Tackling issues of coexistence between protected areas and communal lands: Using Role playing games and participatory modeling to understand cattle herding strategies at the edge of a protected area

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Coexistence and conflicts are common on the edges of protected areas. In our study area (Sikumi Forest, Zimbabwe), local communities use a protected area throughout the year to drive cattle. It results in (i) cattle predation by wild predators, and (ii) concerns about the capacity of the protected area to effectively conserve wild herbivores. To address the issue and better understand herders' strategies, we applied the companion modeling approach to co-design a role playing game with 10 members of this community. We demonstrate how such approach is adapted to the study of wicked environmental problems, and the benefits in terms of simulation of complex social-environmental dynamics. Through the co-design and implementation of the game, we obtained an endogenous formalization of the environment and human practices that can be used to simulate the interactions between the protected and the communal land. Based on this case study, we highlight the potential of participation at the edge of protected areas: addressing wicked problems and making research more robust by providing high quality information inputs; coping with incertitude; highlighting emerging properties of human/nature interactions. In terms of management, participatory processes should lead to higher quality decisions based on more complete information, and establish common trust and ground between local actors who have an opportunity to learn and appreciate each other's viewpoints. In the context of TFCAs, beyond their scientific value, such processes could participate to the transformation of adversarial relationships and help find new ways for local actors to work together.