training programmes in line with the qualification and skills needed for green growth are required to support people to find new jobs. Public campaigns can support adaptation to the changing conditions. Special attention is needed for the older employees as this group has a weak position on the labour market. In order to stop further migration, the workshop participants advocate the necessity to create new employment opportunities in the weak economic regions, in agriculture and new industries that apply green technologies. Besides capacity building
programmes, financial incentives for innovation would facilitate such developments.

In a large part of the Republic of Macedonia agriculture is the most important source of employment and income. Farmers are likely to be heavily affected by climate change.

In addition to the predicted increasing temperature and decreasing precipitation, which leads to a higher demand for irrigation water, the farmers have to cope with declining water supply and obsolete irrigation systems. There are large irrigation systems in some regions, built in the past, but only a small part is still functioning, due to neglected maintenance. As a result the yields are decreasing and agricultural land is lost to erosion. Rehabilitation of the irrigation systems is necessary, according to the workshop participants.

In the Green Growth scenario, the negative impact of agriculture on the environment will be minimised by promoting erosion control, integrated pest management and drip irrigation, which also allows a more precise targeting of the application of fertiliser and pesticides. A transition towards climate smart and quality-based agriculture, such as organic farming, including improved supply chains will lead to a stronger market position of Macedonian farmers on the domestic and foreign markets. A major part of the Macedonian farmers, however, are small-scale farmers, who are unlikely to make the transition to high quality agriculture. They do not have the required resources or access to capital for investments, neither the required knowledge and skills for good agricultural practices. Additional education, training and knowledge exchange with other countries are ways to adjust farming practices to international standards. The government should support this transition through investments in rehabilitation and expansion of irrigation systems, land consolidation and improved agricultural education and extension.
The recommendations formulated in the workshops cover a broad range of aspects, from short-term measures to support specific groups to recommendations for long-term investments. In this chapter these recommendations are summarised in recommendations on green growth strategy development and sector-specific recommendations. As mentioned before, the findings of the workshops are not representative for the country as a whole, but provide clear indications on which social aspects to take into account when designing and implementing a green growth strategy for the Republic of Macedonia.

7.1 Strategy development

*In order to get the green growth process in motion, the strategy needs to be translated into clearly defined actions in terms of time, cost and responsibilities.* The participants in the workshops were well aware of the harmful environmental and social effects of current practices in the long term and also of the benefits and opportunities of a transition towards a green growth strategy. They identified a long list of possible green growth measures. In order to prioritise the measures, they ranked them on a two-dimensional scale of complexity and cost. ‘Complexity’ refers to the difficulty of implementing the respective measures, while ‘cost’ refers to the investments needed for these measures. In Figure 7.1 a selection of green growth measures is presented in a four-quadrant cost-complexity diagram, which should be interpreted as follows.
## Figure 7.1  Examples of green growth measures, divided into categories of complexity and costs of implementation by workshop participants

<table>
<thead>
<tr>
<th>Easy to implement</th>
<th>Most expensive, need for financial support</th>
<th>Hard to implement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to implement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocational training in new technologies</td>
<td>Innovation in green technology</td>
<td>Revision of education system</td>
</tr>
<tr>
<td>Education and training of farmers</td>
<td>Utilisation of renewable energy sources</td>
<td>Changing legislation</td>
</tr>
<tr>
<td>Awareness raising campaigns on climate change, environment and green growth, including energy saving and waste recycling</td>
<td>Thermal insulation of buildings</td>
<td>Law enforcement</td>
</tr>
<tr>
<td></td>
<td>Increasing service level of public transport</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Early retirement schemes to provide jobs for young people</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hybrid/electric vehicles (private/public)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydro and geothermal power plants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New water reservoirs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewage water treatment plants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gas-fuelled heating systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Public-private partnerships in public services and green industry</td>
<td></td>
</tr>
<tr>
<td>Less expensive, no need for financial support</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
of the education system, new and adapted legislation and law enforcement are required, which is in most cases complex and time-consuming.

This is a qualitative approach helping people in assessing possible policy measures. More sophisticated quantitative approaches are required to decide on what measures to implement.

**Green investments are the engine for employment generation and for overcoming the social problems associated with change.**

Investment in new business activities or in existing businesses to make them more sustainable will increase economic stability and prevent loss of jobs. Besides direct financial support, national and municipal authorities should actively promote business investments and streamline administrative procedures to facilitate investments. The three sustainability criteria (people, planet and profit) should be applied to guide the investment process. In addition to business support, compensation payments should be put in place for the most vulnerable groups.

**Lack of awareness around the green growth concept is a major obstacle for future designing and implementing green growth strategies. Information is crucial for a successful implementation of green growth strategies.**

It is necessary to develop mechanisms for sharing information among decision-makers in different sectors, between local and higher-level government agencies and across decision-making bodies. Without such information-sharing, coordination across different decision-makers will prove difficult. Social marketing will be crucial to clearly identify key audiences and messages for public campaigns, as well as for targeted incentives for behaviour change and implementation of specific green growth measures. Appropriate support by local and national authorities is necessary for a successful implementation of green growth measures, regardless of whether they are aimed at the short, medium or long term. Everyone should have easy access to relevant information on green growth measures. Accurate and timely information is needed on the benefits of green growth measures and the available funds for promoting them.

**Strengthening local capacities for planning, promoting and implementing green growth strategies is necessary for achieving green growth targets at local level.**

Appropriate transfer of information, financial and technical resources will increase the ability at the local level to plan, promote and implement green measures and make use of local knowledge on adaptive measures. Training of municipal staff is required so that they are capable of informing local people
about different options for green growth, related costs and benefits and possible financial support. Capacity building requires coordination across a variety of local actors and decision-makers since no single blueprint solution for partnering with a specific type of actor can address the multiple needs for effective local adaptation.

There is a need for strengthening laws, regulations and by-laws and enforcement of them.

Green growth requires not only new legislation but also enforcement measures. Currently, the implementation of many regulations is rather weak due to lack of control mechanisms. Lack of enforcement will affect both environmental and social aspects of green growth policies.

Coherent planning, extensive consultation and organised action of involved government bodies at local and national level is required for a successful introduction of green growth measures.

The difficulties around solid waste management practices and policies in the Republic of Macedonia illustrates the importance of an integrated approach. Not only the decision making process with respect to the location of new large dumping sites, but also the introduction of regular waste collection services, sorting and recycling procedures and facilities at local level are hampered by lack of coherent policy and financial coordination. The participants in the workshops underlined the need for coherent actions at all levels of government in order to ensure social cohesion, good governance and the involvement of the various social actors in the decision making process. Only in that way the green growth agenda can be implemented at local level.

7.2 Sector-specific recommendations

Apart from the overall recommendations, the PSD workshops also yielded a number of more specific suggestions on how to ensure inclusive green growth. These are presented in Table 7.1, ordered by the themes included in the WB GG Programme. The first theme deals with the economy in general. Two of the themes constitute sectors of the economy: agriculture and mining & manufacturing. Three refer to services that are essential to facilitate the other sectors: energy, water and transport and the environmental service of wastewater management. The last theme refers to urban issues other than those already contained in the preceding themes.
For each theme the possible impact of climate change is briefly described (second column). The third column presents measures that are likely to be formulated to deal with these impacts under a Green Growth strategy. The fourth column shows the social effects of these measures. This is followed by recommendations formulated during PSD workshops on how to deal with these effects, i.e. how to mitigate them where they are undesirable. The final column indicates who should act on these recommendations. For instance, Probistip, where the mining industry is a mainstay of the local economy (column 1), struggles with a severe problem of water pollution and water shortage. This will be aggravated by climate change (column 2). Under Green Growth, there will be measures to reduce pollution and to use water more efficiently (column 3). Although these measures will have positive social effects in the field of public health, they will also lead to increased operating costs for the industry (column 4). It is therefore recommended, as an outcome of the PSD workshops, on the one hand to invest in safety for workers (another social problem) and on the other hand to explore the potential for substitute employment (column 5). The responsibility for doing this lies with both government and businesses (column 6).

The recommendations provided in the table build on the recommendations in the preceding subsection and make them more concrete. The overall message of the table can be summarised as follows: the Republic of Macedonia has been doing well in terms of economic growth, but this growth is socially unbalanced and environmentally unsustainable. Climate change is a threat both to economic growth and to social wellbeing. A Green Growth strategy can deal with the environmental side of the equation, but additional policies are needed to distribute the fruits of growth more equitably, and to mitigate the effects of climate change on vulnerable groups. Some of the Green Growth measures are socially neutral, some are beneficial (public transport and urban planning), but some come at a social cost: realistic charges for public services, for instance. This necessitates compensatory social measures, the most promising of which are those that increase incomes among the poor: first and foremost, education and employment. Such measures may be at the expense of short-term economic growth, but will enhance the potential for long-term development.
Table 7.1  Sector-specific recommendations to promote social inclusiveness of Green Growth measures

<table>
<thead>
<tr>
<th>Sectors &amp; themes</th>
<th>Forecast of climate change impacts</th>
<th>Potential Green Growth measures</th>
<th>Social impact of Green Growth measures</th>
<th>PSD recommendations to promote social inclusiveness</th>
<th>Who to act on recommendations</th>
</tr>
</thead>
</table>
| **General economy** | - Damage due to extreme weather events | - Promotion of development of green growth technologies and production methods  
- Public investments in green growth technology | - ‘Green’ technology as such is socially neutral, but income disparity is great and needs to be addressed | - Fiscal measures to decrease income disparities  
- Emphasis on creating employment  
- More investment in education and capacity building  
- Social safety net for the poorest | - These are in essence political decisions, which may be conditional upon successful economic growth, but supported by stakeholders such as trade unions and civil society in general |
| **Agriculture** | - Less rain in growing season, leading to lower yields  
- Possible shortage of water for irrigation | - Development towards quality climate smart agriculture  
- Rehabilitation and expansion of irrigation systems and land consolidation  
- Promotion of sustainable agricultural practices: integrated pest control, drip irrigation, effi- | - Farm incomes are likely to become more unequal: small farmers may not be able to cope, medium-scale and large farmers will see their incomes increase | - Support to smallholders who lack the resources and knowledge to make the transition to quality-based agriculture | - Government and farmers’ organisations, with the support of agro-industrial enterprises and possibly banks |
<table>
<thead>
<tr>
<th>Mining and manufacturing</th>
<th>- Shortage of water for cooling and other processes</th>
<th>- Stricter environmental rules, leading to less pollution and less GHG emissions</th>
<th>- Operating costs to business will increase, leading potentially to lower investments</th>
<th>- Investments in safe production methods</th>
<th>- Government and business</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy</strong></td>
<td>- Possibly less water for hydropower</td>
<td>- Investment in hydroelectric potential, instead of thermoelectric plants</td>
<td>- More employment in rural areas</td>
<td>- Measures to improve incomes of the poor to compensate them for higher electricity costs: see above</td>
<td>- See above, 1st row</td>
</tr>
<tr>
<td></td>
<td>- Higher energy demand for air conditioning</td>
<td>- Investment in small-scale energy production, based on biomass and solar energy</td>
<td>- Higher electricity bills to reflect real cost of electricity and encourage efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Measures to encourage energy saving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td>- Reduced water reserves</td>
<td>- Investments in water reservoirs</td>
<td>- Higher water bills to reflect real cost of water and encourage efficiency</td>
<td>- Measures to improve incomes of the poor to compensate them for higher water costs: see above</td>
<td>- See above, 1st row</td>
</tr>
<tr>
<td></td>
<td>- Increasing demand for water</td>
<td>- Improved water supply systems to decrease water losses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Water-saving measures in households and industries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>- Climate change does not affect transport, but transport generates large greenhouse gas emissions</td>
<td>- Investment in new energy-efficient public transport systems</td>
<td>- Socially neutral, but cost may increase</td>
<td>- Subsidise public transport to ensure adequate coverage; this does not necessarily imply public ownership</td>
<td>- Local authorities for urban transport, central government for transport to rural areas</td>
</tr>
<tr>
<td>Waste management</td>
<td>- Concentration of pollutants may increase due to reduced river flow</td>
<td>- Development towards reduction, re-use and recycling of urban waste, with fewer and more sophisticated landfills</td>
<td>- Better environmental quality in urban areas</td>
<td>- Redeployment of current solid-waste collectors into the new waste management system</td>
<td>- Local authorities, with encouragement from central government</td>
</tr>
<tr>
<td>Urban issues</td>
<td>- More heat waves in urban areas leading to increased risk of diseases and increasing mortality</td>
<td>- Control of urban development through urban planning</td>
<td>- Better environmental quality in urban areas</td>
<td>- Improve delivery of public services to vulnerable groups</td>
<td>- Local authorities, under the aegis of national legislation</td>
</tr>
</tbody>
</table>
7.3 Recommendations on PSD methodology and tools

The project team used the ‘Capacity development manual for participatory scenario development’ (World Bank Discussion paper number 19, 2010) as starting point for organising the PSD workshops in the Republic of Macedonia. Below are listed a number of lessons learnt, most of them in line with the recommendations in the manual. The major difference is the duration of the workshops. The manual recommends a workshop of one or one and a half day, whereas the project team advises to limit the workshops to a maximum of half a day or an evening in order to allow sufficient participation of different groups in the workshops. This limitation sets restrictions on the content and approach of the workshops. In this project, the PSD workshops were aimed at professionals, i.e. people who are working with or represent local government, semi- and non-governmental organisations and (large) public and private companies, and who are knowledgeable on the topic at stake. The purpose and target groups of PSD workshops, however, can vary widely depending on the stage in the process of strategy development and implementation. The target group and the methodology will, for instance, be quite different for PSD workshops that are aimed at contributing to designing scenarios at national level and PSD workshops that are aimed at promoting policy measures in the implementation phase at local level.

It is questionable whether this type of workshop is the most suitable method for a public awareness campaign about climate change and green growth, because other methods and media, such as newspapers, radio, TV and social media (e.g. Twitter) have a much wider reach. However, for consultations with key stakeholders on strategy development at national and local level this approach is very useful, because it allows representatives from various governmental and non-governmental organisations as well as private companies to discuss future developments from different perspectives in an open atmosphere. The participatory workshops organised in this project have proved to be instrumental in translating generic policies into specific measures.

The following list of lessons learnt may help in organising these workshops:

- It is recommended to focus participatory workshops for green growth strategy development on government and community leaders, as it was done in this project. A stakeholder analysis helps to identify the right people, i.e. the interested and influential people;
- The date and timing of the workshops need to be in line with seasonal variation in working time etc. It is, for instance, not useful to organise a workshop for farmers in the harvesting period;
- Invitations need to be sent in time, taking into account customary procedures for sending invitations;
- In order to get sufficient stakeholders to attend the workshops, it is recommend to limit the workshops to half a day or an evening;
- Because of the limited time available, it is recommended to focus the workshops on one or two aspects of green growth and climate change that are relevant to the invited target group;
- The workshops need to be prepared thoroughly, with respect to agenda, presentations, duration of sessions, breaks and reporting;
- Facilitators need to be fully prepared for the process, to provide guidance during the sessions, to offer feedback during plenary sessions and to report;
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Appendix 1
Climate change projections for the Republic of Macedonia

A1.1 Introduction to climate projections

Projections on future climate change depend on the socio-economic scenarios used and assumptions that underlie different climate change models. Hence, we cannot make one single trajectory for climate change, but always have to look at a range of possible outcomes. Tyndall Centre for Climate Change Research provides projection data at country level up to 2100. Those projections include modelled data of four different models, each projecting a slightly different outcome using the same SRES scenario. These models are also used in the third assessment of IPCC. Therefore we present all model outcomes to indicate the range of change. These models have the following abbreviations:

<table>
<thead>
<tr>
<th>Model acronym</th>
<th>Research centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGCM</td>
<td>Canadian Centre for Climate Modelling and Analysis, Canada</td>
</tr>
<tr>
<td>CSIRO-MK3.0</td>
<td>Commonwealth Scientific and Industrial Research Organisation (CSIRO), Atmospheric Research, Australia</td>
</tr>
<tr>
<td>HadCM3</td>
<td>Met Office Hadley Centre, UK</td>
</tr>
<tr>
<td>PCM</td>
<td>National Center for Atmospheric Research, USA</td>
</tr>
</tbody>
</table>

These models are so-called global circulation models, which include earth-ocean-atmosphere interactions. The models use different assumptions on feedback loops between the earth-ocean-atmosphere compartments as well as effects of clouds etc. on temperature. Since uncertainty exists on possible feedback loops, projections of all model types should be included to indicate a range of possible climate change. Moreover, future projections on global and local demography, economic development, domestic consumption and energy use all affect emissions of greenhouse gases and hence warming potential and precipitation patterns. For this, IPCC developed four different global scenarios of future change, called SRES scenarios A1, A2, B1 and B2.

For more information see the website of the Dutch Environmental Assessment Agency:
These storylines operate on a global scale, and do not imply a particular development in FYR Macedonia or any other single country. In reality, the future will probably entail a mixture of storylines, but the storylines illustrate what might happen. Therefore we use those SRES scenarios to depict the range (variability) of climate variables - notably temperature and precipitation.

A1.2 Temperature projections

With temperature projections, we look at two parameters; the average temperature change and the occurrence of temperature extremes in FYR Macedonia.

**Average temperature**

The four climate change models predict slight and sometimes large differences in temperature projections within the SRES scenarios. The yearly average temperature rises in all scenarios (Figure A1.1). Differences exist between model projections within an SRES scenario and these differences are consistent; the range in temperature projections is equal among the SRES scenarios. The average temperature increase for 2030 is between 1.34 and 1.48 °C depending on the SRES scenario. It is not recommended to pick the lowest or highest temperature increase for illustration since all SRES scenarios are plausible future development trajectories.

The average temperature increase is not evenly distributed over the year. The largest deviation is found in July and August, where all models and all SRES scenarios show a larger temperature increase than in other months (Figure A1.2).
Figure A1.1  Annual temperature increase in FYR Macedonia

Source: Predicted by four climate change models (CGCM, CSIRO, HADCM and PCM) under four SRES scenarios (A1, A2, B1 and B2) up to 2100. Source: Mitchell et al. (2003).

Figure A1.2  Monthly temperature increase in FYR Macedonia in 2030

Source: Predicted by four climate change models (CGCM, CSIRO, HADCM and PCM) under four SRES scenarios (A1, A2, B1 and B2) compared with historical averages from 1900 to 2000. Source: Mitchell et al. (2003).
Heat waves

Within the EU-funded integrated programme PRUDENCE (Christensen et al., 2007), regional climate projections were made using the HadCM3 model (Gordon et al., 2000; Pope et al., 2000; some results of this model are presented in Figure A1.1 and A1.2. These regional projections used the SRES A2 scenario and a control scenario with an historic trend (1961-1990) extrapolated to the future. Climate projections were made for a time slice of 30 years, corresponding to 2071-2100 (see Dankers and Hiederer, 2008), hence the climate change extremes depict a more distant time horizon than the 2030 horizon in the previous figures. Besides average temperature deviations caused by climate change, extreme climate events are also relevant and, if occurring frequently, a scope for adaptation strategies. Among weather extremes, periods of high temperature, so-called heat waves, are likely to occur in the Balkan region. Heat waves are continuous periods of temperatures exceeding a threshold for several days. They are generally associated with countries of hot climate. The heat wave of 2003 caused damage to society estimated at over €5,800m, and lead to the deaths of more than 45,000 people (e.g. Dankers and Hiederer, 2008). Some of the effects of such extreme heat waves are:

- Increase in mortality of age groups at risk;
- Disruption of transport and public works;
- Reduction in productivity and efficiency;
- Increase in energy consumption and decrease in energy production;
- Increase in vector-borne diseases and other pests;
- Direct damage to vegetation (crops, trees, etc.).

The paper by Dankers and Hiederer (2008) reports several indicators for measuring heat wave events, for instance the number of consecutive days hotter than 35 °C. As an illustration, we will use the latter indicator. Figure A3 depicts the number of days above 35 °C in the A2 scenario for the time slice 2071-2100 in the upper graphs and the difference in these days compared with the historic trend in the lower graphs. The figure shows that, compared with the historic trend, FYR Macedonia will face an increase in heat waves of up to 15 days, most notably in August. This high temperature event calls for adaptation options throughout (economic) sectors and society as a whole. Although the spatial resolution of the graphs is insufficiently precise to make regional predictions in FYR Macedonia, the change mostly occurs in the central part of the country.
A1.3 Precipitation projections

Annual changes in precipitation caused by climate change may not be very illustrative, but changes in monthly patterns indicate seasonal problems with water surplus or droughts. For all SRES scenarios the climate models predict less precipitation between May and September. Autumn, winter and early spring precipitation patterns are less consistent among the SRES scenarios and among the models. Most models also predict less precipitation in autumn, while half of the models predict more precipitation between February and April, irrespective
of the SRES scenario assumed. Figure A1.4 depicts the seasonal changes in precipitation patterns.

**Figure A1.4 Monthly precipitation patterns in FYR Macedonia in 2030**

Reduced precipitation will lead to a cumulative precipitation deficit, with negative effects on sectors depending on rainfall, such as agriculture. FYR Macedonia and the Balkan in general already face rainfall deficits during summer (see left part of Figure A1.5.), and climate change will add to this deficit. Although not as strongly as on the Iberian peninsula, the Balkan and FYR Macedonia will face longer and stronger summer precipitation deficits (see right part of Figure A1.5). Figure A1.5 illustrates a long-term projection for the second half of the 21st century, but shorter-term patterns up to 2030 already indicate summer rainfall deficits (see Figure A1.4).
A1.4 Effects on growing season in agriculture

While summer precipitation strongly decreases under climate change, spring precipitation slightly increases for FYR Macedonia (Figure A1.6). With increased temperature, this may suggest a shift in agricultural production towards the spring. Higher temperatures and higher precipitation levels makes short season spring agriculture more favourable.
A1.5 Cumulative effects of climate change

The climate change projections for FYR Macedonia show two main effects which may accumulate: expected summer precipitation deficits and prolonged and more intense heat waves during summer. These two processes will lead to larger water deficits in summer with negative effects not only during that season but also for building up water reservoirs throughout the year. Evapotranspiration is caused by temperature and will likely increased due to higher summer tem-
peratures. Hence, water bodies may dry up during periods of heat waves and low precipitation. In other words, FYR Macedonia can expect serious water problems coinciding with higher summer temperatures. This will have an effect on all (economic) sectors as well as affecting civil society. Therefore, adaptation strategies should include coping with water shortages.
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The social dimension of green growth in the Republic of Macedonia