Understanding & Accompanying Multi-Scale Change & Adaptation

Géraldine Abrami and the GEAU team

geraldine.abrami@irstea.fr

CoOPLAaGE

Wat-A-Game and its family

Coupling actors, methods and issues for socio-environmental change and governance

Géraldine Abrami, Nils Ferrand, Emeline Hassenforder, Raphaele Ducrot, Sylvie Morardet, BenjamiN NOury
Patrice Garin, Bruno Bonte, Wanda Aquae-Gaudi

CoOPLAage is a robust apparatus coupling participatory methods, designed and used in various countries
Integration of actors, stakes, scales, methods, disciplines / (2nd order) transfer and minimal intervention / "yes they can model" to explore and change their own pathway in a complex environment

The Cooplage toolkit

Cooplan – Building action plans

Confronting heterogeneous actions and strategies at all levels

Wat-A-Game – Modeling & role-playing-games

Low tech participatory modeling and simulation

Just-A-Grid – Discussing justice principles

Sharing principles for sharing resources

PrePar – Preparing design of the decision process

Designing roles and methods for the participatory process

Encore-Me – Evaluating impacts

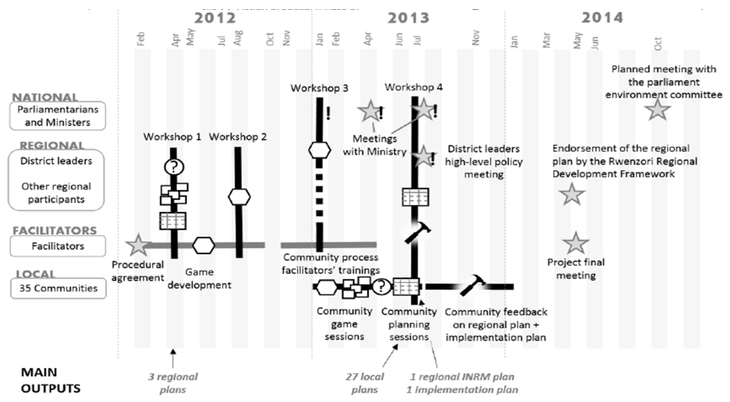
Discussing and evaluating social and political impacts

Scoolplaage – Learning by doing

2nd order outscaling by training facilitators and full transfer

Examples of multi-scale processes in the Afromaison project (FP7)

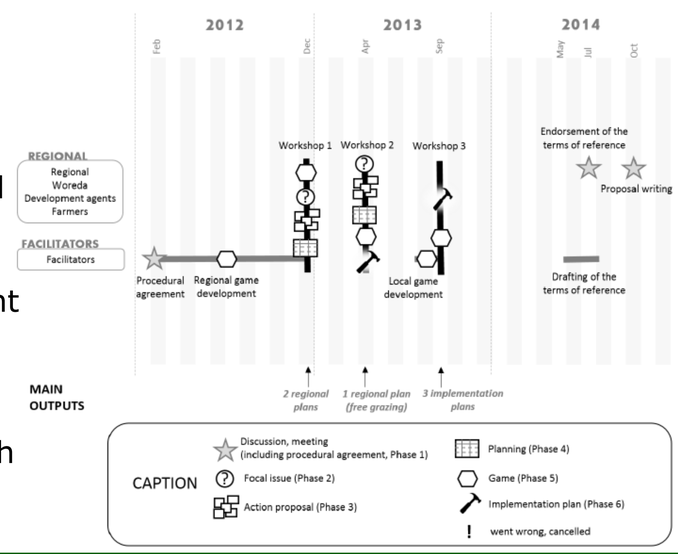
Rwenzori (Uganda)
Issue : proposal and validation of INRM plan in context of overexploitatoin of land and resources
Scales : Communities (poverty, local practices) vs Catchment (water quality, biodiversity loss, regulations)



Participatory planning and role-playing game in communities

Role-playing game and participatory planning at regional level

Fogera (Ethiopia)
Issue : Agriculture intensification and soil degradation in uncertain land tenure context
Scales : Communities (land tenure / equity) vs Catchment (land degradation / intensification)
1 conceptual model = 2 games at different scales with different focus



RPG at catchment scale : impact of actions on water and soil. Farmers and decision-makers play in parallel sessions

RPG at community scale : impact of land and cows assets on grazing practices. Farmers play and decision makers watch

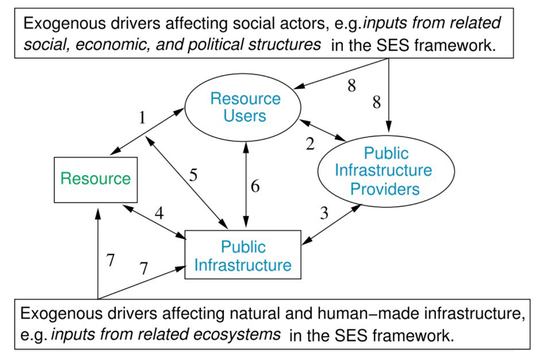
-> Ensuring cross-scale resilience by supporting groups of actors in dealing collectivelly with different aspects of complexity through different perspectives of modelling : procedural decision-making, resources dynamics and system management, decentralized planning, monitoring and evaluation

MAGIC

Studying and simulating multi-scale adaptations and vulnerability transfers

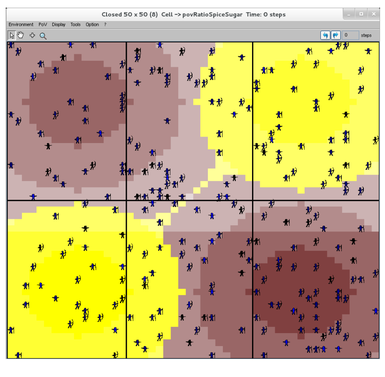
The MAGIC project (Belmont forum) : Multiscale Adaptation to Global change and their Impacts on vulnerabilty in Coastal areas
identify and specify and prevent potential vulnerability transfers (between levels and between stakes) due to adaptations to risks linked to global change
3 case studies in France, UK and South Africa

Robustness framework (Anderies et al, 2004)
The SES robustness and analysis framework is used to analyse and model case studies and theoretical prespectives



Sugarscale : an artificial society for exploring the robustness framework for cross-scale and vulnerability transfer issues

The artificial society is based on Sugarscape.
The robustness framework is implemented trough states as institutions and borders and national markets as infrastructures. Harvesters are considered as the resource users. External drivers are demographic and localised resource collapse shocks.
Harvesters can adapt by migrating and states can activate or not their infrastructures.
Harm indicators are loss of welfare and death at individual and state levels.
Vulnerabilty is measured by indexes aggregating harm indicators over time and stochastic realisations

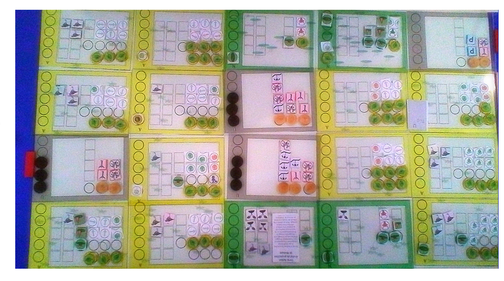


-> Experimenting and studying transfers of vulnerability in a virtual laboratory.
Work in progress :
- first results show how adaptations may induce vulnerability transfers between types of harms, individuals and states
- need to develop the artificial society and improve measures and analysis

Amenajeu : Introducing robustness and multi-scale issues in a serious game to analyse coastal coupled infrastructue systems with stakeholders

Objective : Allowing heterogeneous stakeholders involved in governance structures to explore together perspectives on cross-scale impacts of their decision-making within a virtual situation

A game board = a territory (municipality or municipalities group) with several plots. A plot has a soil type and a zoning (urban, agriculture, nature, transition)
Players represent one sector or sub-sector in the whole territory or in a part of it and their decision consists in building infrastructures attached to their sector stakes. Users at stake for the different sectors are represented by pawns which evolve with transition rules according to the infrastructures around them.
There is also a player which is the "mayor" of each game board : he can modify zoning, leads discussions and can coordinate with the other mayors to build "super-infrastructures"
At each round there might be climate change shocks (land submersion, floods..).
A specific game set can be generated from this model structure by specifiying the local sectors, infrastructures, users and rules of transition of a specific area



A game set has been designed for the French case study. Sectors are urban, nature, tourism and agriculture. For the urban sector for instance, infrastructures are dwelling and services and users are different kind of inhabitants (traditional, precarious, ..)
1 session with 4 game boards (4 territories of the coastal area) and 35 stakeholders happened in 2016. A new game set is currently designed for the South Africa case study with a computerised board (with Cormas). It will be experimented over 3 sessions in June 2017 in South Africa

-> This multi-scale game (area, territories, plots, users) has a rather high level of abstraction (KILT) but structure , elements and dynamics representative of the local situation.
In the french test, players were concentrated in improving their sector and vulnerabilty transfers were observed and discussed between sectors and territories