Collaborative design of actions

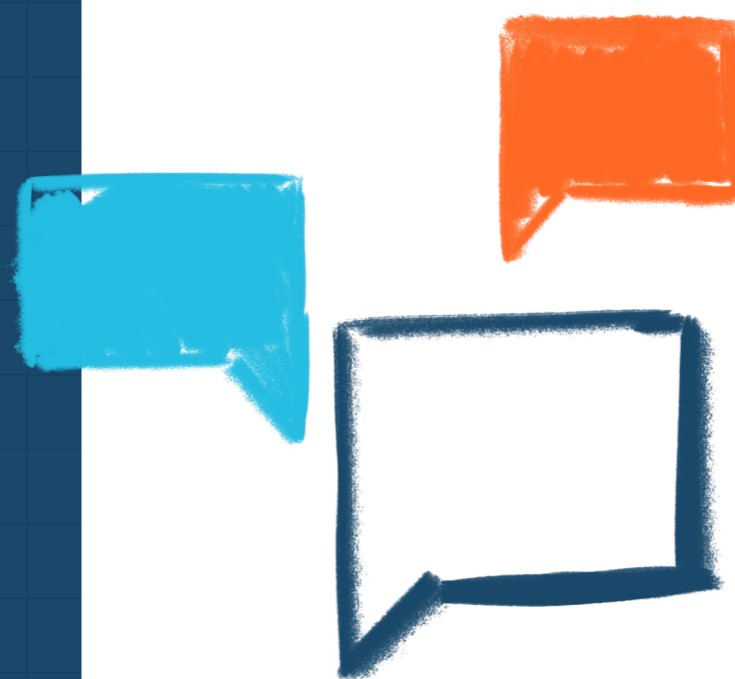## Collective intelligence for experimenting and scaling with others
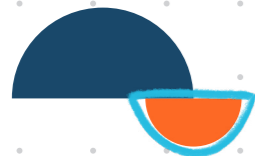
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Introduction

In March 2022, three local governments of Buenos Aires tested an app simultaneously to gather information on freshwater ecosystems. Led by the Co_Lab, the Accelerator Lab of the United Nations Development Programme (UNDP) in Argentina, the project involved scientists who developed the initial version of the app, government officials from several areas and diverse backgrounds, citizens, and NGOs. Originally called "Appear", we renamed the app "**PreserVamos**", along with the scientists that created it. Some of the items on which information was gathered through the app had been defined by the municipalities themselves. The app displayed the logo of the municipality where the user was located, and government officials took active part in the fieldwork. The testing phase yielded valuable and diverse information on freshwater ecosystems, promoting innovation and local environmental governance. It also assessed the contribution of citizen participation in this crowdsourcing initiative.

In November 2023, a workshop on native flora was held at Isla del Puerto, in Concepción del Uruguay, Entre Ríos, Argentina. The workshop was organized together with the municipality and the Binational Project "Climate Change adaptation in vulnerable coastal cities and ecosystems of the Uruguay River (Argentina, Uruguay)" (ACC Río Uruguay, in Spanish), led by the UNDP. It aimed at raising awareness about the importance of native flora and its role for the environment. The workshop gathered ONGs, research centers, universities, residents, plant nurseries, park rangers, and lifeguards. Discussions revolved around different circumstances, obstacles, and possibilities in relation to native flora, and led to the formulation of action plans to promote its adoption.

Both the experiment and the workshop could have been conceived and executed in many different ways, but **they were carried out collaboratively.** Their goals, actions, dynamics, and even every single material needed for their implementation were agreed upon in successive meetings among partners. After the activity, the results were shared and subjected to the consideration of all of the workshop's organizers. This way of working takes time, a lot of time! It requires regular meetings and conversations among participants with different backgrounds, interests, goals, and even time availability. This dynamic is made possible through a conscious journey of mutual understanding and trust-building, conversations for teamwork, collaboration, and the multiplication of ideas. **This document aims at offering experiences and materials to work as a guide so that anyone can follow this path and collaboratively design development interventions.** We believe that this collaborative way of work is fundamental for understanding and scaling solutions that address development issues effectively and feasibly.

Why collaborate?

The Co_Lab aims at identifying and promoting solutions for development-related challenges through innovative approaches that enable their implementation and evaluation on a small scale and within short timeframes. The solutions tested emerge from a "bottom-up" perspective and are often off the radar of governments or agencies. **In other words, these small-scale interventions identify, test, and promote innovative grassroots solutions that have the potential to accelerate our understanding of the complex problems impacting development.** Furthermore, these solutions are diverse, addressing different facets of a problem through various means and strategies, thus embodying a portfolio approach in areas such as digital inclusion, citizen science, or artificial intelligence. The pilots and experiments that we conduct allow us to analyze how these solutions work, and if they are likely to be scaled up. To do so, **we leverage collective intelligence through the collaborative design of actions, which can be used both in person and in online environments.** For instance, the experiences (pilots, experiments, workshops) shared in this report were carried out in person, but previously organized during online meetings.

In collaborative design, the implementation of actions can involve numerous stakeholders: citizens, organizations, and government officials, coming from various disciplines and backgrounds. This means that each participant brings their own cultural baggage, which leads to different understandings and even terminologies for the same concepts. While this diversity of perspectives can be challenging, it also offers a tremendous opportunity, as a single problem can be conceptualized and tackled in different ways, through a portfolio of actions.

> The very nature of collaborative design is to ensure that these diverse actors are actively involved in the project design, rather than merely being observers of the outcome. Thinking about design collaboratively helps to align expectations, methods, and outcomes.

For instance, working with state counterparts might reveal specific needs, knowledge, or limitations that we are unaware of. They might also bring regional insights to the table, due to their experience in that area. Something similar can happen when working with citizens because no one knows their concerns better than themselves. This kind of knowledge is extremely valuable and often crucial, as it allows for planning or restructuring of the project from the outset, taking these factors into account. Through this design approach, it is possible to prevent obstacles and select the most cost-effective approach even before the project launches. Ultimately, the collaborative model leads to inclusive outcomes thanks to the inputs from all stakeholders, and often enables us to save and make a more efficient use of time, money, and other resources.

Collective Intelligence

Collective intelligence is fostered using facilitation techniques to achieve a dialogue that is both free and structured.

This dialogue is free in the sense that all ideas, voices, and opinions can be expressed safely, without feeling censored or constrained. A safe environment for all participants means without fear of retaliation—*if the dialogue is between individuals with different positions of power and/or asymmetries in organizations*—, and by promoting the expression of those who have a low profile or are less likely to speak up in conversation and discussion spaces.

Structured means that this dialogue has, simultaneously, specific predefined goals that are sought to be achieved. It is organized in a way that allows for the channeling and structuring of the discussion so as to reach different milestones or agreements, which are always aligned with the original goals of this instance.

Today, there are agile methodologies for creative facilitation that offer a wide range of activities. However, this kind of tools are not new, as they have been regularly used in fields like psychology, pedagogy, sociology of organizations, or management, each with diverse techniques.

A particularly interesting approach to collective intelligence is that of the "**Liberating Structures**" project, which has systematized many of these activities. *What are Liberating Structures? They are interaction methods—easy to learn—that enhance the way people establish relationships and build trust. They promote active participation of groups of any size, truly making it possible to unleash everyone's potential.*

Conventional structures tend to be too rigid in some cases (presentations, reports, directed debates) or too disorganized in others (open discussions, brainstorming). Often, this does not allow for a diversity of voices or the emergence of innovative ideas, which can lead to feelings of frustration within the team, as well as an inefficient use of time and other resources, leading to results below the expected potential. There are many examples of liberating structures practices, including spiral journal, panarchy, cocycles, among others.

Collective intelligence activities can be used for very diverse purposes. In the "step by step" guide we share below, we give some examples of how we have used them for different actions.

Why small-scale?

The 91 Accelerator Labs are part of a global network that **works on a small scale to gather evidence over relatively short periods through low-cost interventions**. These interventions complement other forms of research and development. The goal is to produce useful learnings that can be adapted by development agencies, governments, and various decision-makers to guide interventions, programs, and public policies. **Small scale work has several benefits: it's easier to involve and coordinate with different stakeholders, and it allows to get useful and generalizable results with fewer resources.** Through this approach, we can run experiments and tests to evaluate if the mapped solutions (or their parts) actually work. We do this through pilot testing, prototypes, experiments, or quasi-experiments. In summary, small scale allows for:

- ☑ Lower costs
- ☑ Greater control of variables
- ☑ Faster execution and results
- ☑ Greater flexibility to explore different ideas and make adjustments
- ☑ Risk minimization (if things don't work out, less time and money are lost)

The involvement of participants in different parts of the process facilitates the understanding of the goals of the intervention and horizontality in decision-making.

Experiments

Experiments are used to test hypotheses and establish causal relationships between variables. In other words, **they allow us to observe the effect of one variable on another and to modify it to determine its impact.** To achieve this, participants or instances are divided into a control group and an experimental group. The former does not receive the intervention or treatment under investigation, thus serving as a benchmark for comparing results with the experimental group, which does receive the intervention. The gold standard for such studies is randomized controlled trials (RCTs). However, an RCT is not always the best alternative, either due to feasibility issues, the temporal and resource costs involved, or mismatched conditions for the intervention. For these reasons, as mentioned earlier, Co_Lab proposes pilots and small-scale experiments. **The idea behind implementing these experiments is to optimize resources and obtain scalable short-term results to**

address more complex questions related to development goals. With a small-scale experiment, it is possible to quickly test solutions and analyze their usefulness and scalability.

Beyond experiments: Collaborative design approach

The collaborative design approach is valuable not only for experiments but also for other initiatives such as pilots or workshops.

Workshop "Nativa: Flora de Concepción"

Communities living in green and coastal environments are most affected by various natural, water-related, and climatic phenomena leading to frequent floods. Simultaneously, these communities possess valuable knowledge about their environments and events. In the climate action learning cycle, Co_Lab aims to facilitate various instances of collective intelligence for the exchange of knowledge to enable the recovery of this information, raise awareness, and promote actions to better prepare populations. The Binational Project ACC Río Uruguay, in turn, seeks to build resilience in these communities. The municipality of Concepción del Uruguay has also undertaken initiatives and actions for ecosystem protection within the environmental management framework of the city. The organization of the workshop involved a several activities, including collective intelligence sessions during the preparation meetings to define workshop goals. These sessions were also dedicated to the creation of a map of relevant actors and the subsequent determination of the activities, individuals, and organizations involved in the event.
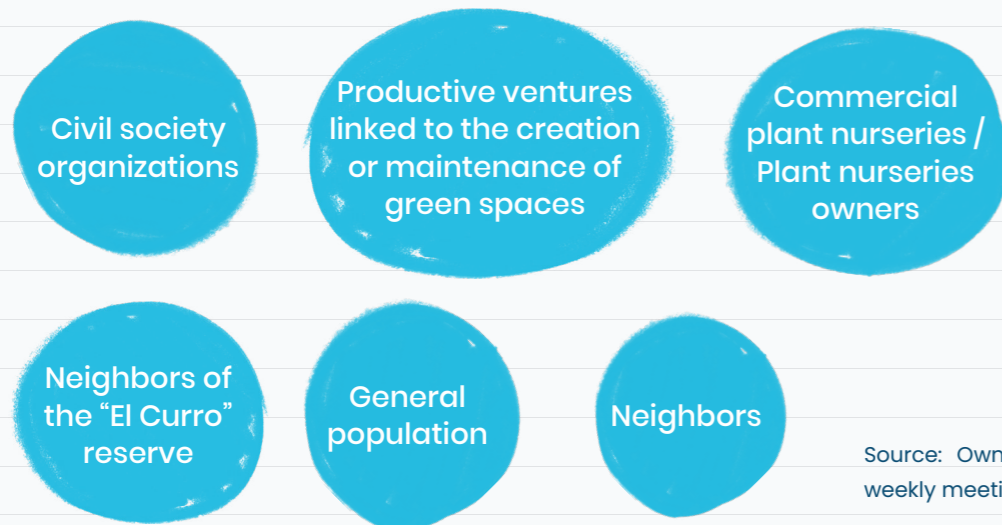
Today´s Meeting   Date 18/9

- ☐ Jointly define general and specific goals
  - • What are we focusing on? Understanding, raising awareness, reinforcing
  - • Who are we focusing on?
  - • In which areas?
- ☐ Set a tentative date
- ☐ If we reach an agreement , discuss planning and schedule.

Stakeholder Map

UNDP - Binational Project *(ACC Río Uruguay)*
UNDP - Accelerator Lab
Concepción del Uruguay Municipality

Public

- Municipal plant nursery
- Concepción del Uruguay Municipality
- Government of Entre Ríos
- Another public actors

Private and civil society

- Civil society organizations
- Productive ventures linked to the creation or maintenance of green spaces
- Commercial plant nurseries / Plant nurseries owners
- Neighbors of the "El Curro" reserve
- General population
- Neighbors

Source: Own elaboration, based on weekly meetings, September 2023.

The goal of this conceptual framework is to outline the considerations, tools, and actions necessary for the success of a collaborative project that relies on small-scale pilots and experiments with an impact on development variables. Next, we will delve into each step of the process.

The collaborative design of the *Con Vos* Network experiment

The *Con Vos* (With You) Network is a project that scales an innovative grassroots solution, connecting community markets with digital inclusion. It involves a network of nearby stores, where neighbors can carry out administrative online procedures close to their homes with the assistance of shopkeepers. In addition to promoting inclusive digitalization, neighbors save time and money by handling these procedures online. To implement this solution **we partnered with the municipality of Concepción del Uruguay to collaboratively design and deploy the network.** Together, we invited stores that already had computer and Internet access and we trained their owners and shopkeepers to offer this service and, thus, become part of the network. Different treatments were defined to evaluate how the network worked. Stimuli were provided to the supply side of these solution; printers and/or promotional materials were given to a group of nearby stores. In some areas, information or discount coupons were distributed to neighbors to stimulate the demand side.
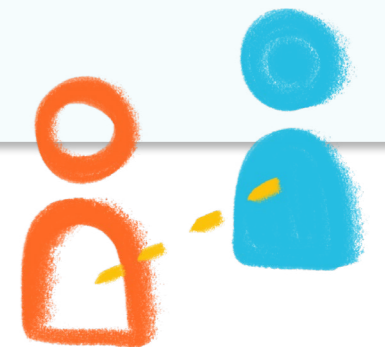
2. Guide to designing an experiment collaboratively

Step by step

Step I.
Selecting partners

In our case, collaborative actions are conducted to test solutions (or some of their parts), enhance our understanding of them, facilitate their introduction to the territory, and leave the tested solutions ready to smooth the way for adoption and scaling by our government partners. **Such collaborative initiatives may serve different purposes, for which a diverse selection of partners is needed.**

Our **partner selection strategy** for actions is based on **establishing strategic alliances that generate a twofold impact.** We collaborate closely with local governments that engage in experiments to reach the population and/or scale initiatives and align them with the Sustainable Development Goals. We also partner with the organizations responsible for the solutions we test, leveraging their expertise and subject matter knowledge. Thus, by involving them as technical experts and co-owners, they effectively gain resources that they can later use to promote the solution they lead. **This approach has proven to be successful** and, as an example, we can mention our work with the Municipality of Concepción del Uruguay.

In this case, the owner of a supply store in San Martín, Buenos Aires, where we initially mapped a solution that inspired a network of nearby stores to support neighbors with their online administrative procedures, was also the one who trained field promoters when the initiative was scaled up to Concepción. In another example, we hired the team from the Citizen Laboratory of the University of Buenos Aires, and, in partnership with the municipality of Quilmes, we conducted a citizen science experiment on household waste weighing —created by the **Citizen Lab** itself— to understand the effect of this experience on pro-environmental attitudes. Thus, this model of partner selection allows us to create scalable solutions, strengthening all parties involved in collaborative design.

Step II.
Forging bonds and building trust

Collaborative design engages various stakeholders, some of whom may be unknown beforehand or, if known, it might be the first time coordinating actions with them. Therefore, **it is crucial to take the necessary time to communicate the preliminary goal of the action, which should be open, at least partially, to be redefined collectively, as well as the collaborative dynamics of the effort so that participants also take on responsibilities throughout the process.** This way of working inevitably takes time. This does not mean that it is impossible to work quickly, but even in these cases,

it will be always necessary to **invest time in fostering mutual understanding and initiating the conversation that will lead to the desired outcome.** The work dynamics vary from case to case. For example, in the PreserVamos initiative, there was an initial phase of collaborative work with the AppEAR scientists team. Once the goals of the action were defined, we started looking for partners from the government. We invited three municipalities to the project and we had weekly meetings with each of them and another meeting with the AppEAR team. When establishing the *Con Vos* network in Concepción, we were already in regular communication with the Production area, with which we discussed and discarded alternatives so that we could, together, devise the action from scratch. We already knew each other before we began the designing stage of the experiment. In the case of the workshop on native flora, the teams had never worked together, nor had they engaged in this collaborative dynamic in the past.

Step III.
Defining the question

Collaborative design **begins with a broad question or hypothesis to be tested.** This question must be clear, objective, and specific. Initially, this inquiry is often abstract. The goal of the collaborative design model is precisely to attempt to ground this general question through experimentation. Sometimes, the exercise involves reducing the level of abstraction of the original question while, in other cases, the question itself may change.

> **Original question of the PreserVamos (WePreserve) experiment:**
> Can citizen science contribute to policies that address the most urgent problems of development?

Sometimes the intervention may have a specific goal and may not be framed in terms of a question. In the case of the workshop on native flora, this goal was also collaboratively defined.

Defining goals

Collective intelligence activities promote the multiplication of ideas by promoting plurality. In this sense, it is crucial to combine instances of individual idea generation to capture the original and specific contributions of each participant. In the case of the workshop on native flora, in one of the meetings, we requested participants from the partners organizations to first think about their own goals individually. Subsequently, all individual goals were read, organized according to how they converged with each other, and some of these were selected.

Workshop "Nativa: Flora de Concepción".
→ Definition of goals

Select a dimension (understanding, raising awareness, reinforcing, other) and propose a specific goal that helps us achieve the general goal.

- Ex. 1: Gain knowledge about the territorial extension based on the experience of islanders..
- Ex. 2: Raise awareness about productive use.
- Ex. 3: Strengthen the participation of volunteers in controlling invasive plants.

"My goal would be… to raise awareness about the value of native species to replace/complement and increase vegetation."

"My goal would be… to generate an exchange and raise awareness about the use of native species instead of exotic ones in public green spaces."

"My goal would be… to survey exotic species and specimens in relevant urban spaces with a high social, cultural, and environmental value."

"My goal would be… to promote exchanges of experiences and to share learnings, systematizing good practices."

"My goal would be… to promote landscaping with native specimens, gaining a better understanding of its diversity and different types."

"My goal would be… to raise awareness about biodiversity."

"My goal would be… to learn, share, and build connections regarding experiences (control of exotic specimens and post-production) within the territory."

"My goal would be… to systematically obtain and survey information from a registry of observations made by local residents that may be beyond the reach of the technical teams."

"My goal would be… to identify "ambassadors" or key informants regarding the territorial extension of plants."

"My goal would be… to recover knowledge about the interaction between invasive plants and other elements of the ecosystem, water, floods, and drainage."

→ Selected goal

Raise awareness about the value of native species and the environmental damage caused by certain exotic ones. Promote the use of native species to replace or complement exotic ones in gardens, public spaces, etc.

Source: Own elaboration, based on weekly meetings, September 2023.

Who would we invite to be part of the activity?	What do we wish to know, reinforce, or raise awareness about?	Specifically... What and how would we ask?

• Urban design and landscaping professionals
• Commercial plant nurseries
• Municipal plant nursery and personnel in charge of maintaining public green spaces and trees
• Productive small businesses related to the creation or maintenance of green spaces, parks, gardens, etc.
• Civil society organizations
• The general public interested in this issue
• Teachers from education institutions linked to or interested in the issue
	• Beneficial properties of native species vs. exotic ones
	• Uses, ornamental properties, planting times, suitable soil types, and growth times of native plants
	• Reforestation with native plants according to the ecosystem
	• Impact of exotic plants: do they promote or prevent flooding?
	• Exotic plant control methods
	• The added value or by-products that could be obtained through the control of exotic species
		• Analysis of previous perceptions (recognition of and education on the benefits of native plants)
		  - Do you know any plants or trees that are native to our area? Which ones?
		  - Characteristics of the most well-known species
		• Where could these species be planted, that you know of?
		• How significant do you perceive the impact of biodiversity loss in relation to the invasion of exotic species?
		• Key factors exacerbating the proliferation of invasive plant species, such as grazing, watercourse disturbances, and others

Many times, this collaboration scheme involves experts in different topics closely tied to the tested solution. Regardless of this, it is always an asset to carry out a review of the academic literature and previous studies related to the research question, particularly when it has already been operationalized, to understand the context and the theoretical basis of the issue addressed. This helps to identify knowledge gaps and design an experiment that provides valuable information.

Step IV.
## Formulating the hypothesis

This step involves transitioning **from the general hypothesis to specific hypotheses** and considering different **dimensions of analysis** of potential experiment/intervention. Various collective intelligence activities can be employed, some of which are available within the menu of different liberating structures activities (see text box).

To illustrate how these methods are implemented, we will examine the case of the spiral journal. It is important to note that any other method could have been chosen from a comprehensive menu of alternatives, but we present this specific case as an example. The spiral journal is a dynamic process guided by different questions or guiding instructions that vary in each specific case. The idea is for participants in this collaborative model to think about these questions and their answers individually first, so they can later discuss them and agree on a collective final model through interaction and dialogue with peers.

In our case, the initial phase of the experiment design was conducted with the team of scientists who developed the solution we were testing. Building on the original question of the PreserVamos experiment: "Can citizen science contribute to policies that address the most urgent problems of development?", we aimed to explore
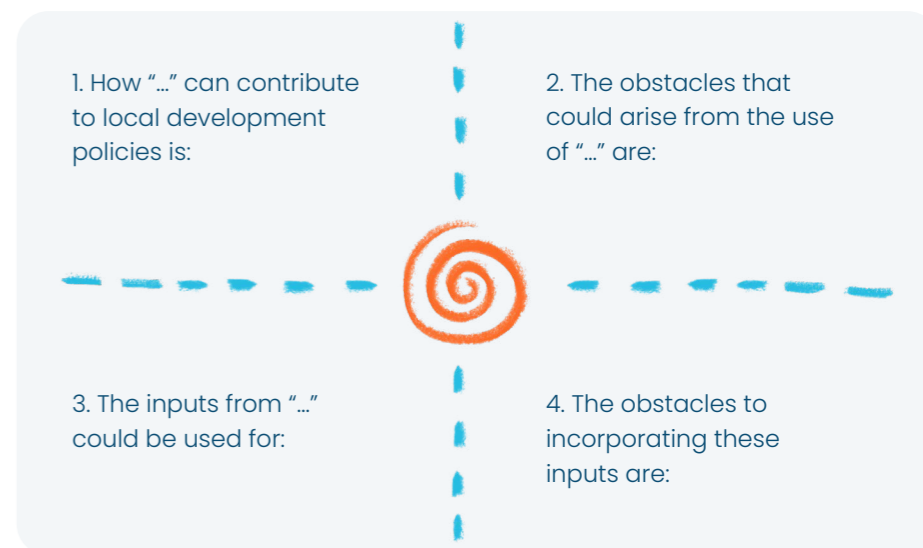
the potential contributions of a specific citizen science experience in local policies. In this case, this experience was AppEAR, the application that gave rise to PreserVamos.

The **first step** of the spiral journal process involves dividing a sheet into four quadrants. Participants are then asked to **draw a spiral in the center, making it as tight as possible.** The goal of this activity is to capture the participant's full attention.
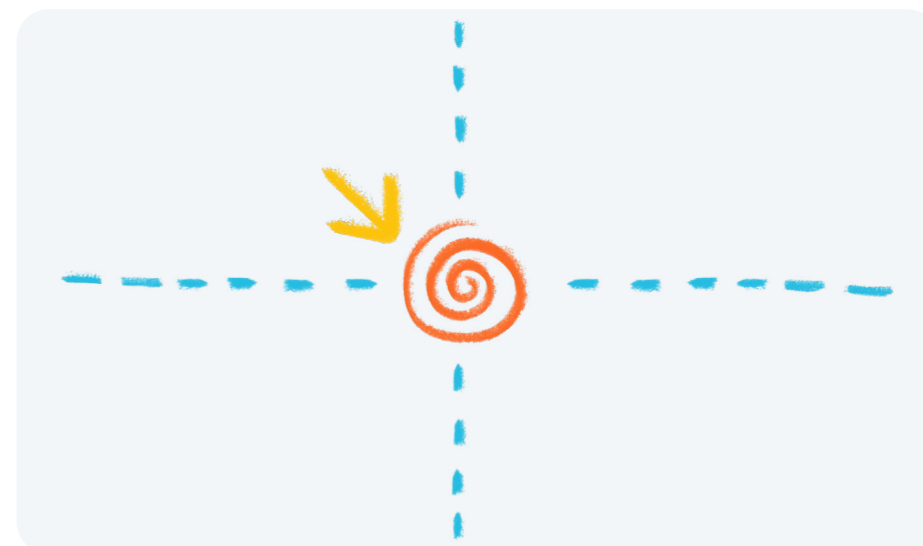
This exercise allows us to break down the general question into different dimensions of analysis that may, in turn, contain smaller sub-dimensions. To provide a visual idea of the dynamics, we can observe the following table with guiding questions and/or prompts:

In a **second step**, we move on to **working on each quadrant, assigning a specific question or prompt to it.** These prompts or questions are revealed one by one initially, before asking participants to start working on them. In the case of AppEAR, the prompts were related to the uses, obstacles, and inputs for the implementation of this application.

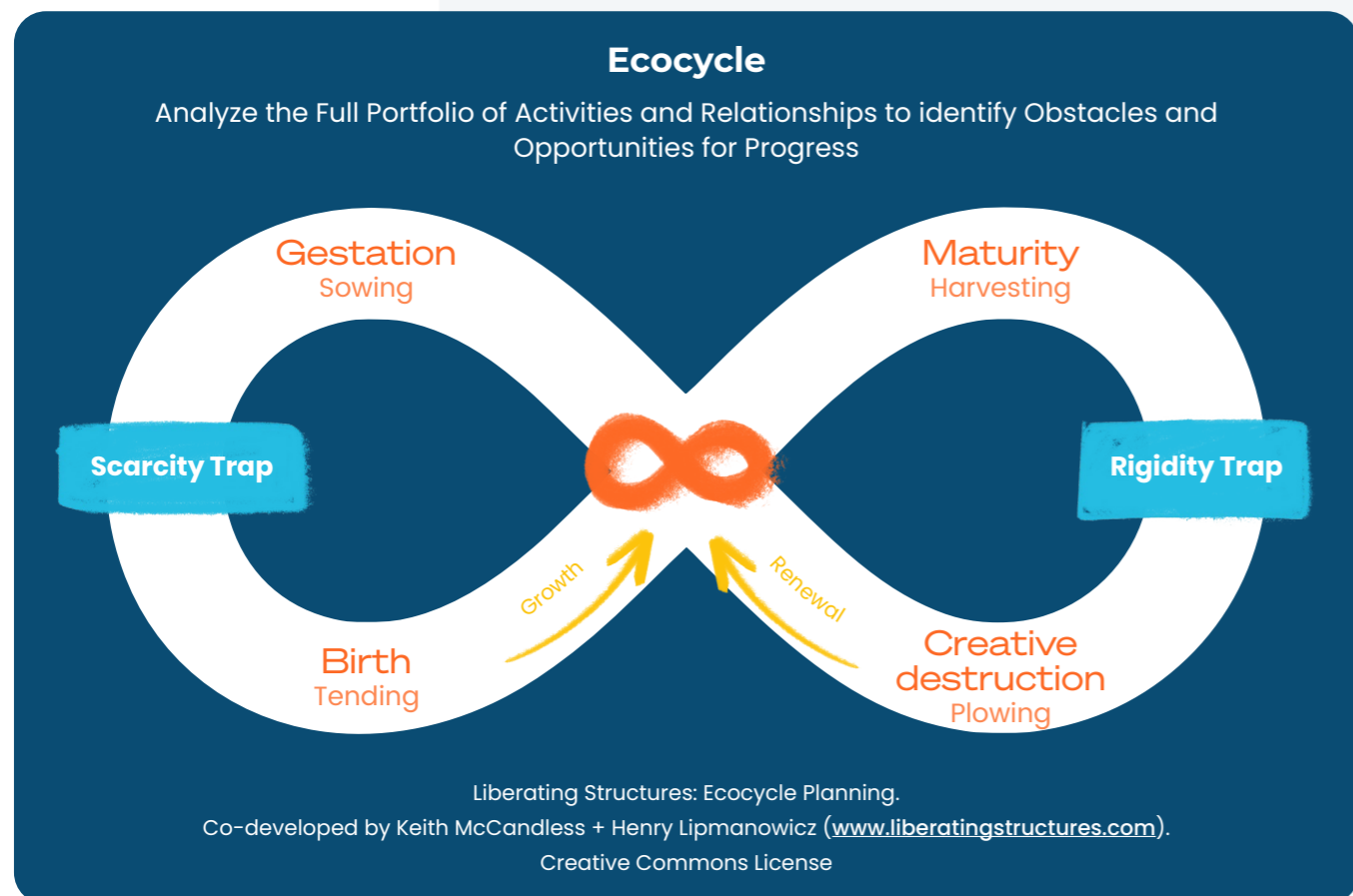| 1. How "..." can contribute to local development policies is:	2. The obstacles that could arise from the use of "..." are:
3. The inputs from "..." could be used for:	4. The obstacles to incorporating these inputs are:

In this case, the questions were:

1. What could facilitate the use of AppEAR and/or promote positive opinions about it?

2. What obstacles could arise from the use of AppEAR or could foster negative opinions about it?

3. How could we implement what was mentioned in item 1? How can we ensure that positive information about what enhances the use of AppEAR reaches all users?

4. How do we prevent obstacles and everything that goes against the use of AppEAR?

It is important to remember that, while these questions can be useful and applicable to numerous situations, they are not a rigid guide to follow. It is crucial to analyze which questions or prompts are necessary for each situation.

Exploring liberating structures: Ecocycle planning

Ecocycle planning is an activity that involves working in groups with everyone involved in the action. The first step to implement this structure is to invite the group to see, organize, and prioritize their current activities using four developmental phases: birth, maturity, creative destruction, and renewal. Then, the group is encouraged to generate actions that:

• Accelerate growth during the birth phase;

• Extend life or increase efficiency during the maturity phase;

• Allow leaving behind rigid practices during the creative destruction phase;

• And connect creative individuals or prepare the ground for new things to emerge in the renewal stage.

Ecocycle

Analyze the Full Portfolio of Activities and Relationships to identify Obstacles and Opportunities for Progress

Gestation — Sowing
Maturity — Harvesting
Scarcity Trap
Rigidity Trap
Growth
Renewal
Birth — Tending
Creative destruction — Plowing

Liberating Structures: Ecocycle Planning.
Co-developed by Keith McCandless + Henry Lipmanowicz (www.liberatingstructures.com).
Creative Commons License

The groups are formed according to the 1-2-4-All scheme, meaning the first activity is done individually, the second in pairs, the third in groups of four, and finally, everyone works together, facilitating sharing and discussion.

After each participant individually replies to the prompts, we move to a feedback session where all responses are read aloud first ordered and then operationalized across various dimensions of analysis, which are crucial for testing the effects of the intervention.

Step V.
Specific questions, variables and proxies

In another work session, we considered **what the proxies could be.** To implement the solution, it is crucial to first **define the dependent and independent variables** needed to implement or test the solution (in the cases of experiments), meaning the variable whose outcome we want to observe and the ones we will modify to see their effect. However, these variables are not always measurable, or at least not directly, as measurement can be very expensive, time consuming, or not possible, given the technology and resources available. The next step, then, is to **search for or build proxies that allow us to measure each of the variables of interest indirectly to collect the necessary information.** The question we should ask ourselves at this point is, "Which proxy best measures this variable?" considering that the measurement is feasible.

Following with the PreserVamos experiment, after the initial ideation, **we settled on three specific questions to test examples of citizen science in local policies:**

• Does the government use the tool?

• Are data generated?

• Are the data used in the short or medium term, or is there any change in the approach to freshwater ecosystems because of this experience?

From the question to the proxies: The example of the *Con Vos* Network

The *Con Vos* Network is the solution mapped and scaled by Co_Lab, it is a network of nearby stores where neighbors can carry out digital procedures close to their homes with the assistance of shopkeepers. Focusing on this intervention, we want to measure two things: whether the network effectively encourages more people to perform procedures online and whether it saves time and/or money for those who visit these stores. The crucial question then is: "how do we measure the variables of interest?" It is important to note that there may be more than one answer to that question.

To measure if more people are performing procedures online, one approach could be conducting a survey with people using the network, asking why they prefer this service. If the answer is that they do not know how to perform the procedure online or that they want to save time/money/distance, we can assume that they previously conducted the procedure in person or did not do it at all. An alternative measure could be analyzing the number of people who visited the offices in person before and after the intervention or requesting statistics about the number of online procedures carried out in public or city center offices, although this information may be more challenging to access. Precisely, based on the resources and information availability, one can choose one alternative over the other.

On the other hand, to measure whether people save time and money, we can use a proxy, which is the distance in kilometers from people's homes to the nearest office where they could perform the same procedure. For this, we need the user's and office's addresses. Considering the value of public transport and distance, we can calculate how much time and money they save by being able to carry out the procedure in the store near their home.

Following the same logic of work on an individual basis first and collective feedback later, each team member shared potential proxies to answer each of the questions posed.

The proxies to measure the variables of interest could be divided into three groups: those linked to app usage, such as the number of downloads, number of active users, app usage time, user characteristics, etc.; **those linked to the evidence generated**, such as the number of evaluated sites and the characteristics of these places; and finally, **proxies linked to the use of the generated evidence in policies**, such as the number of policies implemented or modified based on the app's use or the quantity of policies that use data from the app as justification. In each case, it was necessary to consider which indicator was the best to answer the question of interest, considering the feasibility of its measurement.

Potential proxies

The local government uses the tool

- Number of participants.
- Number of field trips organized by the municipality.
- Hours devoted to collection.
- Socioeconomic level of the participants.

- Number of participants downloading the app.
- Average number of submissions per participant.
- Number of uninstalls.

- Amount of government revenue to the tool in a specific period / Number of active users in a specific period.
- Number of contributions made by the government through the tool in a specific time.
- Hours of government activity in the tool.

- One or more actions where it is used.
- Number of agents using it.
- Money or other resources allocated to use it.
- Willingness to expand its use to other areas/sectors.

The use of the tool generates evidence

- Number of valid/invalid submissions.
- Percentage of watercourses in the district reported by the tool.
- Percentage of assessed sites not previously evaluated in the literature.
- Relationship between valid reports and land uses.

- Percentage of data generated/reported that was not available before the implementation of the tool.
- Amount of support/evidence used while the tool was in use.
- Amount of activity/data generated/reported that remains saved/stored by the tool.

- Amount of data generated by AppEAR (broke down by type).
- Amount of reports submitted.

- Number of observations generated through its use/adoption (weighted by number of participants).

The evidence is used in public policies

- Percentage of evidence mentioned for the implementation of new public policy(ies).
- Percentage of evidence mentioned for the modification of public policy(ies).
- Percentage of evidence mentioned for the justification of public policy(ies).
- Percentage of public policies that use the generated evidence, whether for their implementation, modification, and/or justification.

- Number of news articles on the subject (public opinion).
- Interest of the district in taking ownership of the tool after the experiment.
- Number of times the experiment results are used in decision-making (citations).

- Use for public policy actions: Changes in decisions based on evidence from AppEAR.
- Inspections/actions regarding pollution.
- Use for the generation of information: e.g., results maps.
- Use for the generation of educational or promotional content.
- Public actions post-experiment driven by the same municipality.
- Ownership of the tool/continuity.

Step VI.
Ideating the experimental design

The experimental design involves **defining the dependent variables**, i.e., those we want to study, and the **independent variables**, i.e., factors we will manipulate to observe their effect on another variable. It also involves **selecting the study population** and, if necessary, dividing this representative sample into a control group and an experimental group. The former is the one that does not receive the intervention, and the latter is the one that does. The goal is to compare the results between both groups and thus conclude whether the project was effective. The most important aspect of the previous exercise of defining questions/general goals, operationalization, and thinking about variables and proxies is that when designing the experiment, both the actions and the information collection instrument align with these goals, variables, and proxies.

Along with the team of scientists at AppEAR, we devised a design in which we would provide the app to three municipalities and invite them to use it for the same two weeks, varying the degree of involvement of different actors. In one municipality, we decided to involve only the government, i.e., allowing only the municipality to use the app. In another, we involved both the government and the scientists, while in the last case, the government, scientists, and citizens were all involved. Learn more about the design and results in this report. Once the municipalities were selected, they actively participated in the redesign of the app.

Step VII.
Taking Action 1. Reverse engineering for planning

Once the specific hypotheses and/or dimensions of analysis are defined, it is crucial to **determine how we will answer these questions**. This requires **carrying out the experiment or intervention and obtaining the data that answers our hypotheses or research questions.**

After designing the intervention itself, it is essential to plan it, i.e., define the necessary stages for implementing this solution, the region or area of implementation, all the necessary materials and supplies needed for each stage, who will be involved and in which role, and how much time will be necessary for each step of the action.

Following our collaborative journey, we designed and facilitated a dynamic to define how we would act in the case of PreserVamos, for which we first considered **how we envisioned carrying it out**. Based on the answers of all those involved, **we organized the results into some dimensions of analysis.**

We synthesized participants' answers for each of these dimensions.

Let's take action!

I. Pre-production to make it useful
II. General tools
III. Specific tools
IV. Call to governments/Recruitment of public officials

How do we envision we could do it?

I. Let's take action!: Pre-production to make it useful

a. Get to know the municipality well enough to be able to detect how the action could contribute to the measures taken by the government, thus preventing biases in the use of the app (i.e., to artificially encourage the use of the app or its inputs).

b. Procure maps of freshwater ecosystems in the municipalities under study and identify priority areas for the scientific team.

II. Let's take action!: General tools

a. Build simple and clear proxies to ensure data collection.

b. Adapt the infrastructure for data.

c. Develop a promotional campaign to encourage citizens' participation, when needed.

III. Let's take action!: Specific tools

a. Modify the app with the ideas of all stakeholders involved.

b. Build a specific tool for early warnings in the municipality.

c. Customize the information collection instrument for each municipality.

d. Establish contact with municipalities for them to receive and make visible the information produced by the app.

IV. Let's Take action!: Call to governments

a. Minimize possible costs for the parties.
  - Provide a very solid justification to tempt and engage the authorities.
  - Understand the incentives and interests of municipal officials.

b. Propose continued collaboration with the parties.

c. Clearly communicate what types of data AppEAR collects and what analyses it involves.

d. Adapt the data infrastructure.

e. Consider the possibility of a cash-for-data scheme.

f. Think about training for municipal officials.

Step VIII.
Taking Action 2. Distribute tasks

Thinking about how to implement the solution and the tools and how to identify the actors that should be involved at each stage is crucial to carry out the activity or project. However, it is not sufficient. In all interventions, **it is necessary to distribute specific tasks among the organizers to ensure that everyone is involved and that each step is completed on time**. While collaborative work often involves having more participants, it can also make organization more complicated. Therefore, it is crucial to clearly specify everyone's responsibilities and tasks and set deadlines and conditions for their fulfillment.

In the case of PreserVamos, tasks were divided into five categories:

I.   Intervention monitoring

II. Pre-production of the application

III. Citizen sampling: time to use the app!

IV. Data collection and analysis

V.   Design and monitoring of tool adoption for local policies

These categories were further divided into general tasks, which were then subdivided into more specific ones. For example, "Intervention monitoring" was divided into "Weekly project meeting" and "Procurement" (you can see the rest of the sub-categories in the table on the next page). The distribution of responsibilities arose naturally based on the knowledge and experience of the organizing parties. For instance, tasks related to the design and prototype of the app were divided among the scientists in the AppEAR team, while other tasks, such as interviews and selection of municipalities, were conducted collaboratively between the Co_Lab and the AppEAR team.

A crucial point to consider is that all tasks, no matter how minor they may seem, must have someone in charge. This individual may not necessarily be the one performing the whole task but they are responsible for ensuring that the task is completed before the deadline, even if it involves resorting to a distribution of the responsibilities or the coordination with others.

CC Experiment Task List: PreserVamos

Task	Institution responsible	Month 1 Week 1	2	3	4	Month 2 Week 1	2	3	4
I. Monitoring									
Weekly project meeting	Lab	x	x	x	x	x	x	x	x
Procurement	Lab/AppEAR	x	x	x	x				
II. Pre-production									
List of activities and schedule (first version)	Lab	x							
Team assembly									
Scientists providing technical support to municipality 1	AppEAR	x	x						
Scientists/academics continuing action coordination with municipality 2	AppEAR	x	x						
Scientists/academics continuing action coordination with municipality 3	AppEAR	x	x						
Sampling coordinators working with citizens in municipality 1		x	x						
Experiment coordinators (if scientists for each municipality are different individuals)	AppEAR	x	x						
Technical coordinator of the experiment, Co_Lab's liaison with everyone else	Lab	x	x						
Field leader -on-site- acting as a global liaison with coordinators for AppEAR	AppEAR	x	x						
Guidelines	Lab	x							
List of municipalities for interviews	Lab	x							
In-depth interviews	Lab		x	x	x				
Agile processing of interviews	Lab				x	x			
Re-design of the action and establishment of a final schedule	Lab					x	x		
Definition of municipalities									
Selection of municipalities	Lab/AppEAR					x			
Submission of proposals to municipalities	Lab/AppEAR					x			
Confirmation of municipalities	Lab/AppEAR					x			
Adaptation of the tool for the action									
Final design of the questionnaire	AppEAR								
Wireframe of screens	AppEAR								
Design of logo and final graphics	Lab								
Development of the app, server, and web form	AppEAR								
Alpha & beta testing	AppEAR								
Completion	AppEAR								
III. Citizen sampling									
Citizen sampling in municipality 1									
Design	AppEAR								
Activities calendar	AppEAR								
Specific materials (audiovisual)	AppEAR								
Training workshops for municipal staff	AppEAR								
Pre-productions (spaces, materials, staff, compensation/gifts)	AppEAR								
Citizen recruitment	AppEAR								
IV. Data collection and analysis									
Data collection									
Data collection in municipality 1	AppEAR								
Data collection in municipalities 2 and 3	AppEAR								
Data analysis									
Validation and standardization of the database	AppEAR								
Data analysis and drafting of a use campaign conclusion	AppEAR								
V. Design and monitoring of tool adoption for local policies									
Experiment conclusion report	Lab/AppEAR								

Task distribution: The experience of the native flora workshop

As mentioned before, to carry out the workshop "Nativa: Flora de Concepción", the Co_Lab collaborated with the municipality of Concepción del Uruguay and the Binational Project ACC Río Uruguay. This involved approximately 10 people in the organization. To organize ourselves efficiently, tasks were assigned to each person during meetings, and deadlines were defined for when the tasks needed to be completed before the workshop. This task distribution was documented in a spreadsheet accessible to all the involved organizations. When asigning tasks, it was very useful to categorize them based on whether they were related to the workshop's activities, invitations, and media outreach, among others. It is worth noting that working collaboratively and having frequent meetings (weekly or biweekly) made it much easier to communicate any doubts or difficulties regarding tasks, allowing us to advance at a fast pace.

Step IX.
Rethinking / visualizing the experiment

A final collective intelligence exercise was that of **speculative futures.** The instruction was for each member who participated in the collaborative design to build a narrative to imagine that the experiment had already been carried out and try to tell someone else about it, either in writing or orally in approximately 10 minutes (the time may vary depending on the situation).

Tell the story in 10 minutes (one or two paragraphs)

Imagine that the experiment we are ideating has already been carried out and you want to share with someone how it went, how would you tell that story?
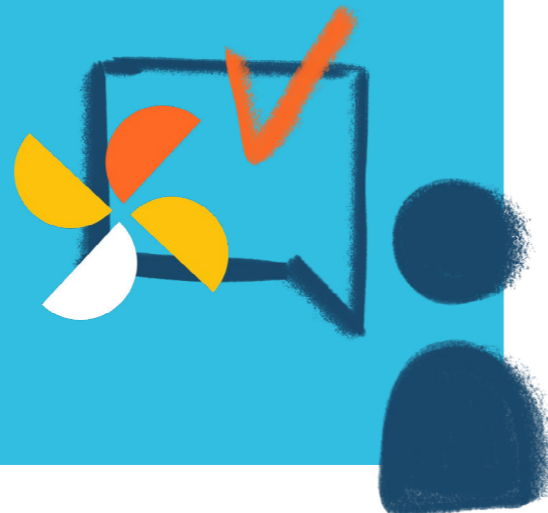
For example, in the case we mentioned above of the *Con Vos* Network, once one visualizes the implemented solution, questions such as: "how do we get nearby stores to want to join the network? How can we spread this initiative and get people to use it? Should we train shopkeepers so that they can help with the procedures? Who will be in charge of the training? How do we ensure that people and merchants complete the form?" can arise.

This exercise allows us to visualize issues that must be taken into account when implementing the solution, which simplifies the organization and prior design.

Guide completed
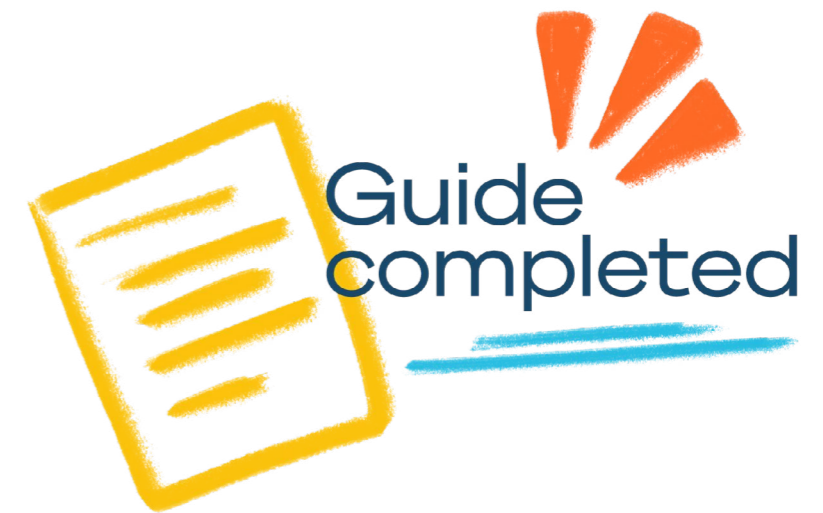
3. Summary

The collaborative design is the approach of the Co_Lab for the ideation and implementation of experiments and small-scale interventions, essential elements for addressing complex challenges and promoting innovation. This design involves selecting strategic partners and forging bonds, as well as jointly ideating each step of the action, including its goals and execution To facilitate this process, we rely on **collective intelligence activities** to foster active participation and leverage the potential of all stakeholders involved.

The advantages of this approach to collaborative work **include the possibility of aligning expectations, methods, and results among very diverse groups**, such as governments, scientists, social organizations, and individuals from various educational and cultural backgrounds, making this a very inclusive approach. **Participation also entails leveraging the knowledge and resources of each participating group.** The outcomes of actions collaboratively planned with relevant stakeholders prove to be more **cost-effective**. Participation and collaboration throughout the entire process, from its planning to its implementation, result in a high level of consensus among everyone involved, making its goals achievable and its results legitimate for all participating organizations.

We have successfully applied this approach to experiments in citizen science and digital inclusion, as well as for planning and facilitating workshops. Through this report, we make several tools available to readers so that they can replicate this approach for various purposes to drive effective and scalable solutions that contribute to sustainable development at a global level.

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