

The IMAGE 2.2 Implementation of the Millennium Ecosystem Assessment scenarios

E-Mail: image-info@pbl.nl

Web: <http://www.pbl.nl/image>

Dear Sir or Madam,

You have downloaded the User Support System of the "The IMAGE 2.2 Implementation of the Millennium Ecosystem Assessment (MA) scenarios. This User Support System (USS) presents information on the IMAGE model (Integrated Model to Assess the Global Environment, the 2.2 version) and includes the implementation of the MA scenarios of 2004. The USS includes information on indirect driving forces (population, income, energy use and agriculture), direct driving forces (emissions and land use) and all kinds of variables on the state of environment and ecological services (e.g. climate change, land cover, sea-level rise, and change in agricultural yields).

We issued this version in September 2010 in the process of publishing important IMAGE results on scenarios. More information on the Millennium Ecosystem Assessment project, including a detailed description of the scenarios, can be found on the [MA website](#). The IMAGE results are mainly discussed in Chapter 9 on the "Changes in Ecosystem Services and Their Drivers across the Scenarios".

The MA scenarios

The Millennium Ecosystem Scenarios were developed using both qualitative ("storytelling") and quantitative tools ("modeling"). While these different approaches were used to enforce each other and consistency checks were made, it was also accepted that to some degree differences between the different elaborations of the scenarios could remain emphasizing uncertainty. The scenarios on the CD-ROM are therefore the IMAGE implementation of the scenarios (and other elaborations of the same scenarios exist). The IMAGE results have formed the backbone of the quantitative chapter in the Scenario Volume of the MA (Alcamo, Van Vuuren and Cramer, 2005).

The set of MA scenarios explore changes in ecosystem services and their drivers across a set of four scenarios. These scenarios are:

- **Global Orchestration** (This scenario assumes a world with rapid economic growth based on a high level of socially conscious globalization and macro-scale policy reform. The main focus in this world is on human development and the approach towards environmental problems is reactive).
- **Order from Strength** (This scenario assumes a retreat from global institutions results in a fragmented world. In the scenario international blocks of states are formed that focus on national security and protectionism. As a result, there are large differences in wealth across the world. Technology development under this scenario is assumed to be slow).
- **Technogarden** (This scenario emphasises the development of green technologies, partly as substitutes for ecosystem services. The scenario also assumes a globalized world and a proactive approach to manage environmental problems.)
- **Adapting Mosaic** (In this scenario, local institutions are strengthened in order to protect ecosystems. Important elements in this scenario are learning processes at the local scale).

References and further reading

Alcamo J, van Vuuren D, Ringler C, Cramer W, Masui T, Alder J, Schulze K (2005) Changes in nature's balance sheet: Model-based estimates of future worldwide ecosystem services. *Ecology and society* 10.

- [to the article](#)

In addition, the data itself may be referred to as “data on the IMAGE 2.2 implementation of the MA scenarios provided by the IMAGE-team”. Both in the chapter in the paper cited below further information on these scenarios can be found.

Alcamo J, Van Vuuren DP, Cramer W (2005) Change in Ecosystem Services and Their Drivers across the Scenarios. in Carpenter SR, Pingali P, Bennett EM, Zurek MB (eds.) *Ecosystems and Human Well-being. Scenarios, Volume 2*. Island Press, Washington.

- [download chapter 9](#) (pdf)

Aim of IMAGE

The Integrated Model to Assess the Global Environment (IMAGE) is a dynamic integrated assessment modelling framework for exploring global change. The main objectives of IMAGE are to contribute to scientific understanding and support decision-making by quantifying the relative importance of major processes and interactions in the society-biosphere-climate system. To accomplish this, IMAGE provides:

1. dynamic and long-term perspectives on the systemic consequences of global change;
2. insights into the impacts of global change;
3. a quantitative basis for analysing the relative effectiveness of various policy options to address global change.

Historic Background

The IMAGE modelling framework has continued to evolve over the years to incorporate the latest insights in environmental modelling. The IMAGE 2.2 version has been used in 2001 to elaborate the IPCC SRES scenarios, the results of which have been widely made available by means of a CD-ROM (now downloadable via the IMAGE website). The IMAGE 2.2 version was also used to develop the Millennium Ecosystem Scenarios. The IMAGE 2.3 version was used extensively to develop different climate change mitigation scenarios. In 2006, IMAGE 2.4 was released. This model version has, for instance, been used to develop the IMAGE contribution to the OECD environmental outlook and the IPCC-Representative Concentration Pathways.

With this, IMAGE continues to be at the forefront of the integrated modelling of environmental change, and is internationally recognized as being one of the leading parties in this field.

Contents of the download package

- The IMAGE 2.2 User Support System (USS), a comprehensive and interactive graphical interface to view and analyse scenarios of global change.
- Quantification for the Millennium Ecosystem Assessment (MA) scenarios (Global Orchestration, Order from Strength, Technogarden and Adapting Mosaic) by the IMAGE 2.2 model on basis of the HADCM2 climatic-change patterns.
- Extensive documentation on the models and indicators in the help function (F1).

- A manual to provide an overview of the possibilities and special features of the USS, and a step by step guide how to use them.
- A tool for exporting data to GIS-software.
- Narratives and assumptions for the IPCC scenarios (SRES: A1B, A1F, A1T, A2, B1 and B2) by the IMAGE 2.2 model on basis of the HADCM2 climatic-change patterns.

Conclusion

We hope that this User Support System is a supportive tool to many policy makers, stakeholders and scientists in the world of integrated assessment and global change, as well as anyone who is interested in understanding the complex interactions of the earth system. We welcome comments and suggestions for improvement.

Sincerely yours,

The IMAGE Team.
August 2010.

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