

Report from the Innovative education project: **Game based simulation for teaching about stakeholder behavior in natural resource management**

Project leader: Bente Jessen Graae

Other participants:

Thor Harald Ringsby (course responsible Natural Resource Management course (NARM))

Hans Peter Hartsteen (game developer Prometheus),

Martin Nielsen, University of Copenhagen, Developmental studies,

Christian Klöckner, Department of Psychology, NTNU.

EiT village on games for sustainable development

The NARM programme

AfricanBioServices researchers

Espen Moe, Political Sciences

This project has generated huge activities at Department of Biology, University of Copenhagen, Developmental studies and from researchers from other NTNU departments, mainly Department of Psychology, and in a later stage also Department of Political Sciences. In the below I make a short overview of the activities, co-funding generated, results, and planned continuation of the project.

Background

The purpose of the project was to create a board game that could be used for more active teaching in the interdisciplinary course, Natural Resource Management (NARM). The idea was to use the expertise and facilities within the EU Horizon 2020 project AfricanBioServices to build a game that realistically reflects the livelihood and environmental dilemmas for building a sustainable future in local communities bordering protected wildlife areas in East Africa (In our case the Serengeti-Mara ecosystem). After having produced a first version of the game we wanted to take it to play with different local stakeholders in East Africa and record how they were playing the game and how they experienced the game. Back home at NTNU we also played the games with our students at Natural Resource Management and recorded their way of playing the game. We then wanted to show the students these differences between their way of solving dilemmas and local stakeholders' way to generate insights and experience for the students in the aspects of more participatory involvement of local stakeholders for development and solving human wildlife conflicts. The project hence had several purposes:

- Creating an interactive and own-experience-based teaching tool for our course
- Making our teaching more connected to the expertise on our ongoing large Eu research project
- Increasing the focus on participatory nature management for sustainable development

AfricanBioServices co-funded the project by contributing the research needed for the background, and the man power and logistics to carry out the game sessions in East Africa. An additional purpose from AfricanBioServices became to:

- Create a tool for better communication with local stakeholders in our system

Activity report

November-December 2017: the game developer, we researchers and Thor Harald Ringsby, the course leader on Natural Resource Management had intensive discussions about the design of the game.

January 2018: A preliminary version was produced and tested in a class in Experts in Team (this was a village working with games for sustainability). The game was evaluated and the reflections were brought back to the game developer

February 2018: A test round with voluntare students from the NARM programme.

April 2018: Ringsby, Hartsteen, Nielsen and Graae went to Tanzania and played the game with a group of men and a group of women in 12 villages. Covered by AfricanBioServices.

April 2018: We received extra funding 400.000 from NTNU Sustainability for cross disciplinary Master students (Biology, psychology and Political Sciences) to work in East Africa

August 2018: Nielsen, Hartsteen, Moe and Graae went to Tanzania to play with Higher level stakeholders (covered by AfricanBioServices and NTNU Sustainability)

October 2018: Nielsen, Klöckner, Moe, Ringsby, Graae played the game and recorded the game behavior of 16 Narm students. Also a workshop among the project participants (Covered by NTNU Sustainability)

December 2018: Nielsen, Graae, Klöckner, Moe and four Master students went to Kenya and played the game with Higher level stakeholders and with two groups (men and women) in each of four villages. Funded by NTNU Sustainability and AfricanBioServices.

March 2019: Graae went with four students to play with four more villages. At this trip we also played with two groups of NARM students at Nelson Mandela University Arusha. Trip funded by NTNU Sustainability and AfricanBioServices.

April 2019: Klöckner played the game with Psychology students

May-June 2019: Promoteus produced new layout and extensions for the board game based on our experiences with the first version. 100 games has been produced whereof we would like Innovative education (NT-faculty money) to pay for 20 of these. We need to give away some games in East Africa so they will be paid by AfricanBioservices and NTNU Sustainability. The game has a top professional layout and look.

June 2019: The game was presented on a stand at the "Big Challenge Conference" in Trondheim.

July 2019: The game was presented at the AfricanBioServices stand at the "Trondheim Conference" in Trondheim.

August 2019: Graae has had meetings with NTNU TTO about rights for potential future selling of the game.

October 2019: Graae and Klöckner and one Master student will present results from the project at the ESP world conference 10 in Hannover, Germany in the session:

Playing games to save the planet? – Can games help to promote the Ecosystem services concept more widely? Participation and travels funded bu the NTNU Sustainability

Results:

We applied 250.00 NOK and we spent 190.000 for letting Hartsteen, Prometheus, designing the game and for permits and travels to East Africa for Hartsteen and Ringsby. We spent a lot of extra funding from AfricanBioServices for our research time and the four travels to East Africa and our workshops here in Trondheim. We now have data from how students at the NARM programme, at psychology, NTNU and at the Nelson

Mandela University are playing the game. This needs still to be processed. We want to analyse these data and publish a paper on the teaching with the board game. Graae, Nielsen, Ringsby and Klöckner are responsible for this.

We have data from the 12 villages and the two Higher level stakeholder workshops. Nielsen is in charge of analyzing these data and preliminary results show that women are better at building sustainable communities than men, and the worst players were actually the policy makers. One AfricanBioServices paper will be submitted with Nielsen as first author and the rest of the group as coauthors.

Graae and Ringsby will play the game again with the new NARM students in September 2019.

During the evaluations with the students they let us know that they liked playing the game and wants us to continue the project and the use in teaching. However, they also pointed to that the teaching surrounding the game could be improved. They wanted to spend more time analyzing what happened in the game and the consequences of the different behaviors and how to do differently. We need to develop a teaching portfolio where we better consider the learning from the project. So far, we are developing a home page for this portfolio (www.savannalife.no) but we will need to apply for more funding for this and preferably also engage pedagogical researchers with expertise in such learning methods. We tried to get this incorporated in an application to DIKU in autumn 2018 but our application was unfortunately not successful at the central selection at NTNU. We will try again.

Narm students playing October 2018



Local villagers playing in Tanzania April 2018



Savanna life - the final game ready to be showed at the Trondhiem conference July 2019