Application of an agent-based model of land use change
Deliverable 6.3 presents the final design and uses of the agent-based model (ABM) developed in Work Package (WP) 6 to model land use change at European scale. The model has previously been outlined in Deliverables 6.1 and 6.2, and D6.3 completes its conceptual and technical description, as well as presenting its applications within the VOLANTE project.

The first section of the Deliverable is intended to describe the rationale for the ABM, its capabilities and applications in VOLANTE, and how these inform the work of other Work Packages and Modules. It begins by outlining the model’s purpose and scope, and goes on to briefly describe the uses to which it has been and will be put. Two main areas of application are identified: to model land use change at a European scale, and hence provide a complementary option to the existing models that operate at this scale (Work Package 7), and to explore possible development of real and theoretical land use systems under a number of scenarios of future change, primarily specified in terms of human and institutional behaviour. Both of these applications feed into subsequent pieces of work in VOLANTE, and these are identified.

The second Section of the Deliverable details how the results of a meta-analysis of agricultural land use change are used to inform model applications. This meta-analysis (described more fully in D6.2) was carried out as part of WP6 in order to inform the development and configuration of the ABM at European scale. It is the single largest source of information on human behaviour and its translation to model parameters used by the ABM, and so its findings are very important in shaping the final form of the model. The main implications of the meta-analysis for the model are identified, and the role of the findings in establishing the final, European model is explored.

The final Section of D6.3 gives technical details for model applications that have been undertaken or are planned for the VOLANTE project. It is divided into two parts, the first of which deals with the data requirements of the model, and the second of which explains how these requirements are satisfied for the European and other model applications. The European application is the principal outcome of WP6, and so the data inputs and potential of this application are described in some detail. However, smaller-scale and theoretical applications have been developed and are anticipated to play a further role in contributing to the aims of WP6, especially in allowing more focused exploration of the effects on human behaviour on land use change, and so detailed examples of these are given. This Section therefore also outlines the questions that can be addressed using different applications of the ABM, and the potential future usage of the model within and beyond the VOLANTE project.