

## **SEAMLESS training material on concepts and models for Integrated Assessment of agriculture and sustainable development**

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### **Introduction**

Concerns about environmental problems, food security and climate change have put sustainability in agricultural development prominently on policy agendas. There has been a shift from supporting agricultural production towards policies supporting sustainable (rural) development in a broader sense. Hereby, important drivers of change in agricultural systems, (e.g., globalization, liberalization, environmental policies, climate change) request integrated analyses considering the full set of natural, economic, social and institutional aspects of sustainability at multiple scales (i.e. field, farm, region, market and global levels). Such integrated assessment of agricultural systems requires integration of knowledge from different disciplines.

Over the past years, there tends to be an increase in large research projects with the aim to develop integrated assessment tools for various domains. One example is a large European research consortium that has developed an integrated modelling framework to support analysis of relationships between agricultural systems and sustainable development: SEAMLESS-IF (System for Environmental and Agricultural Modelling; Linking European Science and Society – Integrated Framework; Van Ittersum *et al.*, 2008). The SEAMLESS-IF is a computerized integrated framework that assesses and compares *ex-ante*, alternative agricultural and environmental policy options, allowing (1) analysis at the full range of scales (farm to EU and global), (2) analysis of the environmental, economic and social contributions of a multi-functional agriculture towards sustainable rural development and (3) analysis of a broad range of issues, such as environmental policies and liberalization.

Integrated assessment projects require a new generation of scientists with strong integrative skills, both conceptually, methodologically and technically. Such scientists may have a strong disciplinary background supplemented with inter- and transdisciplinary skills or they may have a mainly interdisciplinary training. Developing ‘T-shaped skills’ (broad scientific overview combined with in-depth knowledge of specific subjects) allows for scientific, communicative and co-operative flexibility (Bouma, 1997). We anticipate that new courses and curricula are needed which on the one hand capitalize and disseminate experiences and capacity from large integrated assessment projects and on the other hand train a new generation of scientists. This contribution reports, as an example, modular training material developed from the SEAMLESS project. This training material can be used for undergraduates, postgraduates and experts from research and policy institutes, and parts of it can also be useful for discussions with other stakeholders.

### **Training and courses**

SEAMLESS training material is based on a modular structure (Figure 1; Reidsma *et al.*, 2008). The underlying principle is that several modules can be flexibly combined together and some specific ones can be added depending on the course duration, intensity and the audience to easily produce ‘à la carte’ courses. One of the courses developed is the post-graduate course of one week, which can be considered as an example of how to use the SEAMLESS training modules to create a course.

The objectives of the course are (1) to present concepts for integrated assessment of agricultural systems, (2) to gain theoretical and practical understanding of the methods, models and tools used in integrated assessment of agricultural systems, (3) to understand how integrated assessment and modelling can support *ex-ante* impact assessment and decision-making processes and (4) to understand how own specific research relates to an integrated assessment and modelling perspective.

In the course, SEAMLESS-IF and its research tools are used as an example to present how concepts and models can be integrated to assess complex agricultural systems. The course is problem orientated, so all lectures are linked to practical applications, such as environmental policies within the Nitrate Framework Directive or trade policies.

The post-graduate course is an advanced course and can form a basis for researchers that want to learn about methods for integrated assessment and/or that want to continue working with the framework or with individual components (advanced level). When training policy experts or other stakeholders the focus will be more on basic and intermediate level modules. The courses and their set-up will be evaluated, which can improve training material and identify gaps in SEAMLESS-IF.

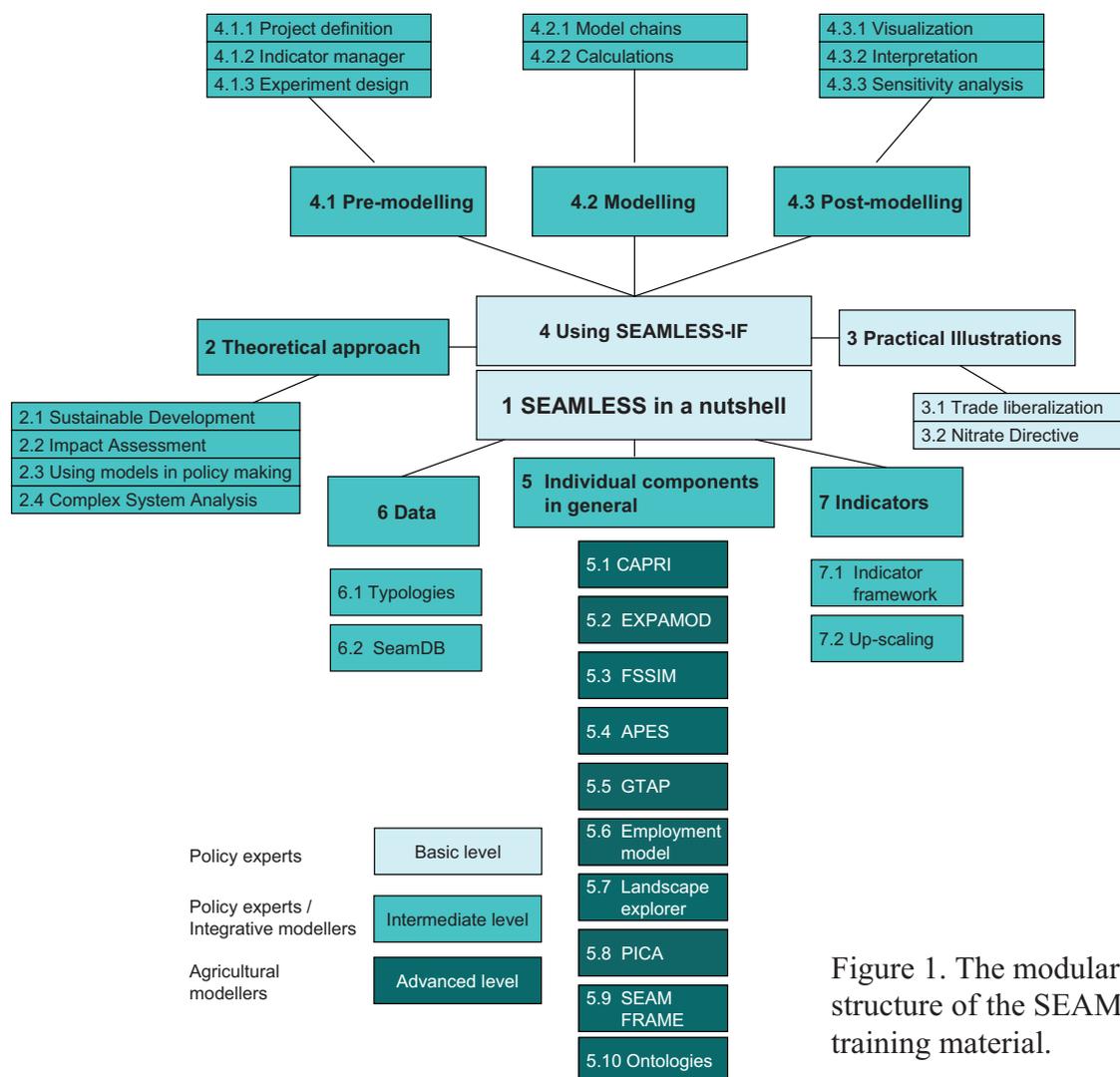


Figure 1. The modular structure of the SEAMLESS training material.

## References

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 Reidsma, P., *et al.*, 2008. PD7.5.2, SEAMLESS Integrated Project.  
 Van Ittersum, M.K., *et al.*, 2008. *Agricultural Systems* 96: 150-165.