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Engineering Participatory Decision Making in Transition

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UNU
Macau

TRAINING SESSION

ENGINEERING PARTICIPATORY DECISION MAKING IN TRANSITION : A SHORT PRIMER ON COOPLAGE

Nils Ferrand ^{1,2'}

with **STEEP, INRIA Grenoble, France & G-EAU, INRAE Montpellier, France**

& Emeline Hassenforder, Patrice Garin, Géraldine Abrami, Sabine Girard, Bruno Bonté, Raphaele Ducrot, Sylvie Morardet, Benjamin Noury, Sarah Loudin, Patrice Robin, Laura Seguin, Julien Burte, Rémi Lombard-Latune, Katherine Daniell, Caroline Lejars, Stefano Farolfi, Olivier Barreteau, Audrey Richard, Séverine Bouard, Mélaine Aucante, Pavel Bautista, Clovis Kabaseke, Samuel Tronçon, Eva Perrier, Julie Latune, Mariana Rios, Mathilde Boissier, Peter Sturm, Jean-Yves Courtonne...



INRAE



Inria

Equipe-projet



STEEP

Soutenabilité, Territoires, Environnement, Economie et Politique

Our approach

Decision-making steps

PREPARE PARTICIPATION

DIAGNOSIS

SCENARIO EXPLORATION

DEFINITION OF OBJECTIVES AND PREFERENCES

IDENTIFICATION OF ACTIONS AND PLANS

CHOICE, PRIORISATION AND VOTE

IMPLEMENTATION

MONITORING AND EVALUATION

Citizen's perspective

We will respect our own rules

We know what is happening around us

Now we understand the big picture

We know what we want

We, too, have good proposals to make

In democracy, our voice count

Let's do it!

Are we getting there?

Participatory tools

PrePar
Preparing design of the decision process



Rock
Observing the river



Smag
Establishing a territorial diagnosis



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



Just-A-Grid
Discussing justice principles



Cooplan
Building action plans



Encore-Me
Evaluating impacts



Ex. in Uganda (2012-2014)



COOPLAGGE

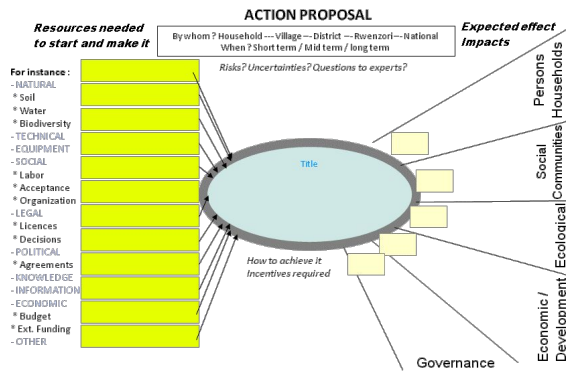
Field applications

CoOPLAaGE

- **France & Outre-Mer**
 - **Agence de l'Eau Rhône Méditerranée Corse** : méthodologie pour des projets de participation citoyenne (PGRE, HydroMorphologie, PAPI) <https://frama.link/RMCPart>
 - **Drôme (SMRD)** : co-préparation citoyenne de la révision du SAGE en appui à la CLE
 - **Camargue, Thau, StBrieuc** : débat public électronique pour la GIZC
 - **Région Occitanie** : cadrage participatif citoyen de la participation en zone littorale
 - **Luberon** : dialogue sur la faisabilité sociale de la réutilisation des Eaux Usées Traitées
 - **Nouvelle-Calédonie** : planification territoriale et conception de la politique de l'eau
- **Europe**
 - **Bulgarie** : construction participative d'un plan de cogestion inondations sécheresses
 - **Slovénie, Suisse, Autriche, Italie** : participation sur services écosystémiques rivières
- **Afrique, Amériques, Pacifique**
 - **Ouganda, Ethiopie, Kenya, Afrique du Sud, Mozambique, Bénin, Mali, Niger, Costa-Rica** : modélisation participative, jeux de gestion, planification multi-niveaux, pour la gestion des ressources naturelles (eau, alimentation, sols, biodiversité, pollution, conflits...)
 - **Tunisie, Brésil** : (ré-)ingénierie de la gouvernance participative inter-niveaux
 - **Sénégal** : conception participative de stratégies alternatives d'assainissement
 - **Kiribatis** : modélisation participative pour aider à l'effcience du service public de l'eau



COOPLAN: confronting heterogenous actions and strategies at all levels



NEEDS (for household)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
...

Example : outcoming strategy And.. YES ! It's implemented.

Strategy Household Short Term (ordered)

- Energy saving stoves
- Adopt energy saving technology at HH level (solar & biogas)
- Tree planting
- Tree nursery beds
- Education
- Conservation methods of farming + organic farming / Better methods of agriculture
- Control pollution of soil/water/air
- Mutual Information sharing and documentation
- Family planning

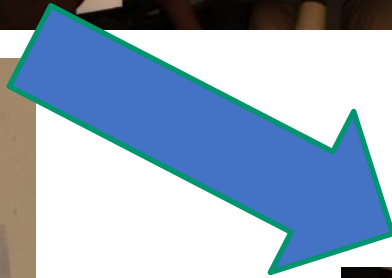


Uganda– 2013

27 communities
strategies

+

3 meso-level
strategies



**Proposed regional
INRM strategy**



Final draft INRM strategy (soft version)

E = Energy I = Infrastructure
 A = Agriculture L = livelihood
 C = Conservation M = Market / Economic
 P = Policy H = Health
 W = Water T = Tourism

Scale	Category	Household	Scale	Category	Community	Scale	Category	Regional / national
m+u	E	Energy saving stoves	d	P	Information sharing and doc	u+d+	P	Enforcement of laws and policies
i+m	E	Adopt energy saving technology at HH level (solar & biogas)	m+d	P	Education	m		
u+m+	AC	Tree planting	+u			u	P	Put means of preventing animals destroying crops
d+i			u+d	AC	Tree planting			
u	A	Tree nursery beds	i+m	AC	Tree nursery beds	i	P	Harmonise working relationship between gazetted areas and the community
m	P	Education	u	P	Reporting environmental encroachers to relevant authorities	m	P	A sense of ownership by policy makers about NRM
m+d+	A	Conservation methods of farming + organic farming / Better methods of agriculture	m+i	P	Establishment of Environmental committees	m+d	P	Environmental Monitoring, reports + independent body at regional level to look into environmental and natural resource mgt issues
u			i+m+	P	Community bye-laws on sustainable NRM (formulation & Enforcement)	+i		
d	P	Control pollution of soil/water/air	d			u+d	P	Sensitization about NRM + extension of the game
W			u+d	P	Sensitization about NRM + extension of the game	d+i	P	Mass sensitization about NRM
C			u+m	PA	Demonstration centres and plots	m+d	P	education
d	P	Mutual Information sharing and documentation	d	A	Vegetable growing	i+m	P	Policies on family planning - population growth control
m+d	PL	Family planning	u+m	MP	Collective marketing and establishing markets	u	I	Construction of feeder roads
m+d	A	Food crop / vegetable growing	u	A	Zero grazing	m	P	Protection of wild life
m	A	fruit growing	i	P	Proper land use planning			
m	W	Water harvesting	d	CP	Demarkation of wetlands	m	T	Promotion of tourism in Rwenzori region
u+d	A	Piggery	m	A	Making fish ponds	d	TC	Non polluting hotels
m+d	A	Bee keeping	m+d	L	Sanitation	u	M	Lowest price for agricultural products - no access to good prices
u	A	Community members to construct terraces	m	AH	Herbal medicine clinic and training centre block	u	M	Value addition to maize and millet
u	A	Coffe growing	d	W	Borehole	d	H	Herbal medicine clinic & training centre block
m	A	Kitchen gardens	d	W	Pump	d	H	Construction of health centres
u+m	L	Sensitization on and proper disposal of non Biodegradable materials	d+m	T	Promotion of tourism in the Rwenzori region	u	H	Construction of health centres
			d	T	Camping site	m	P	Policies on non-Biodegradable materials
			d	LC	Non-polluting washing bay	m	P	Policies on non-Biodegradable materials
			d	C	Authorized sand mining	m	W	Bore hole
d	A	Nursary beds	i	PC	Educate school children on envt	u+d	P	Environmental monitoring for the whole of Rwenzori region + Feed back from forums/ platforms
u	AC	Agroforestry	i	MP	Mobilise the community to initiate income generating activities			
m	A	Eucalyptus growing	i	P	Use media to sensitize community	i	P	Translate available policies on NRM into local language
m	A	Tea growing	d	AC	Exposure visits	i	M	Subsidies for tree seedlings
d	C	Proper soil and water conservation	d	P	Feed back from forums & platforms	i	M	Subsidies for tree seedlings
W			d	P	Making environmental reports	i	P	Government should work with corporate bodies which cause pollution for contribution
d+u	P	Family planning	i	WP	Stringent laws on water usage			
u	W	Rain water harvesting for domestic use	m	W	Building of small reservoirs	u+i	I	Rural electrification
u+d	E	Biogas	m	LC	Non-polluting washing bay	m	P	Sensitization on environmental conservation
m	E	Energy saving stoves	m	L	Ecosan toilets	m	P	Sensitization on environmental conservation
u	EC	Authorised charcoal burning	d	A	Promotion of floriculture	m	C	Restoration of degraded river banks
d	L	Proper waste management	d	A	Tea growing	m	C	Restoration of degraded river banks
m	L	Ecosan toilets	u	A	Organic farming	u	M	Loaning farmers at a minimum percentage rate
d	H	Family medicine plant gardens	u	T	Campsite			
			m	T	Tour guiding			
			u	A	Rear animal according to land capacity			

Are on the final picture of the regional strategy (meaning the "action implementation sheets" have been made)



INRAE Inria

Encore-Me

Evaluating
impacts

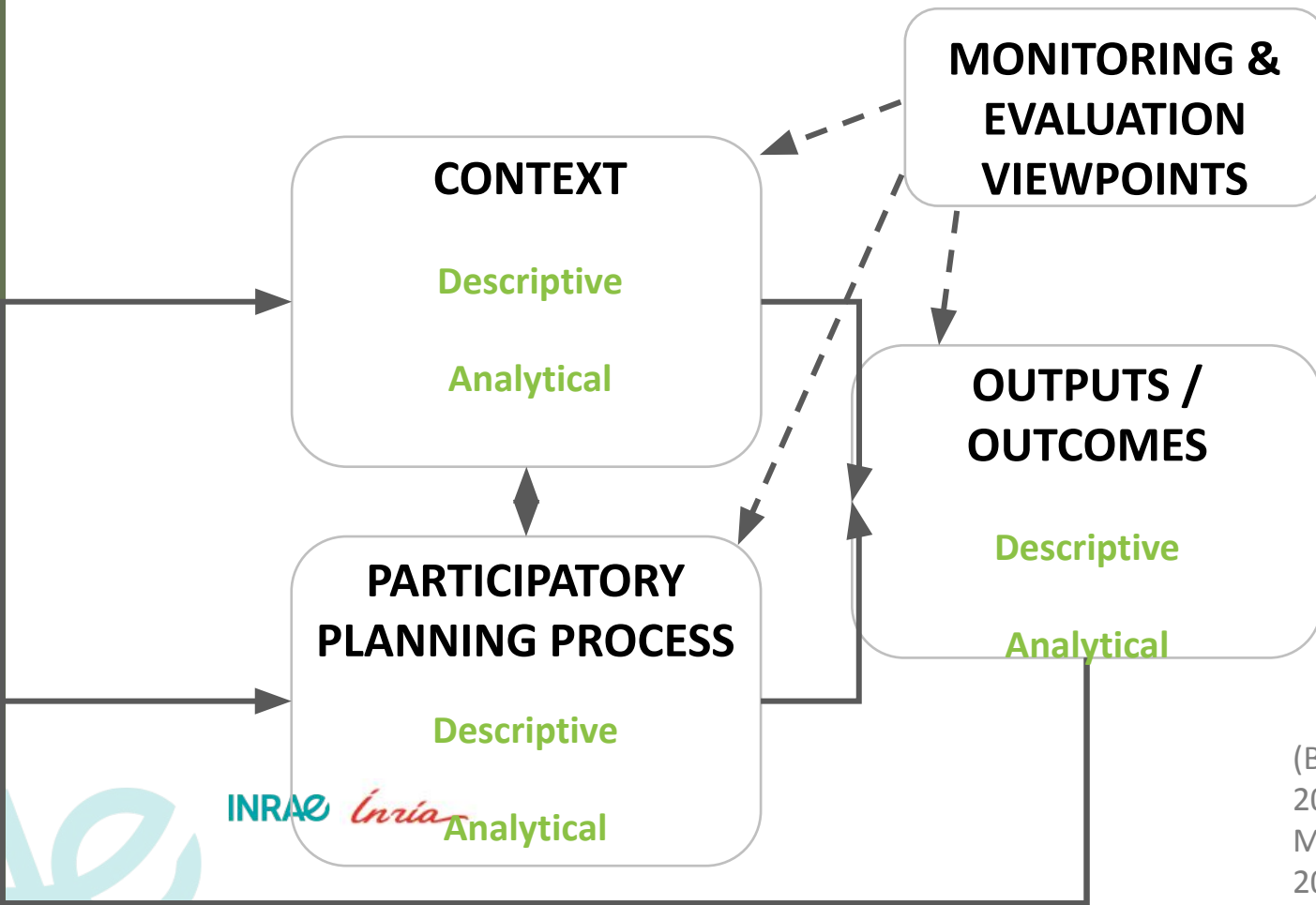
E.N.C.O.R.E. : coupled dimensions of change for a target group

(Ferrand, le Bars, 2004)

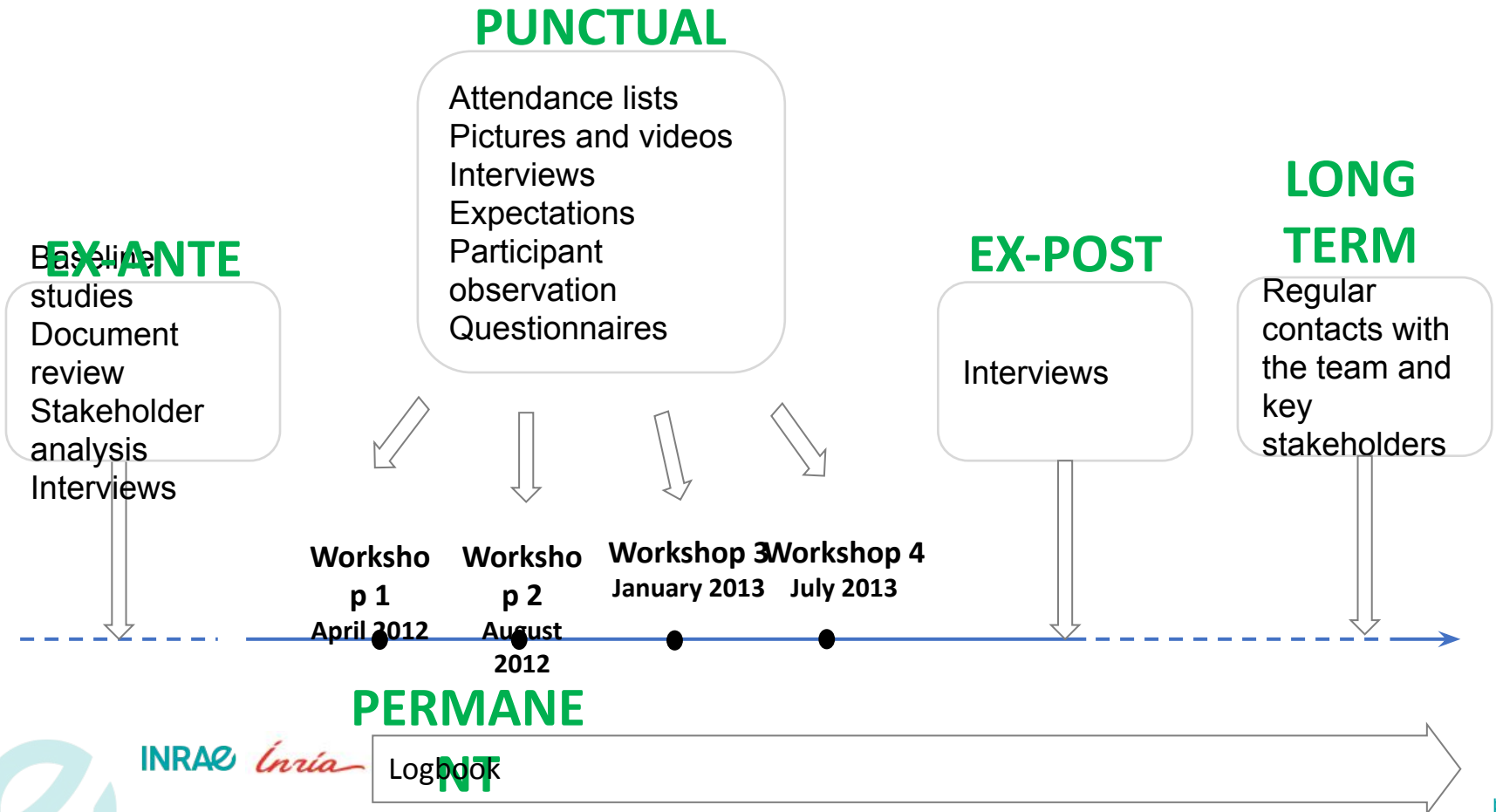
- External: external (to the group) change in sustainability
 - *Environmental / Political / Economical*
- Normative: changing participants' values and preferences
- Cognitive: changing participants' representations and beliefs
- Operational: changing participants' practices and actions, within and outside the group and process
- Relational: changing participants' social relationships
- Equity: changing the social justice' regime (distribution of resources, equity) among participants and outside

□ A generic framework to observe and describe multi-dimensional **INRAE** change, but not to prescribe (non normative)

An overall approach of M&E (Hassenforder, 2015)



M&E methods



A global M&E approach

10



PERMANENT (everyday)

Logbook 1: Overall process

Tracking all stakeholders interventions, sessions, interactions, events, operational change, and other external or contextual factors

Events' file



3 forms/files:

- Events
- Participants
- Participants/Events



Events' form

Round	Date	Time	Location	Facilitator	Participants	Activities	Observations	Remarks
Round 1
Round 2
Round 3
Round 4

Logbook 2: Local scale process

For entering all the M&E documents related to the local sessions

4 forms/files:

- Monitoring tables
- Rapporteur debriefing sheet
- Facilitator debriefing sheet
- Simple questionnaire

PUNCTUAL MESO & LOCAL scales

Pictures and videos

Attendance list



Monitoring tables

LIP STREAM	Progress trouble		Activities played
	Green	Red	
Initial situation	17	0	
Round 1			
Round 2			
Round 3			
Round 4			

Expectations



Interviews



PUNCTUAL MESO scale

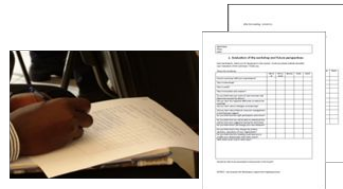
By researcher

Participant observation

By Facilitators



Thorough Questionnaires



PUNCTUAL LOCAL scale

By rapporteurs (local observers)

Participant observation

By Facilitators

Rapporteur debriefing sheet



Facilitator debriefing sheet



Simple Questionnaires



Pictures and videos of the documents



Transfer to researchers via logbook 2



Today's workshop: a COOPLAN starter

⇒ Issue : manage limited resources and multiple stakes in a participatory planning process toward transition

⇒ process : COOPLAN method + ENCORE evaluation

⇒ structure of the workshop : groups 5-6 persons

⇒ Case study : a large and well-off city located in a tropical region, fully dependent from its surroundings (for water, food, energy, labor, wastes) ⇒ you have to design a transition plan



Disclaimer !

This workshop simulates a participatory process held normally with any kind of stakeholders, including illiterate citizens (with support).

Don't expect to engage in a complex quantitative modeling process.

It's simple, robust and validated by field experience (on real case studies, not like here)

It's not aimed at satisfying us, modellers, but the needs of participatory decision making.



Reasoning participation on an (abstract) case

« *We live in a coastal tropical region called Tropipol, in the Comoa city .*

Situation:

- *City of Comoa*
 - *(500.000 px) + demographic growth (immigration)*
 - *high GDP but high inequality*
 - *fully dependent from its surroundings for water, food, energy, waste disposal*
 - *very high individual water, energy and (virtual) soil footprint*
 - *intense touristic activity in the city and near the coast,*
- *Outside it :*
 - *mixed agriculture with rice, irrigated, orchards and vegetables,*
 - *petrochemical (seaside) and food industry,*
 - *brackish laguna with RAMSAR bird area downstream*
 - *mountains & forests upstream in the natural park,*
 - *a large multi-purpose dam, hydroelectricity, tourism .*
 - *a shallow aquifer downstream between the city and the coast*

Tropipol region

Mountains

Erhno Dam

COMOA

Rice

Rice

Irrigation

Orchards

Aquifer

Veggies

PetroChem

Laguna

Sea resort
Hotels

Food
Processing
unit

SEA

The challenges

- For the last 15 years, recharge of the dam and the river flow have clearly diminished.
 - Meanwhile impact of floods in the lower suburbs of the city and downstream in the touristic area near the sea got worse.
 - Overall carbon impact of the city is 5 time higher than rec. / IPCC
 - Food provision chains extends very far, with high C cost
 - The two factories play a key economic role, but the PetroChem plant is challenged after a pollution spillover in the river and the protected laguna.
 - Inequalities rise in the city and outside, with very poor farmers' communities claiming for rebalance
- **A new development and transition plan has to be set**



Phase 1 : choosing a role

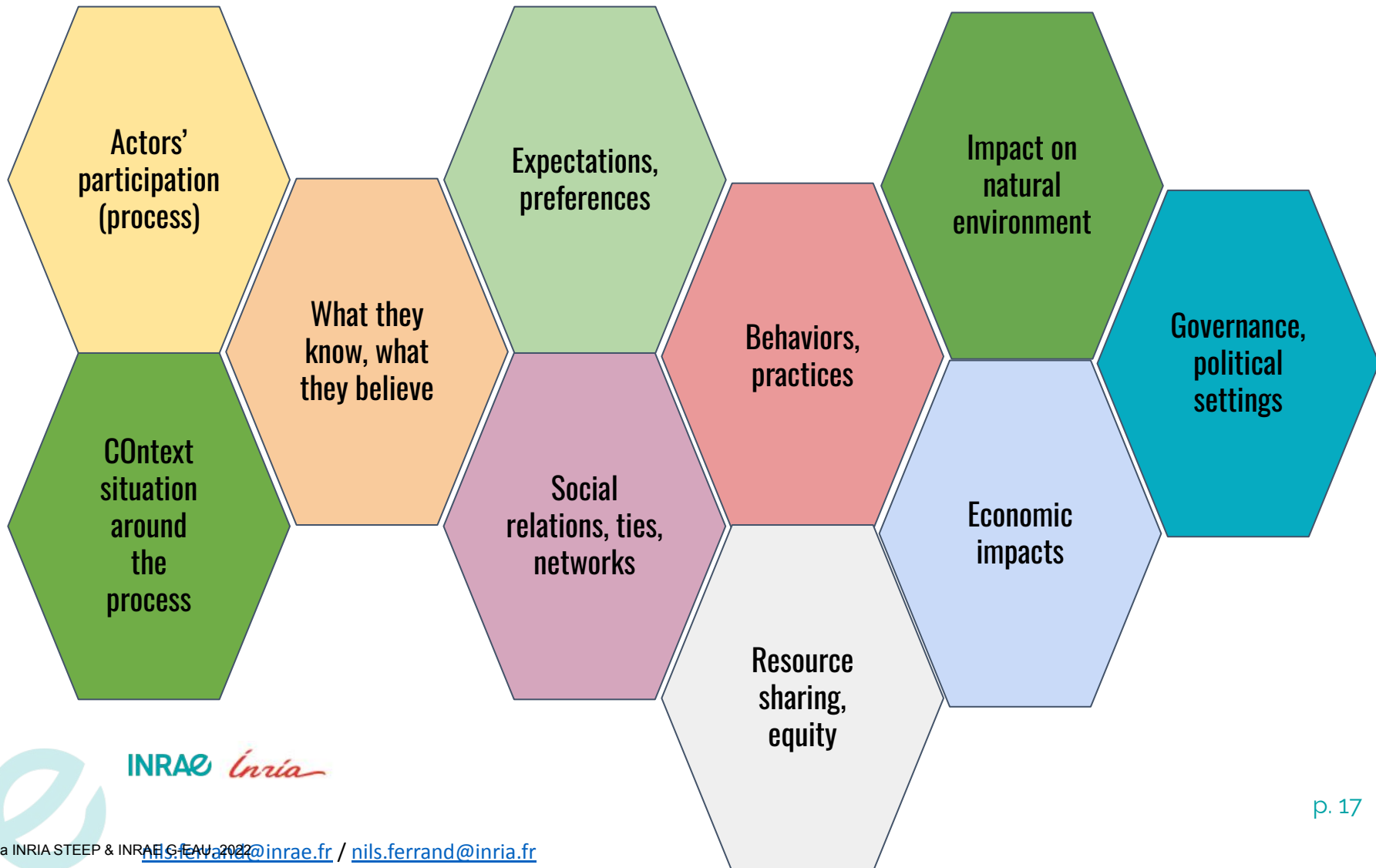
DO you want to be (* mandatory role in the group)?

- The mayor of the city *?
- The elected leader of the whole region *?
- A representative of a citizens' NGO/CBO ?
- An Environmental NGO representative *?
- A business & real estate developer ?
- The chief of the farmers' union from outside *?
- A researcher in sustainability sciences ?

Please take the role and endorse what you consider to be the main traits, expectations and behaviors of this.



Changing what (the ENCORE+ framework with 10 dimensions) ?



P2. Setting objectives

1. Based on your role, define individually (privately):
 - a. your personal goals
 - b. the goals you'll publicize for the city and the region
2. Share your public goals
3. Considering the ENCORE+ framework, discuss what your plan should aim at for the 10 dimensions
 - a. You don't need to agree on it - dissensus welcome
4. Write your conclusions



P3. Building your own action model

For your case study, as a group:

1. choose 3 or 4 critical resources (material or immaterial) which are at stake, and should be saved and shared (e.g. water, energy, labor, social willingness)
2. choose 2 or 3 common stakes or global targets (e.g. ecologic, economic, societal)
3. Copy and edit [the online Cooplan editing spreadsheet](#)

3 scales are imposed :

Individual (domestic, or in-business) / city / region



Guidelines in COOPLAN editing sheet

Do not edit this file directly --> copy it in your drive and edit your own copy

replace all resource names "Ress#" by your own choice for your model

replace all impacts names "impact#" by your own choice for your model

change actors' names if required

resources and impacts categories are the same for the whole group --> use the same action strip format

fill one action strip by action proposal

to fill an action strip :

1. put the name

2. put a short description

3. select one spatial scale - erase others

4. select one time horizon (now, later) - erase others

5. fill the actors' role table by ticking the cells with a 'x'

6. choose the resources' needs, for each ressource, from none to maximum (+3) --> ERASE irrelevant values

7. choose the impacts levels for each action, impacts can be negative AND positive -->ERASE irrelevant values from cells

8. process next action



P4. proposing actions' titles

Individually, based on your role:



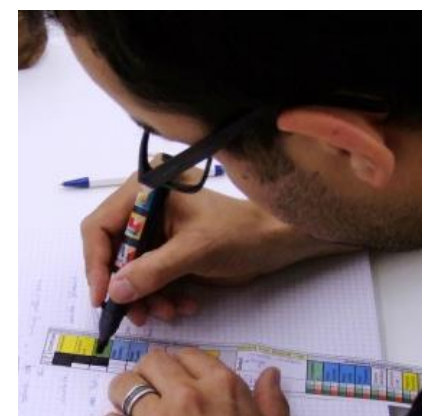
- List a set of actions which you want to recommend for:
 - Your roles or others, at all scales
 - for now or later
 - here or elsewhere
 - for any domain or sector → it's open proposal
- Only drop on a title on paper for now
- propose no more than 6 actions per person

As a group:

- post and share your action proposals and cluster them
 - NO prioritization, only organization



P5. Fill the action strip



Individually choose one action in the board
 Online (preferred) on a shared file for your group (google spreadsheet), fill one action strip

cc INRAE, 2023	Needs, requirements				City	Impacts						When ?	Actors' role							
COOPLAN	Ress1	Ress2	ress3	Ress4	demo action 1	Impact1	Impact2	Impact3	Impact4	Impact5	Impact6	Soon	City mayo	Reg Lead	Envir NGO	farmers	Citizens	Business	Scientist	
Low	+	+		+	blah blah blah blah blah This is a demo action blah blah blah blah blah This is a demo action blah This is a demo action	+1	-1		-1	+1	-1		Initiator, x	x						
Medium		++		++			2		2	3				Active, maker	x				x	
High				+++					-3					Impacted			x	x		

cf. Guidelines in the folder

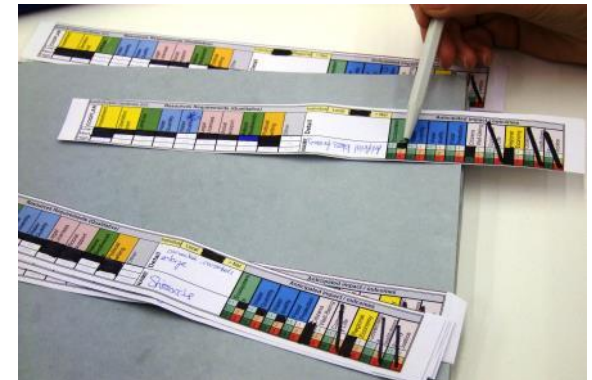
And repeat for the other actions not yet processed



P6. Confrontation arena

Choose one mate and discuss your 2 action proposals, compare and adapt content.

Switch groups. Co-process all actions.



P7. Building and assessing an integrated action plan

- As a group
 - For each space and time scale (3 x 2)
 - Select actions you want to implement
 - Stack the action strips
 - Online you can copy from one sheet to another

⇒ Assessment' dialogue

1. discuss by columns the resource needs
2. discuss the impacts in regards to goals
3. discuss the actors commitments

Assess feasibility and efficiency of the plan



The challenge' game

For each resource and each scale, put a set of 20 virtual units and consider how you'd distribute them in the plan.

→ physical : use tokens

→ digital : use numbers

DO it for all resources and check feasibility

What happens if you reduce one resource by 50% ? which actions to you remove ?



Conclusion

COmments and questions welcome.

