

Adapting and combining foresight and ex ante impact pathway evaluation for place-based research planning with stakeholders

Genowefa Blundo-Canto^{1,2}  | Marie Ferré^{1,2} |
Leidy Tibaduiza-Castaneda³ | Nadine Andrieu^{1,2} |
Sandrine Fréguin-Gresh^{4,5} | Gonzalo Rodriguez-Borray³ |
Adriana Santacruz-Castro³ | Sara Mercandalli⁴

¹Departement Environnements et Societes, CIRAD – UMR Innovation, Montpellier, France

²Departement Environnements et Societes, Universite de Montpellier, Montpellier, France

³Centro de Investigación Tibaitatá, Corporación Colombiana de Investigación Agropecuaria (AGROSAVIA), Bogota, Colombia

⁴Departement Environnements et Societes, CIRAD, UMR ART-DEV, Univ Montpellier, CIRAD, CNRS, Univ Montpellier 3, Univ Perpignan, Montpellier, France

⁵Departement Environnements et Societes, Campus agro-environnemental Caraïbe, Le Lamentin, Martinique, France

Correspondence

Genowefa Blundo-Canto, CIRAD – UMR Innovation, Departement Environnements et Societes, Univ Montpellier, 73 rue Jean-François Breton 34398 Montpellier Cedex 5, France.

Email: genowefa.blundo_canto@cirad.fr

Abstract

Evaluators widely utilize theory of change or impact pathway approaches to design and evaluate interventions. In research settings, there is increasing demand for ex ante impact pathways that are place-based, coherent, and plausible, in order to foster more impactful interventions. Foresight approaches, which enable a collaborative, structured, and systematic way to anticipate, prepare, and affect the course of change, can help achieve this by exploring diverse future scenarios, the consequences of different assumptions, or how to overcome threats and leverage opportunities for change. Through three case examples, we show how foresight tools used prior to developing impact pathways can free participants from preconceived notions of the intervention's context, actors, and impacts, and thus support creative and systemic analyses of the future to rethink the present. They extend the analysis of how different actors can shape the future, identifying effects that might otherwise be overlooked or marginalized during the planning and evaluation of the intervention, while also helping to identify the conditions necessary for desired impacts. Nonetheless, their use entails

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2024 The Author(s). *New Directions for Evaluation* published by American Evaluation Association and Wiley Periodicals LLC.

evaluative judgments about the potential impacts to be prioritized in intervention design and evaluation. This is especially relevant in the case of research where scientific or technical aspects are usually prioritized. Finally, there is an entry cost to foresight tools for evaluators, in particular for the facilitation of strategic thinking about the future. However, we recommend them as a worthwhile addition to the evaluator's toolbox to broaden the scope of design and evaluation.

INTRODUCTION

Evaluators commonly use theory of change or impact pathway logic to design and evaluate interventions. This approach describes a theory of action, or how an intervention will produce intended outcomes (changes), and a theory of how change happens (a theory of change) (Douthwaite et al., 2003). Impact pathway evaluation has been applied for a long time in publicly-funded agricultural research for development (Blundo-Canto et al., 2019; Springer-Heinze et al., 2003). The usually inherent assumption is that a well-suited scientific innovation, such as a technology, will generate positive development outcomes. This can result in simplistic impact pathways that lightly address the sociocultural, economic, and governance factors underlying societal change.

Designing and evaluating impact pathways that are place-based, coherent, and plausible within the intervention's specific context is needed for more impactful research. Foresight approaches may help achieve this by exploring diverse future scenarios, imagining the consequences of different assumptions, thinking about how to overcome threats, and leveraging opportunities for change toward desirable futures, as agreed upon by local stakeholders (Vergragt & Quist, 2011). Foresight is a collaborative and multidisciplinary process "to explore futures in a structured, and systematic way to anticipate, prepare, and affect the course of change" by analyzing "potential disruptions or opportunities, and [considering] multiple possible scenarios for the future" (UN Globalpulse, 2024). Foresight is not prediction but is a strategic capacity to think about the future (Shallowe et al., 2020). In science, it can be defined as "looking systematically into the future of science and technology" (Martin, 2010). Foresight approaches "use" the future to rethink the present and orient or motivate action, through diverse tools.

The conceptual link between foresight and impact evaluation is apparent, however they are seldom combined. Bridging foresight and impact pathway evaluation can improve decision-making and the actions to be taken in the present by jumping into the potential consequences of future pathways in a way that is meaningful to those involved and potentially impacted by an intervention. The integration of foresight and impact pathway evaluation also makes sense beyond the design stage, for instance, to monitor and revise the impact pathway in light of new shocks or disruptions. It can also be part of ex post evaluation and be used to analyze results in light of future emerging trends.

This paper presents insights from three case examples in which foresight tools were integrated with impact pathway concepts to develop participatory and place-based action plans with stakeholders. Specifically, we aim to show how combining three foresight tools, the Futures Wheel (Bengston, 2016), the Futures Triangle (Inayatullah, 2008), and the Three Horizons (Sharpe et al., 2016) in ex ante impact pathway evaluation allows actors, including researchers, to develop more systemic, creative, and contextually meaningful action plans and pathways to change (Blundo-Canto et al., 2023). It also boosts participants' perception

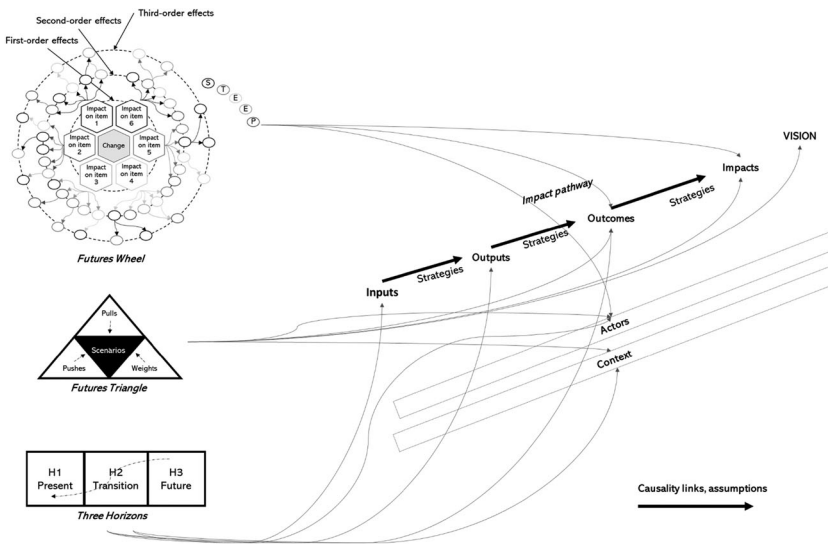


FIGURE 1 Graphical representations of the Futures Wheel, the Futures Triangle, the Three Horizons, and how they inform the impact pathway (adapted from Blundo-Canto et al., 2023; Bourgeois et al., 2023).

of their own agency, roles, and influence by applying foresight and evaluative thinking to their decision-making.

THREE FORESIGHT TOOLS AND THEIR LINKS WITH THE IMPACT PATHWAY

The three case examples discussed in this paper present different combinations of the Futures Wheel, Futures Triangle, and Three Horizons applied to ex ante impact evaluations of agricultural interventions in Colombia and Guadeloupe. Figure 1 includes a graphical representation of the three tools and how and where they can inform the impact pathway.

An impact pathway is a causal chain, usually starting with a vision of a desired future, that is shaped by the long-term effects (impacts) of an intervention and the targeted changes (outcomes) in actors’ practices, behavior, interactions, opportunities, or capabilities that are necessary to achieve them. It also presents the outputs or products that must be generated to support these changes and the inputs or resources available to produce these outputs. Moreover, it describes the strategies and causal links needed to move from inputs to outputs to outcomes to impacts and how these elements are shaped by (and shape) the context in which the intervention occurs. In our application of impact pathways for ex ante evaluation, the strategies to achieve the outcomes are identified by addressing the existing obstacles and opportunities related to these changes (Blundo Canto et al., 2020). The literature contains reflections on the application of this approach to agricultural research for development (Blundo-Canto et al., 2023; Douthwaite et al., 2017; Thornton et al., 2017).

The Futures Wheel, Futures Triangle, and Three Horizons foresight tools can complement the development of these causal chains through a systemic reflection on potential futures.

The Futures Wheel (Bengston, 2016; Glenn, 2009) is a structured brainstorming process used to collectively reflect on the direct and indirect consequences of change in a

given system. A change may consist of foreseeable ruptures such as a breakthrough in technology, weak signals of change, or new ideas at an incipient stage of implementation. The result of this process is a detailed “mind map” of what the potential future following the given change might look like. In practice, the studied change, for instance a new agricultural technology, is placed at the center of a graphic wheel. Around this center participants, having diverse cultural perspectives, experiences, knowledge, genders, and ages, distinguish first-order effects (i.e., the most direct effect of the change) and then second- and third-order effects (i.e., the effects of each first- and second-order effect) that this change would generate. These effects, which address social, technical, economic, environmental, and political or governance dimensions (STEEP), are proposed and agreed upon by participants.

The Futures Triangle (Inayatullah, 2008) enables stakeholders to develop future scenarios by combining three elements: the weights of the past, the pushes of the present, and the pulls of the future. The weights of the past relate to what holds back potential change, or the obstacles, barriers, and social or institutional structures that hinder change. The pushes focus on the present, examining the current situation and current drivers of change in certain directions. Finally, the future pulls involve describing the signals of future possibilities, innovations, and aspirations, whether positive or negative, that seem to be pushing forward (Inayatullah, 2008). Graphically, the Futures Triangle is represented by three joined triangles, at the center of which future scenarios are defined. The Futures Triangle assists in conceptualizing technological transitions by examining both the drivers and constraints of change (Fergnani, 2020). For instance, when used to analyze new sustainable agriculture practices, the pushes of the present could be lobbying by consumers who push for healthy food. The weights of the past could be the outdated skills of the agricultural advisory service, and the pulls of the future could be the likely preference of future adults for sustainable products. Once the pushes, pulls and weights have been analyzed, participants choose a date in the future for their scenarios and one or more future scenarios by combining these three elements (in the center of the triangle). This means that they describe the future state of each of the pushes, weights, and pulls they choose to analyze and “take” to the future. For instance, if a current push is the incipient development of digital services to connect producers and consumers in a country that has low digital literacy, then the future state of this trend could be that the large majority of producers use tailored online marketing channels to reach clients. The different future states described can be then translated into the future vision that the intervention aims to achieve.

Three Horizons (Sharpe et al., 2016) is an approach representing a full scenario (from the present to the future) from which an action plan can be derived. Horizon 1 (H1) depicts the present situation, including elements of the future that are already on the horizon today. Horizon 3 (H3) represents the future state, which may include elements of the past (H1) that will be maintained in such a future. Horizon 2 (H2) identifies the events of the transition that connect the future and the present. It works through a back-casting logic, meaning that the discussion starts by describing the state of things in a future time, set by stakeholders, for instance, in 15 or 20 years, and works backward to identify all the events that led to this future. Applied to agricultural technologies and practices, the Three Horizons approach provides a systemic overview of the potential changes that will lead to a technology’s use and its impacts (Blundo-Canto et al., 2023). However, the Three Horizon approach is by definition systemic and does not focus only on the pathway of the intervention but on the pathway of the whole system analyzed (whose boundaries are defined by the elements present in Horizon 1 and Horizon 3). See Dart and Gates (2024) for another case example of the Three Horizons approach in practice.

As shown in Figure 1 all three tools help to identify the actors who may be impacted by an intervention, as well as the actors who might change their practices, relationships, and capabilities because of the intervention. The Futures Wheel mainly informs thinking about impacts—short-term to long-term, direct and indirect—through analysis of second- and third-order effects. During discussions about these effects, potential outcomes, or changes in practices and so on, might also be detected. The Futures Triangle informs an understanding of context through a systemic analysis of the pushes of the present and the weights of the past. Information useful for detecting potential outcomes and impacts also emerges in discussions about the pushes, weights, and pulls directly related to the intervention. Once one or more scenarios are defined by describing the future state of selected pushes, weights, and pulls, the future vision emerges, that is, the description of the future state of things. Finally, Three Horizons is the tool that is closest to the impact pathway in the sense that it makes the transition (i.e, the pathway) from the present to the future explicit, but is built in reverse. It provides elements that can be translated into inputs, outputs, and outcomes. It also informs the context analysis by describing the present situation in Horizon 1.

CASE EXAMPLES OF THREE FORESIGHT TOOLS

Case 1 (Guadeloupe, Caribbean Region): Development of an action plan to introduce sheep to banana plots where soils are contaminated with pesticides

The first case example is set in Guadeloupe and concerns the development of an action plan to introduce sheep to banana plots where soils are contaminated by the past use of pesticides, with the purpose of weed management. Pressure to reduce the use of plant protection products in agriculture (e.g., fertilizers and pesticides) has increased in the French overseas territories, departments, and regions. Past use of these products has generated diffuse pollution that continues to pose serious public health problems, as in the case of the insecticide chlordecone in banana plots in Guadeloupe. The population of French overseas territories thus question the health and environmental issues involved in agricultural production, all the more so as new regulations are banning a growing number of products, and consumers are turning to agricultural products that are certified or labeled as having a reduced impact on the environment.

Research experiments on innovative weed control methods in Guadeloupe reported that sheep can reduce the level of grass on plots and provide effective weed management compared to chemical herbicides (Andrieu et al., 2024). However, one of the key challenges to this change in practice is that sheep become contaminated due to grazing on contaminated soils, which limits their use for meat production. Therefore, an action plan for their introduction to banana plots requires careful consideration of the potential positive and negative consequences, and how to address them. Researchers testing the practice invited public agencies' representatives, farmers testing the practice, public associations' representatives, crop and animal scientists, meat producers, staff from laboratories analyzing chlordecone contamination in blood, and advisors supporting banana farmers and breeders to a participatory workshop.

Using the Futures Wheel, they first developed a systemic representation of the consequences and core constraints and levers of a potential scale up of sheep introduction to banana plots (Bourgeois et al., 2023). Workshop attendees identified a large number of potential effects, such as positive environmental impacts linked to lower herbicide use, reduced costs and work arduousness, and income diversification. Moreover, this innovative

practice would improve the image of agricultural activity tarnished by diffuse soil pollution. However, the Futures Wheel workshop also revealed a potentially adverse dynamic. The new sheep breeding activity has implications for livestock management, parasite pressure, and meat sales management, and is a potential nuisance for neighbors. The development of a meat sector must be planned with adequate levels of decontamination, and theft can facilitate the sale of meat through informal markets that do not follow the required sanitary procedures.

Some months after the workshop, in order to start developing an action plan using the results from the Futures Wheel application, researchers prioritized key systemic changes (e.g., updated health management services for farmers and breeders, public incentives for livestock diversification, and the emergence of new professions such as farmer breeders) based on their knowledge of the context. Subsequently, they brought the changes before several of the same participants at a second workshop for validation and discussion, and they identified the desired future changes using an impact pathway approach (Blundo Canto et al., 2023). Seven desired changes (outcomes) emerged, including that some farmers become planters-breeders, meaning they carry out livestock breeding and crop farming, whilst others join forces with breeders who supply sheep for “service” in the plantations, and the establishment of a functional system to control the sale of informal meat on a large scale.

Subsequently, participants worked on strategies to overcome obstacles and seize opportunities to achieve these desired changes and the actors who could support these strategies. The overall purpose was to define the most plausible and legitimate strategies to instigate these changes, subsequently deconstructing them into activities and outputs for the impact pathway, and then translating them into actionable plans. During the workshop, researchers highlighted the strategies that they could support and worked with participants to identify concrete research actions and their outputs for the impact pathway. These actions and their outputs provided the basis for subsequent research planning and were part of a proposal submitted to the regional innovation fund, which is currently funding these activities.

Case 2 (Guadeloupe, Caribbean Region): Diversification of tree species in banana plots in abandoned areas

The second case example concerned the diversification of tree species in banana plots in areas of abandonment in Guadeloupe, in an effort to limit the use of pesticides and generate new sources of income. Indeed, new banana diseases and the development of a policy working toward zero pesticides in banana plantations calls for diversifying production systems (Tarsiguel et al., 2023). A participatory activity involving key stakeholders engaged in the territory, in the research project, or in the banana value chain (e.g., agronomists and geneticists, technical advisors, public agencies, and farmers’ organizations) aimed to lay down foundations for an action plan to diversify banana plots.

The proposed approach to investigate the scaling potential of this new practice included using exploratory tools to identify potential scenarios, constructing a vision of a desirable future, and creating an associated transition path including the use of lands currently unassigned or unsuitable for other land uses. The tools used were the Futures Triangle and the Three Horizons. The Futures Triangle exercise addressed: (i) the weights of the past (such as markets that do not currently attach high value to products from diversified production, producers and advisory services that focus on standardized technical practices, and the organization of the value chains by export products which hinders diversified production); (ii) the present pushes (such as young farmers who lobby for diversification,

the increasing price of pesticides, and the political pull of banana producers); and (iii) the pulls of the future (such as increased land pressure and climate change affecting arable land and types of production).

Next, the participants chose a time horizon (2035) and decided to develop one scenario with a desired vision of the future. They described the desired future state of all the pushes, weights, and pulls identified, such as moving beyond crop-specific value chains to value chains for diversified crops to support the production, transformation, and marketing of local products. They then used the Three Horizons approach to imagine the pathway of events and actions that connect the desired future to the present, moving backward in time. The transition path from the present situation to the desirable future included actions, such as the work of champion farmers implementing the innovative practices.

Finally, specific actions for research institutions could be formulated to guide the action plan, such as disseminating the results of ongoing research using formats adapted to different types of actors, designing training curricula for the advisory service, and assessing the results of champion farmers. This translation into research actions encouraged the research team to question their feasibility in the imagined time frame, and whether preceding actions or events needed to be identified for each action or event to happen. The discussion with participants allowed the identification of short-term scientific outputs, such as validating agronomic results and building specific capacity for farmers and support services. These were identified as necessary scientific conditions before the innovative practice could be scaled. Participants also identified which actions not directly involving research were feasible in the short term and which needed specific changes to happen before becoming operational. Whilst this logic is inherent to the building of the transition horizon, discussing it at the end of the exercise made the causal logic of the impact pathway more explicit.

Case 3 (Colombia, South American Region): Development of an integrated water management project

The third case example concerned the development of an integrated water management project involving different actors (including Indigenous and non-Indigenous populations) within the Rio Frio watershed in Colombia's Magdalena region. After identifying the current context through: (i) participatory territory mapping; (ii) an analysis of gender- and ethnicity-related dynamics; and (iii) a yearly calendar of water-related activities, participants developed a vision of a desirable future. This vision involved regulating the use of water and improving water access and availability through governance support, conflict reduction, and population health, among others.

Next, participants used the Three Horizons exercise to imagine the transition pathway connecting the desired future to the present context. For example, the pathway includes actions to integrate different actors via the structuring of a multistakeholder platform to address specific issues around water access and management. To build a functional platform, participants identified it would be necessary to carry out events and training to increase cultural exchange and understanding between upstream and downstream watershed actors. They also identified sustainable community tourism as a way to include outsiders in this virtuous dynamic. In parallel, they highlighted the need for actions to address the negative impacts of some Indigenous agricultural practices on water for downstream users as well as the displacement of Indigenous people due to internal migration phenomena. The Three Horizons tool was partially built using backward thinking; some discussions started from changes needed in the short term to achieve the desired future and then identified the next steps, instead of moving from the future to the present.

To conclude the workshop, participants identified the key changes (i.e., outcomes) shaping the transition pathway, the actors involved, the obstacles and opportunities for each change, and the strategies for achieving these changes. After a round of open discussion and reflection on the impact pathway, participants chose the two most urgent but also achievable changes in the short term: a functional collective platform for watershed management and a functional watershed restoration strategy. Based on this choice, they identified the main actors to involve, current obstacles to these changes, and strategies to overcome them.

The resulting impact pathway shows the key role of environmental education and the need to include an Indigenous perspective in the actions to be implemented. The inclusion of new actors, such as fishermen, so far excluded from watershed management because they operate outside its area, was also agreed upon. Moreover, compared to initial project ideas, the workshop drew attention to previously unidentified challenges linked to agrochemical use, livestock-related activities, and internal migration issues affecting Indigenous communities. The Three Horizons tool highlighted the timeframes to achieve key outcomes and the events necessary before they can be achieved.

Table 1 provides a summary of the three cases and the advantages and limitations of combining foresight tools and impact pathways.

BENEFITS OF COMBINING IMPACT PATHWAY AND FORESIGHT TOOLS

In light of our experience, integrating foresight and impact pathway tools is useful for evaluation researchers and practitioners aiming to push the boundaries of intervention design and evaluation by gazing into likely and unlikely futures. For evaluators supporting such ex ante processes, using foresight tools before developing the impact pathway allows participants to free themselves from their preconceptions of the intervention, its context (past, present, and future), and the impacts it should generate. For instance, in the case of introducing sheep to banana plots, the effects of scaling the practice were perceived differently by participants, and certain dimensions, such as organizational and social consequences, had been underestimated in previous discussions but became more important when the Futures Wheel was applied.

Indeed, foresight tools not only support a systemic analysis of the future but also a rethinking of the present by using potential futures as multidimensional states to pursue or steer away from. They open up the discussion on how different actors could shape and be affected in the future, identifying effects that might otherwise be overlooked or marginalized when planning the intervention. They also support the identification of necessary conditions for the achievement of outcomes and impacts, adding a time dimension and a deeper understanding of the roles and responsibilities of different actors.

In the first practical case presented, the Futures Wheel depicted promising but also controversial future dynamics on the introduction of sheep for weed management. It generated a multidimensional reflection of the future, pushing the analysis beyond the technical aspects on which local actors and researchers had focused in the experimentation phase, and toward consideration of unexpected, unpredictable effects, including social and institutional ones (e.g., the need for new public policies regulating the meat sector and the emergence of new professions). It therefore showed how the innovative practice could lead to a major transformation of the production system as well as upstream and downstream activities and other connected aspects of the local food system. Following the foresight exercise, the team developed an action plan with more grounded impacts, limiting negative effects. At the same time, some of the effects identified through the indirect (i.e., second- and third-order) effects may be unnecessary for action planning. As an

TABLE 1 Summary of the three cases.

	Case 1: Introduction of sheep to banana plots, Guadeloupe	Case 2: Diversification of tree species in banana plots, Guadeloupe	Case 3: Integrated water management, Colombia
Targeted intervention	Upscale the use of sheep for weed management in banana farms	Diversify farming systems with trees in areas no longer suitable for banana production	Regulate the use of water to reduce conflicts and improve health
Actors involved	Researchers, farmers, advisors, public agencies, civil society	Researchers, farmers, advisors, public agencies	Researchers, farmers, advisors, public agencies, civil society, Indigenous representatives
Foresight tools	Futures Wheel	Future Triangle and Three Horizons	Three Horizons
Main achievements of combining foresight and impact pathway tools	Identifying a diversity of systemic effects at a territorial scale, including unexpected and unintended ones.	A powerful combination that makes the time dimension explicit, and supports planning for different future scenarios.	A tool that makes the time dimension and the underlying assumptions of the causal chain explicit. This is the easiest tool to translate into an impact pathway (inputs, outputs, and outcomes).
New elements identified for the intervention through the use of the foresight tool	Through the analysis of direct and indirect consequences, the Futures Wheel supports the identification of actors impacted by an intervention, including those that would only be marginally impacted and likely overlooked.	The Future Triangles provides a systemic assessment of the present context and potential future trends. It allows us to include past dynamics when analyzing the future and developing the impact pathway.	It provides a holistic view of the events leading to a targeted future vision, in which the impact pathway of the intervention will be embedded.
Limitations	<ul style="list-style-type: none"> • Indirect impacts • Impacted and impacting actor <p>A prioritization of the most relevant effects identified in the Futures Wheel is necessary in order to orient the impact pathway efficiently and avoid dispersion</p>	<ul style="list-style-type: none"> • Existing obstacles and opportunities • Systemic future vision • Impacted and impacting actors • Elements to build alternative scenarios <p>The link with the future vision must be explicit in Horizon Three (Future), for consistency</p>	<ul style="list-style-type: none"> • Short-, medium- and long-term outcomes: plausible time dimension • Necessary conditions that need to be in place to achieve outcomes <p>Thinking from the future to the present is not always straightforward. A combination of backward- and forward-thinking is necessary.</p>

example, one of the potential third-order effects of fencing would be reduced freedom of movement for walkers, which are extremely rare in banana plantations in Guadeloupe. Therefore, there is an evaluative step in choosing which impacts identified in the Futures Wheel should be addressed for intervention planning and evaluation.

In the practical case of tree diversification in banana plots, the time dimension, often less addressed in impact pathway workshops, became a key factor in the choice of a future scenario through the Futures Triangle. Once participants developed the pathway to the future scenario with the Three Horizons, it quickly became clear that social, economic, and institutional factors needed to change before the practice could be scaled. The diversification strategy became a medium- to long-term solution bound to these preceding changes. As shown in the practical case, when combining the Futures Triangle and the impact pathway, the future vision is developed by combining elements from the three dimensions of the triangle (pushes, weights, and pulls). It embeds key impacts and outcomes that characterize this imagined future, considering the current context. Combining Futures Triangle with Three Horizons provides a powerful basis for planning for different future scenarios with a systemic understanding of events and actions beyond the scope of an intervention.

In the third practical case, the future vision focused on empowered actors who face fewer water-related conflicts through concerted and clear water management and regulation that is inclusive of upstream and downstream actors, in particular Indigenous people. The Three Horizons tool highlighted key actors, outputs, and outcomes, as well as their timelines and the conditions necessary for their emergence. However, building it by going backward from the future to the present is not always straightforward, and skillful facilitation is needed so that participants unfold the whole chain of events that would shape the transition pathway.

We have shown how combinations of participatory foresight and impact pathway tools foster reflexive and evaluative thinking in participants, developing a better understanding of the issues of the present and the potential issues of the future. Incorporating the knowledge and perspective of local actors starting from the development of a project idea supports priority identification and ownership through increased dialogue (Archibald et al., 2016), potentially fostering more meaningful collaboration (Andreotti et al., 2020). In this process, we argue that foresight tools support more systemic, creative, and place-relevant impact pathways. They have the advantage of exploring broad, unlimited futures that can then be narrowed down to more operational elements through the impact pathway. This operationalization generates action plans that make sense for participants and are made more realistic by their collective sensemaking. Arguably, these impact pathways and action plans are more convincing and credible given that different future states are discussed before choosing one desired direction.

STRENGTHS AND LIMITATIONS

Our results exemplify some of the strengths and limitations of embedding foresight at the stage of theory building and action planning. Before designing the impact pathway, scenario building enables the capture of aspects of the intervention context and actors that might otherwise be overlooked. In the Futures Triangle, the weights, pushes, and pulls allow us to analyze the context of an intervention in terms of its past, present, and foreseeable future dynamics. These include those that are directly related to the object of the intervention, but also those that might affect it indirectly, now or in the future. This is particularly valuable to construct the analysis of obstacles, opportunities, and risks. Once the outcomes are defined, the weights of the past can be translated into obstacles, the pushes of the present into opportunities, and the pulls of the future into opportunities or risks.

At the same time, the process of choosing one or two scenarios for intervention theory building can be challenging and requires negotiation between stakeholders to choose which elements (weights, pushes, and pulls) are combined in each scenario and why one scenario is chosen over others. In our practice, we have found it useful to let stakeholders develop one scenario that allows the intervention to be widely adopted and also define a second scenario in which this adoption would be low. However, working on both scenarios requires working in groups or increasing the length of the workshop. Participants tend to “care” for the scenario they have constructed and prefer to work toward the “desired” scenario rather than one that implies a degree of failure. The time to work on multiple scenarios for theory building and action planning is a constraint to consider. The way we carry out these steps is through facilitated negotiation: facilitators strive to ensure that all voices are heard and allow participants to discuss until a choice that “everyone can live with” is made. Power dynamics are inherent to this process, and this requires facilitators to know them at the onset in order to choose facilitation tools that encourage a plurality of voices (e.g., group work, anonymous idea writing, and collection of cards by the facilitator).

In terms of the Futures Wheel, we find it fosters creativity and multidimensionality in identifying the impacts of an intervention. Stakeholders thinking through these effects before focusing on those desired or to be avoided can produce impact pathways that are different from their usual practice or preconceptions. For instance, they can identify negatively impacted actors not at all linked to the intervention, for example, tourists, who would not have emerged otherwise. At the same time, some impacts might be anecdotal and therefore careful discussions about the boundaries of the intervention and its effects must ensue before proceeding to theory building. The specification of the content placed at the center of the wheel, the subject of the matter, is also a critical evaluative step that should involve as much local knowledge as possible.

The Three Horizons tool is the most similar approach to impact pathway building. Nonetheless, we find that it supports more systemic impact pathways because it involves unpacking a multidimensional future in all its elements, beyond the intervention. This requires skillful facilitation, so the intervention pathway is embedded within systemic changes in policies, actors, relationships, and technological developments. Additionally, because the Three Horizons is free from the discussions around what should be defined as an impact, an outcome, or an output, it allows one to focus on the pathway to achieve a certain future scenario and to define these terms in a second phase. This fosters creative discussion among participants. We also find that the translation into impact pathway terminology is a step best done by a smaller team after agreeing on the meaning of each term of the impact pathway, and with the support of an evaluator.

CONCLUSION

Our results illustrate the potential and power of integrating foresight tools and an impact pathway approach to design and evaluate interventions that challenge common assumptions and standardization, and that are more place-based and creative. At the same time, whilst foresight tools support out-of-the-box future thinking, their combination with an impact pathway approach operationalizes their results into context-tailored action plans. In other terms, anticipation for anticipation's sake is not enough for many stakeholders. Participating in strategic future thinking becomes particularly relevant for local actors when they can translate its outputs into tangible actions. At the same time, discussing the unintended, unexpected, or unlikely effects of an intervention through foresight can generate robust impact pathways by making their underlying causal assumptions more explicit.

In our experience, almost any type of stakeholder can participate in foresight and ex ante evaluation exercises as long as they can easily communicate with each other: we have carried out workshops where researchers, ministry staff, local authorities, and Indigenous leaders collaborated in strategic future thinking. However, the facilitation of foresight tools requires skillful facilitators who work as critical companions, challenging stakeholders to think creatively about their perception of the past, present, and future, and of their and others' agency in these dynamics. Moreover, when stakeholders with disparate educational and cultural backgrounds participate, as for any participatory activity, facilitators must prepare to use different supports, such as visuals and maps.

This means that there is an entry cost to foresight tools for evaluators that aim to facilitate their use. We find that this entry cost is not related to theoretical learning, as resources abound and by reading the key guidelines of each foresight tool evaluators can easily relate to them thanks to their evaluative thinking backgrounds. However, facilitating the use of foresight tools, at least once, with a foresight specialist is the best learning strategy. Ultimately, in order to carry out useful foresight and impact pathway workshops, adequate planning and skillful facilitation are required, as well as the time and the team to translate the theory built into detailed design and ex ante evaluation of the intervention.

ACKNOWLEDGMENTS

This work was supported by the French Ministry of the Overseas (Territoires Durables, 2020-2023).

[Correction: This article was first published online on July 29, 2024. It has since been updated to include the funding statement.]

ORCID

Genowefa Blundo-Canto  <https://orcid.org/0000-0003-4182-3663>

REFERENCES

- Andreotti, F., Speelman, E. N., Van den Meersche, K., & Allinne, C. (2020). Combining participatory games and backcasting to support collective scenario evaluation: An action research approach for sustainable agroforestry landscape management. *Sustainability Science*, 15(5), 1383–1399. <https://doi.org/10.1007/s11625-020-00829-3>
- Andrieu, N., Dorey, E., Lakhia, S., Meynard, P., Hatil, E., Normand, L., Gourdine, J. L., & Bambou, J. C. (2024). Introducing sheep for agroecological weed management on banana plantations in Guadeloupe: A co-design process with farmers. *Agricultural Systems*, 213, 103783. <https://doi.org/10.1016/j.agsy.2023.103783>
- Archibald, T., Sharrock, G., Buckley, J., & Cook, N. (2016). Assumptions, conjectures, and other miracles: The application of evaluative thinking to theory of change models in community development. *Evaluation and Program Planning*, 59, 119–127. <https://doi.org/10.1016/j.evalprogplan.2016.05.015>
- Bengston, D. N. (2016). The futures wheel: A method for exploring the implications of social–ecological change. *Society & Natural Resources*, 29(3), 374–379. <https://doi.org/10.1080/08941920.2015.1054980>
- Blundo-Canto, G., Triomphe, B., Faure, G., Barret, D., de Romemont, A., & Hainzelin, E. (2019). Building a culture of impact in an international agricultural research organization: Process and reflective learning. *Research Evaluation*, 28(2), 136–144. <https://doi.org/10.1093/reseval/rvy033>
- Blundo Canto, G., De Romemont, A., Hainzelin, E., Faure, G., Monier, C., Triomphe, B., & Barret, D. (2020). *ImpresS ex ante. An approach for building ex ante impact pathways in development-oriented research. ImpresS ex ante methodological guide (Second version)*. CIRAD. Retrieved from <https://agritrop.cirad.fr/598605/>
- Blundo-Canto, G., Rodríguez-Borray, G., Vásquez-Urriago, Á. R., Ramírez-Gómez, M. M., Zambrano-Moreno, G., Tibaduiza-Castañeda, L., Huertas-Carranza, B., Santacruz-Castro, A., Agudelo-Chocontá, B. E., Soullier, G., Proietti, C., Mejía-Mejía, A. D., Ferré, M., & de Romemont, A. (2023). Impact weaving: An approach to strengthening the plausibility of anticipated AR4D impact pathways. *The European Journal of Development Research*, 35(2), 402–425. <https://doi.org/10.1057/s41287-022-00566-6>

- Bourgeois, R., Penunia, E., Bisht, S., & Boruk, D. (2017). Foresight for all: Co-elaborative scenario building and empowerment. *Technological Forecasting and Social Change*, 124, 178–188. <https://doi.org/10.1016/j.techfore.2017.04.018>
- Bourgeois, R., Freguin-Gresh, S., Mercandalli, S., Andrieu, N., Dorey, E., & Tarsiguel, L. (2023). *Atelier de prospective autour de l'introduction de la gestion de l'enherbement en bananeraies par d'animal de service en Guadeloupe*. CIRAD. Retrieved from <https://agritrop.cirad.fr/606626/>
- Dart, J., & Gates, E. (2024). Incorporating futures thinking into theory of change: Case and lessons learned from a social enterprise intermediary in Australia. *New Directions in Evaluation*, 2024(182), 45–62.
- Douthwaite, B., Mayne, J., McDougall, C., & Paz-Ybarnegaray, R. (2017). Evaluating complex interventions: A theory-driven realist-informed approach. *Evaluation*, 23(3), 294–311. <https://doi.org/10.1177/1356389017714382>
- Douthwaite, B., Kuby, T., Van De Fliert, E., & Schulz, S. (2003). Impact pathway evaluation: An approach for achieving and attributing impact in complex systems. *Agricultural Systems*, 78(2), 243–265. [https://doi.org/10.1016/S0308-521X\(03\)00128-8](https://doi.org/10.1016/S0308-521X(03)00128-8)
- Fernani, A. (2020). Futures triangle 2.0: Integrating the futures triangle with scenario planning. *Foresight*, 22(2), 178–188. <https://doi.org/10.1108/FS-10-2019-0092>
- Glenn, J. C. (2009). Futures wheel. In J. C. Glenn & T. J. Gordon (Eds.), *Futures research methodology—Version 3.0* (pp. 1–4). The Millennium Project.
- Inayatullah, S. (2008). Six pillars: Futures thinking for transforming. *Foresight*, 10(1), 4–21. <https://doi.org/10.1108/14636680810855991>
- Martin, B. R. (2010). The origins of the concept of 'foresight' in science and technology: An insider's perspective. *Technological Forecasting and Social Change*, 77(9), 1438–1447. <https://doi.org/10.1016/j.techfore.2010.06.009>
- Shallowe, A., Szymczyk, A., Firebrace, E., Burbidge, I., & Morrison, J. (2020). *A stitch in time: Realising the value of futures and foresight*. The RSA. Retrieved from <https://www.thersa.org/reports/futures-thinking-foresight>
- Sharpe, B., Hodgson, A., Leicester, G., Lyon, A., & Fazey, I. (2016). Three horizons: A pathways practice for transformation. *Ecology and Society*, 21(2), 47. <https://doi.org/10.5751/ES-08388-210247>
- Springer-Heinze, A., Hartwich, F., Henderson, J. S., Horton, D., & Minde, I. (2003). Impact pathway analysis: An approach to strengthening the impact orientation of agricultural research. *Agricultural Systems*, 78(2), 267–285. [https://doi.org/10.1016/S0308-521X\(03\)00129-X](https://doi.org/10.1016/S0308-521X(03)00129-X)
- Tarsiguel, L., Dorey, E., Dorel, M., & Andrieu, N. (2023). Alternative practices to pesticide use in the Guadeloupe banana belt: Do biophysical constraints limit agroecological transitions? *Agricultural Systems*, 210, 103710. <https://doi.org/10.1016/j.agry.2023.103710>
- Thornton, P., Schuetz, T., Förch, W., Cramer, L., Abreu, D., Vermeulen, S., & Campbell, B. (2017). Responding to global change: A theory of change approach to making agricultural research for development outcome-based. *Agricultural Systems*, 152, 145–153. <https://doi.org/10.1016/j.agry.2017.01.005>
- UN Globalpulse. (2024). *Strategic foresight glossary*. UN Globalpulse. Retrieved from <https://foresight.unglobalpulse.net/wp-content/uploads/2023/03/UGP-GLOSSARY.v04.pdf>
- Vergragt, P. J., & Quist, J. (2011). Backcasting for sustainability: Introduction to the special issue. *Technological Forecasting and Social Change*, 78(5), 747–755. <https://doi.org/10.1016/j.techfore.2011.03.010>

How to cite this article: Blundo-Canto, G., Ferré, M., Tibaduiza-Castaneda, L., Andrieu, N., Fréguin-Gresh, S., Rodriguez-Borray, G., Santacruz-Castro, A., & Mercandalli, S. (2024). Adapting and combining foresight and ex ante impact pathway evaluation for place-based research planning with stakeholders. *New Directions for Evaluation*, 2024, 63–76. <https://doi.org/10.1002/ev.20608>

AUTHOR BIOGRAPHIES

Genowefa Blundo Canto's research focuses on impact assessment of agricultural research for development (AR4D) interventions. She is currently based at the French Agricultural Research Center for International Development (Cirad) and seconded at the Alliance Bioversity CIAT in Cali, Colombia.

Marie Ferré works at the French Agricultural Research Center for International Development (Cirad), on the evaluation of socio-economic impacts of agricultural research interventions.

Leidy Tibaduiza-Castaneda is in participatory research, genetic resources, traceability, and capacity-building at AGROSAVIA, Centro de Investigación Tibaitatá.

Nadine Andrieu is an agronomist working on the co-design of agroecological farming systems with stakeholders at the French Agricultural Research Center for International Development (Cirad). After 5 years in Burkina Faso and 7 years in Colombia, she has been based in Guadeloupe since 2020.

Sandrine Fréguin-Gresh is a researcher at the French Agricultural Research Center for International Development (Cirad). She has more than 20 years of research experience in agricultural economics and rural geography, with specific expertise in family farming, agrarian dynamics, rural migrations, food systems, and policies related to agricultural development.

Gonzalo Rodriguez-Borray's work is in agroecconomics, with an emphasis on territorial agro-food systems analysis and impact assessment. He has a position as Senior Researcher of AGROSAVIA at Centro de Investigación Tibaitatá.

Adriana Santacruz-Castro's work focuses on analyzing and strengthening agroindustrial value chains and agrifood systems, including impact analysis, transdisciplinary and differential approaches at AGROSAVIA, Centro de Investigación Tibaitatá.

Sara Mercandalli works at the French Agricultural Research Center for International Development (Cirad). Her main research topics include the role of labor migration in restructuring rural households' livelihoods, as well as the relations between rural-urban linkages, employment, and regional development in the context of the sub-Saharan demo-economic transition.