ATP-in-ALL: Analysis of Transformation Processes within Agroecosystem Living Labs

Erika Angarita, Prof. Dr. Jens Dauber

Thünen Institute für Biodiversität

Karlsruhe – 03.06.2022

AGRICULTURE RESEARCH GOALS & CHALLENGES

a new generation of research

to accelerate transformations + **to transfer** existing knowledge into **action**

Productivity

Efficiency

Sustainability

Resilience

Context / Introduction

Increasing demand for Transformation

Projects and initiatives ($, opportunities)

New Research Infrastructures (Living Lab)

Challenges & uncertainties

- How to do it? – Methodological
- What and Why? – Analytical
- For whom? – Strategic

RESEARCH QUESTION

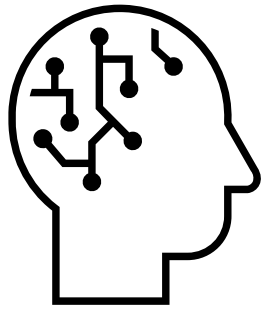
How to monitor (for reporting) and analyze (for learning) the degree of transformative change in Living Labs?

RQ: How to monitor (for reporting) and analyze (for learning) the degree of transformative change in Living Labs?

ATP-in-ALL

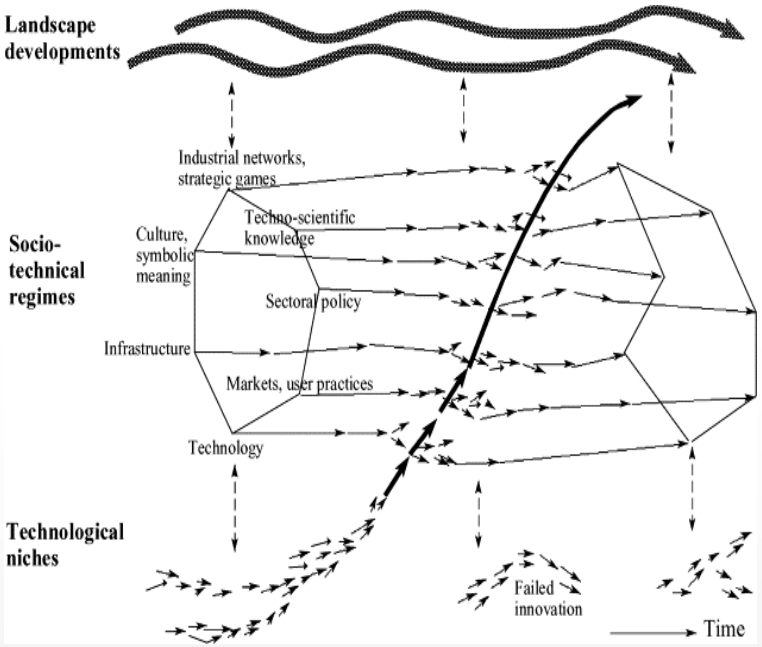
Analysing
Transformation
Processes within
Agroecosystem
Living **L**abs

- Concept
  - Understand the transformation process in order to learn.
  - What is relevant?
    How to frame it?
- Tool
  - Evaluate the developing transformation process in order to report, improve and scale it.
  - How to measure it?



AS A CONCEPT: Logic framework

Multi Level Perspective (MLP)



24 ELEMENTS

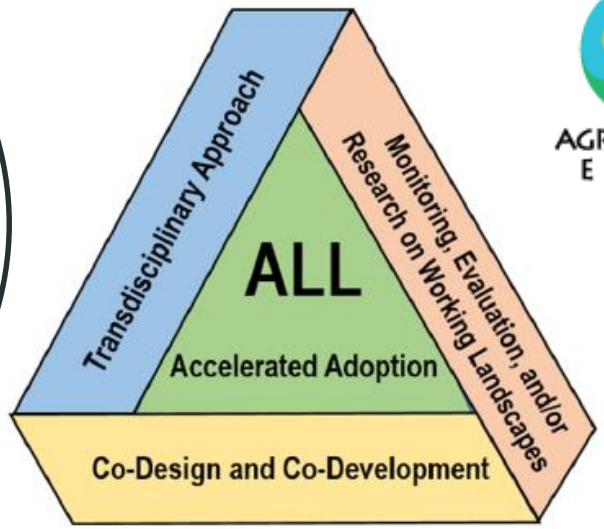
3 dimensions of change

Enabling factors

Key components

Criteria

Agroecosystem Living Lab (ALL)



AGROECOLOGY EUROPE

European Network of Living Labs

The purposes & benefits of ATP

1) Identify critical points in the Lab's development and propose improvements during the process.
2) To facilitate the integration of disciplines and results.
3) Actively involve stakeholders in the evaluation of the Lab's performance.
4) Respect and use the particularities and specificity of each ALL in the evaluation.
5) Use the lab to better understand transformation (trial – error).
6) Facilitate the reporting of results internally and externally (for funders).

AS A TOOL: 3 steps of assessment

DESIGN & PRE-DEVELOPMENT (BEFORE)

1. Enabling factors for transformative change

- Check list, pre-conditions
- 10 factors
- Quick Questionnaire
- Score

IMPLEMENTATION & DEVELOPMENT (DURING)

2. Measuring the degree of transformation

- Progress report, early warning!
- 10 Components = indicators
- Self-assessment
- Degree of change

FINAL STAGE* & IMPACT EVALUATION (AFTER)

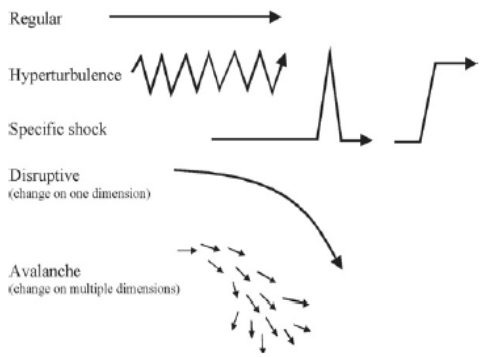
3. Establishing transformational impact

- Impact analysis, aggregation.
- 4 criteria
- Correlations and interactions.
- Compilation of lessons learned, recommendations and strategies (guidelines, toolbox).

*not only at the end of the project.

Step 1: Enabling factors

1. Environmental changes



2. Land access

3. Interest and motivation

4. Visions

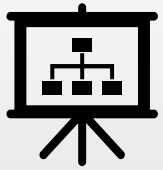
5. Funding

6. External support

7. Sense of urgency

8. Timeframe

9.Reasonable



10. Alternative options

Markets, infrastructure

Key question	Answer and Score	Examples
What type of environmental change creates the sense of urgency to change?	0= Regular 1= Hyper-turbulence 1= Specific shock 2= Disruptive 2= Avalanche	Which one? (e.g., political discussions, social movements, Fridays 4 future, etc)
How strong does the problem endanger the fundamental functioning of the system (survival risk)?	0= low survival risk 1 = high survival risk	Examples of sense of urgency or survival risk: events as Fire, Drought, Flooding, pest infestation…
Is the farmer the owner of the land?	1 = Yes 0= No	
Are infrastructure projects planned in the landscape?	1= No 0= Yes	
Have people in the landscape disposition to participate, contribute, and be part of the initiative?	1=Yes 0=No	How many people in proportion of population in the landscape?
Are alternative(?) supply chains, agents, institutions, or infrastructure present that support new products and markets?	1= Yes 0=No	Who, how many, which potential business?
What is the source of funding?	0=Only public funds 1= Only private funds 2= PPP (Public-Private Partner)	What type of funding strategies? Policy (such as CAP), research project, capacity building, subsidies, companies, etc. Who, how many, which potential business?
How is the profile, scope of action, and type of contribution of entities for external support?	0 = low diversity of stakeholders (same profile and scope of action) 1= medium diversity 2 = high diversity	Who is involved in the process? What is the expertise of the stakeholders? What type of contributions can bring these stakeholders or institutions?

Step 2: Measuring the degree of transformation

Dimensions	Components	Indicators
Acting: **Functional and structural aspects.**	Management of resources & Land-use	Diversification of resources & Land-use
	Innovation	Disruptiveness
	Dynamic	Acceleration
	Flexibility and adaptability	Resilience efficiency
Organizing: **Structural and relational aspects.**	Timing	Synchronisation
	Social inclusion	Diversification of social structures
	Networks	Centrality indices
Thinking: **Cognitive and relational aspects of actors.**	Transparency and communicative	Accessibility and rate of information use
	Knowledge and experience	Appropriation of knowledge
	Social values and beliefs	Narrative shifting

Participatory self-assessment: Degree of transformation

Component: Land-use / Indicator: Diversification of land-use	Assessment in the Lab (data)		SCALE OF CLASSIFICATION CO-DESIGN, BASED ON A SITE-SPECIFIC *GUIDING PRINCIPLES* OUTCOMES			
			Undesirable	Acceptable	Desirable	Ideal
Elements to monitor in the lab:	**Descriptive Qualitative**	**Quantitative**	**1**	**2**	**3**	**4**
Crops and practices (productive purposes)	# crops Tillage (hous of work, frequency)	2	Monoculture	Monoculture + Reduced tillage	Implementing agri-environmental measures on 5% of the agricultural area, e.g., flower and buffer strips.	Intercropping. Agri-environmental measures on 10-15% of agricultural area
Biotopes (non-productive purposes)	# of biotopes identify/ha	1	> 2% of landscape	between 2 and 10%	Betweeen 10 and 15%	more than 15% of landscape
Animals (productive purposes)	# animals/m2	2	Intensive system "industrial"	semi-intensive system	semi-intensive with 20% of Animal Welfare recommendations	semi-intensive with 50% of Animal Welfare recommendations
Water consumption						
Soil assessment* (erosion)						
Support synergies to ecosystem services (GHG emi						

10^x

1

3^n

2

6 elements x 4 ideal score = 24 (100%)

If assessment is 1+2+3+4+1+1 = 12 (50%)

Acting dimension

Components	Indicators	Description of indicator
Management of resources & Land-use	Diversification of land-use	Diversification of land-use = crop diversity+ animal diversity + landscape diversity + diversity on plans for management natural resources (models and production systems)
Innovation	Disruptiveness	Disruptiveness = (efficacy technical criteria for the innovation + number of powerful actors using the innovation + economic efficiency and competitiveness of the innovation) * (number of innovations at the end)/ number of innovations initially proposed.
Dynamic	Acceleration	Acceleration = number of meaningful activities implemented / time unit (year)
Flexibility and adaptability	Resilience efficiency	Resilience efficiency = Output under Shock /Normal Output

Organizing dimension

Components	Indicators	Description of indicator
Timing	Synchronisation	Synchronisation = activities developed at the right time/activities planned
Social inclusion	Diversification of social structures	Diversification of social structures = (amount + diversity of actors) + (role of actors*power of decision)
Networks	Centrality indices	Centrality indices = Betweenness, Closeness and Strength indicators for network analysis Level of intensity on ties (strong, weak) Number of persons with whom a stakeholder is directly connected (degree of centrality) Number of times an actor is in between two other actors that are disconnected (betweenness centrality)

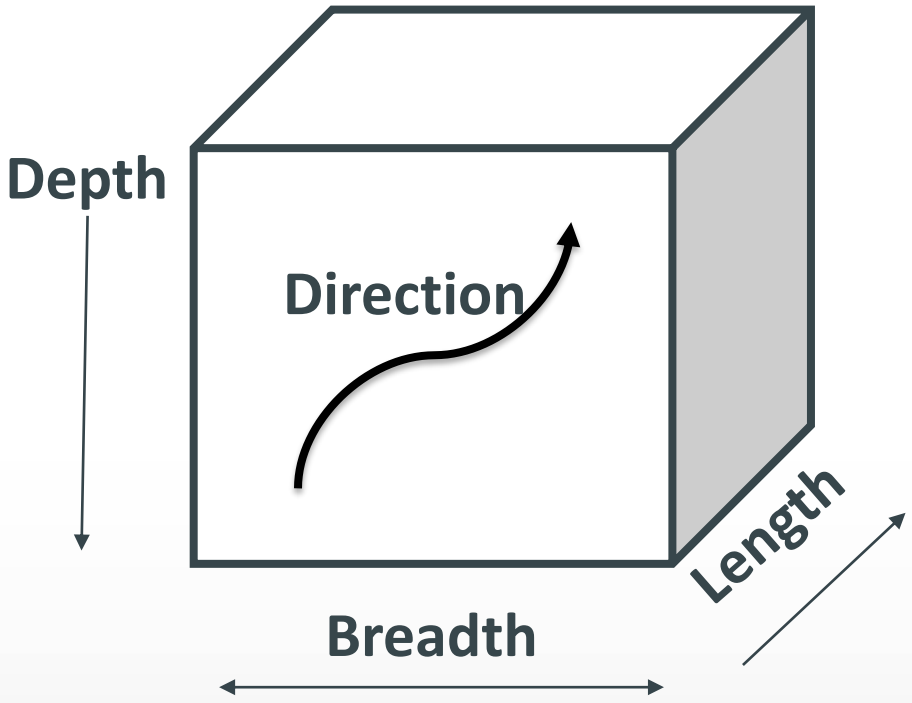
Thinking dimension

Components	Indicators	Description of indicator
Transparency and communicative	Accessibility and rate of information use	Accessibility and rate of information use = (number of communication channels used / total number of communication channels) + (frequency of updating databases / frequency of database consultation) * (type of audience consulting databases and using communication channels)
Knowledge and experience	Appropriation of knowledge	Appropriation of new knowledge = number desirable (right) answers in a survey, interview, or questionnaire for a specific issue or topic / total of questions.
Social values and beliefs	Narrative shifting	Narrative shifting = difference in the number of key concepts used by the actors at the beginning and the end of an evaluation cycle * frequency of use of the concepts

Step 3: Establishing transformational impact

Depth = mentality + behaviour

New paradigms and values?



Breadth = System, scope of action

how far have we come?

Direction = trajectories and transition pathways

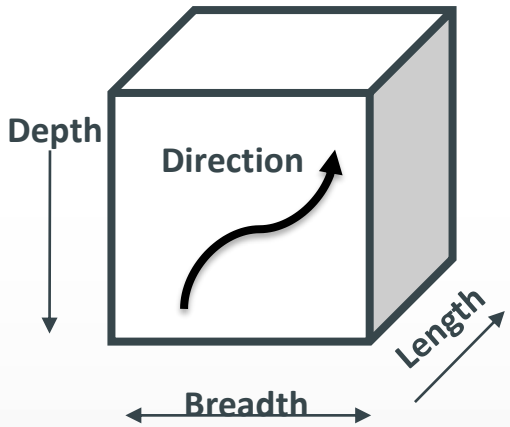
Retrospective analysis: What and how?

Length = persistent, durability of change (TIME)

Lifetime of interventions and actions implemented.

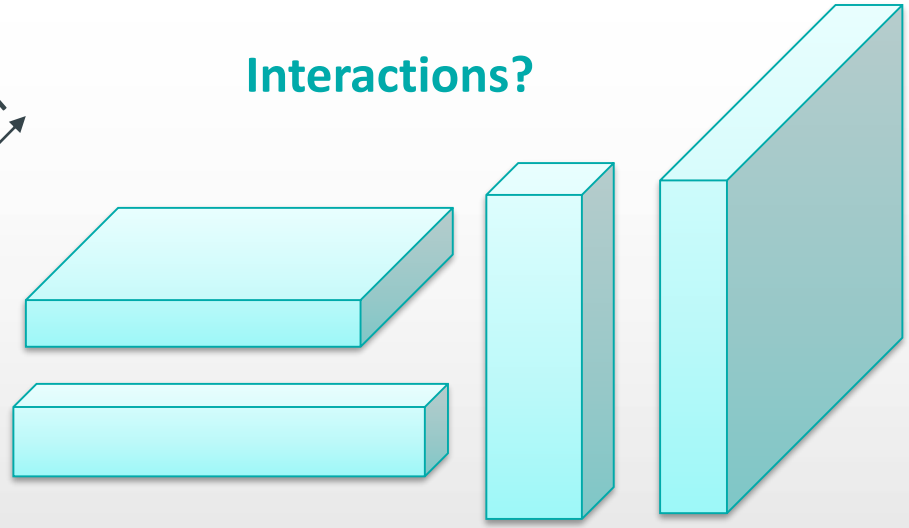
Analysis of transformational impact based on changes.

INTERVENTION:
Integration of structural elements into the landscape (e.g., strips of trees of agroforestry systems used for energy production)



What forms?

Interactions?



CHANGES GENERATED

Indicators	
Diversification of land-use	↑ +30%
Disruptiveness	
Acceleration	↔ 0%
Resilience efficiency	↓ -50%
Synchronisation	
Diversification of social structures	
Centrality indices	
Accessibility and rate of information use	
Appropriation of knowledge	
Narrative shifting	

ADVANTAGE AND USES OF ATP-in-ALL

- ✓ ALL can be used as experimental spaces to better understand, learn and improve the Transformation Processes (TP).
  - ✓ Mixed methods, innovation on co-creation, types of data and info, best practices?
- ✓ We seek to integrate features and traits of diverse frameworks (ALL+TF)
- ✓ Can be used in different stages of development.
- ✓ Is flexible and adaptable to the specific needs of each Lab.
- ✓ Used the main characteristics of LL (participation, co-creation) in the assessment.
- ✓ Promotes self-reflection and critical thinking.

- Difficult to explain
- Is not for everyone
- Needs certain skills (evaluator)
- Too theoretical (for now)

Thanks a lot!
Vielen Dank!

ANY QUESTIONS???

erika.angarita@thuenen.de

REFERENCES

International Agroecosystem Living Laboratories Working Group. Agroecosystem Living Laboratories: Executive Report. G20 Meeting of Agricultural Chief Scientists (G20-MACS). 2019. Available online: https://www.macs-g20.org/fileadmin/macs/Annual_Meetings/2019_Japan/ALL_Executive_Report.pdf (accessed on 20 November 2020).

Structure Matters: Real-World Laboratories as a New Type of Large-Scale Research Infrastructure. A Framework Inspired by Giddens' Structuration Theory. *GAIA* 27/S1(2018): 12–17.

Jointly Experimenting for Transformation? Shaping Real-World Laboratories by Comparing Them *GAIA* 27/S1(2018): 85 – 96

McPhee, C.; Bancerz, M.; Mambrini-Doudet, M.; Chrétien, F.; Huyghe, C.; Gracia-Garza, J. The Defining Characteristics of Agroecosystem Living Labs. Sustainability 2021, 13, 1718. https://doi.org/10.3390/su13041718