Serious games as a way to foster social learning of local actors and researchers towards sustainable agroforestry management

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To better understand the ways farmers interact with trees is key to any action-oriented research process aiming at supporting sustainable agroforestry management. Agroforestry systems are particularly complex agricultural systems involving diverse activities as well as covering a large biological diversity. Supporting the development of sustainable agroforestry systems hence requires specific tools for the exchanges of knowledge and discussion between the different actors, such as farmers, scholars, and extension workers. Serious games are commonly used either for collecting information and data (games for research) or for education and training (games for knowledge transfer). Using games to trigger and facilitate transformative changes represents a third way that has been promoted by specific participatory modelling approaches such as companion modelling. The game serves as an intermediate object allowing exchanges of viewpoints among participants. It builds on reality in a stylized form so that each user can find ways to project features of the socio-ecosystem that make sense for her/him. In contrast to the "expert system" vision where the tool is supposed to provide elements for selecting the best decision, here the game seeks rather to encourage exchanges between participants so as to share points of view and opinions on the functioning of the system represented. Finding a good balance to represent complex agroforestry systems with multiple activities and a high biological diversity while keeping this representation simple and easy to catch for participants is particularly challenging. In this communication, we describe and compare two serious games on agroforestry systems in the Brazilian Amazon and in Madagascar. Despite the specificities of both contexts, common mechanisms have been identified and formalised. We discuss the generic scope of these mechanisms and describe the outline of an “Agroforestry Systems Modelling Toolkit” that could be used in a wide variety of contexts.