



Guide for co-elaboration of scenarios

Building shared understanding and joint action for reform and security of forest tenure

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Foreword

The rights and benefits belonging to people living in and around forests are receiving growing recognition. Forest tenure reform alters the rights, responsibilities and authorities with respect to forest resources. It can include changes in existing rules that transfer (part of) rights and responsibilities away from the centralized forest authorities to customary authorities, local resource users, nongovernmental organizations or local governments.

Tenure security refers to the degree to which an individual or group believes its relationship to land and other resources is safe (Poffenberger 1990). Security of the rights depends on how people perceive and experience the rights, and whether the rights are statutory or customary. Therefore, ‘security’ reflects the ability of an individual to appropriate resources on a continuous basis, free from imposition, dispute or approbation from outside sources, as well as the ability to claim returns from investment in the resource” (Mwangi and Meizen-Dick 2009, 310).

The Center for International Forestry Research (CIFOR) initiated the GCS-Tenure project in Indonesia, Uganda and Peru with funding from the European Commission (EC) and the International Fund for Agricultural Development (IFAD), as well as from the Global Environment Fund (GEF) and the Food and Agriculture Organization of the United Nations (FAO). The project conducted the study to analyze the relationships between statutory and customary land tenure and how these relationships affect tenure security of forest-dependent communities, including women and other marginalized groups.

Using a global comparative approach and standardized methodologies, the study analyzes the differential success or failure of policy and institutional innovations to enhance secure tenure rights. It also examines how these innovations identify strategies likely to lead to desired outcomes. As a first step, the process engaged key stakeholders through Participatory Prospective Analysis (PPA) (Bourgeois and Jésus 2004). PPA, which has been used previously in Indonesia and elsewhere, is an entry point for engaging local stakeholders in project implementation and to ensure that local voices are heard.

By building consensus, a scenario-based PPA facilitates negotiation and improves the relevance of results (Liswanti 2012; Shantiko 2012; Shantiko et al. in press). The process involves relevant stakeholders, including forestry officials (and other relevant government officials), and representatives of NGOs, academia, practitioners, the private sector, etc. Through participatory meetings, all expert stakeholders

progressively identify and develop a range of tenure security scenarios. They then elaborate actions in response to the scenarios identified. Based on evidence from an earlier case study in Indonesia, this approach helped strengthen the capacity of stakeholders for joint analysis and problem-solving.

With the application of PPA, the research team aims to answer the following questions: What are the key factors influencing forest tenure security? What possible actions can mitigate negative implications (or reduce barriers impeding implementation) and promote positive changes (e.g. equitable access for women and marginalized groups)? Who should be responsible for those actions?

PPA aims to help decision makers understand the key drivers, challenges and future consequences of policy options. In this way, they can reform tenure at local, regional and national levels more effectively. Using a scenario approach also helps evoke and communicate people's ambitions, plans and perceptions of change. It helps people make decisions today based on changes that may occur in the future (Wollenberg et al. 2000).

PPA is built on intense interaction among stakeholders. It helps to develop a common understanding of the current situation and evolution of the problem, as well as to construct collective agreements around resource management and planning.

PPA is widely applied to different natural resource management problems. In Indonesia, this approach has helped develop better policies and to deal with social issues, especially if the tools are integrated into local decision making (Liswanti 2012). It has also awakened decision makers to take actions that would bridge conflicting interests over natural resource management at the district level (Shantiko 2012).



1 Setting the stage

This chapter presents the purpose of the guide (Section 1.1), describes co-elaborative scenario building (Section 1.2) and outlines the basics of Participatory Prospective Analysis (Section 1.3). As such, it sets the stage for Chapters 2 and 3, which present the approach in detail.

1.1 Purpose of the guide

This guide aims to help field-based practitioners co-elaborate scenarios* at local level with multiple stakeholders on forest tenure security. It is the product of the application of the Participatory Prospective Analysis method* (Bourgeois and Jésus 2004) in three training workshops, each held over five days. These were conducted in Indonesia, Uganda and Peru in the context of CIFOR's Global Comparative Study project on forest tenure security (hereafter the GCS-Tenure project). The three workshops trained more than 60 people as facilitators through a learning-by-doing process.

The guide includes both technical implementation and preparation/organization components. It benefits from the feedback of the workshop participants who evaluated the training and provided useful and practical advice. More than 200 people who took part in 10 implementation workshops in the above-mentioned countries also provided important feedback that informed this guide.

This guide is designed to provide the needed knowledge to help practitioners understand the future needs related to tenure reforms and tenure security, and to take joint action. The authors advise users to rehearse the steps before applying them with stakeholders in the field.

Forest tenure security* is a domain of major uncertainty. Like many other development issues, it depends strongly on social, political and cultural factors, as well as economic ones. Most of these factors are usually considered as ‘given’ and not believed to evolve rapidly and significantly. This posture often leads local communities to feel disempowered and passive, even as avenues for change do exist. Participatory scenario building allows a longer-term perspective, giving local actors the potential to become agents of change. By using the future to change the present to change the future, local communities and stakeholders can proactively engage in transforming the future of forest tenure security at their local level.

Chapter 2 provides guidance on preparing a co-elaborative scenario-building process on forest tenure security at grassroots level using the PPA approach. Chapter 3 presents the PPA approach, step by step. Each step provides outputs that, in turn, become inputs for the next steps. No step can be overlooked without jeopardizing the coherence and consistency of the method. Each step is documented with examples from the above-mentioned training workshops and field implementation. It is accompanied by helpful hints from field practice, as well as feedback from the participants.

Note: Key terms are explained in the Glossary in Annex 2. When used for the first time in this document they are accompanied with a * mark.

1.2 What is co-elaborative scenario building?

Building scenarios to explore the future is not a new idea. Here we define scenario* as a description of how the future may unfold according to an explicit, coherent and internally consistent set of assumptions about key relationships and driving forces. Building scenarios about the future of forest tenure security aims to explore plausible* transformations by identifying their driving forces and mutual connections.

When scenarios are intended for use at local level, stakeholder participation is a basic requirement. However, the term participation itself can be understood and interpreted in different ways. Participation can involve simple consultation of local people to validate scenarios built by external teams. It may also mean engaging local stakeholders in the scenario-building process (e.g. to get inputs about the current situation). Co-elaboration refers here to the constant and thorough involvement of local stakeholders in all steps of the scenario-building process, as well as the dependence of the process on the direct inputs from local stakeholders.

Co-elaboration is at the core of an empowerment process based on using the future (Bourgeois et al. 2017). It helps contributors gain confidence about their own capacity to understand and better their own futures. It also creates a strong sense of ownership, which is critical for engaging in future-based actions.

All steps of the PPA approach presented in Chapter 2 are designed to foster a continuous co-elaborative approach.

1.3 Participatory Prospective Analysis

Participatory Prospective Analysis (PPA) for exploring the futures of forest tenure security is a foresight* approach. It considers alternative futures and the design of related actions to achieve a desired goal. In other words, it facilitates shared understanding and joint actions to inform the future of tenure reforms and tenure security.

PPA for forest tenure security looks at the future to inform the present. This approach can integrate multiple dimensions and their connections and turn them into a range of choices and alternatives. It provides foreknowledge* – knowledge about how and why the future may take various aspects, and about what these aspects are. This foreknowledge plays two roles: it can be used to be proactive (how can I best prepare myself if this or that scenario happened?) and to be proactive* (how can I influence the future in a way that is desirable?).

PPA generates powerful by-products, including better understanding of factors affecting tenure security and how these are connected. It unveils the diverse dimensions behind the issue of forest tenure security, which stakeholders do not always capture easily. It also provides a clear structure to help build scenarios and identify key forces for building better futures for tenure security. The discussion of the forces of change (drivers) forms the basis for understanding the problematics of tenure and tenure security at various levels.

The PPA approach is buttressed by two sets of principles (see also Figure 1). These are related to primary objectives and key attributes of its process and outcomes:

1.3.1 Principles related to the objectives of the PPA

- **Effectiveness.** Achieving results in a limited time frame. Several options are possible for organization, but there are two main choices: a five-day workshop with two weeks for preparation and one to two weeks for the finalization of the results; or a four-to-five-month process divided into milestone activities.
- **Inclusion.** Integration of stakeholders' knowledge into a comprehensive framework for the exploration of the future. The method provides enough time for participants to interact. Participatory brainstorming techniques ensure that all express their ideas and can see them taken into consideration.
- **Relevance.** Production of results that can be used for action. PPA is an applied method that intends to provide the user with an added value, a direct benefit from its implementation.
- **Capacity development.** Engaging participants not only in a reflection about the future, but in the development of their capacities through a learning-by-doing process.

1.3.2 Principles related to the attributes of results

- **Consistency.** Internal coherence of results. This is ensured by the use of a rigorous sequence of steps, each one leading to outputs that become inputs for the next step.
- **Reproducibility.** Method and process that can be applied to other issues and settings.
- **Transparency.** ‘Transparent subjectivity’, meaning there is no hidden assumption and no tampering with results. All steps are clearly and systematically documented and all results are available to all participants and the public.
- **Plausibility.** Scenarios produced are judged to be reasonable because of their underlying assumptions, internal consistency and logical connection to reality. This principle closely relates to the consistency principle.

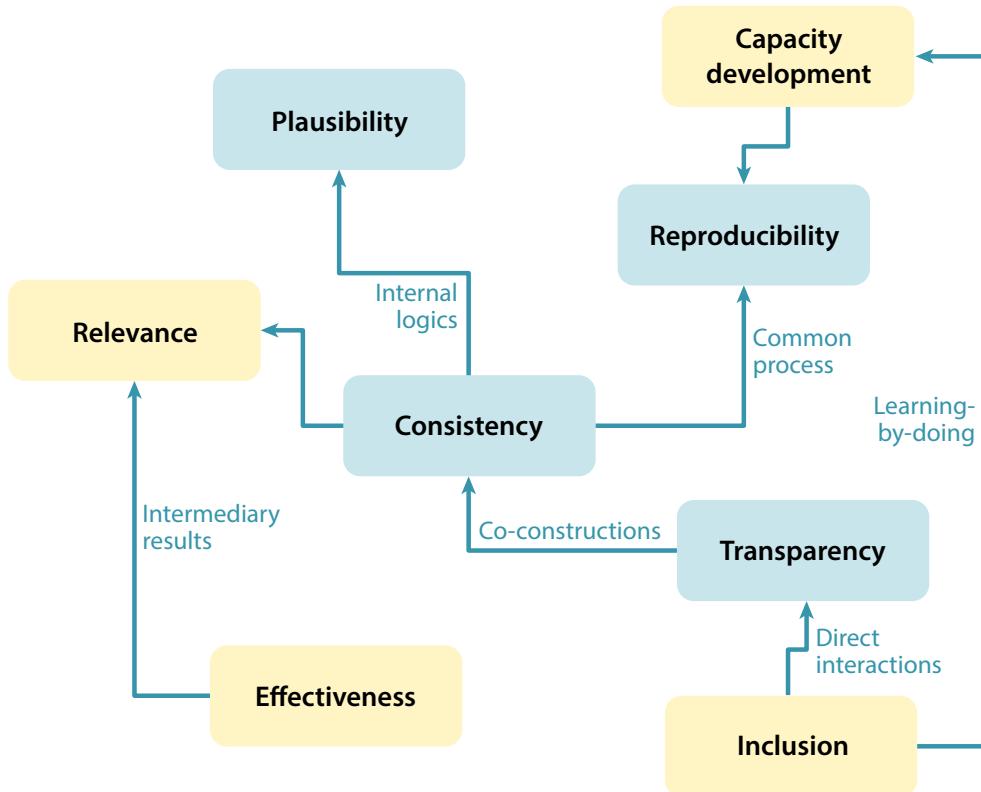


Figure 1. The key principles of the PPA method.

In summary

Participatory Prospective Analysis

PPA consists of a stepped framework to anticipate changes in unstable environments with input from multiple stakeholders. It helps prepare stakeholders to face highly versatile evolutions and to better debate strategic choices. It also builds capacity to produce and share efficiently useful information for decision making.



2 Getting prepared

This chapter has been divided into two sections. The first provides practical information on how to engage stakeholders in debates about forest tenure security. The second looks at the organizational and logistical sides of preparing for implementation.

Engaging stakeholders is crucial for the successful use of foresight in forest tenure security. Often, multiple stakeholders have conflicting views and interests. They must all be approached before field work to ensure buy-in, avoid resistance and gain active support for implementation.

Logistics and organization need to be carefully planned to ensure enough people and funds are available. The time required for implementation also needs to be well understood. There is always an inclination to rush through the various steps. Yet each step requires a certain amount of time to complete. If these limits are further shortened, the process will not produce satisfactory and quality outputs. Further, participants will feel pressured beyond their absorption and ownership capacities. Quality and relevance cannot be exchanged for time.

2.1 Engage stakeholders

Three different groups of actors must sustain the implementation of a co-elaborative scenario-building process such as the PPA approach in forest tenure security: a group with higher-level responsibilities (hereafter the ‘Support Group’); a group of ‘doers’ directly involved in the co-elaboration process (hereafter the ‘Expert* Group’), and a group in charge of technical implementation (hereafter the ‘Task Group’).

2.1.1 Build a Support Group: From back-up to ownership

The main challenge of any foresight work is to enlighten public action beyond the circle of ‘doers’ (the Expert Group). To that end, a Support Group ensures that key stakeholders become supportive and not opposed to the implementation process. In this way, they become more likely to own the results and turn them into action.

The Support Group is made up of high-level officials or representatives of public authorities and organizations. These include civil society organizations (CSOs) and customary leaders related to the broad sense of forest tenure security. Some criteria for identifying members of the Support Group are listed below.

- Who has the capacity/power to promote/impede the implementation process?
- Who must own the results to potentially make a change?
- Who has the capacity to turn results into action?
- Who has the power to authorize/forbid staff availability to engage with the Expert Group?

Answers to these questions will determine the composition of the Support Group. Each putative member needs to be approached on an individual/institutional basis with the objective of informing and engaging them in support of the initiative. The Support Group must also be kept up-to-date about progress made step by step. It may provide comments and suggestions, but is not allowed to alter results produced by the Expert Group.

Box 1. Building a Support Group in Indonesia

In Indonesia, a regional workshop on the earlier process of the GCS-Tenure project was held in Lampung and Maluku. In the context of forest tenure reform in Indonesia, the Forestry Agency both at province and district levels is primarily responsible for implementing the different reform schemes. Trained facilitators introduced this approach to the Head of Forestry Agency in Lampung and Maluku, again, at both province and district levels.

These government agencies have engaged in the PPA process since the earlier stage. They helped the facilitator identify the “Expert Group”, which was involved in implementing forest reforms. They also actively provided inputs and suggestions after completing each PPA workshop. This support group is also known as the “Steering Committee”. All Expert Group members responded positively to the involvement of the decision maker or Support Group in this process. The Support Group is expected to implement the action plan provided by the Expert Group during the PPA process.

Members of the Support Group are expected to enlarge the dissemination of the results and take actions related to decision making, moving progressively from back-up to ownership.

2.1.2 Build an Expert Group: From individual expertise to collective knowledge

The Expert Group provides technical inputs to the foresight work and engages in the full sequence of work. An Expert Group is formed by people with different backgrounds and experience. The word ‘expert’ refers here to a person with a special skill, knowledge, insight or ability in a particular domain based on research, experience, judgment or occupation. The Expert Group meetings provide a space where the four principles, as shown in Figure 2, shape interactions.

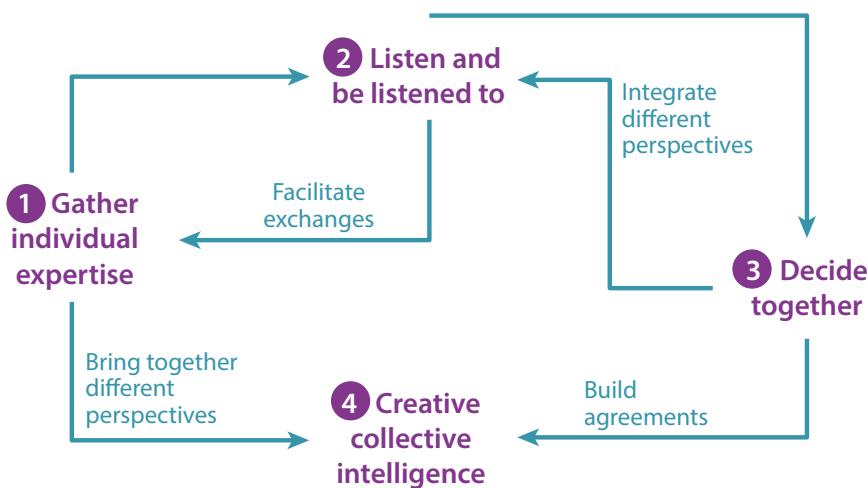


Figure 2. Principles ruling Expert Group interactions.

Building a successful Expert Group requires careful selection of its members. Suggested criteria for selecting participants are noted below.

- **Knowledge.** By gathering enough diverse participants, the PPA can take into account the diversity of all a topic’s dimensions. Knowledge here refers to formal education and training, but also to practical experience. A farmer, teacher, lawyer, trader or local village head are all experts respectively in farming and agriculture, education, rules and regulations, markets and local administration.

- **Socioeconomic diversity.** Gender, age and, when applicable, ethnic diversity and economic power should all be balanced. Expert groups are not formed from the elite. Instead, participants should reflect the diversity of the territory and people whose future is under scrutiny.
- **Individual characteristics.** Experts must be selected for their openness to discussion and tolerance of other opinions. Narrow-minded people must be excluded, even if they have good knowledge, since they are likely to either block the group work or bias it.
- **Inclusion.** Education, literacy (e.g. capacity to read, speak or write a specific language) and other cultural differences shall not be used as selection criteria. Otherwise there will be the risk that no participant would be aware of the situation of some specific parts of the system*. Participants should receive support as needed for reading, writing or speaking the language to engage them fully in discussions. This includes having someone to write down their ideas on cards or to read aloud information sets that are discussed if needed.
- **Availability.** All experts who take part in the first workshop have to be present during all the other workshops. Since they engage in a scenario-building process they cannot miss part of it, and cannot be replaced by newcomers. This rule needs to be agreed upon by participants from the beginning. Exceptional cases of including a new participant or having someone miss a step may happen, but not to the extent that it would endanger the group's work.
- **Individual expertise.** Participants are not selected because they belong to a specific organization or sector. Rather they are selected for some specific knowledge that can advance understanding of the future of forest tenure security. Once invited to be part of the Expert Group they are requested to set aside their official functions/positions and view each other as individual participants.

The process of building a group of experts starts with a preliminary list of the most obvious participants. These are people who are known and fit the criteria listed above. Once this first list is established, the people on the list can help identify others who could be contacted and invited according to the same criteria.

The appropriate number of members is not pre-defined. Too many participants would make the method unworkable and less interactive; too few would reduce the relevance of the results or introduce biases. Experience indicates that around 20 people is usually appropriate to cover both the diverse dimensions of tenure security and ensure good working conditions for a successful co-elaborative process. Implementation in Peru indicates that quality of participants is more important than quantity. The Peru Team recommended selecting participants carefully. They met more than once with them to see if they were suitable for participating in the process.

Box 2. Building an Expert Group in Uganda

In Uganda, the project team together with the project steering committees at district level in all three districts assembled a team of experts. The criteria for selection were:

- knowledge/experience/interest in land/forest tenure issues
- being able to give time for the two-three days of the PPA workshops.

Both criteria left many women out since in Uganda men take care of land and forest tenure issues. To achieve more of a gender balance, each district held women-only PPA workshops. In addition to the election criteria above, they sought some political, cultural, religious or socioeconomic leaders. Total attendance in the 3 Districts PPA activities was 144 people involving 32 women and 112 men. Average per each activity was 5 women and 19 men.

Lesson Learned

Selection criteria must give allowance to gender inclusiveness.

Box 3. Building an Expert Group in Peru

In Madre de Dios Region, 10 people participated in the first workshop and 15 in the second one. In Loreto Region, 30 people took part in the first workshop and 25 in the second one.

Lessons learned from the application of the PPA approach in two Amazonian regions in Peru:

- *Diversity of experts:* to ensure people from a variety of disciplines (forest management, community forestry, rural education, health issues, conservation, land titling, community rights, government budget, productive projects, university teachers, community people).
- *Openness to discussion:* to ensure gathering of the most information available.
- *Meet continuously with the experts:* to ensure the correct selection and that experts meet expectations before, during and after the workshop.
- *Quality better than quantity:* to ensure that experts are interested in contributing to the discussion.

Box 4. Building an Expert Group in Indonesia

The context for PPA in Lampung and Maluku. In Maluku, which has a strong customary system, most traditional communities have owned huge customary forest territory; however, the forest reform process has not started yet. Lampung is more dominated by migrants. Land tenure has long been a major issue; forest area was converted to cash crops a long time ago; and tenure reforms have been successfully implemented in some areas.

Hence, selecting the Expert Group on each site presented different challenges. The Expert Group consisted of people from different backgrounds and expertise (land titling, community forestry, customary leader, university, governments, NGO and private sector). Members had to be open minded, willing to listen, tolerant, active in the process, not dominant and selfish, and respectful of other people's ideas.

Inception workshops in Lampung and Maluku initially identified Expert Group in Indonesia through Stakeholder Identification processes. The result was shared with the Support Group, which helped select participants. In Maluku, three PPA workshops were attended respectively by 19, 14 and 17 people. The two workshops in Lampung were attended by 19 and 17 people.

Include people with different perspectives (e.g. stakeholders with a more inclusive [or not] perspective on the role of communities in forests). In the case of Peru, almost all participants agreed that communities should have access rights to the forests, claiming that communities traditionally protect forests. Interestingly, a number of participants argued the need for more severe rules to prevent increased deforestation. The results of the workshop could help solve some community tenure problems, but they should represent more than one perspective. Some members defend the integrity of forests, others defend private interests, others defend the government, and so on.

HINTS

- Use a table to map the required knowledge and expertise. Start with the names of identified people in the corresponding cells for the required expertise.
- Add information about institutions only for final checking. Be careful to select people from a large number of different organizations to avoid bias. Be aware of the tendency to select officials from governmental bodies in the field of tenure security and forestry. Consider other people working in other contexts.
- Ensure balance using the selection criteria.

2.1.3 Build a Task Group: From facilitation to co-elaboration

Applying PPA to forest tenure security requires support from trained resource persons. To that end, the three workshops in Indonesia, Uganda and Peru trained facilitators for the GCS project. During a five-day learning-by-doing session, participants were trained in PPA, as well as specific facilitation techniques and interpersonal skills. It sought to provide them with the practical knowledge and the necessary know-how for co-elaboration of scenarios for the future of forest tenure security at local level.

At least two trained neutral facilitators, who are not stakeholders, guide the workshop. They take on the following crucial roles:

- lead and manage the session step by step without interfering in the content
- ensure that all participants are given an equal opportunity to intervene
- follow all steps and apply the rules agreed upon
- seek agreement before going from one step to the next one
- keep records of decisions and intermediary outputs
- manage eventual bias or control by some participants over the discussion; this should be eased by the fact that participants were appropriately selected and accurately briefed about the rules.

The process aims to progressively turn the dynamics from facilitated work to co-elaborative work. Experience shows that participants are often eager and able to become more directly involved in the different sequences of work. Facilitators then only need guarantee that the elements listed above remain at the center of the work dynamics.

Because of the wealth of information produced, other resource people should support the two facilitators, thus building a real Task Force. The facilitators and some of the resource persons must be able to handle a laptop where the software for structural analysis and incompatibility analysis is stored. Computer literacy includes handling basic software such as a word processor, a slide maker (optional) and a spreadsheet.

HINTS

- Task Force: When approaching potential members of the Expert Group and needed members of the Support Group, present the objectives first, and then explain expected results and how these will be used.
- Expert Group: Explain why the participants were selected. Insist on their status as knowledgeable individuals and on the diversity of their individual knowledge of the real situation.

Box 5. Building a Task Group: Peru Case

In Peru, we had a team of at least three people:

- one facilitator involved in all research project activities who understood key issues around the country's tenure reform processes
- one facilitator who coordinated the PPA methodology and participated in all workshops
- one facilitator per region who knew the regional and local context and continuously met with the Expert Group and Support Group.

Lessons learned

Coordination between Task Group members is key for a successful workshop. Good relations improve the timing and engagement with experts.

Box 6. Building a Task Group: Indonesia Case

In Indonesia, two members of the GCS-Tenure Project facilitated the PPA workshops in Lampung. In Maluku, the PPA workshops were facilitated by three people (one from the GCS-Tenure project and two people from a project partner in Maluku). All facilitators had been trained in Bogor before the workshops began. They understood how to apply PPA in the context of forest tenure reform (main issues, constraints and challenges); they were familiar with research project activities, in different regions, and ensured fairness of participation during the process. They did not influence or provide answers to participants. They were careful to involve all participants. From time to time, they encouraged participants to facilitate some aspects of the process to offer them a new experience.

Box 7. Building a Task Group: Uganda Case

In Uganda, the four-member team of facilitators (three women and one man) were trained in the introductory stages. However, in each district, two other people who were trained and locals of the study districts helped out, especially with translation (each of the three study districts has different local languages and some participants could not understand English). Two facilitators joined the translator for each session. The other two facilitators documented the process.

2.2 Set logistics and organization

2.2.1 Implement Expert Group workshops

Option 1: a sequence of two or three workshops each one lasting two or three days over a period of time, expanding over one to two months. In this way, participants will still remember the previous output. Option 2: a six-day workshop that contains all the steps. An Expert Group scenario-building meeting in brief during the implementation of workshop is available at Table 1.

These two options have pros and cons. Our experience shows that Option 1 produces higher quality of results. This option provides the Expert Group and the Task Force with time to reflect on the outputs and prepare the inputs for each step. Analysis is deeper. One difficulty is to keep the same members of the Expert Group over the extended period. However, this is usually overcome by selecting members, in part, for their long-term availability. By definition, Option 1 overcomes the challenge of getting people's commitment for six straight days.

Option 2 has the advantage of 'getting the job done' quickly. But it faces the constraint of ensuring that Expert Group members will be available for a full week. It is also constrained by the pressure put on participants to achieve results by the last day. Usually this approach does not allow full development of the scenarios or engagement in a good work plan through backcasting (the process of working backwards from the definition of a plausible future to determine what needs to happen to make this future unfold and connect to the present). Other meetings are usually necessary after the completion of the six-day workshop.

GCS staff in Indonesia, Uganda and Peru preferred an intermediate solution with different settings (see Box 5, 6 and 7). It reduces the limitations and benefits from the advantages of each one, e.g. the Task Group has sufficient time to evaluate the results, to prepare materials and to consult with the Support Group. On the other hand, it is hard work and more responsibility for the Task Group. In all cases, the Task Group stays almost until midnight each day to finish output for the next day. These options were selected due to resource constraints the project was facing for implementation of the PPA approach.

Engaging people in a process leading to a shared understanding and joint action related to future tenure reforms and tenure security goes beyond the use of foresighting tools. It is more about changing stakeholders' perspectives and turning them into actions. As such, it deserves the allocation of resources to do it properly.

Box 8. Pros and cons in organizing workshops as a sequence

In Uganda, Peru and Indonesia, attending the workshop for more than two or three days was considered difficult, especially for government officials. Hence, the work was arranged in a series of two workshops of three days each (Lampung and Uganda); three workshops of two days each (Maluku); and two workshops of two days each (Peru).

In any case, before the sequence of work gets underway, the Task Force must ensure good availability and adhesion of the members of the Expert Group, as well as interest and commitment from the Support Group. This preliminary work is critical for Expert Group members to co-elaborate scenarios. Once the Support Group and Expert Group members have been identified and briefed and agree on the implementation approach, logistics have to be carefully planned

2.2.2 Material needed and practical arrangements

Visualization techniques help people interact. These include supports for displaying outputs of each step (Styrofoam boards, flipcharts, walls, screen) and media for presenting results (colored cards, markers, adhesive tape, magnets, repositionable glue).

Box 9. Example of the implementation of PPA workshops

Peru organized two workshop of two days each; Uganda held two workshops of three days each; and Indonesia had three workshops of two days each and two workshops of three days each. The intensity of the work varies depending on targets. Each Task Group does extra work to achieve its target each day during the workshop to make sure the activities are not affected. It also ensures full participation during the process. If the workshop is conducted correctly with good participants, the results meet the expected outcomes. In the case of Uganda, to engage government officials fully for the three days without interruption, the venue selected was far from the target district. This helped them to concentrate on the exercise without being summoned in and out to attend to their offices.

In general, all steps of the PPA could be divided as follow:

Option A: Workshop 1 (Day 1 – Identify and define the forces of change; Day 2 – Analyze influence variables). Workshop 2 (Day 1 – Select driving forces and define states of the driving forces, and Build Scenarios [continued by Task Group after the workshop]); Day 2 – Backcasting and Develop action plans.

Option B: Workshop 1 (Day 1 – Define the system and identify the force of change; Day 2 – Define the force of change) and introduce analysis of influence variables. Workshop 2 (Day 1 – Analyze variables' influence; Day 2 – Define key driving forces). Workshop 3 (Day 1 – Develop state of variables; Day 2 – Build Scenarios).

Option C: Workshop 1 (Day 1 – Define the system and identify the force of change; Day 2 – Define the force of change and introduce analysis of influence variables; Day 3 – Analyze variables' influence). Workshop 2 (Day 1 – Analyze variables' influence; Day 2 – Define key driving forces and develop state of variables; Day 3 – Build Scenarios).

Lesson learned

This approach could be adjusted to the local context. Forcing an unsuitable process upon Expert Group members will affect the final output of the PPA.

Table 1. An Expert Group scenario-building meeting in brief.

Characteristics	Requirements
Expert Group (20 experts) ^a	Experts' agreement/commitment
Balanced selection of experts	Resources for organization cost
Neutral Facilitators (Task Force)	Material (boards, flip charts, colored cards, markers, tape, magnets, etc.)
Reach consensus	Meeting and working space with power plug, laptop, projector
A decision-making rule	Secretarial help (Task Force)
Record keeping	
Continuous presence of experts	

a Ideally, the Expert Group consists of 17–20 people. However, it was sometimes larger (up to 27 people, Loreto, Peru) or smaller (10–15 people, Madre de Dios, Peru).

The meeting room must be equipped with a source of electricity, at least a laptop, and if possible a device for projecting results on a screen or on a wall.

The size of the room must fit or be arranged to fit the number of participants. They must be easily able to look at results and interact with each other. U-shaped arrangements are the most effective for both purposes (see Figure 3).

If there is no whiteboard, using the walls is a good option, especially when there are just two workshops of two days and group work is necessary. The selection of the place for the workshop is key. The room should be arranged well in advance.

Visualization of PPA training of facilitator arrangement in Indonesia



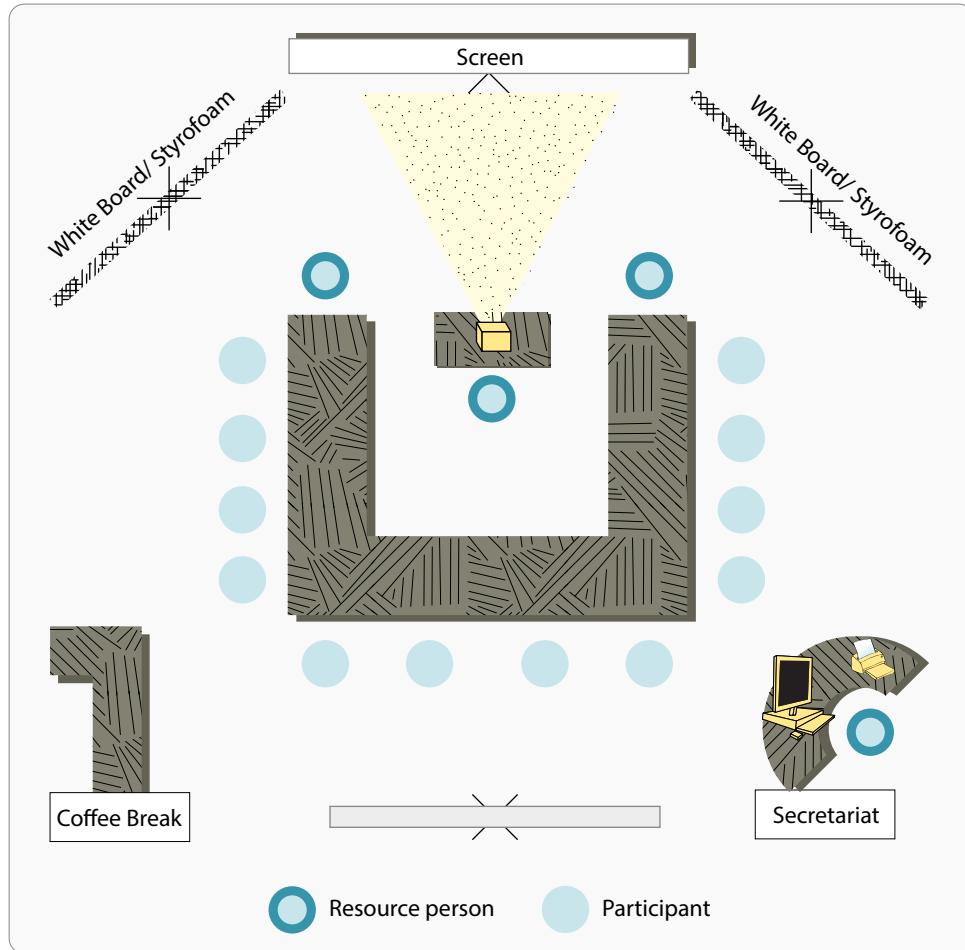


Figure 3. Room arrangement should accommodate the number of participants.

Financial resources

Participants can be financially compensated for their presence as needed; this includes provision for transport, meals and housing. The conditions for compensation must be clear to avoid misunderstandings. The same compensation rules are applied for all participants who need it.

Budgets for organizing a six-day workshop and a sequence of three-day workshops vary between the countries. They depend on the location and logistics. However, when preparing the budget, we make the following suggestions:

- Consider logistical support at the local level. Facilitator work during the workshops is quite intensive and will require some logistical and organizational support.
- Travel costs of the facilitator team.
- Consider making a printer available for the team on site. If this is not possible, make sure the printer and/or photocopy machine is close to the workshops.



Room setting in Indonesia and Uganda





3 Implementing the PPA

Applying a co-elaborative scenario-building process to the future of forest tenure security is a journey with several milestones. Each milestone is a specific output that directs the next segment of the journey. It starts from a situation with knowledge about the past and the present, but no or very limited knowledge about the future. The journey can be represented as a spiraling staircase that the Expert Group member will climb step by step. It ends with the implementation of foresight-based actions (see Figure 4).

Figure 4 describes five principal steps to implement PPA workshops, which must be completed as follows:

- Step 1: Define the system
- Step 2: Identify and define forces of change
- Step 3: Identify and select driving forces
- Step 4: Build scenarios
- Step 5: Elaborate a foresight-based action plan

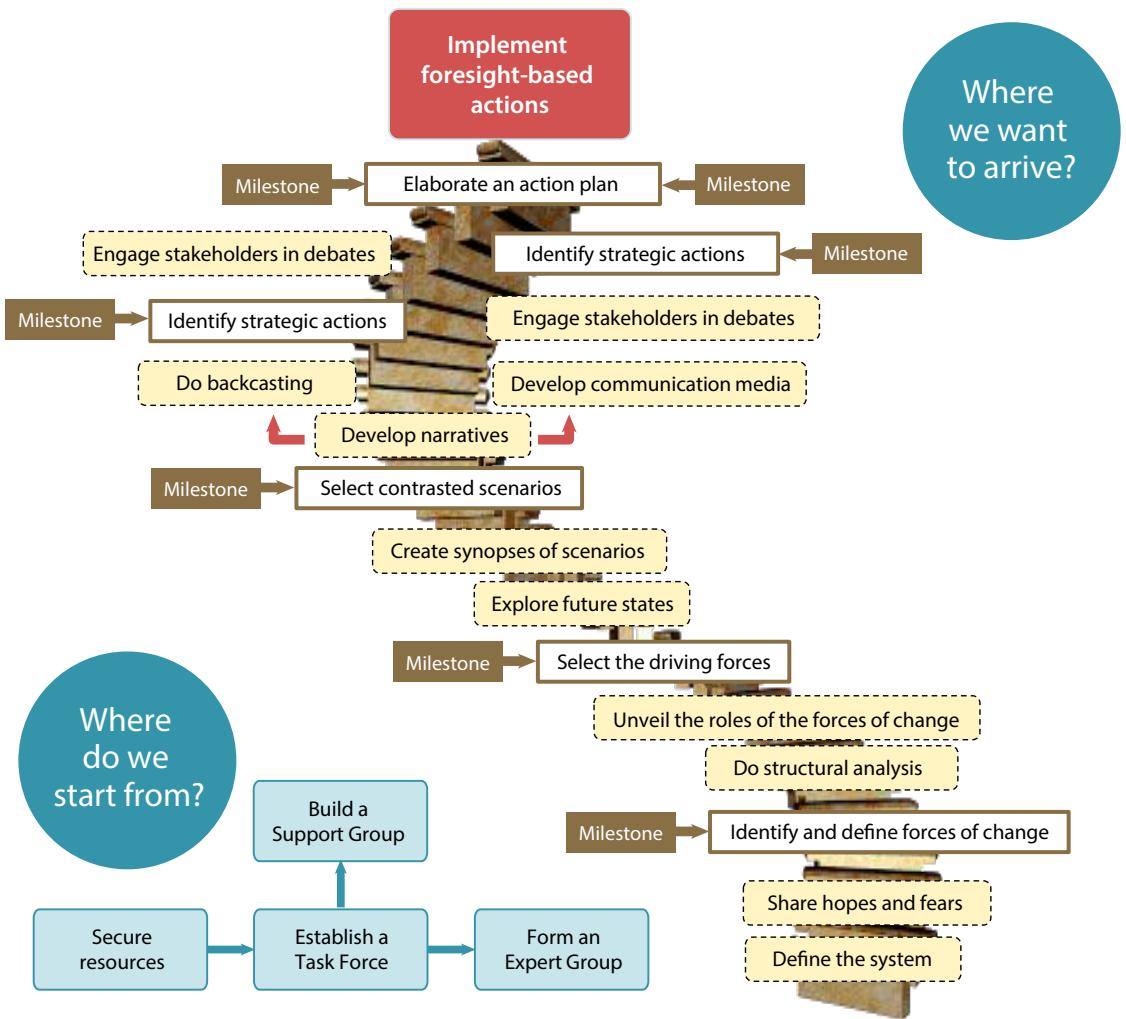


Figure 4. Facilitating shared understanding and joint action around the future of forest tenure reforms and tenure security.

3.1 Step 1: Define the system

The first step of the process is to clarify the question to be addressed through foresight. The question has four dimensions: what, where, how long and who? These four dimensions define what is called a "system". It is the plausible transformations of this system that will be explored through this foresight approach.

What?

- The core question is: What could be the futures of forest tenure security?

Where?

- This question is applied to a geographic space that needs to be clearly defined. As forest tenure security is often locally specific, this type of foresight work relates usually to a ‘territory’. The territory corresponds to a local area (e.g. a village, district, commune or small agro-eco-sociological unit).
- The geographic boundaries of work areas need to be thus clearly defined. Usually the topic itself (the ‘What?’), determines the limits of the area.
- Sometimes an administrative unit can be used to define the location (e.g. a district in the case of a foresight on land-use planning in Indonesia). Sometimes it can be a physical boundary (e.g. the Island of Mayotte or the Island of Tanimbar in Indonesia). Sometimes it can be an ecosystem (e.g. a river basin). Be aware that administrative boundaries are not always the most relevant for defining the system’s spatial dimension, especially when forests cover several administrative units.

How long?

- This dimension refers both to the time horizon* of the foresight work (the furthest point in the future being considered in the work) and the time frame* (the complete period considered).
- The time frame can be anything in the range of 10–50 years. Less than 10 years does not provide enough time to explore significant changes and potential ruptures*. Conversely, more than 25 years may not give local actors a sense of ownership, particularly for decision-making processes. A 25 years+ time frame also gets more abstract and one would doubt the credibility of the result. For foresight inquiry on the futures of forest tenure security, a 10–20-year time frame is recommended. Length will depend on the local context (e.g. considering national mid- or long-term planning for monitoring tenure security).
- A time frame of 10–25 years also corresponds to the emergence of the next generation whose futures are of concern for the current generation.
 - Note this type of enquiry is different from policy or strategic planning* whose time frame is usually around five years.

Who?

- The system is fully defined when all stakeholders are identified. Stakeholders refer here to the various people whose future is linked with the future of the territory and who are affected by the topic of the foresight work.
- In foresight on the futures of forest tenure security at local level, local stakeholders are usually all inhabitants of the territory and all those whose work is linked to the territory. In the context of the GCS-Tenure project, local communities must also be included in the process.

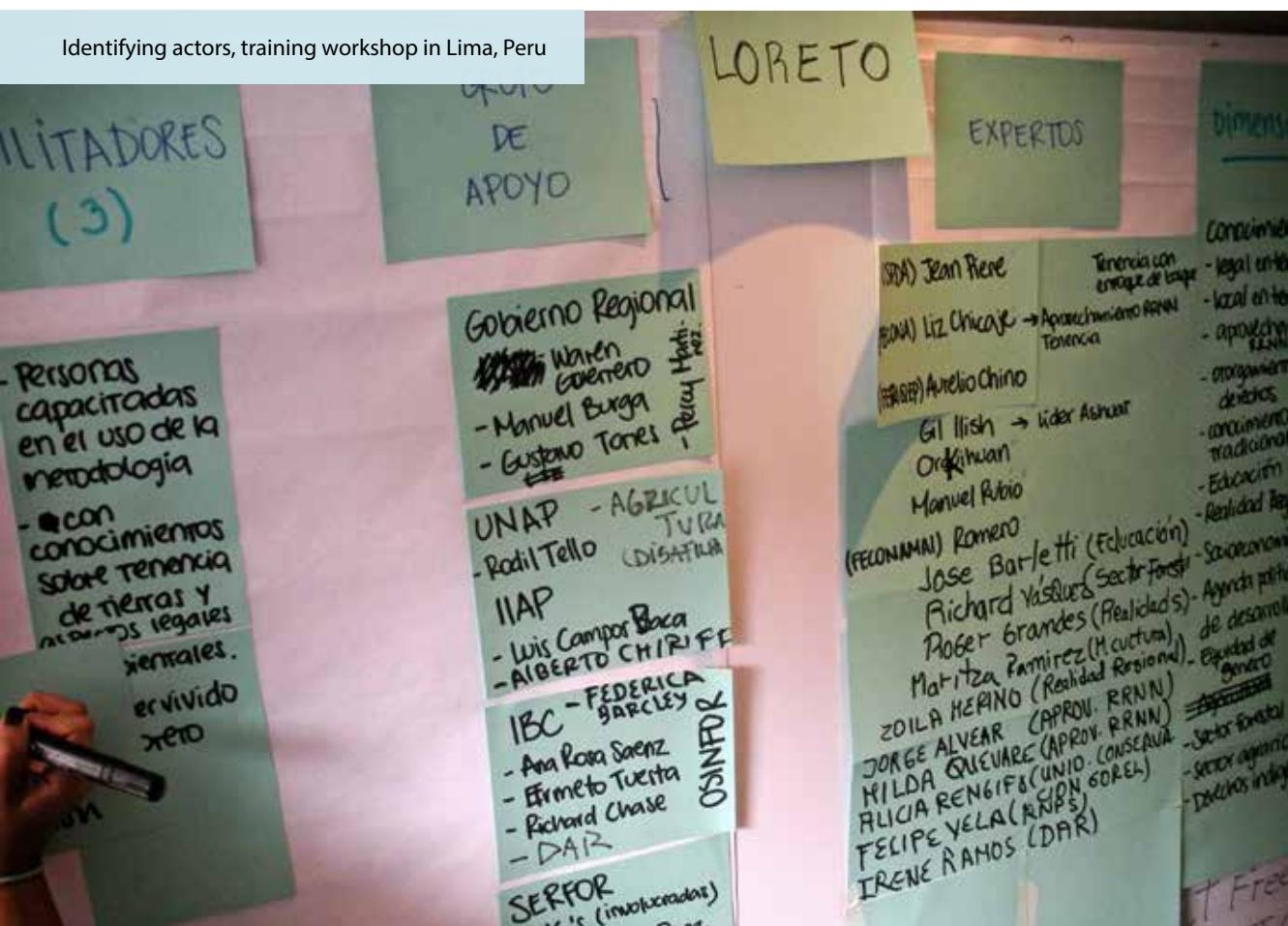
- The list of stakeholders must be clearly established so as to include important stakeholders. The knowledge of these different types of stakeholders about the territory must be reflected in the group of people who will be mobilized for local implementation of the scenario-building process.

The Expert Group, as its first task, defines the system and reaches an agreement on its definition. Members need agreement on what they will collectively consider as the forest tenure security system whose futures they will explore. As a preliminary step, they will have to all agree on a collective decision-making rule. They will use this rule to reach agreements and move forward in case of different opinions among participants. Members are free to select the rule they wish to use, but must all agree without exception to respect the rule when used.

HINTS

A common rule for making decisions: Allot some time for discussion. If disagreement prevails, experts can vote with the winner based on simple majority. In case of very close results (e.g. 51%–49% and 60%–40%), alternative views that will not be incorporated should be recorded. This keeps open the possibility of coming back to them, when members are asked to reflect on their outputs.

Identifying actors, training workshop in Lima, Peru



3.2 Step 2: Identify and define forces of change

Once the system is clearly defined, the first milestone is a list of clearly defined forces of change. A force of change has the capacity to significantly transform the system in the future no matter in what direction.

3.2.1 Understand the system, think forward

When Expert Group members identify forces of change, they may find it difficult to 'project' themselves in the future at the time horizon they have agreed to consider. Similarly, it is not always easy for everyone to have a clear mental representation of the system. To overcome these difficulties, a practical exercise is particularly useful.

Engage all members in a two-round process where each one will be requested to share their greatest fear and greatest hope for the future of forest tenure security in (the location) by (the agreed upon date).

Each participant writes a short sentence or a few words on colored cards (different colors can be used for hopes and fears). Once the cards are ready, they are displayed on the support, and participants say a few words about their meaning. The facilitator takes the cards and moves them to either the 'Fears' or 'Hopes' display.



All information is recorded and remains displayed so that participants can refer to it during the working sessions. Indeed, participants will be requested immediately after to identify the forces of change (forces with capacity to significantly transform the system in the future). Answering this question is not always easy. However, once members identify fears and hopes, it is easier to work on these forces (because they are some of the causes for the hopes and fears to be realized).

HINTS

Use this short session of free discussion as an "ice-breaker" for participants to get to know each other better. To that end, participants introduce themselves. They should focus on their domain of knowledge/experience/expertise in relation to futures of forest tenure security. After, they should briefly explain their respective hopes and fears. Three minutes per person is enough for self-introduction and explanation of hopes and fears. One facilitator should track time to ensure people do not go beyond three minutes.

3.2.2 List the forces of change

The forces of change to be identified are those with a past, present or future influence on the evolution of the territory. The process for establishing a primary list of potential forces of change is as follows:

- Use colored cards to ensure free expression of individual opinions and a balanced contribution between members of the working group.
- Invite participants to write separately the forces of change they consider important, one force per card.
- Collect, read and display all cards on a support that is visible for all without discussion of content.

3.2.3 Visualize, eliminate duplicates and group cards

- Once displayed on the support, eliminate identical (repetitive) cards with the same terms and meaning. This requires agreement between authors of similar cards to ensure they represent the same idea. If not, authors re-write cards to reflect the different meaning and display again.
- Group/cluster the cards into broad categories to discuss their similarities and remove duplicate cards with different terms, but the same meaning.
- Eliminate or discard a card only with agreement of the original author.

HINTS

The facilitator collects, reads and displays the cards. While displaying the cards, facilitators can do some preliminary clustering using the STEEP classification with five dimensions: social; technical; economic; environment; political. However, this classification is not meant to be used in the next steps. It is only a practical way to help regroup ideas. It also helps ensure consideration of the multi-dimensional aspects of forest tenure security.



Maluku workshop in Indonesia - Discussing the forces



3.2.4 Discuss: Relevance, external/internal forces

Once all cards are displayed, meanings are reformulated when needed and duplicates removed, the group discusses the relevance of the proposed forces of change. For this purpose, cards are read again one by one and discussed applying the following rules:

- Rule 1: If a proposed force of change is not clearly related to the topic it is eliminated.
- Rule 2: A sentence is not a force of change; modify the expression.
- Rule 3: Negative forms are not forces of change; modify the expression.
- Rule 4: Physical expressions are generally not forces of change; modify the expression.
- Rule 5: Proposed forces of change for which it would be impossible to identify future different states cannot be kept. The question "Is it a force of change or a future state?" is very useful. A state describes a situation that characterizes how this force could be in the future.

Cards that satisfy the five rules simultaneously are not discussed. All others need to be discussed. Figure 5 displays some examples of reformulating the expression of a force of change.

◊ Not a sentence	: "Inputs are too expansive"	→ Cost of inputs
◊ No negative forms	: "Bad weather"	→ Climatic conditions
◊ No physical expression	: "Money"	→ Access to financial resources
"Conflict between local communities and private companies"		= is not a force but
"Relations between local communities and private companies"		= is a force of change;
and it can take different states such as: Trust; Distrust, Open conflict, Indifference.		

Figure 5. An example of reformulating the expression of a force of change.

3.2.5 Reformulating expressions of forces of change

Formulation of the force is often useful to understand the reality better, as well as each participant's perceptions and expectations. Participants tend to explain the reality by writing things like "Government does not have the willingness to attend to us", "Laws don't agree with the reality", "Intercultural education". The facilitator needs to note these perceptions because they are useful for further steps. A final list of force of changes is then established. This list needs to be further revised to distinguish between internal and external forces. The differences are defined as below:

- **External forces** cannot be controlled by actors directly involved in the system. They belong to the context or environment under which the system evolves.
- **Internal forces** can be controlled by actors of the system. Some or all actors have the power to modify the state this force could take in the future.

The decision on whether a force is internal or not depends on how the system has been defined, and in particular, on its geographic boundaries and the actors of the system. A same force of change can be considered as internal at national level (e.g. “national policy orientations related to forest management”) but external at the level of a local watershed (since local actors have no possibility to control or influence it). Some examples are given of internal and external forces derived from the training workshops (see Table 2 and Table 3).

Establish two final lists: one for internal forces, the other for external forces. Tables 2 and 3 provide an example of internal and external forces identified during the training workshop in Bogor, Indonesia.

Table 2. Internal forces, training of facilitators, Bogor, Indonesia.

Name of the force	Definition
Policy implementation	The local implementation of central government policies related to use of forest land by local government
Local governance	Political, economic and administrative governance from local government in the field of forest tenure
Authorization process	Process related to forest land-use permit by the government including governance procedures and disclosure of information
Sectorial linkages	Relations between sectors of the local government in determining the pattern of sustainable forest management
Distribution of power	The distribution of power between stakeholders in the acquisition of forest benefits
Understanding of local government	Understanding the regional apparatus about forest land access policy
Support to organizations	The capacity of government/stakeholders to provide guidance to forest community institutions
Dependence on forest	People's dependence on forests (as main livelihood)
Access to capital	Access to capital related to easiness and trust for groups with legal rights to forest use
Private sector investment	Capital investment of the business world in the use of forest products
Government budget	Financial resources provided by local governments for forest tenure reform
Economic growth	Economic growth associated with the need for forest land
Population growth	Population growth associated with the need for forest land
Community participation	Community participation in the implementation of forest tenure reform
Management capacity	The capacity of the community in developing the use of forest products

continued on next page

Table 2. Continued

Name of the force	Definition
"Hak Ulayat"	Forest land rights owned for generations by indigenous peoples
Community institutions	The capacity of community institutions to affect implementation of land management policy and use of forest products
Rights/access to land and forest	Rights and access of stakeholders to forest and land use
Organizing capacity	The capacity of communities to organize
Behavior of private sector	The attitude of the private sector toward forest tenure rules and policy
People's awareness	People's awareness of the rights and obligations toward use of forests
Definition of traditional boundaries	Definition by indigenous peoples of boundaries of their territories based on natural boundaries recognized by them for generations
Land conversion	Land-use conversion from state forest to non-state forest land associated with the process of status determination by KLHK ^a
Information and communication	Information and communication system related to geospatial referencing (mapping of forest areas)

a Kementerian Lingkungan Hidup dan Kehutanan (KLHK) / Ministry of Environment and Forestry (MoEF)

Table 3. External forces, training of facilitators, Bogor, Indonesia.

Name of the force	Definition
National policies	Central government policy related to people's access to forest use
Law enforcement	Law enforcement related to the status of public land formerly certified before the establishment of the new tenure reform
Authorization process	Process by which the central government (ministry LHK) gives people access rights to manage forests through the setting of specific areas (HKm, HD, HTR and other CBFM schemes)
Central governance	Political, economic and administrative governance from central government related to forest tenure
State forest regulation	Mechanisms by the LHK ministry in setting the status and function of the land as state forest land
National budget	Budget allocated by the government for forest tenure reform
Geographic conditions	The geographical conditions of a region consisting of the islands affecting certainty of forest tenure security compared with continental area/land; related to biophysical aspects, and accessibility and socio-cultural dimensions

3.2.6 Define the forces of change

For each force of change identified, participants must agree on a common and clear definition. The definition is usually one sentence that explains the nature of the force. This step is extremely important as it results in a milestone. Definitions will be systematically used and referred to in the next step when conducting the structural analysis. The quality of the analysis depends on the quality and precision of the definition. The quality of the definition will also play a crucial role one step beyond the next step, for the identification of the future state of the driving forces. The definition must help identify the plausible future states of this force in the future.

Record all definitions so they can be used in the next steps. Provide all participants with a comprehensive table with the internal and external forces they agreed upon, as well as their complete definition.

HINTS

- Select in the range of 20-60 internal forces of change (*the software can handle up to 73*).
- Take some time to reflect collectively on the result and make sure there is no important force missing.
- Make sure no important dimension is missing (social, technical, economic, environmental, political, etc).
- Ensure your definition is sufficiently detailed (see Table 2 for an example of definition)

Box 10. Forces of change – Peru Case

Madre de Dios participants identified 27 forces, while Loreto participants identified 42 forces.

Lessons learned:

- *Define the force while discussing participants' cards.* When cards are clustered together and participants are deciding if some cards are similar or not, a discussion often begins. A member of the Task Group has to take notes. These will be key in the ensuing discussion on the definition of the forces.
- *Clarify the ideas of participants by asking them "what do you mean with that force?" whenever necessary.* This is important to evidence issues they want to convey. This makes a more efficient use of time. In Peru, after the first day of the workshop, the Task Group still had to work on refining these definitions.
- *Provide participants with the list of forces with their definition and invite feedback.*

3.3 Step 3: Identify and select driving forces

Once internal forces have been identified and clearly defined, analyze the relationships between these forces systematically. This involves an evaluation of the direct influence of each internal force on each other. The existence or absence of direct influence between forces results in a classification of forces that contribute to “structure” the system. For this reason, this work is also called “structural analysis”. The results are entered in a matrix associated with graphs and tables that immediately provides information needed for selecting the driving forces. The driving forces are the ones most influential, the most powerful in the system.

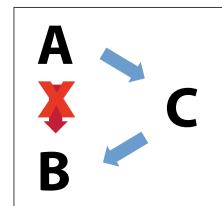
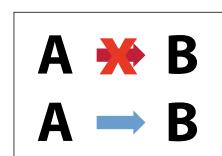
3.3.1 Measure direct influences

Understanding the relationships between forces is an important component for building multi-dimensional scenarios of the future of forest tenure security. It allows us to understand both what ‘drives’ the system and how it ‘moves’. It also allows us to understand the nature of interactions at work and relationships between the essential components of forest tenure security from a dynamic point of view. Members of the Expert Group discuss direct influences during a specific meeting for structural analysis.

The assessment of direct influences between forces is based on an agreed scoring code. A binary system represents the direct influence between two forces {0; 1}. In the absence of a direct influence of force A on force B, the AB relationship is zero ($AB = 0$); with a direct link of influence from A to B, the relationship is set to 1 ($AB = 1$). The relationship between B and A is also evaluated and can take the value 0 or 1 ($BA = 0$ or $BA = 1$).

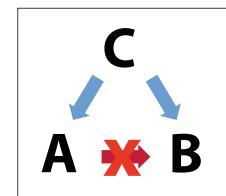
There is a direct influence of force A on force B if any change in force A causes a change in force B, and **this change can be clearly and logically explained**. To ensure the influence identified between force A and force B is a direct one, an explanation is required. The explanation eliminates three main sources of error noted below.

- Confusion in the direction of causality***: someone believes that A influences B, but it is actually the opposite. This happens frequently at the beginning of the influence/dependence (I/D) analysis. However, participants themselves usually rapidly correct it. It may also happen that two forces directly influence each other.
- Indirect influence: A influences B and B influences C, therefore A influences C**: this is a case of indirect influence and should not be included for the reason indicated earlier. When there is a causal indirect relationship between two forces, it is usually possible to identify the intermediate force that links them. If this force is part of the system (already listed), it is a case of transitivity. However, if the force is not included,



the question of including this new force must be discussed. If experts agree to include it, the list is modified accordingly and the I/D analysis is undertaken with this additional force.

- **Co-variation:** someone thinks that two forces are linked because they evolve similarly, but another force is influencing both forces simultaneously: C influences both A and B, but A and B are not directly linked.



Once the direct influence of one force on all others has been discussed and agreed upon, the Task Force immediately prepares the results in an influence/dependence matrix (I/D matrix). This matrix is a table of n rows and n columns, where n is the total number of forces (see Section 3.3.1). The discussion is repeated for each force until the complete filling of the matrix with the agreed values.

The process is time consuming in the beginning, but with more practice the experts move through it faster. The facilitator's main roles are the following:

- Help the Expert Group to consider only causal direct relations. The facilitator must always be focused on the three sources of errors noted earlier. In case of doubt, the facilitator must question the group about the existence of a direct influence versus inverse influence, indirect influence or co-evolution. This is not about pushing the group to accept the facilitator's views, but to ensure the group decides with logical and acceptable arguments.
- Ensure that at all times discussion about direct influences systematically takes place in relation to the *definition* of the force and not just on its *short name*. Using the definition makes it much easier to answer the question, as the question is much more specific. Systematically referring to the definition during the whole structural analysis ensures a higher accuracy of answers. It avoids confusion and misunderstanding brought by individual interpretation that may happen if only the name of the forces was used (see example below).

Box 11. Using the definition, not the name of the variable: An example

This example is taken, using two forces ("Local governance" and "Behavior of the private sector"), from Table 2 related to the training on forest tenure security in Indonesia.

Incorrect: Is "*Local Governance*" having a direct influence on the "*Behavior of the private sector*"?

Correct: Is the "*political, economic and administrative governance from local government in the field of forest tenure*" having a direct influence on "*the attitude of the private sector toward forest tenure rules and policy*"?

This means, in other words, asking the following question:
If a significant change occurred in the situation of the political, economic and administrative governance from local government in the field of forest tenure, will that directly transform the attitude of the private sector toward forest tenure rules and policy?

3.3.2 Implementation

The time required to complete this process depends on the number of forces of change. Participants usually need some time to handle the concept of direct influence and apply it. This is a learning-by-doing process and the analysis becomes progressively faster. Experience shows that after a half-day of learning where at best two or three forces can be discussed, the ‘cruise speed’ of structural analysis is around 30 minutes per force for a system of 50 forces (some forces require more than 30 minutes of analysis; see Box 12). This means that up to a full three-day session would be required. When absolutely necessary, the Expert Group can be split into two subgroups that will handle each half of the forces. However, this must be considered a ‘Plan B’ when there is no possibility to achieve results in the set time frame. The length of the structural analysis meeting needs to be planned in advance to ensure it can be performed with the entire group. The discussion of direct influences requires the use of discussion supports such as the one presented below.

Box 12. Organizing the analysis of mutual influences

The analysis of mutual influences took different times according to the type of forces. In Peru, some of the legal forces require more discussion than others. In Peru and Indonesia it was necessary to divide the expert group into two or three groups. In Peru, the expert group completed the I/D analysis of 42 forces in one day (at least eight hours of real work) with two groups. In Indonesia, the groups completed their analysis in one day with three groups, but a half day was still needed for checking the result from different groups. The main reason for splitting the work into subgroups was that for some forces the discussion took longer than 30 minutes. Given the time allocated for the workshop, the group was divided to ensure we could finish on time.

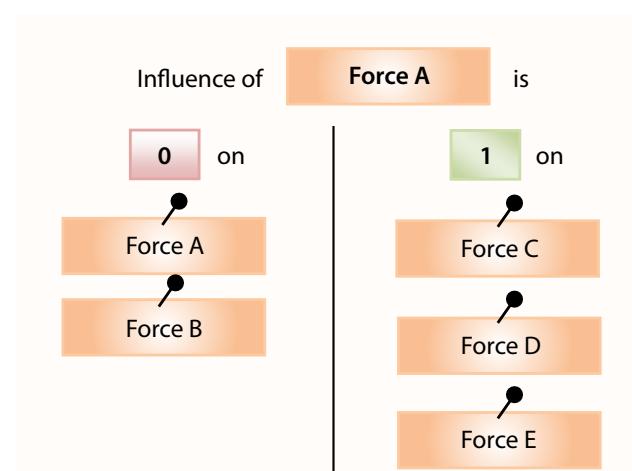


Figure 6. Example of a setting for the I/D analysis.

Use the support as follows:

- **Preparation:** Give all selected forces a shorter name (a ‘nickname’). Write them on a card. Place the card with the name of the force (e.g. Force A) on top of the support.
- **Step 1:** Discuss each force collectively one by one. Ask participants collectively this question: Is Force A directly influencing Force B? If the answer is no, Force 2 is placed in the ‘0’ column. If the answer is Yes, Force B is placed in the ‘A’ column.
- **Step 2:** Record results in the matrix. See Figure 6 for an example of a setting for the I/D analysis.
- **Step 3:** Put the card with the name of the next force (e.g. Force B) on top. Participants repeat the process until all forces are analyzed.

In case of disagreement, apply the decision-making rule adopted at the beginning of the foresight process.

Some facilitation techniques can speed up discussion, including the following ways to engage participants in the decision and promote interaction:

- **Preparation:** Prepare three large vertical supports where all cards can be displayed. One support has ‘0’ on the top, another has ‘Discussion space’ on the top and one has ‘1’ on the top.
- **Step 1:** Select the force you want to discuss (e.g. Force 1) and put it high in the ‘Discussion space’. Place all remaining cards in the ‘0’ space.
- **Step 2:** Engage all participants, in a first round, to select the cards corresponding to the forces they clearly see are directly influenced by Force 1 and move them under the ‘1’ space. This is an individual decision. However, the person must clearly justify the decision to move from ‘0’ to ‘1’. Give no more than three minutes for this.
- **Step 3:** Engage participants in a second round where they individually review suggestions made in the first round. If they have doubts or disagree with the moves proposed, they move the disputable cards to the ‘Discussion space’. Allow three minutes for this process, discuss the cards in the ‘Discussion space’ to decide collectively whether they should go to ‘1’ or to ‘0’, and move them accordingly. Give no more than 10 minutes for this.
- **Step 4:** Invite participants to have another look at the ‘0’ space to ensure that in light of their discussions, there are no further desired moves (of course, don’t discuss cards that have just been moved back to ‘0’ from the ‘Discussion space’). Discuss any new moves collectively and decide where the cards should go. Give no more than five minutes for this.
- **Step 5:** Invite all participants to have a last look and agree on the result. Record the results in the matrix. Re-assemble all the cards in one space (it is quicker to put them all where most cards are located) and call this space ‘0’ before starting the process again.

Sometimes, while doing the influence measure, we noticed there were some forces missing. For example, we have a force A that influences indirectly in force B, C, D and E. Influence is indirect because the correct sequence is A influences X and X influences B, C, D and E. But we did not have the X force. So force A, which should be a driving force, becomes an affected force. The Peru case provides an example:

'Education Quality': this force was considered as very important, but the reasoning was "if we improve education quality, tenure security results will appear in 10 years (when the educated children are adults). So it was considered an indirect influence in a lot of forces. As a result, in the direct influence graphic it appears as an 'effect force'. Finally, participants agreed to 'move it' to a driving force despite the results.

Lesson learned: There must be a consensus in what we understand by 'direct'. Direct means that if I change A, B also changes relatively quickly. There could be more intermediate forces like X force mentioned before, depending on whether experts gave specific definitions to forces.

HINTS

- Participants highly appreciate the interactive process using the "Discussion space". It makes them more directly involved in the decision and saves a lot of time. However, it cannot be used from the start. Participants required some learning and practice before being able to individually and then collectively decide on the direct influences.
- Use this process even more interactively by offering participants the possibility of facilitating the group discussion. "Official" facilitators ensure the workshop follows the agreed-upon principles.
- In case of disagreement and a narrow vote on direct influences, change (if desired) the value entered in the matrix to run a test of sensitivity. To that end, highlight the corresponding cell in yellow. This helps shorten discussion, but don't use the approach systematically. Too much variation would undermine the sensitivity of the results.

3.3.3 Record data and calculate automatically

An I/D matrix can be a large table. If 50 forces have been identified, the I/D matrix is a square table with 2500 cells! Each cell will be filled with the results of the structural analysis except the cells in the diagonal corresponding to the influence of a force on itself (by definition, these cannot be counted as a direct influence).

The analysis of the content of the matrix relies therefore on automated calculation. For this purpose, a simple software program helps visualize the results. The software requires minimum expertise as almost all calculations and displays are already embedded in the spreadsheet through automatic connections between the different worksheets. Basically, only two operations are required: i) enter the name of the forces once and ii) fill the direct influence matrix once. The structure and the functions of the spreadsheets are described thereafter.

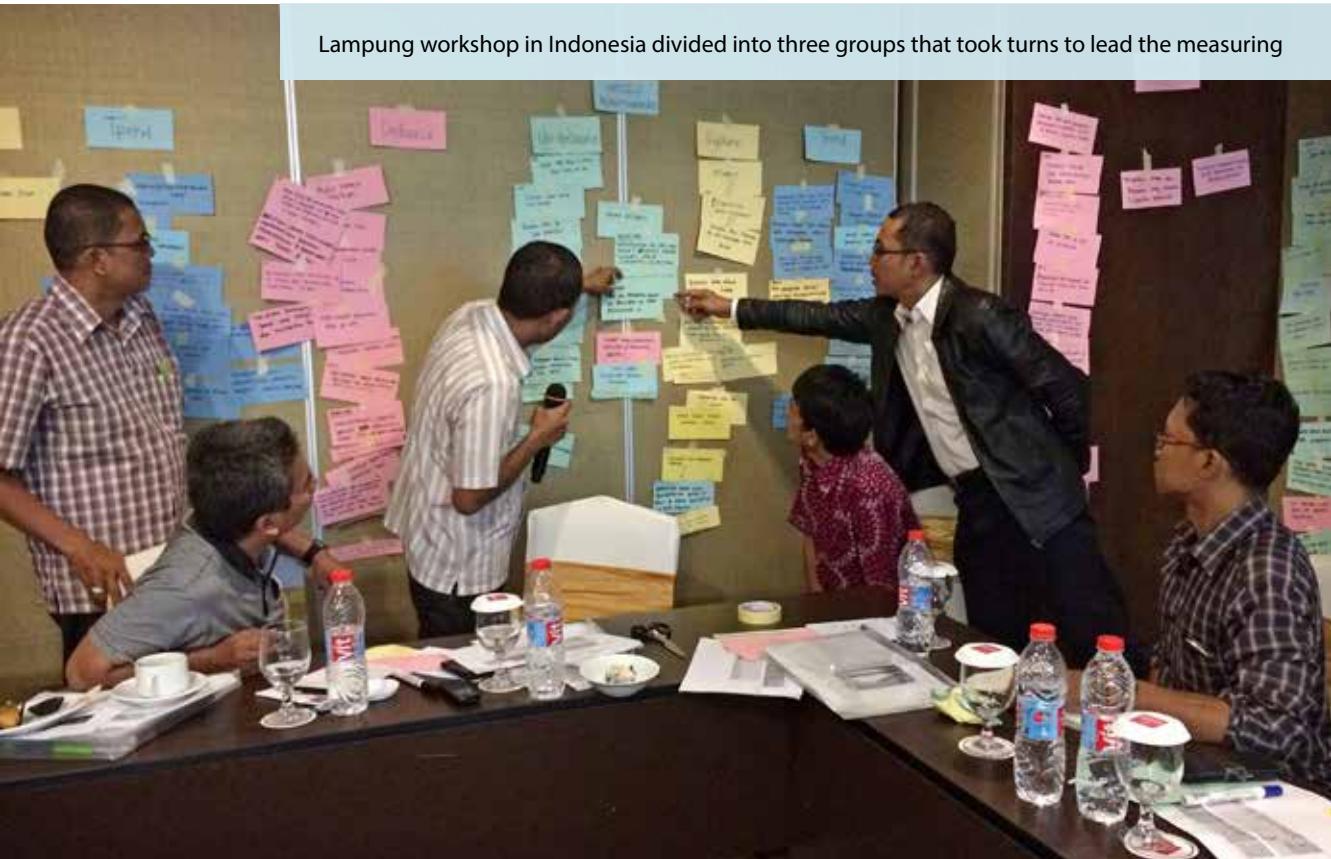
The 'Variables' influence' worksheet

The direct influence matrix is located in the worksheet called 'Variables' influence'. It has to be filled with the outputs of the work done with the experts during the workshop(s). Each force is first registered in this matrix with its nickname in the first column of the matrix (column B). This has to be done only once for each force. The name of each force will automatically appear in the horizontal headline of the matrix (see Figure 7 below based on a foresight exercise on the futures of rural areas in Africa). The value of the influence of each force on each other force is recorded in the matrix, as agreed by the experts during the workshop. The matrix is filled descending line after line, and for each line, from the left to the right. A chain of automatic links between the different matrices, tables and graphs provides immediate display of all results (see Figure 8 below).

The 'Variables' influence' worksheet also displays four additional tables that measure the strength of each force in the system. These tables are located below the matrix as follows:

- A global direct influence table
- A global direct dependence table
- A global direct strength table
- A weighted direct strength table

Lampung workshop in Indonesia divided into three groups that took turns to lead the measuring



Influence of variables on one another															
Copyright: CIRAD - 2001 Authors: Franck Jésus and Robin Bourgeois															
Legend: <table style="margin-left: auto; margin-right: auto;"> <tr> <td>0</td> <td>means</td> <td>no or weak indirect influence</td> </tr> <tr> <td>1</td> <td></td> <td>strong direct influence</td> </tr> </table>										0	means	no or weak indirect influence	1		strong direct influence
0	means	no or weak indirect influence													
1		strong direct influence													
<i>OF ↳ ON →</i>															
1 Geopolitics of Africa	0	-	-	-	-	-	-	-	-						
2 Cultural values	-	0	-	-	1	1	-	-	-						
3 Research to policies	-	-	0	-	-	-	-	-	1						
4 GendeR Inequalities	-	1	-	-	0	1	1	1	-						
5 Education rural livelihoods	-	1	-	1	-	0	-	-	1						
6 State of infrastructure	-	-	-	-	1	1	0	-	1						
7 Level of investment in RA	-	-	-	-	1	1	1	1	0						
8 Access to financial services RA	-	1	-	-	1	1	1	1	1						
9 Political will investin agriculture	1	1	1	1	1	1	1	1	1						
10 Access to natural prod resources	1	-	-	-	-	-	-	-	1						
11 Institutional arranagt for rural dev	-	-	-	-	-	-	-	-	-						
12 Dynamics of land appropriation	-	-	-	-	1	-	-	-	1						

Figure 7. Worksheet display for Influence of variables (driving forces) on one another.

The 'Variable's total influence' worksheet

This worksheet first displays **a matrix of indirect influences between forces**. This matrix is directly connected to the matrix located in the first worksheet. There is no need to fill it. When the matrix of direct influences is completely filled, the indirect influence matrix is also completely filled without intervention.

Under this indirect influence matrix, four tables similar to those located in the first worksheet can be found. They are providing automatic calculation of the following values:

- Global indirect influence
- Global indirect dependence
- Global indirect strength
- Global indirect weighted strength

Below these four tables, there is **a matrix of total influences of each force**, where the direct and indirect influences are automatically added. Again, under this matrix one can find the following four tables:

- Global total influence
- Global total dependence
- Global total strength
- Global weighted total strength

The 'Variables' dir. strength graph' worksheet

This worksheet presents a graph where each force is located along two axes measuring direct influence (vertical axis) and direct dependence (horizontal axis). This graph allows visualizing the position of each force and interpreting its role in the system. For this purpose, the graph is divided into four quadrants separated by two horizontal and vertical dotted lines. This graph is automatically filled when the direct influence matrix is filled.

The 'Variables' indir. strength graph' worksheet

Similarly, this sheet has a graph where each force is located along two axes representing the indirect influence and indirect dependence. This graph allows visualizing the position of each force and interpreting its role in the system based on its indirect influence. For this purpose, the graph is divided again into four quadrants separated by two horizontal and vertical dotted lines. This graph is also automatically filled when the direct influence matrix is filled.

The 'Variables' total strength graph' worksheet

This sheet has a graph where each force is located along two axes representing the total (direct + indirect) influence and total dependence. This graph allows visualizing the position of each force and interpreting its role in the system based on its total influence. The graph has the same four quadrants separated by two horizontal and vertical dotted lines. It is also automatically filled when the direct influence matrix is filled.

The 'Feuill1' worksheet

This worksheet requires a table to be manually filled to analyze higher levels of indirect influences between forces. This process, which is optional, controls the stability of the system of indirect influences and identifies issues about forces.

HINTS

- Save regularly the matrix with different names during the structural analysis process so that you will always have a backup in case of mishandling.
- Ensure the final matrix is stored in at least three different independent drives. You don't want to lose the results of three intensive days of interactions involving 20 people!

Influence of variables on one another									
Copyright: CIRAD - 2001 Authors: Franck Jésus and Robin Bourgeois									
Legend:		0	means	no or weak indirect influence					
		1		strong direct influence					
OF ↓ ON →	Geopolitics of Africa	Geopolitics of / Cultural values	Research to policies	GenderR Inequa	Education rural	State of infrastr	Level of investm	A	B
1 Geopolitics of Africa	0	-	-	-	-	-	-	-	-
2 Cultural values	-	0	-	1	1	-	-	-	-
3 Research to policies	-	-	0	-	-	-	-	-	1
4 GenderR inequalities	-	1	-	0	1	1	1	-	-
5 Education rural livelihoods	-	1	-	1	0	-	-	1	-
6 State of infrastructure	-	-	-	1	1	1	0	1	-
7 Level of investment in RA	-	-	-	1	1	1	1	0	0
8 Access to financial services RA	-	1	-	1	1	1	1	1	-
9 Political will investin agriculture	1	1	1	1	1	1	1	1	-
10 Access to natural prod resources	1	-	-	-	-	-	-	-	1
11 Institutional arrangt for rural dev	-	-	-	-	-	-	-	-	-
12 Dynamics of land appropriation	-	-	-	1	-	-	-	-	1
<input type="button" value="Variables' influence"/> <input type="button" value="Variables' total influ"/> <input type="button" value="Feuill1"/> <input type="button" value="Variables' dir. strength graph"/> <input type="button" value="Variables' total strength graph"/> <input type="button" value="Variables' indir. strength graph"/>									
Ready									
100%									
Worksheet Name	Content			Function	These thumbnails help navigate in the spreadsheet				
"Variables' influence"	The matrix where the names of the forces and their direct influence values are entered Four tables located below the matrix that display: the direct influence, the direct dependence, the direct strength and the weighted direct strength of each force			Records the direct influence values and inputs for other matrices					
"Variables' total influ"	A matrix "Forces indirect influence on one another" where indirect influence values are automatically computed Four tables located below this matrix that display: the indirect influence, the indirect dependence, the indirect strength and the weighted indirect strength of each force A matrix "Variables' total influence on one another" located below these tables where direct and indirect values are summed Four tables located below the matrix that display: the global influence, the global dependence, the global strength and the weighted global strength of each force			Measures the direct role of each force with three indicators: how much they affect the system, how much the system affects them and a ranking of their relative power					
"Feuill1"	A matrix to be filled manually			Produces the values of indirect influences by multiplying the first matrix by itself					
"Variables' dir. strength graph"	A graph that displays the position of each force along two axes according to their weighted direct influence and direct dependence			Measures the indirect role of each force with three indicators: how much they affect the system, how much the system affects them and a ranking of their power in the system					
"Variables' total strength graph"	A graph that displays the position of each force along two axes according to their weighted total influence and total dependence			Produces total influence values through summing direct and indirect values					
"Variables' indir. strength graph"	A graph that displays the position of each force along two axes according to their weighted indirect influence and indirect dependence			Assesses the total role of each force with three indicators: how much they affect the system, how much the system affects them and a ranking of their power in the system					

Figure 8. Summary of the structure of the software.

3.3.4 Using the structural analysis software: Practical skills

This subsection provides a comprehensive and didactic approach to using the software for structural analysis.

Insert names of the variables

Before inserting the name of the forces in the matrix, give to each force a shorter acronym that can be easily understood and visibly displayed in the graphs and tables. Each acronym is preceded by a number to help identify it (see Table 3).

Once this task is done, open the Excel file and select the first worksheet ('Variables' influence'). Position the cursor on the first cell of the left dark column of the matrix (cell B11) and type the number and name of the first acronym. *Note that the cell has by default a '-' sign'. Keep the sign. The number and name of the acronym replace the '-' sign'. Once the acronym is typed in the cell, press Enter and go to the next cell below. Repeat the process until all acronyms are properly entered in the first column of the matrix.*

At this stage, you can see the headers of the same matrix are also filled with the acronyms you just typed, as well as all other matrices and tables throughout the matrix.

Enter data in the matrix

Enter the results of the analysis of the direct influences of each force horizontally from left to right, row by row. Enter all the results of the analysis of the direct influence of the first force on all other forces in

Table 3. Variables in a structural analysis.

Acronym	Number and name of the force
1. Cult_Norm	1. Cultural norms and beliefs
2. R_Women	2. Role of women
3. R_Youth	3. Role of youth
4. P_Com_At	4. People/community attitude
5. FTS_Gov	5. Forest tenure security governance
6. Pop_Press	6. Population pressure
7. Com_Cap	7. Community management capacity
8. FP_Stand	8. Forest products standards
9. Com_FTA	9. Community forest tenure awareness
10. S&W_Ress	10. Soil and water resources
11. For_Ress	11. Forest resources
12. Acc_Land	12. Access to land
13. Acc_Fund	13. Access to financial resources
14. Acc_Input	14. Access to inputs
15. Inc_Dist	15. Income distribution
16. FP_Price	16. Forest products prices
17. Poverty	17. Poverty
18. Ec_Int_FL	18. Economic interest in forested land
19. Oil&Gas	19. Oil and gas industry
20. For_Serv	20. Payment forest services
21. ForAg_Fund	21. Funding forest agencies
22. Pol_Will	22. Political will
23. Pol_Inf	23. Political influence
24. LU_Pol	24. Land use policy
25. Land_Reg	25. Land registration
26. Imp_Strat	26. Implementation strategies

the first row (row 11) from left to right starting with cell D11 (cell 11 is about the self-influence of the force on itself and is by definition 0. Do not modify the diagonal cells highlighted in gray shade). Save and repeat for the second force, starting with cell C12 to the left (except D12, a shaded diagonal cell) and then save. Repeat the process until the last force in the matrix, save the results and make a backup file.

The matrix is protected. This means you can only enter either 0 or 1. Any other entry will make a warning window pop up. If you were about to enter wrong data, close the window and enter either 0 or 1. Be careful because the cells are all formatted by default with the 0 value, which appears as a single ‘-’. If you type wrong data and delete them and leave them blank without restoring the original value of 0, it will impede the automatic calculation of indirect influences. The indirect influence graph will display no variables and the indirect influence tables will display error signs. If this happens, there is at least one blank cell in the matrix. You need to find and correct it. By default, all cells have the value 0. Therefore, any problem with the indirect influence matrix will be caused by an error when entering the data.

Cells K7 and L7 above the matrix are control cells signaling blank cells. If the matrix entails at least one blank cell, the L7 cell becomes automatically red and indicates the number of blank cells. In addition, all cells of the matrix have been formatted to become red if they remain blank; this helps identify problems signaled by cell L7. These control cells ensure that indirect influence can be automatically computed and results displayed.

Adjust the size of the matrix

The direct influence matrix is a 100x100 cells table. By default only a 73x73 cells matrix is visible; the remaining lines and columns are hidden. Follow the steps below to adjust the visible size of the matrix to the exact number of forces entered:

Un-hide hidden columns

Put your cursor at the top of column BW. This automatically highlights the whole column. Press the Shift key and move the cursor to the next column to the right, which is column CZ. The two columns are then highlighted. Right-click on the mouse. Click ‘Unhide’ in the box that appears. All hidden rows between BW and CZ should now be visible. Then click on the top of column CX. Holding down the Shift key, move the cursor to the left until you include the first column without a header with the name of a force. Right-click and click ‘Hide’ in the dialogue box. All columns between the latest column with a header and column CY should have just disappeared. You may make the values in the CX column more visible by selecting the whole column and changing the color of the font to black. Values of total direct influence of each force will appear more clearly.

Un-hide hidden rows

Repeat the same process with hidden rows located between row 83 and row 112. Then hide rows between 111 and the first row after the last row with the name of a force. Then change the font of row 111.

Adjust direct and indirect strength tables

These tables provide the necessary data to rank the forces according to their strength. To do this, copy the content of the direct and indirect strength table into a new Excel file. First, open a new Excel file, name it (e.g. RankingForces) and save it in the same folder where you save the Structural Analysis matrix. Then select the header and all the forces and related values in the table called *weighted direct strength*, which is located from cells M114 and N114 and below. Select the forces you have entered, not all the cells of the table. Copy and paste them in the new file, selecting the ‘Paste Values’ option. Repeat the process with the table located in the ‘Variable’s total influ’ worksheet below cells L109 and M109.

To rank the forces, select all cells of the *weighted direct strength* table. Click on ‘Data’ in the menu options and ‘Sort’. Check the option ‘My data has headers’. In ‘Select by’, select the name of the column with the values of the force. Finally, select the option displaying the values from the largest to the smallest, and click ‘OK’. The table should now display all forces re-ordered and ranked from the strongest on the top to the weakest on the bottom. Repeat the process with the table of indirect strength.

The tables are now ready for comparing changes in their order and value based on their direct and indirect influences.

The forces at the top of the table of direct influence must be considered for selection as driving forces. If they are also at the top of the indirect influences, they will probably be strong driving forces. The forces that move dramatically towards the top from direct to indirect influence are forces with potential to influence the future of the system on a longer term. Those that are significantly decreasing are having a more immediate impact.

How to use the graphs

All graphs automatically display the position of each force based on their influence and dependence coordinates. These coordinates can be found in the rows immediately left of the tables displaying the influence and dependence of the forces below each matrix.

By default, all graphs are shaped using axes with a scale displaying values between 0 and 2. Before analyzing the graphs, ensure that forces with influence or dependence coordinates above 2 are also displayed. For this purpose, set the format of both vertical and horizontal axes on ‘automatic’ for the maximum value displayed. Right-click on any value on the scale of the vertical axis. A box appears. Click on ‘Format axis’. Another box appears. In the options, where ‘Maximum’ is displayed, tick ‘Automatic’ and then close the graph. If a force had an influence value above 2, it should appear in the graph. Repeat the same process with the horizontal axis to make appear any force with dependence above 2.

Finally, as the layout of the graph has changed, manually move the horizontal and vertical dotted lines which originally marked the value 1 so they are again on the value 1. If, after

setting the two axes on maximum, the graph displays maximum values below 2 (meaning that no force has a value above 2), return to the standard setting of a fixed maximum value of 2. This will make results more visible.

Adjust the visibility of the labels of the variables as needed by clicking once on the label of any variable and then selecting a larger font in the Home menu.

3.3.5 Unveil the driving forces

The driving forces are the most influential ones – the strongest in the system. They are called driving forces because any future changes will orient the system in a specific direction, desirable or undesirable. Identifying driving forces is a crucial step in the scenario-building process because these forces are used to frame the scenarios. They are one of the milestones.

Identification of the driving forces relies on two complementary dimensions: i) the interpretation of the graphs where the position of the forces can be visualized and ii) the interpretation of the tables where the influence, dependence and strength of the forces are calculated.

Participants select the driving forces after the analysis and discussions of these two dimensions, including direct, indirect and total influence.

How to use the graphs

The (direct, indirect, total) influence graphs display how the forces are distributed in a four-quadrant space delimited by two axes. The graphs show the position of each force according to the value of their weighted influence and dependence calculated from the influence and dependence table. The coordinates of each force are located in the column left next to the tables (columns E and H in the ‘Variables’ influence’ worksheet and columns D and G in ‘Variables’ total influ’ worksheet). However, they are hidden to facilitate visualization of the tables.

The graphs represent the space where the forces can be displayed using their influence and dependence coordinates. The vertical axis is the influence axis; the horizontal axis is the dependence axis. A vertical and a horizontal dotted line are located in the graph to help separate the four quadrants. These dotted lines are located at value 1, which is used to represent the center of the distribution of the forces according to their dependence and influence. For example, if the total number of influences in the system is 400 and there are 40 variables, the average value of a force is $400/40=10$. The influence value of each force is then divided by 10, so that an average force will have a value of 1 (hereafter the average). All forces with a value above 1 are more influent; all forces with a value under 10 are less influent. This calculation makes the graphs easier to visualize and to use. It does not change the shape of the graph. The dotted lines define four different spaces or quadrants. Each quadrant corresponds to specific characteristics of the forces as indicated in Figure 9.

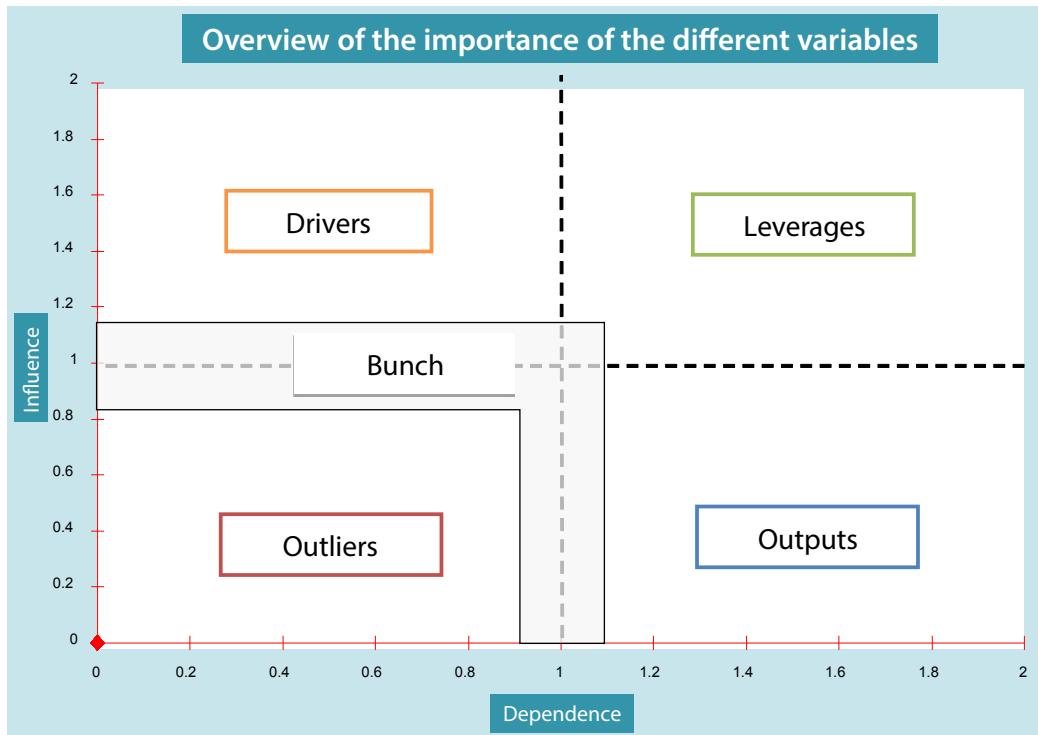


Figure 9. Overview of the importance of the different variables.

The meaning of each quadrant is as follows:

- **Upper-left quadrant: drivers***. Drivers have above-average influence and below-average dependence.
- **Upper-right quadrant: leverages**. These are at the same time influential and dependent. They can drive the system, but the system's evolution also drives them. They help amplify the direction of the system.
- **Lower right quadrant: outputs**. They have little influence and are very dependent. Other forces in the system determine their state. They do not drive it.
- **Lower-left quadrant: outliers**. They behave rather independently from the system. Sometimes outliers correspond to issues believed to be determining forces, but which are not. Yet they need to be discussed. Sometimes they also represent forces that are not yet strong enough to change the system, but could do so in the future (especially if these forces are becoming stronger in the indirect analysis).
- Finally, the gray area along the axes, which separates the lower-left quadrant from the others, is usually where the '**bunch**' of forces can be found. Their role in the system cannot be clearly identified. They contribute to the inertia of the system.

Use the tables (direct, indirect and total influence)

The first two tables immediately below each matrix (direct, indirect and total) provide measures of three dimensions of each force: its influence, dependence and strength. The values calculated in the influence table correspond to the sum of the values entered in the row related to that force in the matrix. The force with the highest value is the most influent force. Similarly, the values of each force displayed in the dependence table correspond to the sum of the values entered in the column related to that force in the matrix. The higher the value, the more dependent the force.

Table 4. Direct influence versus direct dependence.

Direct influence		Direct dependence	
1. Cult_Norm	9	1. Cult_Norm	3
2. R_Women	10	2. R_Women	12
3. R_Youth	14	3. R_Youth	11
4. P_Com_At	12	4. P_Com_At	22
5. FTS_Gov	13	5. FTS_Gov	11
6. Pop_Press	11	6. Pop_Press	18
7. Com_Cap	9	7. Com_Cap	5
8. FP_Stand	6	8. FP_Stand	3
9. Com_FTA	8	9. Com_FTA	10
10. S&W_Ress	5	10. S&W_Ress	11
11. For_Ress	10	11. For_Ress	19
12. Acc_Land	7	12. Acc_Land	12

In Table 4, extracted from the training in Uganda, the values represent the sum by row (influence) of the numbers entered in the matrix. It shows the roles of youth and forest tenure security governance have the highest influence (values are 14 and 13). The columns on the right side display the sum by column (dependence) of the values entered in the matrix. It shows that people/community attitudes is the most strongly influenced force, and therefore the most dependent (value is 22). Cultural norms and beliefs is one of the least dependent forces (value is 3).

On the right of these influence and dependence tables, two other tables provide measurement of the strength of each force. The strength is a combination of their influence and dependence. It provides a single measure based on the idea that two forces with a similar influence, but with different dependences, are not equally powerful in the system. The force with the highest influence and the lowest dependence is stronger. The ‘weighted strength’ uses the same formula, ranking the forces by centering their distribution on the value ‘1’.

Table 5. Direct strength versus weighted direct strength.

Direct strength		Weighted direct strength	
1. Cult_Norm	0.03	1. Cult_Norm	1.39
2. R_Women	0.02	2. R_Women	0.94
3. R_Youth	0.03	3. R_Youth	1.61
4. P_Com_At	0.02	4. P_Com_At	0.87
5. FTS_Gov	0.03	5. FTS_Gov	1.45
6. Pop_Press	0.02	6. Pop_Press	0.86
7. Com_Cap	0.02	7. Com_Cap	1.19
8. FP_Stand	0.02	8. FP_Stand	0.82
9. Com_FTA	0.02	9. Com_FTA	0.73
10. S&W_Ress	0.01	10. S&W_Ress	0.32
11. For_Ress	0.01	11. For_Ress	0.71
12. Acc_Land	0.01	12. Acc_Land	0.53

With the same example, Table 5 displays values representing the combination of the influence and dependence of each force. In the right column, this value is adjusted so that the distribution is centered on 1. The strongest force here has a total strength of 1.45 (forest tenure security governance). The weakest force has a value of 0.32 (soil and water resources).

Select the driving forces

The driving forces are the ones with the strongest influence in the system. These forces have the capacity to directly influence the highest number of other forces. The selection of the driving forces starts with the graph of direct influence. Follow the steps outlined below:

- Start with using the direct influence graph and focus on the strongest direct drivers, those at the top of the ‘Drivers’ and the top left of the ‘Leverages’ quadrants. See Figure 10.
- Consider the table of the weighted direct influence to see the respective ranking of the forces pre-identified in the graph. For this purpose, one can copy and paste the values of the table and rank them in descending order. Use, if possible, a significant gap in the weighted direct strength of the forces to separate the strongest forces from the others. See Table 6.

Using the same example, Table 6 ranks forces according to their weighted direct strength (the two columns at the left side of Figure 10). It shows the four pre-identified forces are effectively among the top forces. However, it also shows that one additional force (LU_Pol) has a strength that needs to be considered to have a powerful role among the top forces in the table.

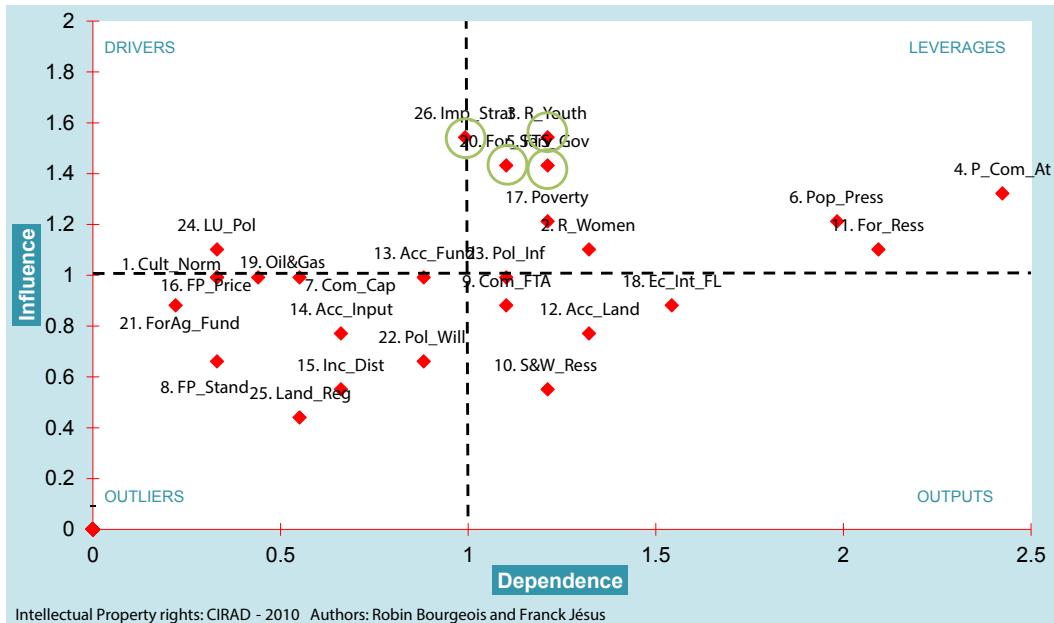


Figure 10. An example taken from the training workshop in Uganda.

Note: Four forces were first selected due to their high position (in green).

Table 6. Weighted direct strength versus weighted indirect strength.

Weighted direct strength	Weighted indirect strength
26. Imp_Strat	1.75
3. R_Youth	1.61
24. LU_Pol	1.58
20. For_Serv	1.51
5. FTS_Gov	1.45
1. Cult_Norm	1.39
16. FP_Price	1.39
21. ForAg_Fund	1.32
19. Oil&Gas	1.28
7. Com_Cap	1.19
17. Poverty	1.13
13. Acc_Fund	0.98
2. R_Women	0.94
23. Pol_Inf	0.88
4. P_Com_At	0.87
6. Pop_Press	0.86
8. FP_Stand	0.82
14. Acc_Input	0.78
9. Com_FTA	0.73
11. For_Ress	0.71
18. Ec_Int_FL	0.60
12. Acc_Land	0.53
22. Pol_Will	0.53
15. Inc_Dist	0.47
25. Land_Reg	0.37
10. S&W_Ress	0.32

Weighted direct strength	Weighted indirect strength
24. LU_Pol	1.69
26. Imp_Strat	1.65
20. For_Serv	1.50
3. R_Youth	1.36
16. FP_Price	1.35
19. Oil&Gas	1.34
5. FTS_Gov	1.33
1. Cult_Norm	1.31
21. ForAg_Fund	1.29
17. Poverty	1.14
7. Com_Cap	1.12
13. Acc_Fund	1.08
4. P_Com_At	0.98
14. Acc_Input	0.94
9. Com_FTA	0.91
8. FP_Stand	0.91
6. Pop_Press	0.88
23. Pol_Inf	0.79
2. R_Women	0.78
12. Acc_Land	0.71
11. For_Ress	0.67
18. Ec_Int_FL	0.58
22. Pol_Will	0.53
25. Land_Reg	0.44
15. Inc_Dist	0.39
10. S&W_Ress	0.32

The software automatically calculates indirect influences (Figure 11). The results are used for discussing the selection of the driving forces and for understanding better how the system is structured and can evolve. Indirect influences can be interpreted as showing longer-term influences of the forces. A force getting more influential through its indirect influence is considered as potentially having a longer-term impact. The reason is that an indirect influence operates through other ‘intermediary’ forces and therefore is triggered after a longer time lapse.

If a force that belongs to the ‘Leverages’ quadrant of the direct influence graph moves to the ‘Drivers’ quadrant of the indirect influence graph, for example, it should be considered for the selection of the driving forces (Figure 11).

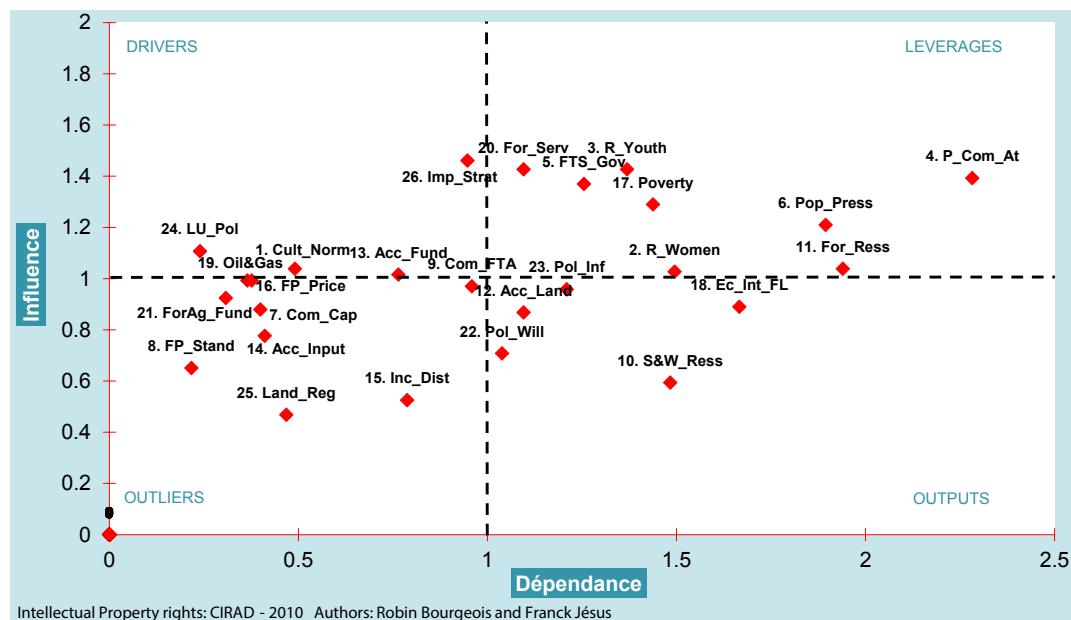


Figure 11. Graph of indirect influences.

In this example from Uganda, the graph of indirect influences does not show significant changes in the position of the forces. Similarly, the top forces in the table of the weighted direct and indirect strength remain the same. This confirms that the selected driving forces play both an immediate and longer-term role in the system.

For the final selection of the driving forces, the number of forces selected must be balanced. Because the driving forces will be used for building the scenarios, the more numerous the forces, the more complicated the scenario-building process. Conversely, too few forces lead to an over-simplification of the exploration* of the future.

This would be a waste of the wealth of information produced during the previous steps. By experience, some principles can be used for this purpose:

- In most cases, scenarios are elaborated with four to eight forces.
- It is always possible to adjust the number of forces, taking into consideration the diversity of plausible future states (see next step). If some forces have a limited number of future states, more forces can be selected.
- It is possible to consider grouping some forces into a single force, if participants feel there is good reason for that.

Box 13. Example of regrouping forces into a single driving force

During the training in Indonesia, after analyzing the graphs and the tables, participants agreed to combine "Community Participation" and "Community Institutions" into one common force whose definition was set as "*The role of local people and organizations including communities and NGOs in the governance and implementation of the forest tenure reform*".

Similarly, "Local Governance" and "Policy Implementation" were combined into one single force defined as "*The political, economic and administrative governance of the implementation of central government policies related to forest tenure reform by local government*".

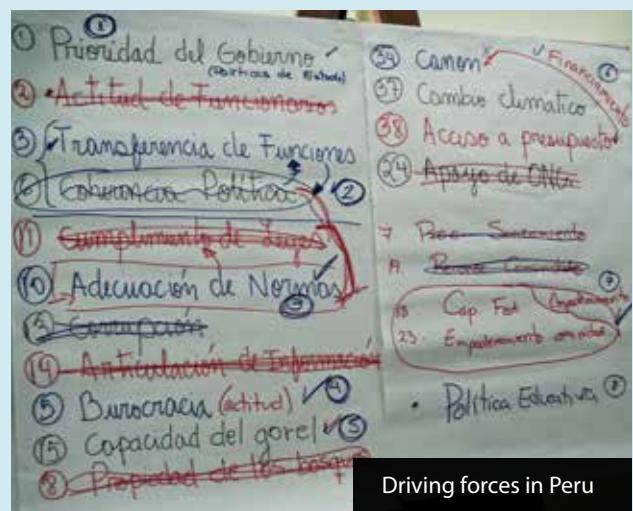
Box 14. Selecting driving forces: Peru Case

The Loreto workshop decided to combine forces related to a similar issue. For example, we combined "Capacity of Native Federations", "Capacity of Native Communities", "Empowerment of Native Communities" and "Inter communities organization" into one force named "Community Empowerment". Participants also decided to move some forces considered too important for being in the leverage box or in the output box. For example, "Education Quality" was renamed "Education Policy" and was moved from output force to a driver force.

Lessons learned:

Participants selected only a few driving forces for use in scenario development. Therefore, if there are two forces (A and B) and A influences B, we should choose A. Combine similar forces because the action planned for one of them should be similar for the other one.

This is our final table of selecting driving forces. First, we wrote all forces appearing in the "driving" quadrant of the influence graph. We combined some of them, eliminated others (the ones influenced by another force already selected) and added new ones from other quadrants.



Driving forces in Peru

3.4 Step 4: Build scenarios

This step starts with identifying the type of transformation that could take place in the future in relation to each selected driving force. Each driving force can evolve in different directions leading to a specific state in the future. These states are then used to produce plausible scenarios. A scenario is not a prediction or a forecast*. It is an anticipation* of a plausible transformation through the exploration of alternative paths. In scenario building, this exploration must be broad enough to allow identification of multiple and contrasted plausible futures.

3.4.1 Define the states of the driving forces

This activity, sometimes called ‘morphological analysis’, aims to identify coherent alternative, relevant and plausible futures. For each driving force previously selected, the experts will identify states that each force might take in the future, emphasizing contrasting and mutually exclusive states. A state is a hypothesis about what could happen to a force; it describes the force in the future at the selected time horizon; this is a qualitative* description, not only a quantitative* measure of this force. Several states are considered, including ruptures. For each force, the states must be contrasted and mutually exclusive, meaning that two states cannot happen simultaneously.

For example, during the workshop in Peru, one of the selected driving forces was the "Relationships between users of forests". For this force, four contrasting states were identified as follows:

Relationships between users of forests	Harmony	Supremacy	Individualism	No users
	Respectful, harmonious, fluid and consistent communication between forest users for concerted decision making	An individual, a group or an entity imposes its vision and interests on users of the forests	Individual interests prevail in a context of limited communication between forest users	There are no more users of the forests

In this example, the described future situations are mutually exclusive of each other and contrasted. The fourth state is a disruption with regards to the current situation. The first one represents a desirable state for all; the second and third are considered as undesirable, but plausible and to some extent already happening.

In the process of identifying future states, participants are thus expected to introduce future states that are disrupting the past or the present. This is a crucial aspect that is usually not incorporated in many foresight works. The discussion of the states follows an interactive process, force after force, with an exchange of ideas and agreement for the final selection of the states. States that are too improbable must not be retained. But we need to be cautious about stating something is improbable.

How to proceed:

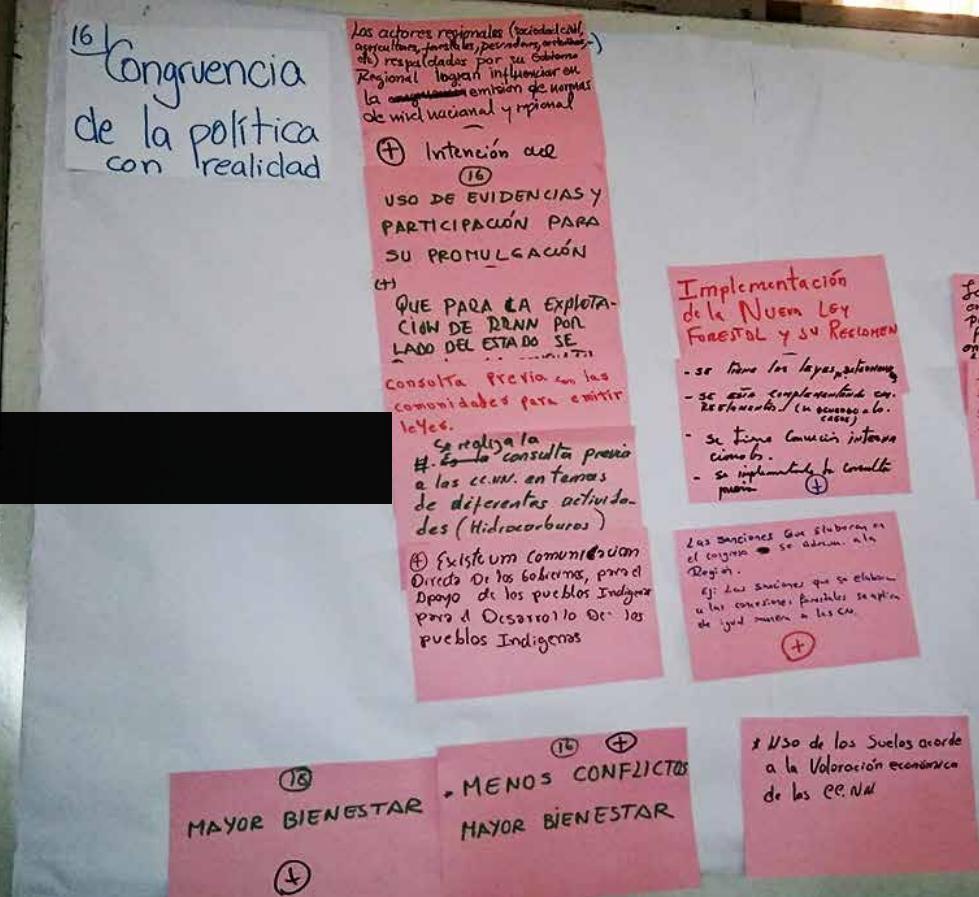
1. Design a table with the selected driving forces in the first column and space for the states in the next columns and display the table on a vertical support.
2. Start with the first driving force and work with participants on the identification of future states as follows:
 - a. Distribute one colored card per participant (e.g. pink) in a first round. Ask them to write a desirable state for this force in the future (using the time horizon agreed upon). Collect and discuss the cards so as to turn them into a number of mutually contrasted and exclusive states. For this, use a vertical support to display and re-arrange the cards.
 - b. Engage participants in a second round, distributing another colored card (e.g. gray), asking them this time to think about undesirable states for the same force. Repeat the collection and discussion process until you reach an agreement on future states.
 - c. Engage participants in a third round to help them be creative about future states. Ask them to think about some other situations that have not been considered yet, desirable or not. Repeat the collection and discussion. The third round is not compulsory; not everyone may be able to envisage other alternative states that would be different and contrasted from those already identified. This round may also be optional if a sufficient number of contrasted states have been found already through the two first rounds.
4. Write a reasonable number of states (2–6) that are contrasted and mutually exclusive in the corresponding columns of the table.
5. Repeat for the next driving force until completing the table (see Table 7, a synthetic table extracted from the training workshop in Peru).

Table 7. Driving forces in Peru.

	1	2	3	4	5
A. Education system	<i>Education for all</i>	<i>Regionalized education</i>	<i>Privatized education</i>	<i>Failing education</i>	<i>Personal education</i>
B. Relationships between users of the forest	<i>Harmony</i>	<i>Supremacy</i>	<i>Individualism</i>	<i>No more</i>	
C. Alternative uses of the forest	<i>Public goods and services</i>	<i>Extraction and services</i>	<i>Fluctuations</i>		
D. Values of decision makers	<i>Common good</i>	<i>Corruption</i>	<i>Indifference</i>	<i>Uncertainty</i>	
E. Decision-making process	<i>Inclusion</i>	<i>Discriminatory centralization</i>	<i>Public authoritarianism</i>	<i>Localism</i>	



Six selected forces and their states from PPA activity at national level in Uganda



Madre de Dios Workshop in Peru

Force is "Politics coherence with reality". The cards result from the brainstorming session to define the positive state.

HINTS

Example of creating states of forces of change. This refers to 4 out of 8 forces of change (H. Education policy, A. Government priority, B. Transfer of functions, C. Adjusting regulations to local reality, see yellow color cards on above pictures).

- Discussion of the states is not always easy. Often, cards do not exactly describe a future state, but rather bring some general statement. They may also provide some information on causes or consequences of a state without describing the state itself. Guide the discussion as follows:
 - a. Display vertically the cards, putting those that are very general at the top (they can be used to find a title characterizing the state as, for example, the bold words in Table 7). Put below those cards that describe causes of the future state. Below them, display the cards that describe more precisely the state of the future (this is the information that is really needed). Below them, put the cards that describe the consequences of the state.
 - b. Arrange the cards in a logical way, connecting vertically causes, description of the states and related consequences.
 - c. Separate contrasted states (the cards in the middle) to define mutually exclusive states.
- Once participants agree on the different states, write them in the table and record the causes and consequences separately to keep this information for the next steps.

Loreto Workshop in Peru

The picture shows four of the eight selected forces with their states.

	Lo que Queremos	Lo peor que pueda pasar	REALIDAD
H. Política Educativa. (30)	Intercultural , bilingüe, fortaleza valores y costumbre de comunidad	Política Alienada	Educación centralista
A. Prioridad del Gobierno (1) Central /Regional	Estado Prioriza el tema indígena	Estado Prioriza act. minera/petro/ agroindus	Estado tiene marco legislativo para CEN pero no se cumple por i. econo, busi, corr.
B. Transferencia de funciones (6,3)	Coordinación efectiva del gobierno regional y local	Centralismo	Transferencia de funciones <u>NO</u> es efectiva. no coherencia
C. Adecuación de normas a la realidad. (10)	Las normas respondan a la realidad.	No existe normativa relacio nada a las comunidades.	Normativa legal Inconsul ta.

3.4.2 Build scenarios

A scenario is a description of how the future may unfold according to an explicit, coherent and internally consistent set of assumptions about key relationships and driving forces. The scenario-building process here relies on assumptions made through the exploration of the plausible future states of the driving forces during the previous step. A scenario is a plausible combination of driving forces in different states.

The total number of potential scenarios is achieved by multiplying the number of forces and the number of states of each force. In Table 7 from Peru, the five driving forces had respectively five, four, three, four and four states. This would give a total number of scenarios of $5 \times 4 \times 3 \times 4 \times 4 = 960$ scenarios.

However, the number of plausible scenarios can be reduced by cross-checking the mutual compatibility between different states. To do this, establish a list of states that cannot coexist together. Two states are incompatible if the elements of the future each one describes cannot logically and plausibly co-exist simultaneously/together.

To facilitate the identification of incompatible states, give each driving force a reference code (e.g. a capital letter) and each state a number. The experts first reflect on the states that are not compatible using the letter and number codes. In the case of Peru, 26 incompatibilities were identified as follows:

A1/B2	A1/B3	A1/C2	A1/D2	A1/D3	A1/E2
A1/E3	A2/B3	A2/E2	A3/B1	A3/D1	A3/E1
B1/C2	B1/C3	B1/D2	B1/D3	B1/E2	B1/E3
B2/D4	B2/E1	B2/E4	B3/D1	B3/E1	B4/C1
D1/E2	D2/E1				

This means, for example, that the state described in the cell B1 (at the intersection of line B and column 1) cannot co-exist with the state identified in the cell D2 (line D and column 2). Indeed, harmonious relations between stakeholders who use the forests are not compatible with values of decision makers driven by greed and corruption. A scenario that would combine these two states would not be plausible because it would be internally inconsistent. Therefore, any scenario with this combination or any combination as identified above in the case of Peru must be discarded. This method is effective to reduce the number of possible scenarios by avoiding inconsistent scenarios to be selected.

HINTS

- Carry out a systematic and comprehensive identification of incompatibilities between the states of the driving forces. To do this, first take cell A1 and check if the states in the lines below (starting from line B) are incompatible with the one described by A1. Then go to A2, and so on. Once line A is completed, move to B1. Repeat the process starting from line C (no need to do it again with line A). This is repeated until the penultimate line of the table where we end the analysis by comparing it with the ultimate line.
- Use the software provided as explained below.

Table 8. Guidelines for using the software for screening scenarios.

I. Entering incompatibilities
Open the software. In the first column of the worksheet "Incompatibilities", write down all identified incompatibilities (starting at cell A10) under the following form, as an example: A1/B2, meaning that the state 1 of force A is incompatible with the state 2 of force B. By default, the first column is formatted to accept up to 150 incompatibilities. If there are fewer than that, the table need not be changed. If there are more, the table can be expanded by copying the last row (row 159) as many times as needed.
II. Specifying the number of states
The first row called "Variables" has eight cells named from A to H, corresponding to a maximum number of eight driving forces. As per the note above, eight forces are the maximum number recommended for the scenario-building process. If there are fewer than eight forces (e.g. five forces), they will be identified in the table from A to E. In the second row called "No. of states", enter the exact number of states identified in the table of the future states under the letter of each force located in row 1. For example, if there are five forces respectively with 2, 5, 3, 3 and 4 for future state, enter in row 2 the number 2 under the letter A in row 1, then 5 under B, 3 under C, 3 under D and 4 under E. This will ensure that in the next step you will not enter a state whose number is above the acceptable number of states (a state that does not exist).
III. Screening scenarios
Once the steps above are completed, the software is ready to screen instantaneously the plausibility of any scenario. To do this, it compares all combinations of states within the scenarios with all incompatible combinations. First, enter in row 3 called "Enter scenario" the number of the state corresponding to each force of the scenario. For example, if a scenario is characterized as "A1 B3 C2 D3 E4", enter respectively the numbers 1, 3, 2, 3 and 4 in cells B3, C3, D3, E3 and F3. If you enter a wrong number that is above the maximum number of states or a sign that is not a number, an error signal will appear in the cell below the error in row 4. Undo the action and enter the right number. Second, once all numbers corresponding to the states of the scenario are entered, the scenario will be accepted or not accepted: Result 1: If cell A7 remains blue and all cells in row 7 remain green, the scenario is acceptable. Result 2: If cell A7 becomes red, the proposed scenario has incompatible combinations. The red cells in row 7 will display the detail of the incompatible combination. This means the scenario should be discarded. Repeat then the screening process for the next scenario until you screen them all.

Creating scenarios

The synopsis of a scenario is a plausible combination of states of the driving forces. For example, in Table 8, a plausible scenario is represented by the combination of states A3-B3-C3-D3-E2. This scenario was called 'Me first' (see Box 15).

Representing each scenario with a codified frame of letters and numbers helps the process of grouping in clusters and sorting the scenarios. It also makes it possible to discard redundant scenarios, consolidate them and discuss the results, emphasizing identification of contrasting representations of the future. At this stage, outputs of the scenario-building process are coded combinations for each scenario (see pictures below).

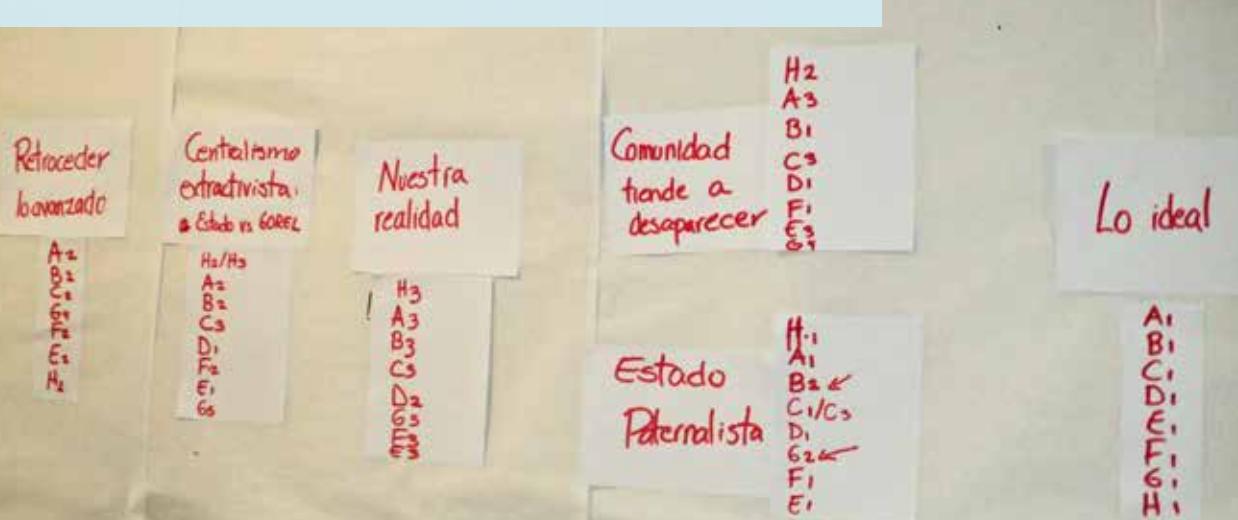
This process can identify a high number of scenarios. The training workshops on the futures of forest tenure security identified on average more than 10 scenarios. After discussion and refinement this number was reduced to seven or eight scenarios. The number of scenarios is usually not pre-defined. It depends on the situation.

Box 15. The "Me first" scenario in Peru

The education system is private, expensive, exclusive and discriminatory. It is based on values related to foreign realities. Local knowledge is not considered, with little involvement of children and young people. Personal interests and lack of communication between forest users prevail. Decision-making processes are locked, centralized, discriminatory, without participation of people, and influenced by private interests of powerful groups. Decision makers are indifferent to the forest and do not value its services and its people. Uncontrolled exploitation of forest land resources and mining activities prevail.

The six scenarios for Loreto

Note: The scenarios comprise "Going back"; "Extractive centralism: State vs. regional government"; "Our reality"; "Community tends to disappear"; "Paternalist government"; "The ideal".



Members of the Expert Group may want to pre-determine a specific number of scenarios. This is normally not advised. If members choose this path, they should work with at least five scenarios. This will allow experts to be creative and go beyond the usual practice of defining three scenarios (one ‘positive/desirable’, one ‘neutral/trend*/status quo’ and one ‘negative/adverse’).

How to proceed

1. Display the table with all states of the driving forces on a vertical support that everyone can see clearly. Distribute the same table to each participant so they can use it directly for creating scenarios.
2. Start with a first round, requesting each participant to create a desirable scenario as follows:
 - a. Distribute one colored card per participant (e.g. pink). Ask them to write a combination of states that would depict a future situation of the system they would consider as desirable. After a few minutes, collect all cards.
 - b. Screen all proposed combinations with the ‘Incompatibilities’ software. Discard scenarios that present combinations of incompatible states. Keep only plausible scenarios. Place all the remaining cards on a vertical support where you can display and re-arrange them.
 - c. While displaying the cards, eliminate redundant ones (cards showing the same combination). Re-group the cards by similarities (cards that present a large number of similar states).
 - d. Discuss scenarios that differ only by a few number of states, ensuring you keep the most contrasted and consistent scenarios. This will ensure the scenarios finally selected will represent very different situations. For this purpose, once you agree on a contrasted scenario, discard other scenarios that are close to that one but not so contrasted. To do this, read aloud the content of the scenario (which is the combination of the codes) to participants. Ask them which combination is more plausible and contrasted.
 - e. Keep the ‘desirable’ scenarios on one side of the vertical support.
3. Repeat the process now for undesirable scenarios as follows:
 - a. Distribute a different color card (e.g. gray) asking participants to identify an undesirable scenario on each card.
 - b. Collect, screen incompatibilities, eliminate duplicates and re-group scenarios for discussion.
 - c. Re-iterate the discussion process to select contrasted scenarios. Ensure they are also contrasting with previously identified scenarios. Place the resulting scenarios along with the former scenarios.

4. Engage participants in a third and final round for creative scenarios as follows:
 - a. Distribute another color card (e.g. yellow). Ask participants to identify other scenarios, contrasting with those already identified. This unleashes the creativity of participants.
 - b. Collect cards, eliminate incompatible scenarios and duplicates, re-group and discuss comparing with the sets of scenarios already produced.
 - c. Put the results on display along with the other scenarios.

HINTS

- The third round is not compulsory. Not everyone may be able to envisage other scenarios that would be different and contrasted from those already identified. This round may also be optional if a sufficient number of contrasted scenarios have been found already through the two first rounds.
- Make sure that all states are being used at least once in the scenarios.
- Scenarios that differ due to several well-contrasted states of forces are useful to scan the plausible futures. Therefore, defining well-contrasted states of the driving forces, including ruptures, is extremely important for building a diversity of contrasted and plausible scenarios.

Developing the narratives* of the scenarios

Seek agreement that the scenarios are sufficiently contrasted and diverse to represent a range of plausible futures. Describe each scenario more completely (i.e. build a narrative, a story). The steps for developing scenarios through coherent narratives are as follows:

- Write down the frame of the scenario by putting together in a single paragraph the full description of the states of driving forces corresponding to each scenario. This is the base of the story. It represents a specific image of the future.
- For each scenario, keeping in mind this base of the story, progressively complete the story by adding compatible states of the other forces. This requires identifying plausible states that will fit with the 'story' told by the combination of the states of the driving forces that are characterizing each scenario.
- Add first the states of the outputs (the forces located in the lower-right quadrant of the matrix). Start with the forces at the lowest right part of that quadrant. Work progressively on the other forces going up and left.
- Once compatible states of the outputs have been included in the story, the image of the future becomes more detailed and precise. Add the compatible states of the leverages forces (those in the upper right quadrant not already used for creation of the scenario). Start with the lowest right forces in this quadrant and progress towards the left and up. Add compatible states of the drivers not yet included in the driving forces, if any.

- Once these states have been entered the narratives/stories are almost developed. Include compatible states of the ‘bunch’ forces.
- At the end of the process, each scenario will consist of a story with at least a number of sentences equal to the number of states of the forces used for developing the scenario.
- Look at the outliers and reflect on how they could connect with the story of each scenario.

HINTS

- Split the work among small groups of participants. Usually groups of 3-4 persons are more effective for developing a scenario.
- Make sure each group shares the story of the scenario with the other groups.
- The development of a scenario follows a logical sequence. It starts with driving forces, then adds outputs, leverages and drivers, and bunch variables. But the final story does not have to reflect this order. To make the story compelling and coherent, you may wish to give the narrative a different order.

Illustration: Outputs form the foresight training workshop in Indonesia, Uganda and Peru

In total, 25 scenarios were produced. The scenarios are extensively described in the respective reports (<https://www.cifor.org/gcs-tenure/publications/project-publications/>). Table 9 displays plausible future states of forest tenure security according to the futures described in the scenarios. Some scenarios are grouped together as they display similar futures for forest tenure security.

The table shows seven different configurations for the future of tenure security according to the type of relationships between stakeholders and the related power structure. Each configuration may entail different and contrasted situations as follows:

- The ‘harmony’ configuration is displayed in the first row of the table. Here, forest tenure security is guaranteed to all through clear and respected rules supported through national and local leadership.
- The ‘community’ configuration (second row) is characterized by forest tenure controlled by local communities. Different situations occur depending on the capacity of communities to enforce their rights.
- In the ‘state failure’ configuration (third row), interest groups are given the possibility to control forest tenure. A continuum of situations ranges from uncertainty about forest tenure security to generalized conflicts.
- The ‘exclusion’ configuration (fourth row) is characterized by state takeover of forest control. No stakeholder is allowed to use forest resources and forest tenure security is

not an issue. This configuration also includes a situation where people have left the area (and therefore forest tenure security is also not an issue).

- The ‘self-interest’ configuration includes rows 5 and 6 of the table. In the absence of legal or community-based control, individual or private interests dominate. This leads to contrasted situations depending on who has enough power to control and defend forest tenure access and maintain their ‘rights’.
- The ‘marginalization’ configuration shown in row 7 of the table corresponds to a control over forest tenure security by a small part of the population composed of the elite/wealthiest. Poor people and local communities are dispossessed from their rights.
- The ‘private partnership’ configuration in row 8 corresponds to a situation where forest tenure security is guaranteed through actions of the private sector towards all forest users, without state intervention.

Table 9. Plausible futures for forest tenure security as per the scenarios developed during the training workshops.

Peru	Indonesia	Uganda
<i>Minka (working together)/ We are happy, let it be forever</i> The security of forest tenure is guaranteed, forest users reach a consensus on land ownership and use resources in a context of harmony and reciprocity or through state leadership. Tenure processes are clear and understood by all. Users and the state benefit from forest goods and services.	<i>The dream of forest tenure reform</i> Forest tenure reforms can be implemented without conflict among stakeholders and provide security for forest-dependent people.	<i>The perfect (renewable) world</i> Undisputed rights of any property related to forest land and resources are guaranteed by a legal system and community normative system that acknowledge and protect them, for a continuous period, and against challenge from other individuals or groups and the state, and are recognized as such.
<i>“Rainbow”</i> Clear and respected tenure rights are strengthened by good relations of forest users and by community authorities whose central role allows the allocation and monitoring of the fulfillment of rights; a low number of conflicts and the ability of users to benefit from forest goods and services.	<i>The “people’s power”</i> Forest tenure security is controlled by a dominant local community, but with limited perception.	<i>The community mosaic</i> Rights on any property related to forest land and resources are haphazardly guaranteed. Powerful communities are the only ones able to guarantee their own forest tenure rights.

continued on next page

Table 9. Continued

Peru	Indonesia	Uganda
Road to disaster/The only way Land tenure for communities is at risk in the absence of efficient educational and political support enabling development of local potential and curbing the actions of interest groups. These groups prey opportunistically on forest resources or else their views are not taken into account in public decisions by an authoritarian state. There are no channels of communication between those involved.	The long way for the forest tenure reform Forest tenure security is difficult to achieve for a forest-dependent community due to insufficient support from the government and private sector.	All on the road to end the forest under government leadership Disputed rights on any property related to forest land and resources are due to a discriminating policy contested and by-passed by all. Everybody can challenge other individuals or groups and even the state. Nobody can have forest tenure security.
The lonely forest The state holds and controls land tenure. No one can access forest resources. The security of forest tenure is no longer a relevant issue.	Government power The government takes control of forest land. Forest tenure security becomes unimportant or is not given an opportunity.	Mayantu Because there are no people, tenure is exclusive of local governments and not affected by market fluctuations.
"Me first" Tenure rights are insecure, with dominating individual interests and characterized by conflicts generated by the struggle for control of access to resources. Tenure rights of non-economic groups are violated by the disinterest of the authorities to fulfill the functions regarding the forest.	The private grip on forest tenure reform Uncertainty of forest tenure security due to conflicts between stakeholders.	The law of the jungle Anyone concerned with forest degradation and insecure life requests land reform. Property rights related to forest land and resources are not guaranteed; no legal or community normative system acknowledges and protects them. Only corrupted and privileged people have forest tenure rights.
Chaos and survival The forest tenure in the country is accessible for community but it has not yet given greater financial resources to the people. This causes constant disagreements and conflicts of interest.	The "doomed future" of forest tenure security Uncertainty of forest tenure security due to open access to forest land and weakness of Ministry of Environment and Forestry.	Everyone by themselves There is no forest tenure security for anybody. Rights on any property related to forest land and resources are not guaranteed. There is neither a legal system nor a community normative system that acknowledges and protects them. Everyone has the "right" to challenge everyone.

continued on next page

Table 9. Continued

Peru	Indonesia	Uganda
Road to forest destruction Forest tenure is insecure, with predominant interests of small groups of interest; it is not accessible to low-income people, only to people with a high economic level.	From failed forest tenure reform to forest capitalism Forest tenure rights are insecure because the private sector dominates reform implementation.	The rich versus the poor Rights on any property related to forest land and resources are not guaranteed for all due to a discriminative legal system and the dismantlement of the community normative system. The legal system acknowledges and protects the rich and excludes the poor and local communities (inequality in forest tenure security).
	Private sector leads the path The community's rights over forest land can be obtained without implementation of forest tenure reforms.	

Box 16. Build scenarios

Peru Case

The participants identified scenarios and built the narrative using combinations of states of driving forces. They eliminated those combinations of states that were similar and produced six different scenarios for each region.

Indonesia case

Future scenarios were built using key driving forces. Each driving force has different states of variables. Both in Lampung and Maluku, the states of variable indicated the desirable, undesirable, trend and rupture conditions. This process needs to be done carefully as the state of variables should also be considered for the current condition. Many states of variables are not compatible, which means they will not happen at the same time. After finishing this process, the participants started to build scenarios using combinations of states from each key variable. Similar scenarios were combined. At the end of the exercise, we arrived at contrasting scenarios. In Maluku we had six scenarios and five scenarios in Lampung.

Uganda Case

From the key driving forces identified, the futures states (desirable, undesirable and rupture) for each of the forces were explored. The incompatible states were identified by the participants and entered into a software Incompatibility matrix. The participants and facilitators then developed the scenario combinations using the different states of all the key driving forces which were confirmed for compatibility by the matrix. Every participant was given a chance to make up possible combinations. The descriptions of the different states were then used to write/ build up the stories from the scenarios. Writing of the stories was done in groups of between two to four people. The number in the group depended on the number of plausible scenarios. Six scenarios were produced in Kibaale district, seven in Lamwo and five in Masindi.

3.5 Step 5: Elaborate a foresight-based action plan

3.5.1 Disseminate scenarios and foster debates

A critical point in developing scenarios through a co-elaborative process is to move from scenarios to action. Debates on the scenarios must be disseminated and fostered beyond the group of experts who were actively engaged in their production. This can be achieved by engaging stakeholders in public debates or by developing foresight-based action plans through backcasting*.

We use examples of scenarios at local level in three countries within the framework of the GCS-Tenure project. These examples can illustrate a process for engaging local stakeholders in shaping the future of tenure reforms to achieve tenure security for local communities as they want.

Example story from Indonesia¹

The first story below comes from grassroots foresight work in Indonesia (Maluku and Lampung provinces) in 2015–16. It shows how making scenarios public led to a commitment to develop action plans.

Public consultation achieved three ends. It brought the PPA results to stakeholders in district and province to obtain their feedback. It ensured these plans have broader ownership and support beyond the experts. And it enlisted the public's help in crafting the action plan that would assure local tenure rights. The action plan could be integrated into regional government programs.

The most desirable future scenario in Maluku is “The dream of forest tenure security”. This scenario revolves around good land and resource governance issues such as transparency, accountability, cooperation and coordination. It also emphasizes the recognition of customary rights. As well, it acknowledges the importance of allocating funds for implementing forest tenure reform. In Lampung, the most desired scenario is “Forest Management Unit Facing Globalization”. This scenario focuses on the Forest Management Unit as the main locus for implementing forest tenure reform under the Social Forestry scheme. Consultations were attended by 40 people in Maluku and 36 people in Lampung. They included representatives of different stakeholders both from province and district level such as the Forestry Agency, Land Agency, Watershed Management Agency, State-Owned Enterprise, Forest Management Unit, Development Planning Agency, community, local NGOs, local businesses and universities.

Most participants have a different perception of local tenure security, including forest tenure rights. In Maluku, for example, laws and regulations are diverse. This can lead to overlap between different agencies and existing customary law.

¹ Source: Nining Liswanti and Tuti Herawati, CIFOR Indonesia

Experts viewed tenure security in a multi-dimensional way. They believe it transcends the actual bundle of rights granted; tenure includes the actual institutions and processes they deem necessary for local rights to be exercised and guaranteed. In Maluku, for example, tenure security comprises governance dimensions that are embodied in implementation processes. It also includes interventions emphasized in the desired scenario (good governance, collaboration, respect and recognition of customary rights and institutions). The undesired scenarios exemplified situations that were under the exclusive control of dominant government or private sector actors.

Regardless of whether the issues are desirable or undesirable, scenarios point to the key issues in the ability of tenure reforms to achieve tenure security for local communities in Maluku and Lampung. Important constraints on reform implementation include budget allocation and changes of policy and regulation. In Maluku, additional constraints are coordination, lack of spatial planning data and lack of recognition of customary rights. In Lampung, constraints included capacity of human resources at government and community level; community business development; and knowledge, experience and expertise of multiple actors on problem solving. These factors will be very important for implementing forest reform and could provide a threat for tenure security.

Example story from Peru²

Peru produced a series of drawings to represent the scenarios obtained in both regions. These drawings were based on how each driver assessed during each scenario would affect three issues: the state of the forests, the state of the community and the relationship between the community and the government.

Figure 12 shows 6 out of the 11 drawings produced during the PPA exercises: 'ideal' scenario on the top left; 'bad' scenario on the top right; "when NGOs replace the government" on the middle left, 'half way' on the middle right; a 'paternalist government' on the bottom left and 'the community disappears' on the bottom right.

These scenarios, so far, have been presented at different events at different governance levels. At the National Forestry Congress 2016, the presentation focused on the differences of the resulting scenarios, strongly influenced by the extractive activity that predominates in each region. Only Loreto scenarios were presented at the meeting of the indigenous organization Federation of Native Communities of the Middle Napo, Curaray and Arabela (FECONAMNCUA); the meeting was attended by indigenous leaders of native communities of the Napo Basin. One scenario that caught people's attention was the 'paternalistic state'. Participants agreed this is exactly what would happen if they received a monthly stipend as the scenario narrates. Finally, during the workshop held with the National Organization of Indigenous Andean and Amazonian Women of Peru (ONAMIAP), the discussion of scenarios focused on the role of women in collective tenure. Attention was drawn to the scenario "The community disappears" as this was a widespread fear among participants. These scenarios reinforced the proposal to strengthen the indigenous identity of each community and to fight against contempt for indigenous culture.

2 Source: Alejandra Zamora and Iliana Monterroso, CIFOR Peru



Figure 12. Six examples of the graphic scenarios from Peru PPA workshops.

Note: From top to bottom, left to right: "Our ideal", "Back to the beginning", "When NGOs took the place of the government", "Half way", "A paternalist government", "The community disappears".

Discussion of these scenarios evidenced the different dimensions associated with tenure security across regions. Among different factors associated with tenure insecurity, local and regional stakeholders consider that political and social factors are the ones affecting the tenure rights of indigenous communities. Lack of information and coordination were highlighted as among the most important constraints for recognition of collective rights. The implementation team is planning other events to continue dissemination of results to engage stakeholders at different governance levels, including the national level.

Example story from Uganda³

Before organizing the women's PPA, the PPA approach was promoted in a series of six workshops in Uganda involving 19 men and 5 women. Lack of women's involvement in the exercises was due to limited knowledge about land and forest tenure issues; most women in Uganda are not involved in land and forest tenure issues because, traditionally, they do not own land. It was also difficult for women to be away from home for several days per week for two weeks, and they had low commitment to attending all the PPA sessions.

Each of the three workshops was attended by 15 women, representing local government, CSOs and local community members from different settings. The women's PPA workshops to empower the participation of women and to accommodate women's concerns related to forest tenure issues were organized in the three districts of Kibaale, Masindi and Lamwo. The PPA workshop for women aimed to identify a range of forest tenure security scenarios affecting women and to elaborate a series of actions in response to the scenarios identified. The specific objectives of the PPA workshop included the following:

- Identify key factors affecting tenure security for women and how they relate to implementation of reform.
- Identify possible actions to mitigate negative implications and promote positive changes.
- Collectively discuss how reform implementation practices can be more effective at increasing tenure security of rights of the women and related possible actions.

Results from the three districts show that women prefer to have a shorter period of forest tenure implementation, e.g. 5 years instead of 10 years or more. Related to the threat of forest tenure security, most women are not allowed to own land in Uganda. Even if they plant trees, the trees do not belong to them. Therefore, in most Ugandan cultures, women's tenure rights are restrained. To increase women's tenure rights, men must support women to own resources such as finances, land and decision-making powers. Women are also concerned with interactions at domestic level (husband/wife, wife/in-laws, children and parents) and the way they encourage or discourage FTS for the women.

The key driving forces are varied and differ in definitions. Women tended to be geared towards women's causes. Based on consensus, eight key driving forces were used for building scenarios, as well as a base for an action plan: political influence, population dynamics, implementation and enforcement of government policies and programs, technical capacity, access to financial resources, markets and industrialization, level of tenure security and influence of NGOs. The force 'Influence of NGOs' is unique to the women because most NGOs promote gender and usually put emphasis on women. Through their advocacy, women's tenure security can be promoted.

³ Source: Concepta Mukasa, CIFOR Uganda

In developing the action plan to involve women in implementation, they focus on several driving forces. For example, with respect to 'political influence', women expected an action that could encourage women to stand for directly elected posts. This would help increase their numbers in councils and parliament, increase their voice in decision making and increase allowances to women standing on affirmative action. With respect to key force "Implementation and enforcement of government policies and programs", women need support (individuals and groups) to plant trees (e.g. provision of seeds/seedlings). Support for women to be involved in decision making was a concern in key force "Access to financial resources". With respect to key force "Influence of NGOs", it's important to create an enabling environment to attract more NGOs that can assist women in securing their forest tenure rights.

In Uganda, women's involvement in the implementation of the PPA workshop (mixed group) was on average only 20%.

However, the exercises showed that women actually have similar ideas to men in terms of the factor "Level of tenure security". During the women's PPA, they arrived at most of the same driving forces as those identified by men. This shows that women also have a lot of knowledge about land/forest tenure issues, although due to cultural reasons they do not own the land. The action plan derived from the women's group has considered a gender element. This was something missing during the PPA mixed-group workshop in Uganda.

These three cases illustrate a local process serving the following objectives:

- Disseminate results beyond the group of experts
- Give a larger societal dimension to the foresight outputs
- Enable the expression of public preferences
- Contribute to negotiate a shared vision, based on convergences and taking into account differences among diverse stakeholders.



3.5.2 Unveil the pathways* to the scenarios through ‘backcasting’

A practical approach to unveil a pathway leading to each plausible future is to work ‘backwards’ from the future to the present, identifying what is needed to make that future happen. This approach is also called ‘backcasting’. Backcasting is the process of working backwards from the definition of a possible future to determine what needs to happen to make this future unfold and connect to the present.

The key issue is to develop the paths leading from the current situation to the future scenarios with consistent concrete steps – for each scenario. This will help identify actions needed to increase the chances for a desired scenario to happen, and also those that would help prevent undesirable scenarios from occurring.

Backcasting identifies and organizes logically all actions needed to ensure the final situation is realized, from the end to the beginning. Backcasting helps avoid the risk of defining short-term actions that seem to lead to an expected future, but that might have unexpected and undesirable effects later.

The Group of Experts performs backcasting according to the following preliminary steps:

- Have a series of scenarios about the future of forest tenure security with clearly identified driving forces and related states (outputs from the co-elaborative scenario-building process).
- Characterize within the Group of Experts the current local state of forest tenure security in relation to the driving forces identified to elaborate the scenarios.
- Prepare a large work space to display the current and future situations, with plenty of space between them (see picture).
- Select one scenario of forest tenure security. On the left side of the work space, display the state of the first driving force. On the right side of the work space, display the current state of that force.

Box 17. Backcasting versus conventional planning

The advantage of a backcasting approach lies in the type of question asked of participants. In conventional processes, the question is: “What should be done to reach the expected situation?” People usually respond in a linear way along a deterministic and causal path.

In backcasting, the question is: “What had to happen so that this expected situation actually came true?” When asked this type of question, people will first identify milestones. Connections between these milestones will determine the path.

How to proceed

Once preliminary steps are completed, engage in a brainstorming process with participants as indicated in Figure 13. This can be facilitated by the following statement:

"We are in the future (e.g. 2030) and this is how forest tenure security looks today (pointing to the left part of the work space) in relation to this driving force. Fifteen years ago (in 2015), this is how forest tenure security looked in relation to the same driving force. I am an historian and I want to write the story of what happened between 2015 and 2030 so that people can understand why the situation changed. Please write on the cards all events that happened to explain this change."

Follow then the steps below:

- Collect all cards from participants. Read them aloud and place them in the work space in a place that is more or less close either to the future situation or the current situation, depending on the content. The exact position of the first cards is not important as they may be moved to another position.
- Each time a new card is added, discuss it with participants and place it either before, after or at the same position as the other cards. If the event identified in the card has to take place before other events already identified, place the card on the right of the other card. If the event on the card takes place after other events, place it on the left. If the event is simultaneous, place it exactly above or below the other one. If the event is similar, remove the card.
- Complete the process by placing all cards in the work space.
- Reflect with participants on the connections between the cards starting from the future (the left side) and working back to the present (the right side). The discussion includes the following issue: is the connection direct or is it needed to make something else happen in between, and if yes, what? Add the necessary events if needed.
- Identify for each connection the main actors and their roles.
- Record the results using visualization (pictures of the work space; slides...) and written notes.
- Repeat the process for the next driving force of the same scenario, until you have completed the backcasting of all driving forces.
- Repeat for each scenario until you complete backcasting for all scenarios as indicated below (steps 1 to 4):

The outputs of this backcasting process are then used to engage the participants in the identification of strategic elements and the design of a foresight-based plan of action.

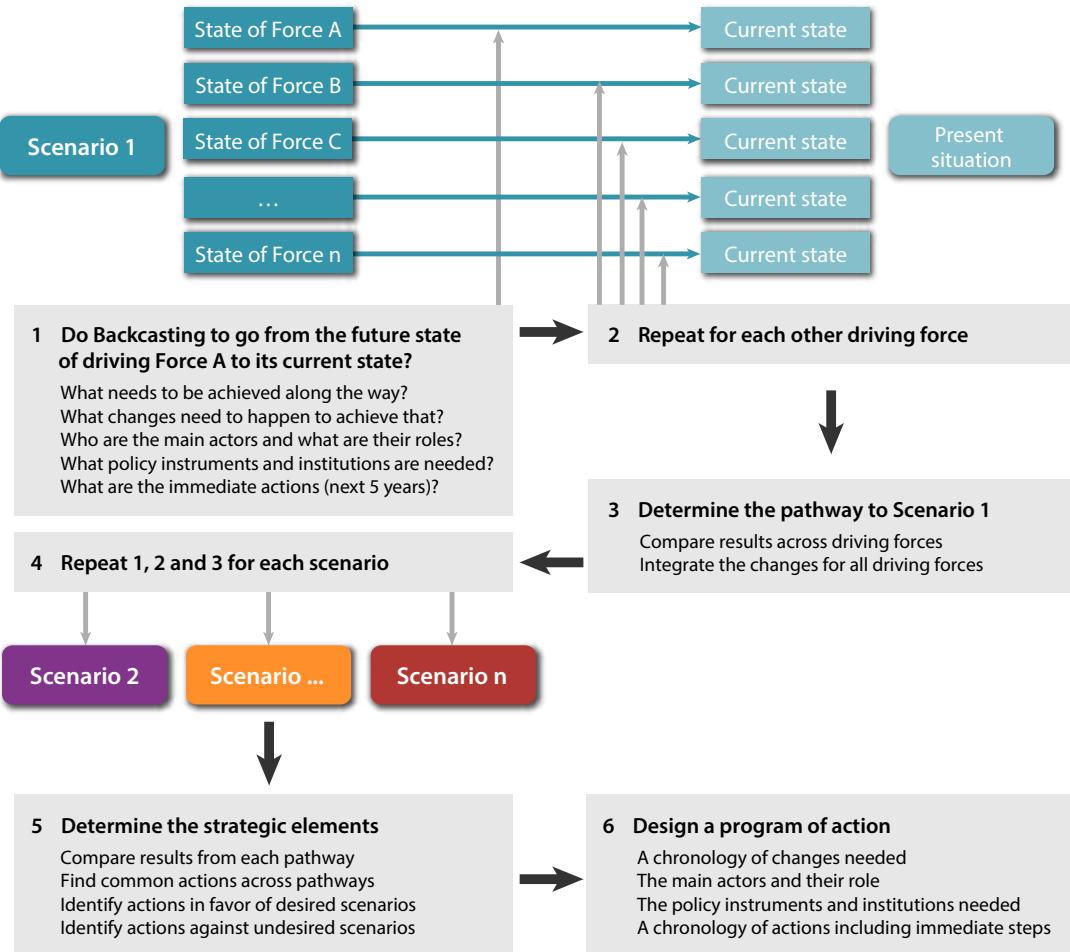


Figure 13. The steps of backcasting.

The most strategic elements correspond to the actions that will simultaneously avoid undesirable scenarios and promote desirable scenarios (step 5 in Figure 13). An action plan can then be prepared. Identify the sequence of implementation of strategic elements, starting from the present situation and leading to the expected future. This requires an agreement about what comprises the expected/desirable future for forest tenure security among stakeholders. For this purpose, combine backcasting and the dissemination of scenarios and fostering of public debates.

Due to the nature of the training workshops in Indonesia, Uganda and Peru, participants had no time to help produce communication material or write an action plan (they also had to develop plans for field implementation for the foresight work on forest tenure security). Therefore, Peru participants only engaged in some backcasting work. Their experience helped to refine the backcasting process as described above.

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Annexes

Annex 1. Suggestions by participants for implementation of the PPA on forest tenure security

Practical implementation in the field

- Implement immediately while the PPA is still fresh; organize PPA activities close to accommodation; provide transport to implementers; have the project unit follow up with stakeholders; and provide necessary hands on guidance to implementers, including monitoring field implementation.
- Consider time frame for implementation of this approach to optimize the output; break the process into separate workshops. Trainees plan implementation at the local level through at least two separate workshops.

Comment on the suggestions: On the first point, the trainer supports the suggestion of participants. The second point is left for consideration by the GCS project leadership. The trainer fully supports and encourages field implementation through at least two workshops as per the plans proposed by the participants.

Selection of facilitator, participants and support group

Many suggestions were made concerning the human dimension to ensure successful implementation of PPA:

- Choose 'experts' and committed participants based on expertise in the subject (knowledge), and also their willingness to collaborate (attitude/behavior).
- Include local communities in the workshops instead of representing through opinion and other leaders.
- Select facilitator carefully to ensure neutrality, clarity about the objective and focus (this relates to an observation that people should facilitate what they understand best).
- Coordinate well with representatives of public actors and community organizations.

Comment on the suggestions: The suggestions confirm the trainees have very well understood the importance of the Expert Group that will co-elaborate the scenarios and how members must be chosen. They also recognize the quality requested for them as facilitators. They have made an important distinction between experts and authorities whose support is needed for implementation.

Annex 2. A glossary of foresight terms used in this document

Anticipation	The sense of expectation of an occurrence, predicting it and occasionally the act of preparing for it.
Backcasting	The process of working backwards from the definition of a possible future, in order to determine what needs to happen to make this future unfold and connect to the present.
Business as usual	A path towards a future considered as the continuation of the current path.
Causality	A logical link between events where a cause precedes an effect and altering the cause alters the effect.
Drivers, Driving forces	Factors causing change, affecting or shaping the future.
Expert	A person who has a special skill, knowledge, insight or ability in a particular domain based on research, experience, judgment or occupation.
Exploration	An anticipatory inquiry that investigates a wide range of possible future developments, considered from a variety of perspectives.
Forecast	A statement that something is going to happen in the future, often based on current knowledge and trends.
Foresight	A systematic, participatory and multi-disciplinary approach to explore mid- to long-term futures and drivers of change.
Future	The time yet to come.
Knowledge	Information about what the future could be before it exists, acquired through the practice of Futures Studies.
Narrative	A coherent description of a scenario (or a family of scenarios), highlighting its main characteristics and dynamics, and the relationships between key drivers and their related outcomes.
Pathway	A trajectory in time, reflecting a particular sequence of actions and consequences against a background of autonomous developments, which leads to a specific future situation.
Plausible	Judged to be reasonable because of its underlying assumptions, internal consistency and logical connection to reality.
Proactive	Oriented towards acting in advance of a future situation, averting an undesirable future and working towards the realization of a desirable future.
Prospective	Refers to the French foresight method ‘La Prospective’, which is based on the principle that the future is not written, but is to be built collectively.

Qualitative	Characterizes something that can be observed, but not measured numerically.
Quantitative	Characterizes something that can be observed and measured in magnitude and multitude.
Ruptures	Abrupt, major changes in the nature or direction of a trend.
Scenario	A description of how the future may unfold according to an explicit, coherent and internally consistent set of assumptions about key relationships and driving forces.
Strategic planning	Preparing for, or achieving, some future state.
System	A set of interconnected elements that are coherently organized in a pattern or structure.
Time horizon	The farthest point in the future that is being considered in a Futures Study.
Time frame	The complete period (past-to-future) considered in a Futures Study.
Transition	A shift of a system from one state to another.
Trend	General tendency or direction of a movement/change over time.
Uncertainty	A state of having limited knowledge about the future.
Vision	A compelling image of a (usually preferred) future.

For more detailed references see: <http://www.fao.org/docs/eims/upload/315951/Glossary%20of%20Terms.pdf>

The Center for International Forestry Research (CIFOR) initiated the GCS-Tenure project in Indonesia, Uganda and Peru conducted the study to analyze the relationships between statutory and customary land tenure and how these relationships affect tenure security of forest-dependent communities, including women and other marginalized groups. Using a global comparative approach and standardized methodologies, the study analyzes the differential success or failure of policy and institutional innovations to enhance secure tenure rights. It also examines how these innovations identify strategies likely to lead to desired outcomes.

The Participatory Prospective Analysis (PPA) is used as a first step by engaging key stakeholders. Through participatory meetings, all expert stakeholders progressively identify and develop a range of tenure security scenarios. They then elaborate actions in response to the scenarios identified. With the application of PPA, the research team aims to answer the following questions: What are the key factors influencing forest tenure security? What possible actions can mitigate negative implications (or reduce barriers impeding implementation) and promote positive changes (e.g. equitable access for women and marginalized groups)? Who should be responsible for those actions? PPA aims to help decision makers understand the key drivers, challenges and future consequences of policy options.

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