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Foresight4Food

Systematic Participatory Foresight Approach

A GUIDE FOR PRACTITIONERS

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Systematic Participatory Foresight Approach

A GUIDE FOR PRACTITIONERS

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Foreword

The Hindu Kush Himalaya (HKH) region is experiencing rapid transformation driven by changes in temperature, precipitation, and extreme weather events, and socio-economic forces including migration, urbanisation, and technological changes. The current reactive and incremental approach to adaptation is insufficient to keep pace with these rapid and dynamic changes. An uncertain future calls for a shift towards anticipatory governance.

Despite improvements in global climate science, there are still critical knowledge gaps and uncertainties regarding its local impacts. A deeper understanding of these impacts on livelihoods, economies, socio-cultural practices, beliefs, and aspirations is required to bridge gaps between global knowledge and local needs to build genuine resilience against an uncertain future.

Consultation across the region with international experts have consistently highlighted the need to shift from reactive to anticipatory adaptation. A dedicated workshop in September 2023 revealed strong interest in futures thinking and a clear need for capacity strengthening in both core concepts and practical tools for foresight. This led to the development of the Systematic Participatory Foresight Framework. Initiated in 2023 by the Foresight Intervention within the Strategic Group on Resilient Economies and Landscapes at the International Centre for Integrated Mountain Development (ICIMOD), the framework was co-developed with the Foresight4Food programme specifically for the HKH context.

The framework employs systems thinking, a holistic approach to understanding the complexities and dynamics of various systems. It ensures gender equality and social inclusion (GESI) integration through a participatory approach that not only guarantees inclusion but also bridges the gap between global scientific knowledge and traditional place-based knowledge through a suite of participatory future-oriented tools. Through methods like scenario building, stakeholders envision multiple plausible futures, allowing them to explore the risks and opportunities associated with each. This exploration of potential futures allows us to stress-test policies and interventions, ensuring strategic planning for a robust and resilient future.

This practitioner's guide provides a structured participatory framework designed to guide communities, governments, non-governmental organisations (NGOs) and other organisations to develop long-term resilient climate adaptation plans and policies. It outlines the systematic yet flexible four-phase foresight process: (a) scoping, (b) sensitising, building understanding, and mapping the system (c) participatory scenario development, and (d) mobilising for systems change, that is grounded in evidence-based practice. Each phase is supported by a suite of practical participatory foresight tools with clear guidelines on their application. GESI principles are integrated throughout these phases through a four-step process.

This manual is not just a guide but a catalyst to build inclusive, adaptive, and forward-looking capacities to integrate participatory foresight approaches into formal policy planning cycles, ensuring tangible actions and investments towards a desired resilient future. This publication is accompanied by the Systematic Participatory Foresight Toolkit, which provides step-by-step guidance on implementing practical foresight tools.

Acknowledgement

The methodology draws from multiple foresight and participatory frameworks, particularly the Foresight4Food system framework developed by Foresight4Food. This guide benefited greatly from the critical inputs of Bram Peters and Jim Woodhill. The authors would also like to thank Amina Maharjan and Arabinda Mishra for their support, encouragement, and insightful ideas.

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Content

PAGE iv
Foreword

PAGE v
Acknowledgement

PAGE 01
Introduction

PAGE 02
What is foresight?

PAGES 03–04
Why foresight?

PAGE 05
Intended user of the practitioners guide

PAGES 06–07
Principles of foresight

PAGES 08–09
How to 'foresight': A participatory guide to futures thinking

PAGES 10–11
Ensuring gender equality and social inclusion: Four key aspects to consider

PAGES 12–25
How to 'foresight': Step-by-step process

I. Scoping
   - Overview and objectives
   - Process
   - GESI considerations

II. Sensitisation, building understanding, and mapping the system
   - Overview
   - Objective
   - Process
   - GESI considerations

III. Participatory scenario development
   - Overview
   - Objective
   - Process
   - GESI consideration

IV. Mobilising for systems change
   - Overview
   - Objective
   - Process
   - GESI considerations

PAGE 26–27
Participatory foresight tools and their application across the systematic foresight process

PAGES 26–31
References

Introduction

The Hindu Kush Himalaya (HKH) is a vast mountain region spanning 3,500 km across eight countries in South Asia, from Myanmar in the east to Afghanistan in the west. The region is rich in natural resources, biodiversity, language, and culture, supporting the lives and livelihoods of 240 million inhabitants who depend directly on it, and additionally providing water, food, and energy to 1.9 billion people in the river basins downstream (Wester et al., 2019). All these attributes, in addition to the region's role in regulating global climate, makes it an asset for communities beyond the region (Mukherji et al., 2019).

The HKH region faces a multitude of challenges including but not limited to livelihood insecurity, poverty, food and nutrition insecurity, gender and social inequity (Murthy et al., 2019, Rasul et al., 2019). These issues are compounded by converging global trends and critical shifts, as the world faces the triple planetary crisis of climate change, pollution, and biodiversity loss, with the HKH on the frontlines of this crisis. It has been noted that the HKH region is warming faster than the global average; models project a temperature rise of 4–5°C and a 20–40% increase in annual rainfall across the region by the end of the 21st century (Kulkarni et al., 2013). Such climatic changes are bound to invite disasters and loss beyond measure. Furthermore, the region's vulnerable communities are disproportionately affected by climate change impacts, which are exacerbated by natural hazards and socio-economic challenges because of globalisation, migration, urbanisation, and population increase (Wester et al., 2019; Rusk et al., 2017; Kelkar 2009; Goodrich et al. 2017).

Addressing these challenges and averting this grim future requires holistic transboundary collaboration, which is in turn challenged by the region's multifaceted environmental, geopolitical, and socio-economic systems. However, evidence-based strategic actions and decisions can ensure long-term prosperity for the HKH by collectively addressing the challenges of the present and preparing for the future (Roy et al., 2019).

What is foresight?

Foresight is a tool to anticipate potential climatic and non-climatic risks, particularly in complex regions like the HKH. It is a structured approach to identify possible future developments, trends and drivers of change enabling individuals and organizations to anticipate and prepare for change.

Unlike forecasting, which extrapolates from past data to project a single, most probable outcome, this approach combines qualitative and quantitative methods to analyse multiple interconnected variables and explore multiple potential scenarios (Cuhls, 2003). It requires taking a broader and longer-term view (spanning 10 to 50 years or more) of the environment, considering expected, challenging, and visionary possibilities, while identifying ways to avert risks, mitigate challenges, or achieve desired future outcomes. The goal here is not to predict the future but identify ways to avert risks, mitigate challenges, capitalise on opportunities, and work towards desired outcomes.

This future-oriented approach helps navigate uncertainties and complexities by integrating necessary considerations into present actions to develop future-ready systems (Rohrbeck & Schwarz, 2013). Ultimately, it is about fostering resilience and adaptability, empowering proactive action instead of reactive responses in an uncertain future.

ORIENTATING PARTICIPANTS ON FORESIGHT TOOLS AT THE TRAINING IN DHULIKHEL, NEPAL

Why foresight?

Foresight enables vision building by helping stakeholders identify pathways to navigate uncertainties and develop robust strategies. Scenario-guided processes[1] are increasingly used to assess evolving risks and challenges supporting informed decision-making, policy development, and strategic planning (Bizikova et al., 2014; Butler et al., 2016; Valdivia et al., 2021; Nalau & Cobb, 2022).

This participatory scenario-guided approach can strengthen research, policy, institutional, and governance processes by exploring key drivers of change across time and identifying leverage points for desired transformation (Wright et al., 2020; Oteros-Rozas et al., 2015). They are particularly effective in capturing complex interplays of climatic and non-climatic factors (such as bio-physical, socio-economic, social and cultural dynamics) shaping people's adaptive capacities and development needs (Bizikova et al., 2014).

FIGURE 1 **IMPORTANCE OF PARTICIPATORY STRATEGIC FORESIGHT**

[1] We use 'scenario-guided' and 'foresight' processes interchangeably to refer to approaches in participatory planning that develop plausible future scenarios to visualise different trajectories of change and adapt efforts according to the desired outcomes

The foresight approach plays a crucial role in strategic planning as it ensures that diverse and relevant inputs are considered. It provides feedback to adjust plans and actions in pursuit of a preferred future. By looking beyond immediate challenges, it allows us to anticipate future trends, disruptions, and opportunities that could impact the system under consideration.

Strategic foresight planning shifts focus from the traditional linear view of the future to a more dynamic and holistic perspective. By allowing the identification of potential risks and opportunities early on, it enables development of innovative solutions and strategies that align with long-term goals (Van de Pol, 2014; Vecchiato, 2012). In essence, foresight is a necessary tool for any institution to stay ahead in a constantly evolving world, by transforming uncertainty into opportunity. Decisions using the foresight approach are better-informed as potential risks and benefits associated with different options are understood. This helps to create shared visions that facilitate consensus in negotiations to work towards a desired future or outcome.

The key objectives of the foresight approach include:

- Ensuring a holistic understanding of the system, allowing for identification of emerging trends, potential disruptions, and risks to plan for reducing vulnerabilities and maximise opportunities in an evolving future.
- Co-creating and defining a shared vision for the desirable future that is future resilient and strategically aligning actions with long-term strategic goals to achieve it.
- Encouraging a culture of innovation by exploring a range of possibilities, while building adaptability and resilience to respond effectively to unexpected changes.
- Involving diverse stakeholders in the foresight process to enrich insights and foster continuous learning to keep strategies relevant in a dynamic environment.

FORESIGHT CAN BE APPLIED WITH BOTH GOVERNMENT OFFICIALS AND LOCAL COMMUNITY MEMBERS

Intended users of this practitioners guide

The practitioners guide is designed for individuals and organisations striving to anticipate long-term risks and opportunities in their respective sector. It is particularly valuable in sectors where long-term planning, adaptability, and strategic decision-making are critical. It can serve as a guide for organisations and professionals to navigate uncertainties and drivers of change, strengthen resilience, and devise plans that remain effective over time through the foresight process that considers multiple future scenarios, contexts, and diverse perspectives. Ultimately, it supports anyone aiming to act proactively and shape their future outcomes rather than react passively to unfolding uncertainties. A companion toolkit of this practitioners guide also provides a step-by-step guide to the relevant tools used in each phase of the foresight process along with real-life examples of their application, making it easy for users to adapt and apply them to their own context.

STAKEHOLDERS ENGAGED IN APPLYING THE RICH PICTURE TOOL, INDRAWATI RURAL MUNICIPALITY, NEPAL.

Principles of foresight

To bring about meaningful transformative change that is resilient, sustainable, and adaptable to future changes it is imperative to identify shared outcomes desirable to stakeholders across multiple levels. The outcomes must be long-term in outlook, evidence-based, and consider the potential alternative futures and uncertainties. Furthermore, fostering strong alliances and partnership with key stakeholders through active engagement is essential to drive desired change by leveraging the entry points identified from a comprehensive understanding of the entire system (Matti et al., 2025; Woodhill and Millica, 2023; Sterman, 2021; Sterman,1994). Therefore, to facilitate a successful and impactful foresight process for anticipatory adaptation actions in development, planning, and transitioning to sustainable mountain economies, eight elements essential for the systematic participatory foresight process have been identified. They are categorised into core methodological principles, thematic priorities, and implementation criteria.

A PARTICIPANT PRESENTS A RICH PICTURE, INDRAWATI RURAL MUNICIPALITY, NEPAL

Core methodological principles:

1. **Systems thinking**: The foresight process must be implemented using a systems approach, taking into consideration key elements/activities, interlinkages, and feedback loops existing in the system.

2. **Anticipatory action**: The foresight process must build towards an anticipatory pathway of change that considers multiple plausible alternative futures.

3. **Participatory approach**: A participatory approach provides opportunity for the inclusion of diverse perspectives, priorities, and aspirations. Engagement of stakeholders throughout the process ensures recognition and acknowledgement of their different needs, concerns, interests, and impacts.

Thematic priorities

4. **GESI integration**: GESI integration will ensure identification, recognition and engagement of the diverse stakeholders in the system including the marginalised and vulnerable groups. It will help to explore and assess differential impacts leading to plural outcomes.

5. **Drivers and priorities**: While understanding drivers of change, it is important to consider not only those shaping the present, but future trends and their potential impact on the system. Anticipatory pathways of change should then be identified and prioritised in line with stakeholder priorities and shared vision, taking into account potential alternative futures.

6. **Climate change impacts**: Climate change is a crucial driver that direct and indirectly impacts the system by accelerating shocks, creating new risks, and amplifying vulnerabilities. It is a large-scale, long-term change that is interconnected with other major changes and together they shape future trajectories.

Implementation criteria

7. **Substantiate with evidence**: Each step of the foresight process must be validated and substantiated with evidence.

8. **Appropriate scale**: Foresight should be implemented at an appropriate scale to ensure meaningful and resilient adaptation. In the HKH context, this would be at the sub-national level. Such a scale enables meaningful engagement with local stakeholders, capturing ground realities and needs, while also aligning with formal development institutions (i.e. local government) to integrate foresight processes and outcomes into plans and policies. The scale of data availability should also be taken into consideration.

How to 'foresight': A participatory guide to future thinking

Systematic participatory foresight is an iterative, evidence-backed practice that applies systems thinking. It adopts a strong co-creation approach, with robust integration of gender equality and social inclusion (GESI), to address diverse needs and priorities while ensuring that the perspectives of marginalised and vulnerable groups are included. The focus on anticipatory pathways ensures that the diverse drivers of change shaping the system, such as climate change, are consistently considered to support a resilient future. Eight principles of systematic participatory foresight are integrated into the design of the foresight process. The entire process operates at a scale appropriately determined by the issues, objectives, and the context it operates in.

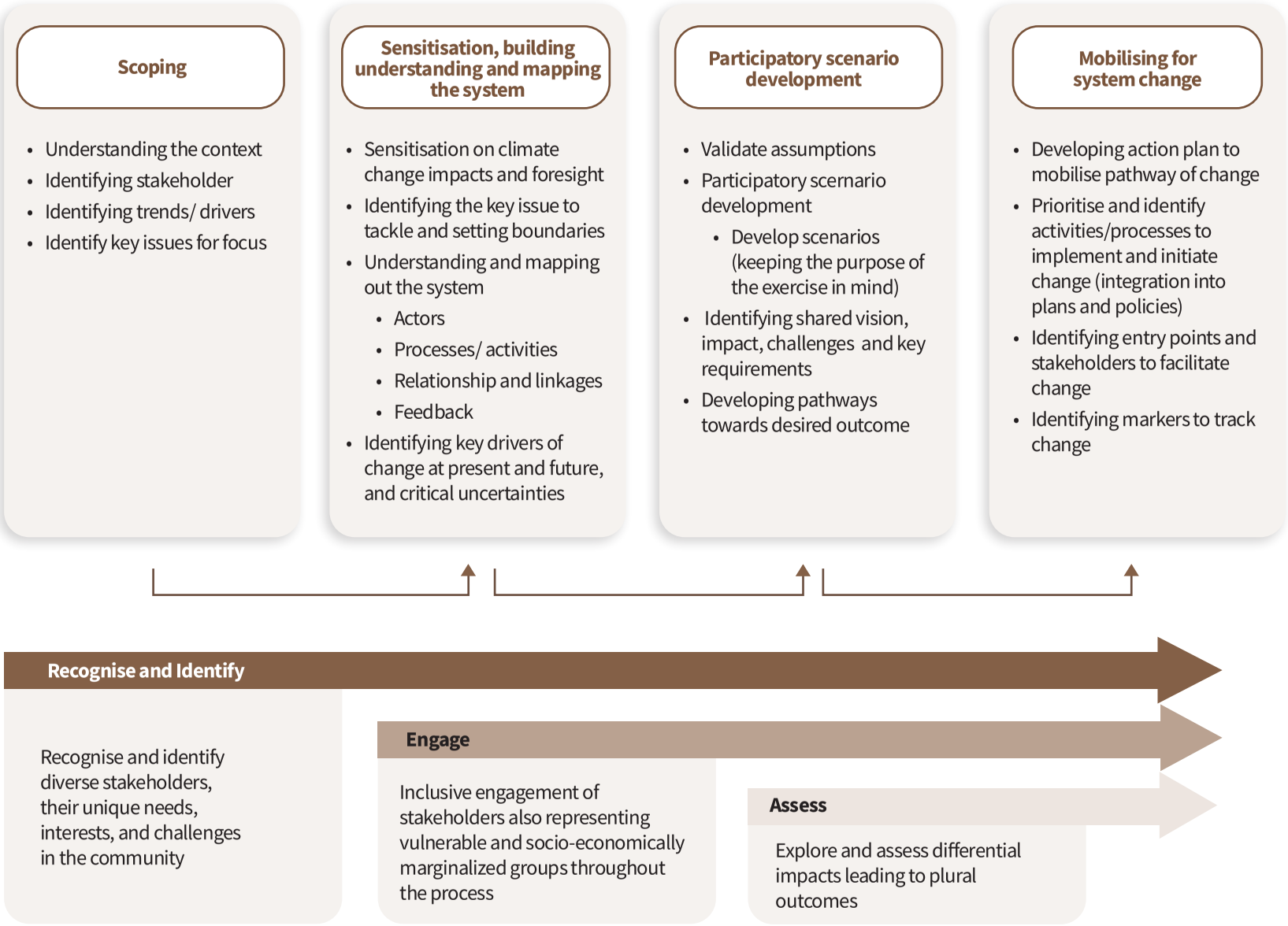
The participatory systematic foresight approach is carried out in four phases[2] (Figure 2):

i. Scoping
ii. Sensitisation, building understanding and mapping the system
iii. Participatory scenario development, and
iv. Mobilising for system change

Each phase builds progressively on the previous one ensuring a coherent and cumulative process. The first two phases focus on getting a good understating of the system, the actors within the system, and the drivers of change impacting the system. This is followed by the third phase of exploring potential alternative future outcomes alongside its implications on the system's actors, processes, and linkages. The understanding of future risk and opportunities help in setting realistic future goals and pathways. The final phase translates the desired future outcomes into actionable pathways, detailing key strategies, plans, and actions, and mobilising stakeholders and resources through targeted and precise interventions at appropriate entry points.

[2] The four phases of Participatory Systematic Foresight Process are adapted based on the following foresight framework and processes: The Foresight4Food Foresight Framework; Foresight Playbook; LAPA Steps; Conceptualizing Strategic Foresight: An Integrated Framework; Towards Climate Resilient future together; Generic Foresight Model; Framework foresight: Exploring futures the Houston way; The nature of strategic foresight research

FIGURE 2 **FOUR PHASES OF THE PARTICIPATORY SYSTEMATIC FORESIGHT PROCESS WITH KEY ASPECTS OF GESI INTEGRATION**



Ensuring gender, equality and social inclusion: Four key aspects to consider

Through the foresight process, it is essential to incorporate multiple perspectives that reflect the experiences and perspectives of different genders and social groups within communities. The composition of those designing and participating in the foresight process, as 'who shapes the process' and 'who is in the room', significantly influences priorities, data collection, and representation in the envisioned scenarios and futures. Hence, inclusive participation, both among those leading the process and those participating, is crucial.

A process that considers gender and inclusion in foresight will reflect the needs of heterogeneous communities and diverse contexts, thereby resulting in scenarios that are both plausible and widely acceptable (Marty et al., 2024; McBride et al., 2017; Allan et al., 2022). Without this consideration, gaps in information and representation are likely, reducing the effectiveness and credibility of the outcomes. Scenarios may then fail to capture the realities, needs, and priorities of marginalised groups leading to biased planning, overlooked vulnerabilities, and interventions that are less equitable or sustainable, ultimately undermining the communities' capacity to adapt to future challenges. To prevent this, a foresight approach must acknowledge and address diverse perspectives, vulnerabilities, and needs (Marty et al., 2024).

The following four key aspects provide a framework to ensure inclusion and equality in the scenario-building process.

1. **Recognise**: Recognising the diverse needs, interests and challenges within a heterogeneous community is the first step towards meaningful inclusion. Equally important is recognising who is designing the tools and who is present in the room to shape visions of the future as these decisions influence which perspectives and priorities are represented. Communities encompass diverse cultural backgrounds, ethnicities, languages, socio-economic status, beliefs, and practices. In these settings, gender identities and socio-economic factors significantly shape vulnerability, often leaving women, Indigenous Peoples, persons with disabilities, and economically disadvantaged individuals disproportionately affected or lacking resources. Recognising this helps in designing targeted interventions that go beyond merely acknowledging the barriers faced by these groups.

2. **Identify**: Identifying and understanding the differential impacts, needs, and issues is critical to ensure inclusive adaptation and adaptation planning. This comprehensive understanding helps assess how current trends and uncertainties might exacerbate existing challenges or vulnerabilities. Furthermore, identifying the marginalised groups and mapping relevant stakeholders within the community is crucial. These stakeholders may include local community groups, women's groups, Indigenous communities, or civil society organisations that can represent and be the voice of vulnerable and socio-economically marginalised groups. By identifying vulnerable groups and the intersecting vulnerabilities of gender, class, ethnicity, geography and other factors that share their experience and exposure to risk, the foresight process will help address rather than reinforce them.

3) **Engage**: Participation and engagement with relevant community stakeholders are fundamental to the foresight process. A participatory approach allows their knowledge, lived experiences, and insights to inform the process. To achieve meaningful engagement, foresight approaches should not only facilitate inclusive dialogue but also remove barriers to participation, considering factors such as language, physical accessibility, and socio-cultural constraints that may limit the full involvement of women or other marginalised groups. This ensures that planning and anticipatory actions are equitable, contextually relevant, and tailored to the needs of different groups.

4) **Assess**: Understanding the implications of foresight processes requires assessing how different future scenarios produce varied impacts and outcomes for different social groups. This includes examining how scenarios and their corresponding anticipatory measures may uniquely affect gender and socio-economically marginalised groups. By analysing these implications, foresight processes can support the development of pathways that build resilience rather than reinforce existing disparities.

PARTICIPANTS DISCUSSING DURING THE FORESIGHT TOOLS EXERCISE

How to ‘foresight’: Step-by-step process

I. Scoping

OVERVIEW AND OBJECTIVE

The scoping phase is foundational to strategic planning and anticipation of future developments. It clarifies the rationale and ambitions for undertaking the foresight process while serving as a preparatory stage to define the scope, preliminary boundaries, objectives, and key parameters that will guide subsequent activities. This includes defining the purpose, focus, and key questions of the analysis; identifying key stakeholders and understanding their concerns, interests, and influence; and establishing mechanisms to guide the process and sustain engagement. It also involves outlining the overall foresight approach and identifying the financial, knowledge, and human resources required. Together, these elements will ensure that the foresight process is focused, relevant, and impactful.

PROCESS

Before initiating any major action or activity the team must have developed an awareness of the socio-cultural, economic, environmental, and political context. The scoping phase will begin with a review of secondary literature and existing data relevant to the selected site. This will be followed by the team engaging with system stakeholders and developing an understanding of the system of interest. Relevant institutions, agencies, and stakeholders will be mapped alongside review of development plans with policies and processed at the relevant levels.

PARTICIPANTS SCOPING THEIR SYSTEM OF INTEREST

STEPS

1. Understand the need and rationale for undertaking the foresight initiative
2. Establish the focus for the foresight process
3. Develop basic understanding of the system of interest[3]:
    - Understand and identify key components of the system, the processes that are operating within the system, the diverse actors influencing or affected by the processes within the system, and the challenge and opportunities they present.
    - Drivers of change: identify trends (climate, biophysical, socio-economic, and demographic) that directly or indirectly impact the system, both now and in the future. There are different types of trends based on the nature of uncertainty, degree of impact, scope, and duration (See different types of trends: Bengston et al., 2024, Saritas & Smith, 2011)
    - Stakeholders in the system: Identify and recognise the relevant stakeholders and their roles in the system.
    - Review existing plans and policies that influence the system.
4. Develop a detailed outline of the foresight process including methods, tools and resource considerations:
    - **Selection of foresight tools and methods**: Choose appropriate tools and methods for each phase based on the objectives, context, and available resources.
    - **Stakeholder engagement strategy**: In any system, there is a diverse range of stakeholders with different roles, interests, and levels of influence. The type of stakeholder and the level of engagement required may vary across different stages and activities of the foresight process. Identify stakeholders, define the nature and level of their engagement across different stages, and develop strategies to ensure effective and inclusive participation.
    - **Resource assessment**: Assess the human and financial resources required and align the scope and activities of the foresight process with available resources.
    - **Data and information sources**: Identify relevant sources including secondary literature, national and international statistics, primary data (e.g. surveys), local indigenous and traditional knowledge, computer modelling, and big data and AI.
    - **Monitoring and guidance mechanisms**: Establish mechanisms to monitor, track, and guide the process, ensuring progress is reviewed systematically and adjustments are made as needed.

Phase I checklist

At the completion of this phase, you should have:

- [ ] A baseline understanding of the system and the socio-cultural, economic, environmental and political factors shaping the system of interest based on secondary literature review, key informant interviews and scoping visits.
- [ ] Clarity on general focus, boundary and scale of engagement.
- [ ] Trends, uncertainties, triggers, and drivers of change relevant to the system identified.
- [ ] Stakeholders and experts for engagement identified.
- [ ] Potential entry points to initiate and facilitate engagement in the system identified and strategies developed.

[3] System of interest refers to the system chosen for study or action. System is defined by placing a mental or a physical boundary around a group of interacting elements. This helps concentrate efforts on analysis, design, implementation, or management. The boundary can be shaped by factors such as location, themes, or any specific key priorities.

GESI CONSIDERATIONS

The scoping phase is a critical first step for embedding gender equality and inclusion (GESI) in the foresight process. As it defines the focus of interest and sets objectives, it is essential to consider who shapes these decisions, since the representation of individuals or groups influences how objectives may affect different gender and social groups, including those underrepresented.

During scoping, it is important to map stakeholders such as women's and community groups, Indigenous communities, youth organisations, civil society organisations (CSOs), and other marginalised or vulnerable groups. These stakeholders should be engaged meaningfully, both as participants and as contributors to the design and planning of the foresight process. Their lived experiences, knowledge, and priorities can guide the focus of the process and help identify barriers and opportunities early. Their engagement helps build a deeper understanding of the system, its context, trends, drivers, and uncertainties.

Integrating GESI ensures the foresight process is inclusive and responsive to the needs of diverse groups, strengthening the relevance of scenarios and recommendations resulting from the process and exercises. Insights gathered during scoping can inform GESI-specific or integrated activities, such as targeted workshops, focus group discussions, and participatory exercises, to maintain diverse perspectives throughout subsequent stages. This approach also helps identify potential entry points for engagement in the system, ensuring the foresight process is well-informed and aligned with the needs of all stakeholders.

PARTICIPANTS IDENTIFYING THE DRIVERS OF CHANGE IN THEIR RELEVANT SYSTEM

II. Sensitisation, building understanding, and mapping the system

OVERVIEW

This phase builds on the information gathered during the scoping phase to map out the system of interest. It focuses on identifying key drivers of change and uncertainties for the future. The understanding and mapping process along with the subsequent phases of the participatory foresight process involve a series of interactive stakeholder dialogues. These dialogues are conducted primarily through consultative workshops. The number of dialogues required will depend on the scale of engagement, socio-political context of the site, and goals of the initiative.

OBJECTIVE

The second phase of the participatory foresight process must meet three main objectives. First, stakeholders and participants must be introduced to and sensitised about relevant information, including key concepts and processes such as climate change and foresight. This enhanced understanding facilitates the operationalisation of the foresight activities and encourages active participation. Second, stakeholders should be engaged in mapping the system of interest. Finally, key drivers of change, enabling and constraining factors, and emerging risks and opportunities must be identified to build a comprehensive understanding of the system's dynamics.

PROCESS

Before initiating activities in this phase, it is important to establish a foundational understanding of the system. This includes identification of the relevant stakeholders, key trends and drivers of change that are relevant to the system at present and in the future. This will provide a clear picture of how different components of the system interact and influence each other. Mapping the system helps understand the current state, anticipate future changes, and identify key drivers of change and uncertainty, enabling informed decisions and targeted interventions for addressing both current and future challenges.

STEPS

1. **Collectively define scope and focus**: Clearly define the objective, key issues to address, along with the boundary, scale and timeline of the foresight exercises based on consensus.
2. **Stakeholder sensitisation and awareness**:

   Engaging diverse stakeholders is essential for capturing multiple perspectives and achieving a holistic understanding of the system of interest. Key stakeholders identified during the scoping phase must be actively engaged, for example, through consultative workshops. To ensure meaningful participation, stakeholders should be familiar with:

   - **Foresight concept and process**: Although foresight is not entirely a new concept, participants may not be aware of the approach, process, relevance or its potential applications.
   - **Objective and scope**: Clarify issues requiring focus, goals of the foresight process, and define boundaries and scale. Collective decisions can be made more effectively if uncertainties are addressed upfront.
   - **Key trends and relevant information**: To support informed participation, stakeholders (participants) undertaking the foresight journey should be exposed to key information and trends identified during scoping, including drivers of change that have shaped or influenced the system or are likely to do so in the future. Climate change and its impacts as a critical driver of change should also be highlighted. Insights gathered during scoping will inform the content and materials presented to participants ensuring their engagement is well-informed.

Methods and tools for awareness and sensitisation:

- Presentations, expert talks, resource materials (e.g. reports, information packets)
- Interactive tools like data walk

3. **Participatory system mapping**:

   Once stakeholders are sensitised to key concepts of foresight, information relevant to the system of interest, and the objectives, focus and boundaries of the foresight exercise, they are better equipped to participate in system mapping. Participatory mapping ensures multiple perspectives existing within the system are captured. Systems mapping should include the following components:

   - **Actors**: Stakeholders that are part of the system including those who influence or are affected by the system's processes.
   - **Processes/activities**: Major process and activities operating within the system.
   - **System dynamics**: The system's cause-and-effect relationships, interdependencies, and resulting feedback loops.
   - **Factors and drivers of change**: Different trends and drivers of change affecting the system now and in the future.

Methods and tools for participatory mapping of the system:

- Drivers of change: STEEPLE/PESTLE, Horizon scanning
- Stakeholders: Participatory stakeholder mapping/analysis
- System visualisation: Rich Picture, Causal Loop Diagram

4. **Holistic system and synthesis**: Multiple perspectives are integrated to develop a comprehensive understanding of the system with information validated against available evidence. The system in its entirety must be assessed to assessed to identify and develop comprehensive of:

   - The complexity of system dynamics emerging from integrating diverse (and sometimes divergent) perspective, and the emerging positive and negative feedback effects as the system evolves.
   - Shared issues, their causes (enabling and constraining factors), and potential opportunities and emerging risks.
   - The nature of the system and potential desired outcomes (see system archetype: Bures & Racz, 2016; Herasymowych & Senko, n.d., Kim & Lannon, 1997)

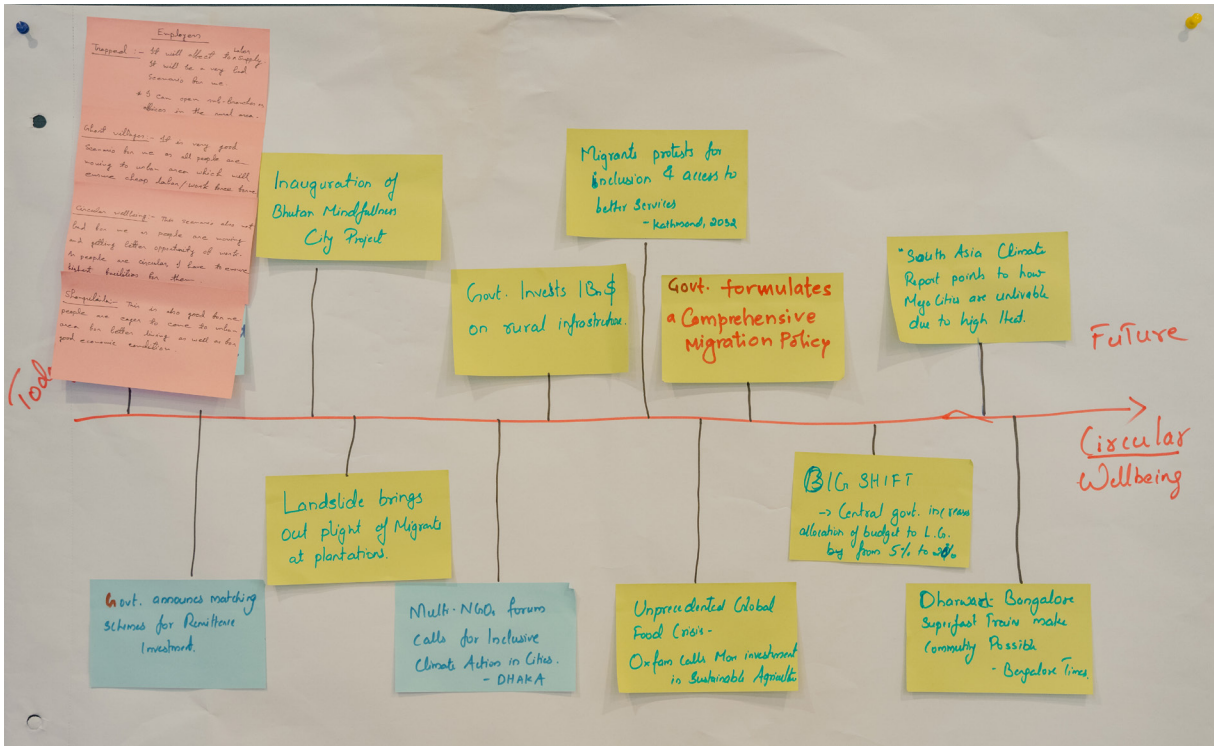
Methods and tools for participatory mapping of the system:

- Key shared issues and outcomes: Problem tree; Importance influence matrix/ power and influence analysis
- Key drivers of change and uncertainty: Impact uncertainty matrix, Delphi method
- Stakeholders: Stakeholder mapping/ analysis; Importance influence matrix/ power and influence analysis

Phase II checklist

At the completion of this phase, you should have:

- [ ] Collectively defined key focus area (issue), objective, boundary, scale and timeline
- [ ] A holistic understanding of the system of interest including:
  - [ ] Key components, activities and processes mapped
  - [ ] Key stakeholders mapped
  - [ ] Linkages between the system components, the dominant system dynamics, and system archetypes identified
- [ ] Diversity within the system recognised with relevant stakeholders (i.e. stakeholders involved in, influencing, or affected by system processes and drivers of change) identified and engaged in the systems mapping process.
- [ ] Current and future key trends and drivers of change identified.
- [ ] System dynamics assessed to identify enabling and constraining factors as well as trade-offs and synergies in the system.
- [ ] Identified additional information to improve and/or support the understanding of the mapped system.
- [ ] The mapped system validated through stakeholder consultations alongside primary and secondary information available.
- [ ] Establish focus and boundary for engagement.



EXAMPLE OF BACKCASTING FOR A MIGRATION VISION OUTCOME. BACKCASTING IS A STRATEGIC PLANNING APPROACH THAT BEGINS WITH ENVISIONING A DESIRABLE FUTURE AND WORKING BACKWARDS TO IDENTIFY THE NECESSARY STEPS TO ACHIEVE THAT FUTURE.

GESI CONSIDERATIONS

In this phase, a participatory and inclusive approach is used to stocktake and map the interplay of factors within the system, including gender and social inclusion dimensions. This involves examining the current context, gender roles, participation, access, decision-making, climate and non-climate vulnerabilities, and other challenges within the system. It also includes identifying and prioritising key drivers of change, as well as stakeholders' specific concerns and shared interests. Additionally, this phase considers differential and intersectional impacts of climate change, inequalities, trends, uncertainties, and factors that may exacerbate existing vulnerabilities. Throughout the stocktaking and integration of information for scenario building, validation by stakeholders is essential for accuracy and to ensure that diverse perspectives are fully represented.

DATA WALK EXERCISE DURING THE STATE-LEVEL CONSULTATION WORKSHOP, SHIMLA, HIMACHAL PRADESH, INDIA

III. Participatory scenario development

OVERVIEW

This phase builds on the validated understanding of the system and key drivers of future change to collaboratively develop alternative future scenarios in a participatory workshop with stakeholders. This phase provides a structured space for in-depth discussions enabling participants to make informed decisions about potential future changes and their impact on the system.

The Intergovernmental Panel on Climate Change (IPCC) broadly defines a scenario as a 'plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces and relationships' (Carter & La Rovere, 2001). By envisioning potential future scenarios, and through in-depth discussions and negotiations, participants can identify desired system outcomes, and the pathways needed to achieve them, based on the influence of future drivers. These insights will inform strategic decision making, policy, and development planning. The agreed adaptation pathways will guide the direction of future efforts and shape key decisions in development and policy.

OBJECTIVE

The main objectives of this phase are to (i) further refine the focus and scope; (ii) develop scenarios considering the various drivers of change that are likely to affect the future; (iii) create a shared vision for the future; and (iv) identify pathways to achieve the desired future outcomes.

PROCESS

Building on validated data and insights from previous phases, future scenarios are developed using participatory tools. The scenarios are created based on the validated information, clear and realistic assumptions, and an assessment of trends and their potential impact on future trajectories. Each scenario should be thoroughly analysed, comparing different perspectives and priorities across stakeholder groups to ensure a range of possible futures is represented accounting for diverse interests and concernWs. Stakeholders are also engaged in developing a shared vision of a realistic desired future and identifying pathways to achieve it.

PARTICIPANTS DISCUSSING MULTIPLE PLAUSIBLE FUTURE SCENARIOS

STEPS

1. Validation and finalisation of system mapping, identification of key drivers/critical uncertainties, and development of scenarios require active stakeholder participation, typically through a consultative workshop for which a minimum of 2 days of engagement is recommended.

2. **Clarify focus and boundaries for scenario development**: It is critical to establish the boundary for engagement to ensure foresight outcomes are focused, actionable, and relevant for uptake. The boundary should be set based on the system context and the set objective. Setting the boundary too narrowly may restrict solution pathways to addressing only the symptoms rather than the underlying causes. However, boundaries set too broadly may lead to unrealistic pathways that are difficult to both implement and manage effectively.

   Before delving into participatory scenario development, communicate, clarify and justify the following to the stakeholders involved:

   - **Thematic boundary and issue**: The initial step is to define a thematic boundary and clarify the key issues of focus within the system of interest, based on the holistic understanding derived during the scoping and mapping phases. The issues must align with the objectives of the foresight process.
   - **Spatial and temporal boundaries of engagement**: The spatial boundary, in terms of geographical and administrative scope, determines the physical area of focus for engagement (e.g., local, sub-national, national, regional, global).

     Foresight time horizons are usually long as the end goal of the foresight process is a shared, desired sustainable system or sub-system transformation which cannot be achieved through a one-time intervention. Foresight scenario and pathway development typically consider a 5-year horizon with more complex issues requiring at least 10 years. The timeframe for exploration should reflect the system's pace of change and the level of ambition considering the practicality and 'time lags'. If the timeframe is too long, it can be broken into multiple time horizons (i.e. short, medium, and long).

   - Setting boundaries is imperative for scenario building. When setting the boundary consideration should be given to the goal, focus, context, stakeholder involvement and resources required. Boundaries help us define the scope of engagement, but they do not have to be rigid. Foresight is a dynamic and iterative process and boundaries can be revisited as the process evolves.

3. **Validation and selection of key drivers and assumptions**: Identify and substantiate key drivers of change and critical uncertainties, analyse the type and extent of the drivers' influence on the system across various future timeframes and, through critical dialogue, explicitly list agreed features and assumptions that will shape the scenarios.

Methods and tools for identifying key drivers of change and uncertainty:

- Drivers of change and uncertainty: Impact uncertainty matrix, Delphi method influence analysis

4. **Participatory exploratory scenario development**:

- Co-develop scenarios drawing on evidence-based understanding of the system, key drivers of change, and underlying assumptions.
- Ensure participation of diverse stakeholders of the system to capture multiple perceptions, interests and concerns.
- Develop plausible alternative future scenarios based on the key drivers and critical uncertainties. Record underlying features, assumptions and uncertainties behind the scenarios and the trajectories.
- Compare and analyse each scenario accounting for differential implications on the system and the relevant stakeholders. Assess the vulnerabilities and opportunities arising from each scenario. Assess critical triggers and tipping points. This learning can be used to develop contingency plans.

Methods and tools for participatory exploratory scenario development:

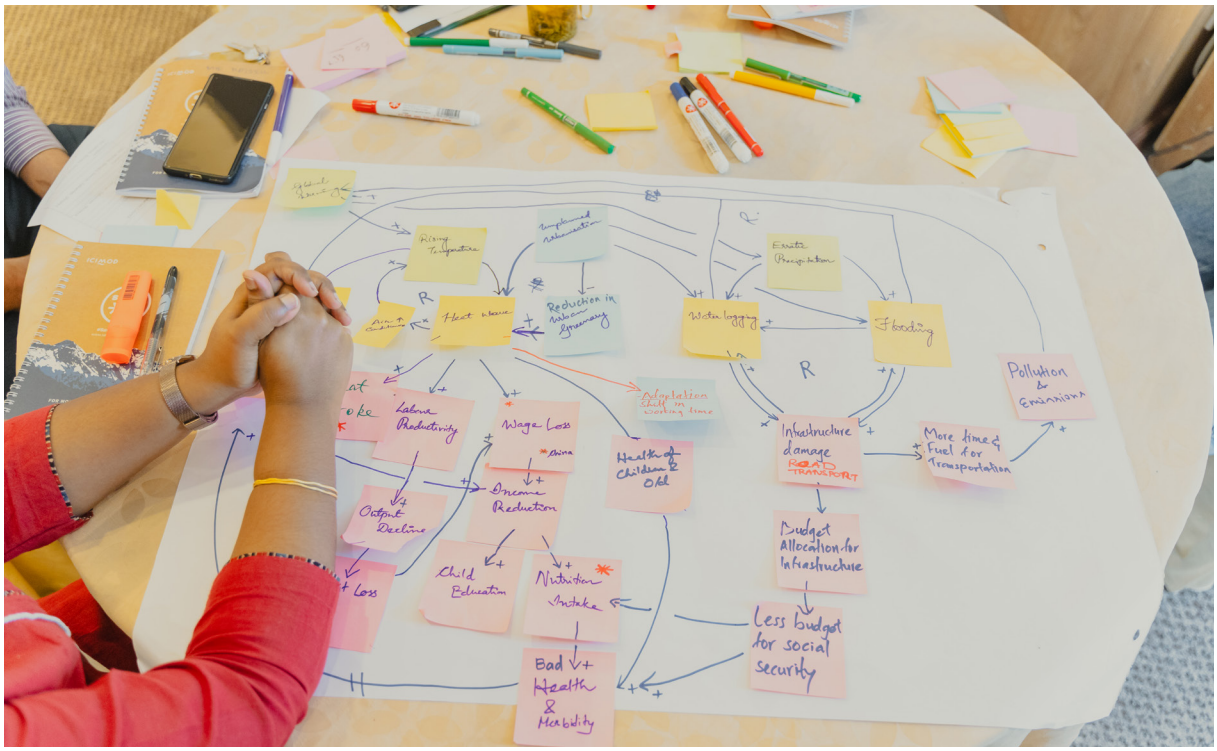
- Four scenarios/ 2x2 matrix, Multiple scenarios
- Rich picture
- Future wheel, Three horizons, Causal layered analysis

5. **Desired future visioning and pathways**:

- Co-develop realistic, desirable future scenarios, considering current system status, future trends, and uncertainties.
- Establish collective long- and short-term visons and goals. List the features of the vision and the assumptions behind the scenario and trajectory.
- Reflect on the desirability and implication of this vision from the stakeholder perspectives. Prioritise elements of the vision that are critical to achieve the shared vision for the future and identify key desired outcomes.
- Assess the enabling and constraining factors influencing achievement of the outcomes. Assess the vulnerabilities and opportunities arising from the scenario. Identify critical triggers and tipping point. Develop pathways to achieve the desired outcomes feeding into the desired vision.

Methods and tools for desired scenario development:

- Developing desired scenario: Visioning, Rich picture
- Identifying pathways to achieve desired vision: Backcasting, Timeline mapping



CAUSAL LOOP DIAGRAM DEPICTING THE LINKAGES AND FEEDBACKS OF SYSTEM

GESI CONSIDERATION

In the scenario development process, it is important to continue engaging diverse stakeholders to ensure that future scenarios reflect their lived experiences, priorities, interests and aspirations. It is essential to consider GESI-relevant drivers such as access, education, and technology for women and marginalised groups, building on the validated understanding of the system. The following questions can be considered in scenario development:

1. What do the scenarios look like for vulnerable and marginalised groups?
2. Does the scenario recognise the specific concerns, vulnerabilities, and capacities of different gender and social groups?
3. Are there any trends and uncertainties that might aggravate existing vulnerabilities and inequalities?
4. How do we consider or address the vulnerabilities, needs, and concerns of diverse groups in future scenarios?

Phase III checklist

At the completion of Phase III, you should have:

- [ ] Potential alternative future scenarios developed and their implications for the system and stakeholders assessed
- [ ] Identified clear and achievable shared desired vision and outcomes
- [ ] Developed general outline of pathways of change to achieve the desired outcomes and vision
- [ ] Assessed the impact pathways on the stakeholders and the system

IV. Mobilising for system change

OVERVIEW

After the pathways are identified, a comprehensive action plan should be developed to achieve the shared desired outcome. To actualise these plans, they need to be integrated into existing plans, policies and initiatives. Drawing on insights and information mapped from prior foresight phases, critical and optimum entry points within the system along with key stakeholder/entities with the necessary interest, resources, power/influence should be identified and mobilised to implement these changes.

OBJECTIVE

The key objective of this stage is to devise realistic strategies and action plans that will help the system move towards the desired outcome in the future. These strategies and activities should consider the drivers of change likely to shape future trajectories. The pathways developed must also ensure the wellbeing and agency of all stakeholders, including marginalised and vulnerable groups.

PROCESS

This phase supports the development of a clear and practical action plan aligned with stakeholder priorities, available resources, and existing system processes, while considering potential future trajectories. It also involves establishing mechanisms to monitor progress and ensure that desired outcomes are achieved.

STEPS

1. Identify change and pathways of change
2. Identify the kinds of system change required to achieve the desired vision and develop strategies to address the changes required at different levels (See types and conditions for system change: Kramer et al., 2018; Brouwer et al., 2019). Develop concrete strategies and action plan to mobilise pathway of change. Develop clear and achievable roadmaps considering the system feedback:
    - Develop strategies, long term and short-term plans, and activities to engage targeted stakeholder to initiate desired change. Revisit and integrate into the existing plans, policies and interventions aligning it to the vision of the exercise.
    - Identify potential entry points using the system mapped. Ensure the strategies, action plan and interventions do not have negative feedback on the system leading to maladaptation.
    - Engage with stakeholders to align mutual goals centering the challenges, needs and wants of the stakeholders. Develop partnerships and networks to facilitate engagement. Map stakeholders, area of engagement, and the type and level of engagement and develop strategies for engagement.
    - Take stock of resources (financial, human, technical) available for mobilisation and identify area of interest and use to reap the maximum impact.
    - Identify most effective and feasible interventions that will bring required change towards desired outcomes and future goals.

Methods and tools for identifying and prioritising intervention:

- Feasibility matrix/ Feasibility discussion
- Prioritisation matrix/ Prioritisation discussion

Methods and tools for developing an operational plan for mobilizing change:

- Big-picture overview of interventions/ activities: Roadmap
- Detailed activity planning: Gantt chart/ timeline

3. Ensure the strategies do not increase the precarity or reduce wellbeing of stakeholders especially vulnerable and minority groups.
4. Develop progress monitoring system with markers of change identified to track the progress.
5. Devise contingency strategies.

Phase IV checklist

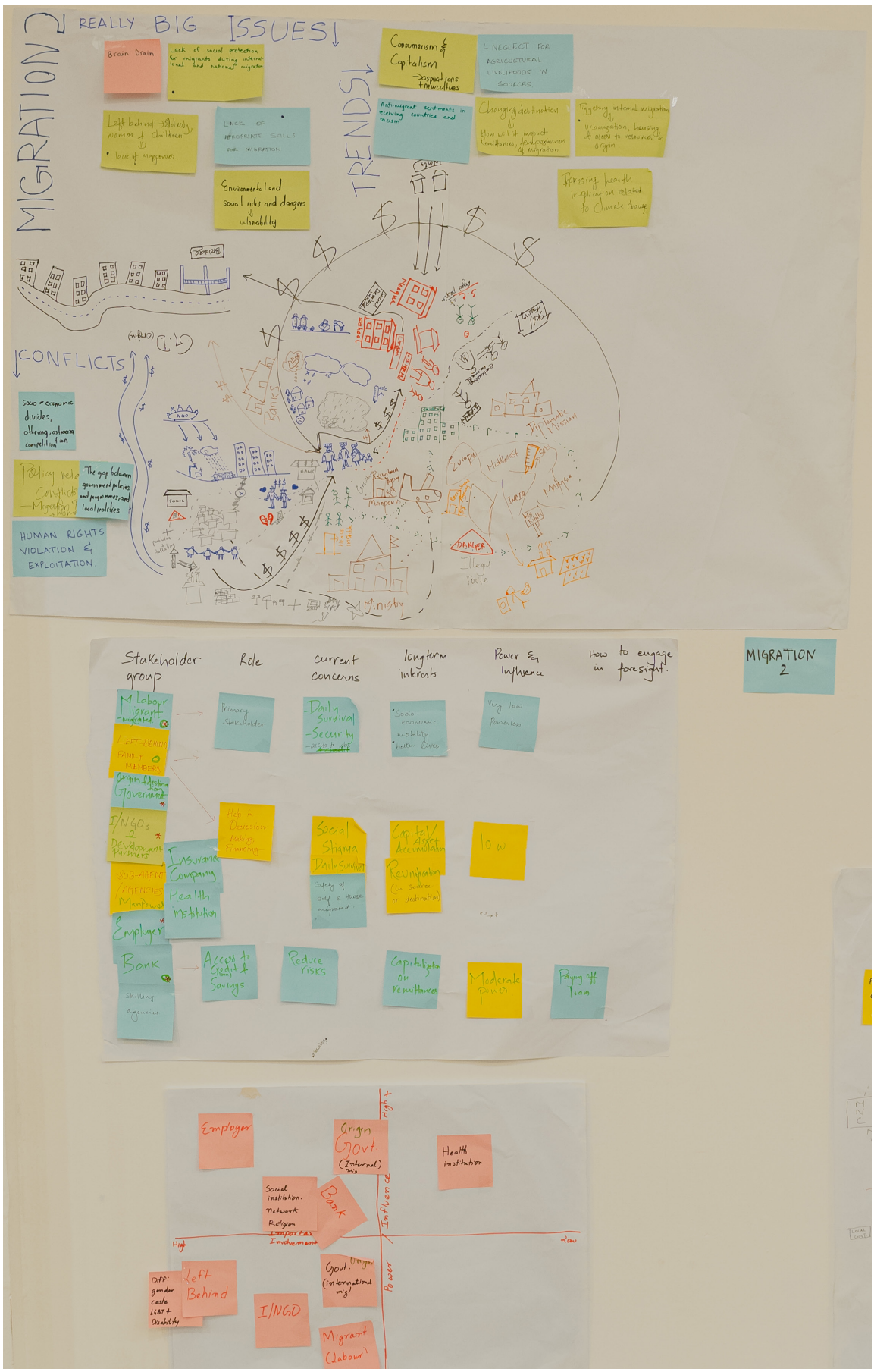
At the completion of Phase IV, you should have:

- [ ] Devised strategies and action plans to achieve the shared desired outcome.
- [ ] Understanding of how the pathways of change will impact the system and its stakeholders. Devised contingency strategies and plans to deal with negative impacts and maladaptation.
- [ ] Identified stakeholders that need to be engaged with to nudge towards the desired changes and strategies to engage with them meaningfully .
- [ ] Identified optimal entry points in the system that would allow for the required changes to take place without negatively affecting the entire system and stakeholders.
- [ ] Identified desired outcome markers (indicators) to track progress and ensure desired changes over time.

GESI CONSIDERATION

Building on the GESI consideration in the previous phases, this stage should further continue the engagement of stakeholders.

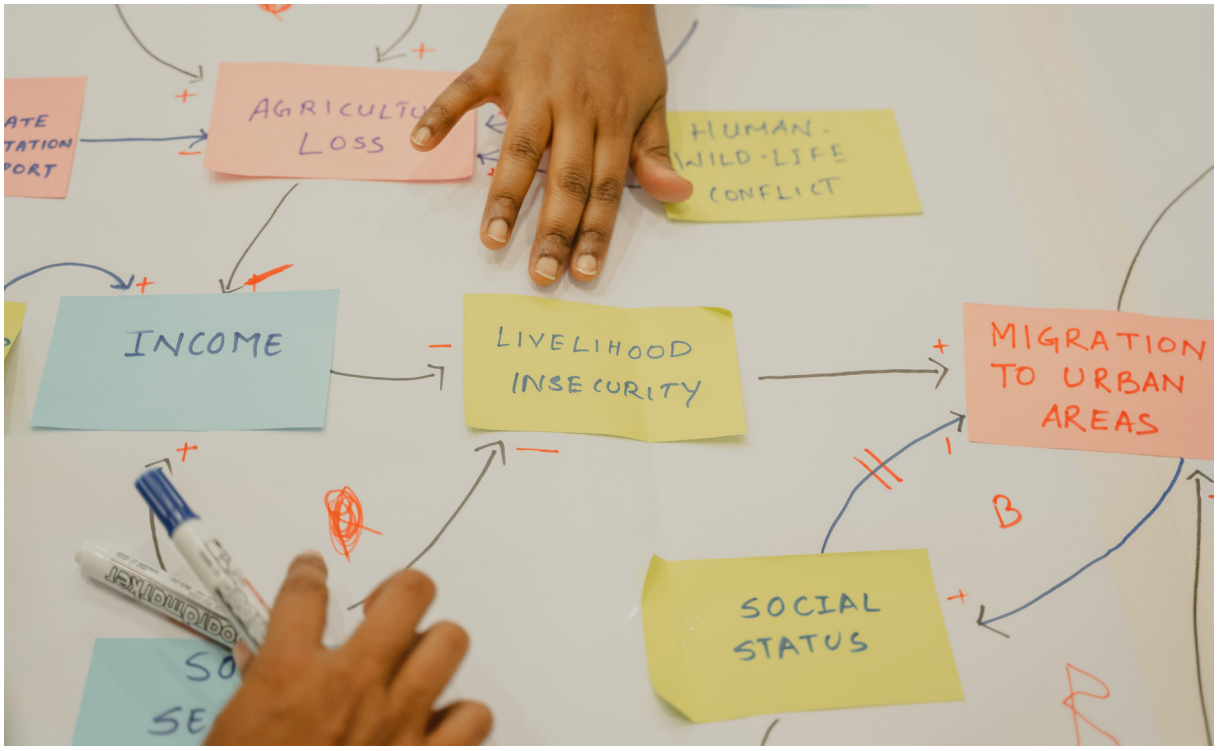
Considering GESI dimensions in previous phases will help inform the development of anticipatory actions and plans that can result in GESI-sensitive vision and outcomes. The pathways of change can be designed to consider and prioritise the issues and needs of socio-economically marginalised groups.



RICH PICTURE, STAKEHOLDER MAPPING, AND POWER AND INFLUENCE ANALYSIS TOOLS WERE USED TO MAP MIGRATION IN THE REGION

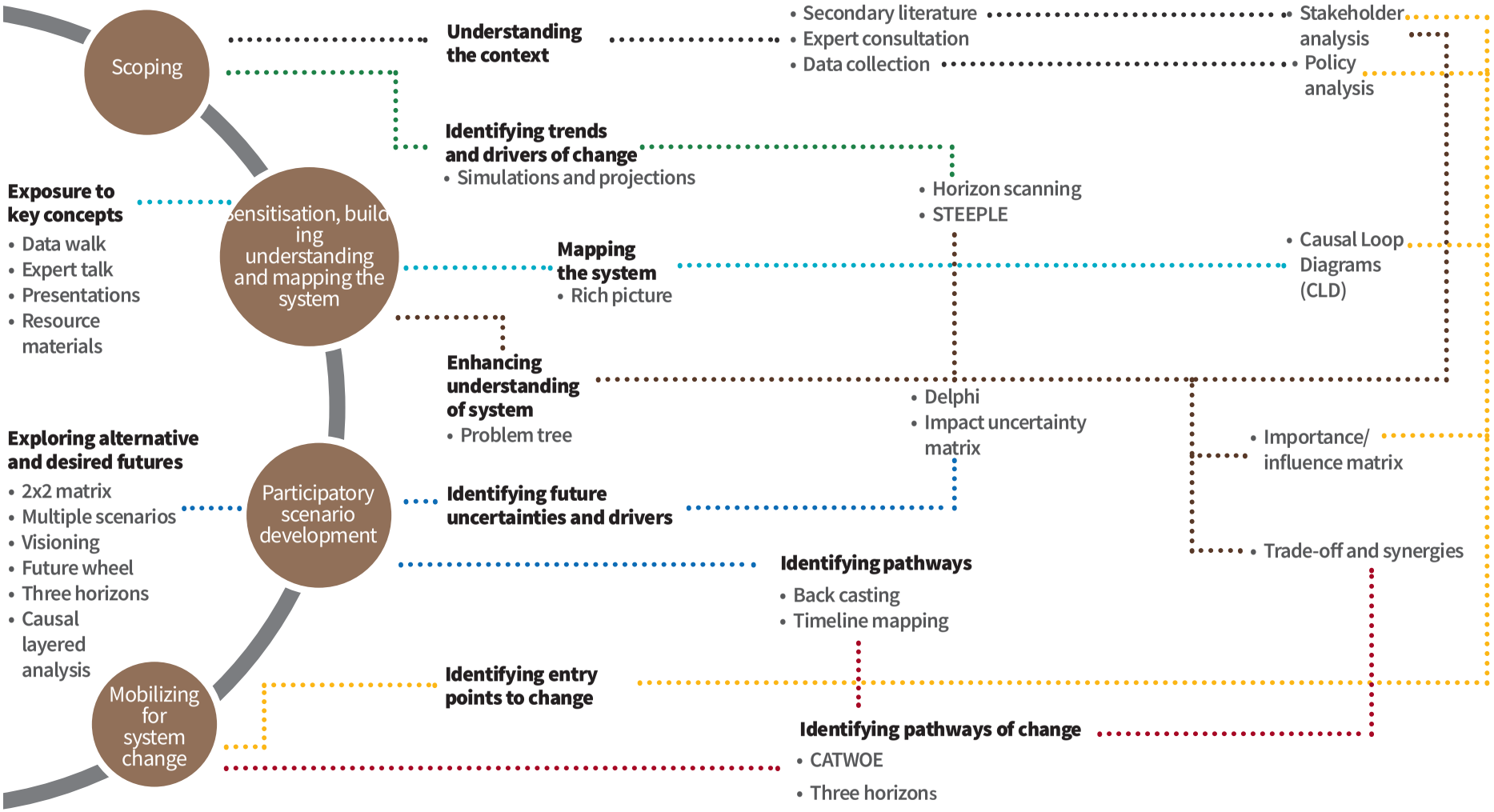
Participatory foresight tools and their application across the systematic foresight process

The same tools can be used across different phases of the foresight process, but with progressively greater depth as each phase builds on the previous one. For instance in the first two phases: (i) scoping and (ii) sensitisation, building understanding and system mapping, the perspective shifts from external to internal. The former involves exploring the system from the outside to identify what already exists, while the latter focuses on engaging with stakeholders to understand the system from within.



CAUSAL LOOP DIAGRAM IS A SYSTEMS THINKING APPROACH-BASED TOOL THAT HELPS US VISUALISE THE SYSTEM. THE CAUSAL LINKS AND INTERCONNECTIONS OF COMPLEX SYSTEMS ARE MAPPED OUT TO FACILITATE UNDERSTANDING OF THE SYSTEM'S BEHAVIOUR.

FIGURE 3 PARTICIPATORY FORESIGHT TOOLS AND THEIR APPLICATION ACROSS THE SYSTEMATIC FORESIGHT PROCESS



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