

Modelling vulnerability to flooding: A systemic approach on farms of the Rhône River Delta

Bremond P.* , Abrami G.* , Blanc C.* , Grelot F.*

1 Agriculture and flood risk on the Rhône River Delta



Rhône river watershed: 95 500 km²
 Rhône river delta: 10 000 km²
 Agricultural activities exposure: 3000 farms
 1000 km²

1 Flood management policies implemented on the Rhône River Delta:

- Floodplain restoration
- Adaptation (vulnerability mitigation)

2 Willingness of local water authorities to have an economic tool (Cost Benefit Analysis) to help decision making

Rationale of the approach: A model of farm vulnerability which takes into account damage on every farm components and farm activity is required to appraise new flood management projects.

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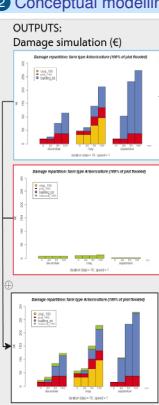


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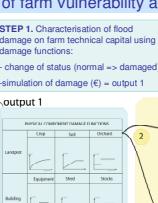
2 Willingness of local water authorities to have an economic tool (Cost Benefit Analysis) to help decision making

2 Conceptual modelling of farm vulnerability and damage simulation

OUTPUTS:
Damage simulation (€)


STEP 1. Characterisation of flood damage on farm technical capital using damage functions:

- change of status (normal => damaged)
- simulation of damage (€) => output 1

output 1


STEP 2. Consequences on farm organization due to technical capital damage (step 1):

- increase in workforce requirement
- equipment unavailable



2
3
4

FARM
 Decision making about recovery strategy depending on technical capital damage, organization, financial and social capital available

STEP 3. Characterisation of farm social and financial capital which determines recovery strategy adopted by the farmer

STEP 4. Farmer's decision between alternatives to recover depending on farmer profile (financial and social capital) determined in step 3

Applications

- Characterisation of farm vulnerability for different flood scenarios (damage type that represents the larger share of the total amount, see damage simulation)
- Efficiency appraisal (Cost Benefit Analysis) of measures to mitigate farm vulnerability that are planned on Rhône River Delta: comparison of the cost of implementation and maintenance and the mean annual avoided damage for two farm types

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