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LittoWag: a serious game to explore adaptation scenarios in front of coastal risks

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Introduction

- Developed coastlines are increasingly vulnerable to sea level rise, marine submergence and erosion: in 2021 the IPCC reports sea level rise between 0.16 and 0.30 meters by 2050 (table 1), and more frequent and severe storms.
- French coastlines and the Occitanie region seaside (from Rhône to Spain) is vulnerable. Since 1945, 2600 hectares of land are lost, and 25% of the coastlines eroded. The Occitan coast faces strong urbanization, started in 60s, and an erosion phenomenon of the sandy coast (figure 1).

Steps

Material and methods

CreaWag method (Wat-A-Game subset): 5 stages involved in creating a model and putting it into action:
(i) framing (identification of the issues, their measurement, the intention of the model, the context of use, and the participants);
(ii) construction of the conceptual model (space, issues, players, resources, activities);
(iii) making the model dynamic by building a game (defining the territory, selecting roles, actions per role, resources, running a first round);
(iv) finalising the game (resources dynamics);
(v) calibrating the model parameters (to highlight the dilemmas, tensions, risks, induced effects and system constraints) (Ferrand et al., 2009).

Workshop organisation:

- Contact of Ceaou municipalities bordering the sea, and some NGOs;
- Ideating to organise workshops with interested parties;
- Workshops

Results: The LittoWag game

Getting the Occitanie citizens to consider their coastlines adaptation in front of marine erosion and submergence.

Ecological engineering actions are preferred to manage coastline risks (7 workshops)

More cognitive learning (28 participants)

The uses of a model/game depend on who is involved in its design (Etienne, 2014). It can reveal a shared problem among participants (Salliu et al. 2021). Being concerned by the problem is a prerequisite (i) to collective action (Callon, 1986) and (ii) to use the game, and the simulation in order to learn more about the system.

Different uses of LittoWag respond to different issues depending on the stakeholders involved (figure 9):
- A toolbox enabling those responsible for the integrated coastline management strategies to involve citizens (Occitanie regional authorities).
- Reflect on the adaptation of the coastline (Occitan coastal citizens).
- Contribute to the definition of the local coastline management strategy (Local authorities of the Aude coast).

References

Table 1 Global mean sea level projections according five global warming levels. (IPCC, 2021)

Table 2 Categories of learning according to the number of participants in the workshops.

Figure 1: Changes in beach widths by coastal unit over several periods (data per ml/year) (EID Mediterranee, 2020).