



# SADC Futures

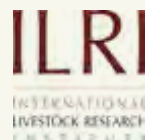
Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development

## SADC Futures Foresight Training Toolkit

Developing Skills and Capacity in Applying Foresight  
to Climate Resilient Agricultural Development in the  
SADC Region



RESEARCH PROGRAM ON  
**Climate Change,  
Agriculture and  
Food Security**



Implemented by:

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# Acknowledgements

The SADC Futures training series, including the six facilitated webinars and this toolkit, were designed and led by Sabrina Chesterman and Constance Neely, independent consultants based with the SHARED Decision Hub. The SHARED Decision Hub, founded in 2012, is a collective of stakeholder engagement behavioural specialists and transdisciplinary scientists. The SHARED approach is a tailored method for stakeholder engagement, managing relationships and brokering multi-stakeholder and cross-sectoral partnerships. The SHARED process is founded on a principle of fostering evidence-based decision making and this formed the basis of design for the virtual series and toolkit, to make the foresight methods, tools, and approaches as accessible and practical as possible.



## Applying human-centred process and science to shift decision culture



**SHARED works to strengthen the linkages across science, practice and policy.** Through a tailored process to decision-making, centred around people and knowledge, transformational change toward sustainable development can result.



We recognise there are many steps to achieving this, as well as internal and external factors. **We offer a range of approaches and tools towards a transformational outcome.**



We work across scales, institutional levels, and themes, and **tailor to context and needs.**

In preparing and planning the series, much gratitude goes to the expertise of the CCAFS scenarios team, including Laura Pereira, Joost Vervoort and Marieke Veeger, for valuable discussions and insight into structuring a training approach to foresight and scenarios. In addition, Laura Pereira and Polly Ericksen provided guidance on scenario planning work under the ILRI PCSL project. Further thanks are owed to Lili Szilagyi for her support as lead editor for the SADC Futures knowledge series and her extensive work on communication.

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# SADC FUTURES FORESIGHT TRAINING TOOLKIT

The SADC Futures project has produced tailored supporting materials and documents as part of a wider approach for foresight training in the region. These documents and the associated foresight framework aim to equip users to practically apply the range of foresight tools and methods for innovative strategic planning and policy formulation. The knowledge series mapped to the SADC Futures Foresight Framework is shown below.





# About the SADC Futures Foresight Training Toolkit

This toolkit aims to be an accessible summary of the SADC Futures Foresight Framework and presents content that was given during the SADC Futures webinar series, a six-part virtual webinar series and facilitated training (<https://bit.ly/SADCFuturesForesight>). The purpose of the toolkit is to provide accessible training to multiple stakeholders on key foresight methods and how and when to apply them. **Each foresight method or tool is broken down into a series of steps so that the process can be replicated with ease.** One of the **key aspects of foresight is developing a mindset in thinking about the future** and so the toolkit equips users with case studies, probing questions and examples which are highlighted throughout the manual.

## SADC Futures Foresight Framework

A tailored foresight framework was created for the project as a foresight exercise typically includes several methods and tools. The framework brings together the key stages of foresight, with methods and approaches that are relevant to the application for climate-resilient agricultural development. The framework in this training series was developed around **four guiding questions which the foresight process** helps us to answer about the future:

- What seems to be happening?
- What is really happening?
- What might happen?
- What do we need to do?

In these highly uncertain and rapidly changing times, the SADC region, like many regions in Africa, remains fundamentally dependent on a resilient agriculture system and natural resource base. Climate change still poses the greatest threat to the agricultural system and therefore technical capacity is needed to address these future impacts and adapt plans, policies, and programs. Considering alternative futures, the SADC Futures project has produced a tailored foresight training series focused around the thematic areas of building climate-resilient agricultural development. The framework and toolkit aim to equip users to practically apply the range of foresight tools and methods for innovative strategic planning and policy formulation for climate resilience.





The foresight framework has been built around seven key stages with key questions:



### **Input**

What is the context? What is happening right now?.



### **Analysis**

Deepening the understanding of the above input questions.



### **Interpretation**

Why is it happening? This is where foresight differs from strategic planning, here we dig deeper to understand why something is happening.



### **Plan**

What do we want to experience in the future and what might get in our way? Here we consider what we might do to get there.



### **Prospection**

What might happen that we have not thought about? This is a critical stage of the foresight process and it requires thinking of multiple different potential futures.



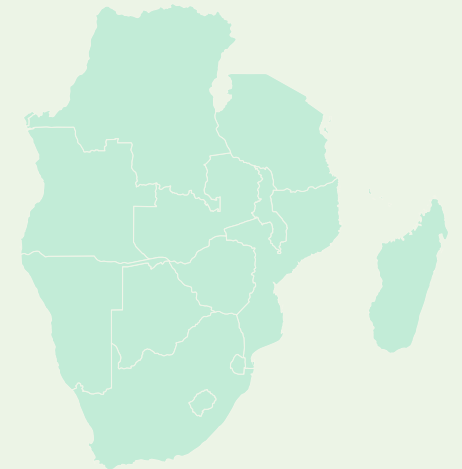
### **Reflection**

Here we consider what we might want to do differently.

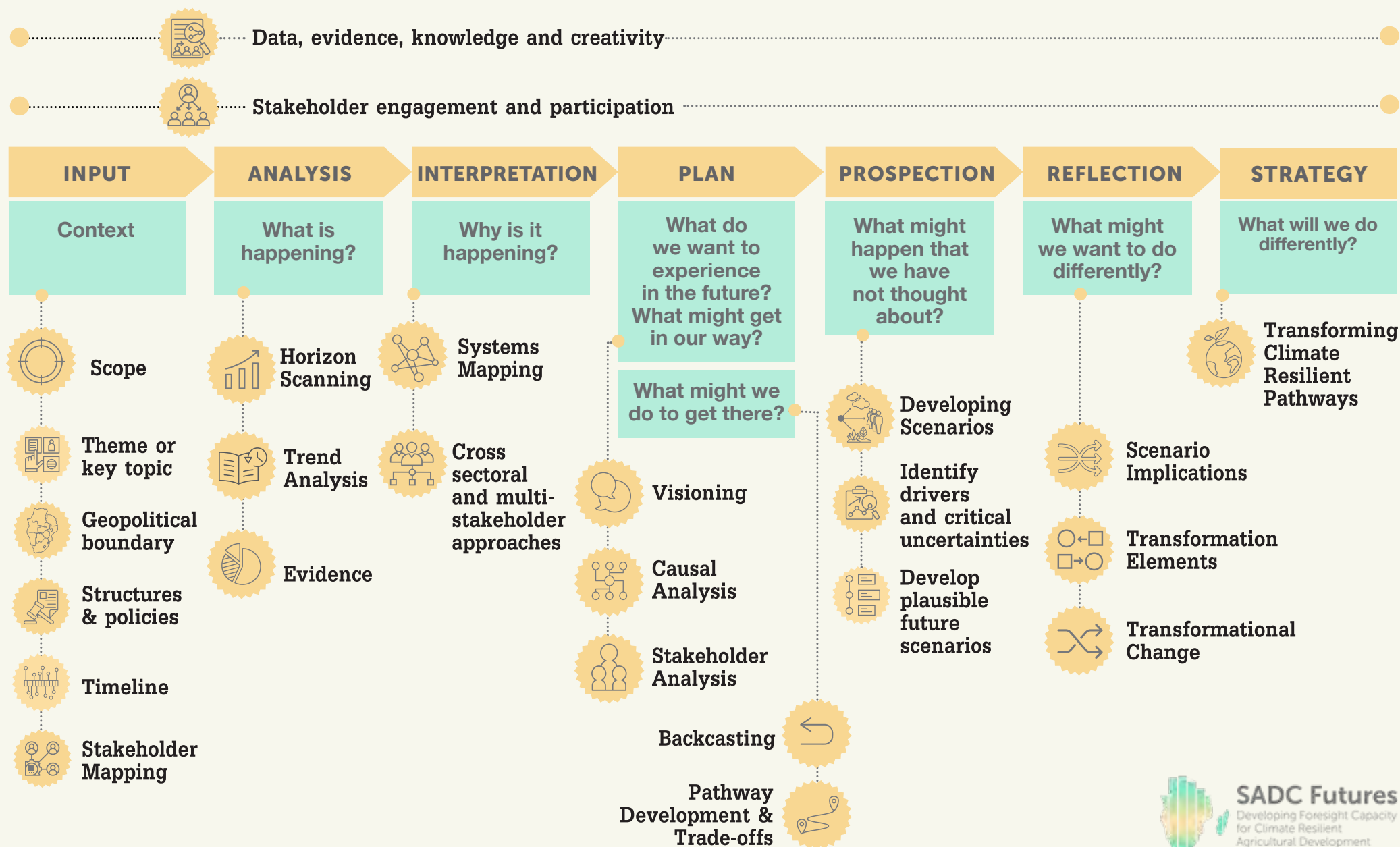


### **Strategy**

What will we do differently? This is where we build our new strategy based on our insights of what the future may be like.



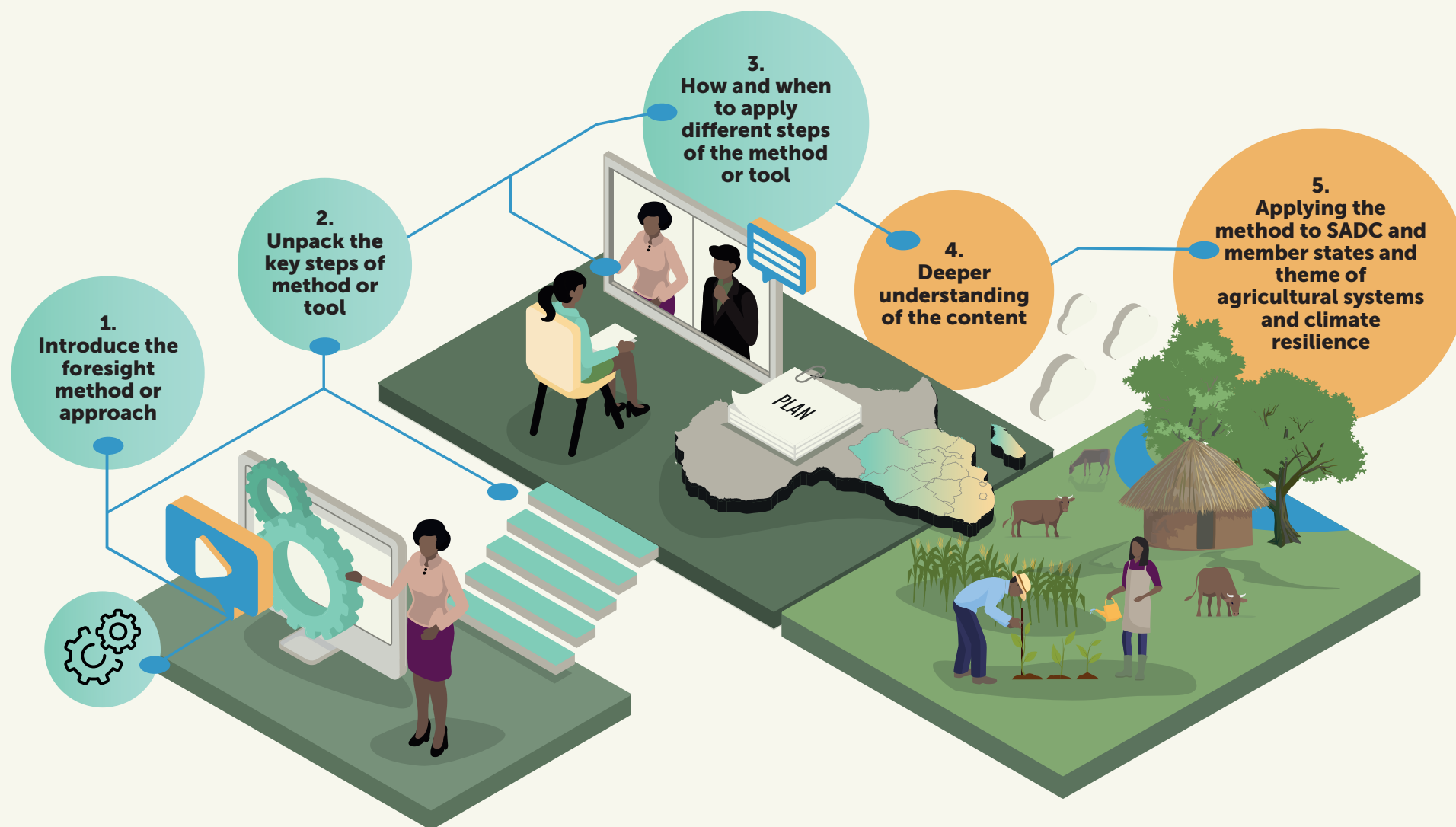
It is important to note that there is no standardised way of doing foresight, the methods, and tools chosen depend on the specific topic or theme, the scale and objective(s) of the foresight process and the questions to be answered (Bourgeois, 2012).



# Training approach

The SADC Futures Foresight Training Toolkit uses an applied approach whereby it embeds each method or tool with a detailed example of application in the context of climate-resilient agricultural development in the SADC region.

The training approach used starts by introducing the foresight method or tool and the key steps to follow in using it. An explanation of how and when to apply the different key steps is provided. The application of the method or tool is then demonstrated in the context of climate-resilient agricultural development in the SADC region.







## Who is this toolkit for?

The training is designed for regional and national government, civil society, researchers, and private sector representatives. Target stakeholders include policy makers, technical officers, farmers' organisations, media, academia, advisory services, women and youth focused organisations, and potential financiers and development partners. The training is also beneficial to anyone working at the policy level in other African regions.

## Structure of the toolkit

The toolkit comprises six modules structured to both show the methodology but also to be applied, by building a clear case study and examples of climate-resilient development in agricultural systems with relevance to the SADC region. This allows the user to gain insights into both the foresight tools, methods, and key steps but also to embed case studies and practical examples on those methods.

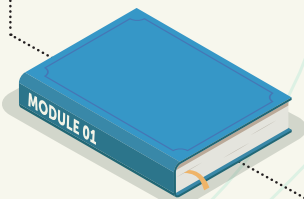
- An **introduction to the foresight method or approach** in question;
- A breakdown of the **key steps of the method or tool**;
- An explanation of how and when to **apply the different steps of the method or tool**;
- **Background on the content**; and
- **Application of the method in the context of climate-resilient agricultural development in the SADC region.**

# The toolkit structure

## MODULE 01

### Introduction to Foresight

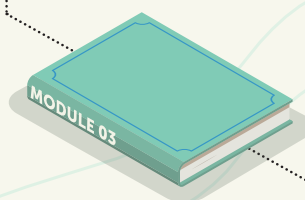
Introduction to applying foresight approaches for climate-resilient agricultural development in the SADC region.



## MODULE 03

### Visioning and Causal Analysis

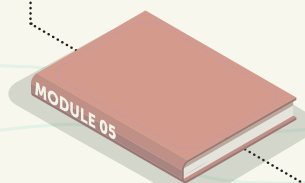
Applying foresight tools and methods: visioning, causal analysis and integrating climate resilience into future planning.



## MODULE 05

### Scenario Implications and Transformational Change

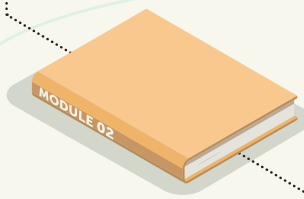
Applying foresight tools and methods: using scenarios to consider uncertainties and create more robust and transformative climate-resilient policies and plans.



## MODULE 02

### Understanding Trends and Multi-sectoral and Systems Linkages

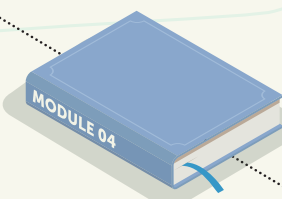
Understanding regional trends, multi-sectoral and systems linkages and climate risks in the region.



## MODULE 04

### Building Scenarios

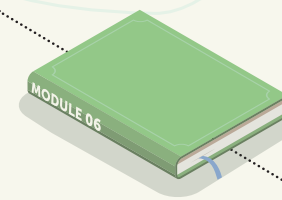
Applying foresight tools and methods: introducing scenarios and building multiple scenarios to consider in future planning.



## MODULE 06

### Review and Applying the SADC Futures Foresight Training

Review of key foresight methods and tools and tailoring practical action to agriculture and climate change future planning and implementation in the SADC region.



# How to use the toolkit

**Exercises, learning reflections and key questions** are provided throughout the toolkit modules to equip users to practically apply the range of foresight tools and methods. They are indicated by a variety of icons as illustrated below.

**‘Test Your Learning’** exercises are provided at the start of each module. These exercises test the user’s knowledge of the SADC Futures Foresight Training Framework. The exercises are based on information learnt in the preceding modules and provide a refresher for the user before progressing with the next module.



**Learning Exercises** are included throughout the toolkit modules to provide step-by-step guidance on how to apply the different foresight methods and tools. These exercises are demonstrated in the context of climate resilient agri-food systems in the SADC region.

Further practical exercises are provided to assist the user in applying foresight in the context of their chosen theme as they progress through the training. The materials produced by the user during the exercises are built upon in a sequential manner along the foresight framework.



**Learning reflections** are provided at the end of each foresight method. These allow the user to reflect on what they have learnt before moving on to the next method.



To guide the thought process of the user **key questions** and answers are highlighted throughout the manual.







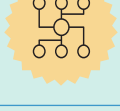

## Questions and Answers from participants of the SADC Futures webinar series




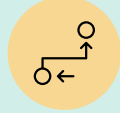


**‘Questions and Answers’** are scattered throughout the toolkit to provide an added learning experience. These questions were put forward by participants of the SADC Futures webinar series. The answers to the questions were provided by specialists in the respective fields in question.















# Glossary of Key Terms<sup>i</sup>








## Foresight







Term	Description
Backcasting 	The process of working backwards from the definition of a possible future to determine what needs to happen to make the future unfold and connect to the present.
Barrier 	Identified obstacle that could stop the achievement of an activity.
Black Swan 	An event that could absolutely not be predicted.
Brainstorming 	A method of obtaining ideas without judgement or filtering. It involves encouraging wild and unconstrained suggestions and listing ideas as they emerge.
Causality 	A logical link between events, where a cause precedes an effect and altering the cause alters the effect.
Complexity 	Complex systems are non-linear and diverse networks made up of multiple interconnected elements. Cause and effect relationships within the system are not easily discernible or predictable. Historical extrapolation is not possible for predicting emergence (new patterns and behaviours) in complex systems.

Term	Description
Critical Uncertainties 	Are drivers that are both highly impactful and highly uncertain.
Cross-cutting Issues 	Issues or challenges that affect more than a single interest area, institution, or stakeholder, and that need to be addressed from all points of view.
Drivers 	Are factors, issues or trends that cause change thereby affecting or shaping the future.
Driving Force 	A cluster of individual trends on the same general subject moving trends in certain directions, they are broad in scope and long term in nature (for example, climate change or globalisation).
Evidence 	The integration of raw data constituting numbers, words, images, and insights emerging from diverse knowledge sources.
External Driver 	External force of change, for example political or market drivers.







Term	Description
<b>Feasible</b> 	Possible and practical.
<b>Forecast</b> 	An estimate or best guess of what might happen in the future i.e. not a definitive prediction.
<b>Foresight</b> 	Structured tools, methods and thinking styles to enable the capacity to consider multiple futures and plan for them.
<b>Foresight Organising Group</b> 	A small core group that builds the foresight plan
<b>Foresight Participating Group</b> 	A broad mix of identified key stakeholders that need to be involved
<b>Futuring</b> 	The act, art, or science of identifying and evaluating possible future events.




Term	Description
<b>Grey Rhino</b> 	These are the large, obvious dangers that will sooner or later emerge but whose exact timing is unknown.
<b>Impact</b> 	Refers to the potential scale of impact of a driver on a scenario theme.
<b>Internal Driver</b> 	Internal force of change for example, social drivers within a farm or community directing the decision making of a farmer.
<b>Mega-trend</b> 	A trend that is apparent at a large or global scale e.g. growing youth population across the African continent.
<b>Mind Mapping</b> 	Allows a group's ideas to be charted in logical groupings fairly quickly, even when ideas are given in a non-sequential manner. This technique allows efficient brainstorming for ideas and at the same time creates a skeletal framework for later categorisation of the information generated.
<b>Modelling and Simulation</b> 	The process of creating and experimenting with a computerised mathematical model imitating the behaviour of a real-world process or system over time. Simulation is used to describe and analyse the behaviour of a system when asking 'what-if' questions about the real system and aid in the design of real systems.

Term	Description
Not Predictive 	Participatory with multiple viewpoints, bringing in quantitative and qualitative evidence but not predictive.
Pathway 	A trajectory in time, reflecting a sequence of actions and consequences against a background of separate developments, leading to a specific future situation.
Plausible 	It is reasonable to assume the scenario could happen. Plausibility does not mean that a future situation will happen.
Predictability 	The degree of confidence in a forecasting system based either on law derived from observations and experience, or on scientific reasoning and structural modelling.
Projecting 	A quantitative technique that can be used in the analysis phase of the foresight process. Projecting or time series analysis are used when several years of data are available, and trends are both clear and relatively stable.
Projection 	An expected value of one or more indicators at particular points in the future, based on the understanding of selected initial conditions and drivers.
Resilience 	A system's ability to cope with and recover from shocks or disruptions, either by returning to the status quo or by transforming itself to adapt to the new reality.




Term	Description
Scenarios 	Are storylines/narratives, answering 'what if' questions that describe multiple alternative futures spanning a key set of critical uncertainties. Scenarios identify future drivers of change and then plot out plausible directions that they may take.
Scenario Development 	<p>An approach to understanding highly impactful and highly uncertain drivers and to describe possible future states.</p> <p>Although they address uncertainty, scenarios are not predictions or forecasts - they are not 'true' or correct/wrong - only plausible.</p>
Social Network Mapping 	A tool to identify the importance and influence of stakeholders as well as how they exchange information or are connected.
Time Frame 	The complete period (past-to-future) considered in a foresight exercise.
Transformation 	An agriculture and food systems transformation is a significant redistribution - by at least a third - of land, labour and capital, and/ or outputs, and outcomes (e.g. types and amounts of production and consumption of goods and services) within a time frame of a decade.
Trend 	A general tendency or direction of a movement or change over time e.g. increasing erratic seasonal rainfall patterns.









Term	Description
<b>Trend Impact Analysis</b> 	Collecting information and attempting to spot a pattern, or trend, and assess its influence from the information.
<b>Uncertainty</b> 	Refers to how much or how clear we are on how a driver will emerge or play out in the future. High uncertainty does not mean 'high improbability', high uncertainty can mean having little knowledge of how something may pan out.
<b>Underlying Cause</b> 	Unpacking why an obstacle is in place.
<b>Unknown Unknowns</b> 	Issues and situations in organisations that have yet to surface and which are blind spots for planners who are unaware that they do not know about them.
<b>Viable</b> 	Able to be done or could occur.
<b>Vision</b> 	A compelling image of a (usually preferred) future.






Term	Description
<b>Visioning</b> 	A well-known prospective technique with a highly participatory approach.
<b>Wicked Problem</b> 	A problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognise.
<b>Wild Card</b> 	A low-probability but high-impact event that seems too incredible or unlikely to happen.







## Climate Resilience




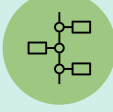

<b>Adaptive Capacity</b> 	The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.
<b>Climate Change</b> 	Climate change is a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer.
<b>Climate Resilience</b> 	The ability of a system to 'bounce back' from the impacts of climate-related stresses or shocks. It is the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.

Term	Description
Exposure 	Refers to the inventory of elements in an area in which hazard events may occur.
Hazard 	A possible, future occurrence of natural or human induced physical events that may have adverse effects on vulnerable and exposed elements.
Risk 	Intersection of hazards, exposure, and vulnerability.
Sensitivity 	The degree to which a system is affected, either adversely or beneficially, by climate variability or change.
Social Vulnerability 	Inability of people, organisations, and societies to withstand adverse impacts from multiple stressors to which they are exposed.
Vulnerability 	The propensity or predisposition of a system to be adversely affected by an event. Vulnerability is a function of a system's sensitivity, and its adaptive capacity.

## Agricultural Systems

Term	Description
Agriculture 	Is the science, art, or practice of cultivating soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.
Agricultural Value Chain 	Includes the people and activities that bring a basic agricultural product such as maize to the consumer. The activities include obtaining inputs and production in the field right through to storage, processing, packaging, and distribution.
Biological Diversity 	The variability among living organisms from all sources, including terrestrial, marine, and aquatic ecosystems.
Cross Sectoral Coordination 	The engagement, management, planning and implementation, of activities conducted across different thematic sectors to deliver development outcomes (e.g. food security, nutrition, sustainable landscapes, and agriculture).
Ecosystem Services 	These include provisioning services, such as the production of food (e.g. fruit for humans or grazing for cattle) and water; regulating, such as the control of flooding and disease; supporting, such as nutrient cycles and oxygen production; and cultural, such as spiritual and recreational benefits.

Term	Description
<b>Elements</b> 	The different, discrete elements within a system (e.g. farms, organisations, inputs, and soil).
<b>Interconnections</b> 	The relationships that connect the elements (e.g. rules, ideas, funding, or service relationships, among others).
<b>Land Degradation</b> 	A process in which the value of the biophysical environment is affected by a combination of human land-use activities. It is viewed as any change or disturbance to the land perceived to be undesirable.
<b>Multi-Stakeholder Collaboration</b> 	Consists of a mix of representatives or stakeholders from public, civil, and private domains of society.
<b>Post-Harvest Loss</b> 	Is the loss in quantity and quality of agricultural produce between harvest and consumption. It includes on-farm losses e.g. damage to grain by pests, as well as losses along the value chain during transportation, storage, and processing.
<b>Pre-production</b> 	This stage of the agricultural process is prior to production and may involve land preparation and the sourcing and purchasing of inputs such as seed and fertiliser.

Term	Description
<b>Productive Inputs</b> 	These are used to increase yields and range from improved seeds, genetics, fertilisers and crop protection chemicals to machinery, irrigation technology and knowledge.
<b>System</b> 	An interconnected set of elements that is coherently organised in a way that achieves something (function and purpose). For example, the purpose of an agricultural system could be to produce dairy products and the system could consist of interconnected elements such as the farmer, employees, cattle, machinery, feed, water, and energy.
<b>Systems Thinking</b> 	A mindset, tool, and process that is reserved for complex problems.
<b>Systems View</b> 	Understands life as networks of relationships.
<b>Transboundary Animal Disease</b> 	Epidemic disease which is highly contagious or transmissible and has the potential for very rapid spread, irrespective of national borders, causing serious socio-economic and potentially public health consequences.

## **Definitions for the glossary were obtained from several information sources (listed below) as well as from specialists in the respective fields.**

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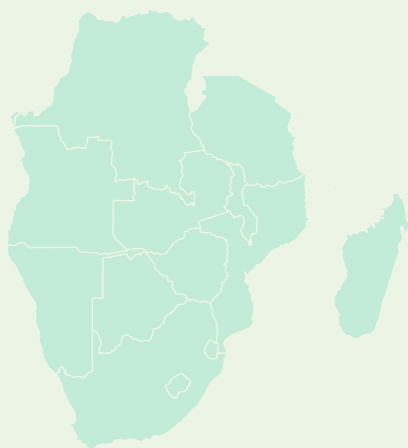


Photo: Felix Clay, Duckrabbitt 2012



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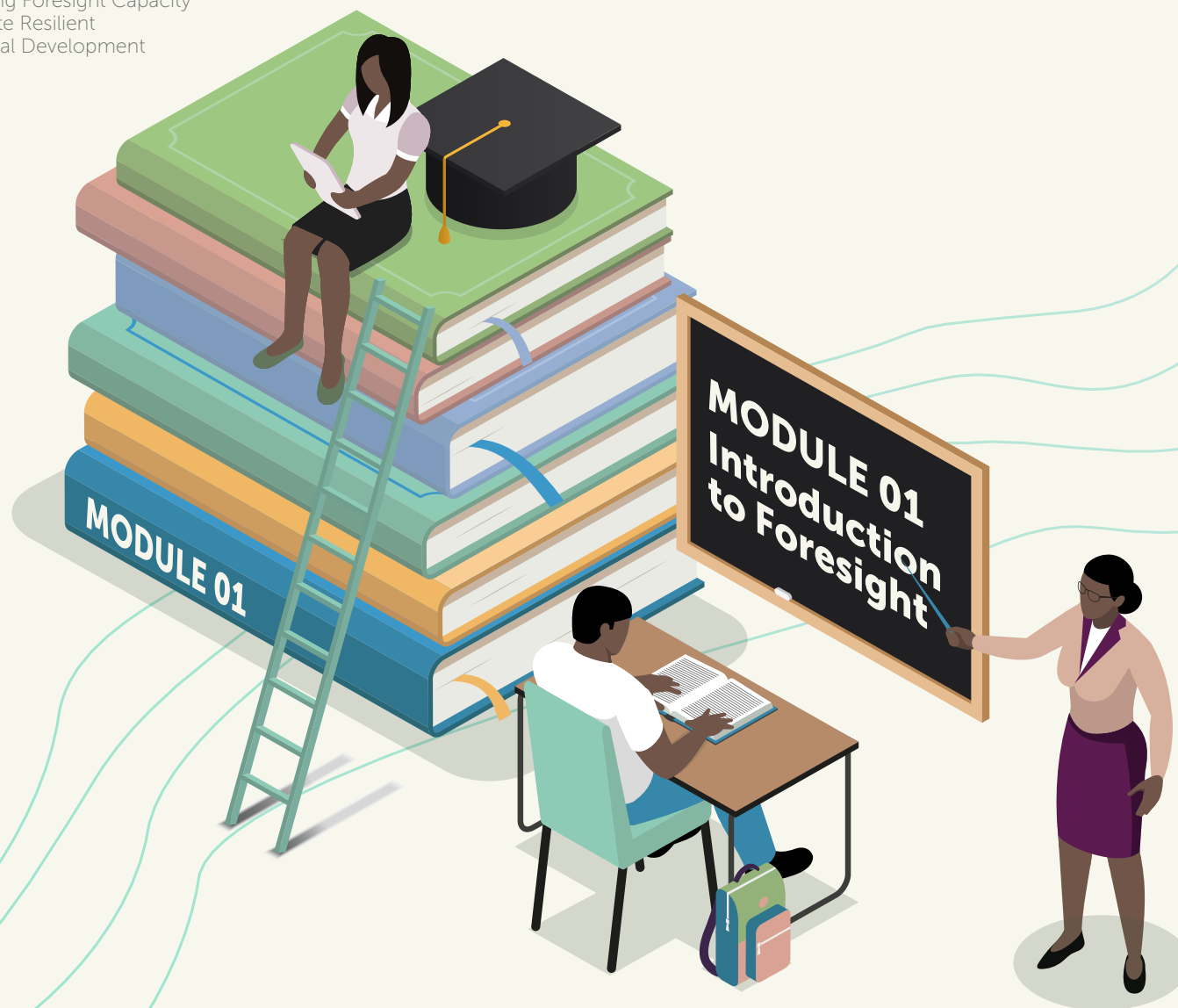
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## SADC Futures

Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



## MODULE 01 Introduction to Foresight



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



Implemented by:







# What Will You Learn?

This module starts with an **introductory section, providing background on what foresight is and why it is a valuable method.** It explains that foresight is a set of tools and approaches for future planning. In addition to establishing a background on foresight and the key methods and approaches in setting up a foresight exercise, the module introduces the theme of climate resilient agri-food systems in the SADC region and how foresight can be used to enhance strategic planning and policy formulation to achieve this.

The next section of the module presents the start of the learning process of 'how to do foresight' by setting up a foresight exercise and applying the defined methods and tools. This module focuses on the input stage of the foresight process, specifically the scope method and associated key terms.

## The following steps will be taken to define the scope:

- Setting the theme;
- Setting geo-political boundaries;
- Understanding the relevant structures and policies;
- Setting the timeline; and
- Mapping stakeholders.



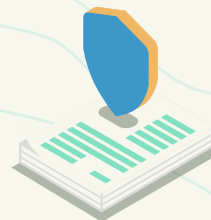
Introducing  
Foresight



Scope Method



Theme



Boundaries, Policies  
and Structures

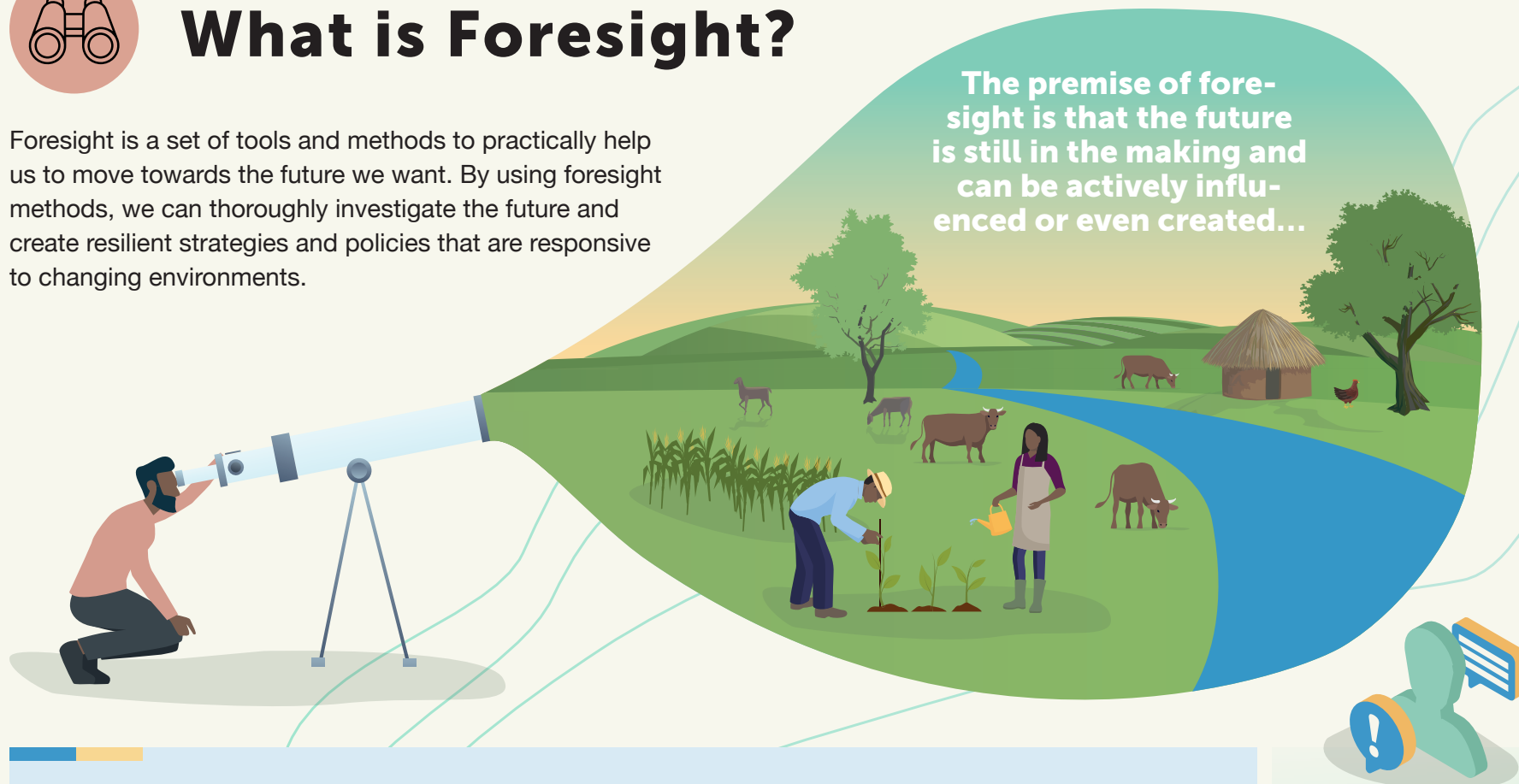


Timelines and  
Stakeholder Mapping



# What is Foresight?

Foresight is a set of tools and methods to practically help us to move towards the future we want. By using foresight methods, we can thoroughly investigate the future and create resilient strategies and policies that are responsive to changing environments.



## Key points to note:

- **The future has not yet been decided**, it is actively made through our decisions and the actions that we take. Understanding this can be an empowering realisation (UNDP, 2018).
- **Foresight requires a change in mindset**. People habitually think about the 'future' as predetermined and unfolding or that the past is eternally repeated. As a result, it can prove difficult to move beyond 'the future' to possible 'futures' to produce new, transformative insights (UNDP, 2018).
- **We want to be active participants in shaping our future**. By coming together to question how the future is being created, through understanding emerging opportunities and risks, we can develop plans that are responsive to a changing world, and that are based on a common vision of the future that we want.

It is important to note that foresight is **NOT A PREDICTION** of the future, but rather a process of imagining many different possible futures.



# Learning Exercise

## What is your understanding of futures thinking?

*You can test this with colleagues and yourself to understand your current comfort levels with future thinking*



Consider the following questions and choose the answers that apply:

**The future is,**

- |                  |                 |
|------------------|-----------------|
| 1. Uncertain     | 5. Certain      |
| 2. Unpredictable | 6. Controllable |
| 3. Foreseeable   | 7. Navigable    |
| 4. Fixed         |                 |

**How comfortable are you thinking about the future?**

1. Very comfortable
2. Comfortable
3. A little uncomfortable
4. Very uncomfortable

**Thinking about the future for me is,**

1. Too uncertain
2. Limited and a bit abstract
3. Comfortable on certain topics but not others
4. I'm confident to vision the future

**When you are planning for your personal future what year do you consider the future?**

- |         |         |
|---------|---------|
| 1. 2021 | 4. 2030 |
| 2. 2023 | 5. 2040 |
| 3. 2025 |         |

**When you are planning for the future through your work what timeframe do you work with?**

- |            |             |
|------------|-------------|
| 1. 1 Year  | 4. 10 Years |
| 2. 3 Years | 5. More     |
| 3. 5 Years |             |

**What processes or tools do you use for planning for the future?**

- |                         |                       |
|-------------------------|-----------------------|
| 1. Personal intuition   | 4. Log frames         |
| 2. Personal experiences | 5. Strategic planning |
| 3. Impact pathways      | 6. Scenarios          |
|                         | 7. Other              |





# Understanding the Terminology

As with any field, foresight has its own terminology. Foresight is closely associated with the term 'futures'. Futures refers to a wide academic and professional field inclusive of research, methods and tools that can be used to develop foresight capacity (Conway, 2014).

Unlike strategic plans that typically include a short term vision of the future, foresight approaches use a longer time frame i.e. 10 to 20 years or more, and thereby encourage thinking beyond our current conditions (Conway, 2014). It is important to note that foresight does not replace existing planning methods, but can be used in conjunction with them, and thereby enhance the planning process.



**Futuring** - is the act, art, or science of identifying and evaluating possible future events.



**Future studies** - explore how people can navigate the past and use different methods to think about and prepare for different possible futures (Forward Thinking Platform, 2014).



**Foresight** - involves structured tools, methods and thinking styles to enable the capacity to consider multiple futures and plan for them.



**Strategic planning** - tends to focus on producing tangible plans rather than on the thinking processes that informs the plans (Conway, 2014).

Regardless of the term used, those who work in this field use the future to inform action today and accept responsibly for future generations (Conway, 2014).



## Questions & Answers

**Is it important to reduce the definitions to exclusive ones, or could a mix be acceptable?**

**As you find each of everything in the different methodologies?**

There are many different planning methods, however most planning methods take into account the current state of affairs (input, analysis and interpretation) and planning steps based on an identified desired outcome (vision) which considers what needs to happen, when, and by whom to achieve the outputs that lead to the outcome. So, there is overlap and some foresight methods fit nicely into traditional planning approaches. When we do foresight, we add more methods into the mix to better understand what is happening (analysis) and why it is happening (interpretation).

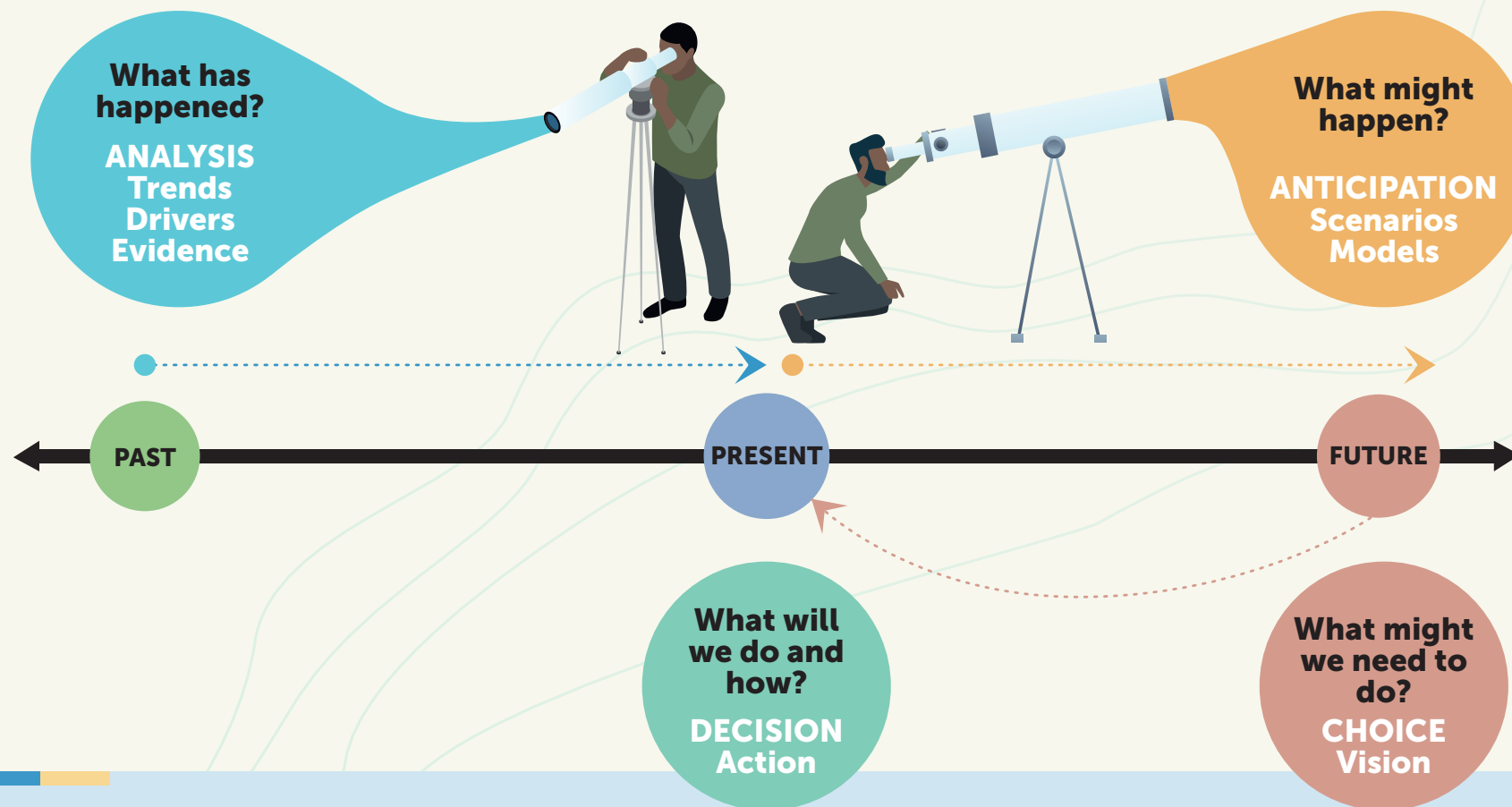
In our planning stage, we clearly articulate a vision and go deep into understanding the underlying causes and behaviours that may keep us from achieving the vision. Prospection allows us to look at multiple drivers and define a number of plausible scenarios so that our strategy takes into account the range of actions that will take our plan from being an iterative one to being a transformative one.

In response to the second question, there are different ways of doing foresight so yes, you incorporate the mix of methods that work best for your situation and often that is dependent upon the scope, the time allotted to the process, the people involved, etc.



# A Representation of the Field of Future Studies

(Adapted from Forward Thinking Platform, 2014)



## Benefits of Using Foresight

The **three key benefits of using foresight** can be summarised as:

- Helping prepare for alternative futures;
- Helping various groups develop a common vision and purpose; and
- Helping transform development policy towards an agile and outward-facing approach.

(OECD, 2018)



# Why Do We Need Foresight?



Life in the **21st century is complex**, we are faced with **'great disruptive forces' such as climate change, technological advances, urbanisation and globalisation**, to name a few. These forces are not new to the world, the unique challenge is that they are occurring at the same time, and at a large scale (UNDP, 2017). The accelerating pace of the forces, how they interact, and their resounding impact is causing change that is exceedingly difficult to anticipate.

New realities are being experienced, some of which are negative, such as the Great Financial Crisis of 2008, the refugee crisis faced in Europe and the present day COVID-19 pandemic. However, the forces that cause these crises are also responsible for developmental progress (UNDP, 2017).

**In the face of rapid change and new realities, traditional governance and planning methods are suddenly not as effective as they used to be, as planning is typically based on:**

- **Predictability;**
- **Clear causality;**

- **Eliminating uncertainty;**
- **Tools that are strict and inflexible (e.g. legal and budgetary frameworks).**

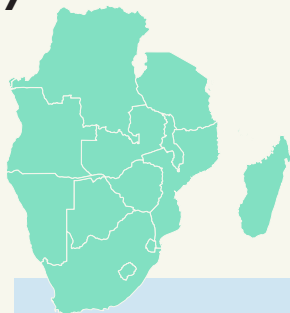
This causes severe implementation problems in an uncertain and changing operating environment.



**The issue is how can SADC governments identify and leverage strategic development opportunities whilst anticipating and minimising risk?**

**Foresight helps us adopt more resilient policies and planning tools that deal with change, unpredictable and unfamiliar futures, allowing us to change course if needed.** It provides a better insight into new realities, how they might change, how they could affect collective and individual interests, and the implications for taking action (Woodhill & Hasnain, 2019). Decision makers and policy planners using the foresight process are empowered to use new ways of thinking about, talking about, and implementing strategic plans that are compatible with the extraordinarily complex and uncertain future (UNDP, 2018).





# Applying Foresight in the Context of Climate Resilient Development in the SADC Region

**Foresight can influence SADC's regional and member country strategies and policy development to ultimately enhance resilient development pathways,** including the use of scenario-guided policy making, strategic planning, and regional prioritisation. There are numerous tools that can be used in a foresight exercise to guide SADC policies, time frames, and institutions. Such tools may include trends analysis, horizon scanning, multi-stakeholder mapping and engagement, systems thinking, causal analysis, visioning, backcasting, and scenario planning for long-term and deep uncertainties.



**By using foresight tools, SADC decision makers and policy planners can strive to answer these core development questions:**



**What does sustainable and equitable economic growth look like for SADC?**



**What role will agriculture and natural resources play in that future?**



**What impacts will climate change have and how do we plan for these?**

Foresight is not a new concept in SADC, it has previously been applied to planning and policy development. However, there is further opportunity for governments to incorporate foresight into national development visions, anticipatory governance and strategic management, resilient policy planning, and policy and public services innovation to contribute to the realisation of visions such as Agenda 2063, 2030 Agenda and Emergent Africa (UNDP, 2017).

It is important to note, that **there is no standardised way of doing foresight, the methods, and tools you choose depend on your specific topic or theme, the scale and objective(s)** of the foresight process and the questions you want to answer (Bourgeois, 2012). Taking the core development questions into consideration, the SADC Futures Foresight Training Series demonstrates foresight application in the context of climate resilient agricultural development in the SADC region. The foresight methods and tools chosen are therefore specific to the theme and may need to be reconsidered for appropriateness, in the context of your study.



## Questions & Answers

**How do we manage the overlaps in the different planning methodologies related to foresight?**

There are different ways of doing foresight, but they often have methods, tools, and processes in common. So, there is an opportunity to bring foresight methods into your planning processes. Most planning methods take into account the current state of affairs (input, analysis and interpretation) and planning steps based on an identified desired outcome (vision) which takes into account what needs to happen, when, and by whom to achieve the outputs that lead to the outcome. So, there is overlap and some foresight methods fit nicely into traditional planning approaches.



# Why Do We Need Foresight for Climate Resilient Agricultural Development in the SADC Region?



Photo: Iyin John Onaeko-unsplash

Achieving food security in the face of climate change is a complex public policy issue, a so called 'wicked problem'. In Africa, close to **20% of people are undernourished, and hunger is increasing in almost all regions**. The effects of malnutrition are severe, contributing to stunting and obesity, with resultant effects on quality of life and public health. According to the United Nations (UN), agricultural production will have to increase by approximately 50% by 2050 to meet population needs (FAO, n.d.). Coupled with this is diminishing land availability, increasing soil and biodiversity degradation, and more frequent and extreme weather events, which are compounded by climate change (FAO, n.d.).

In these highly uncertain and rapidly changing times, the **SADC region**, as with other regions in Africa, remains fundamentally **dependent on a resilient agricultural system and natural resource base to feed its growing population** (IFAD, 2015). Climate change poses the greatest threat to the SADC agricultural system and smallholder farmers are on the front line. Many smallholder farmers operate on marginal rainfed land that is affected by increasing water scarcity and erosion issues. Not only does climate change negatively impact agricultural production, it also affects storage, processing, and market access (IFAD, 2015).



41.2 million people



Are estimated to be food insecure in 2019 and the number is increasing  
(Data for 13 SADC Member States)



Only 7% of cultivated land

In the SADC region is irrigated



Land availability in the region is diminishing

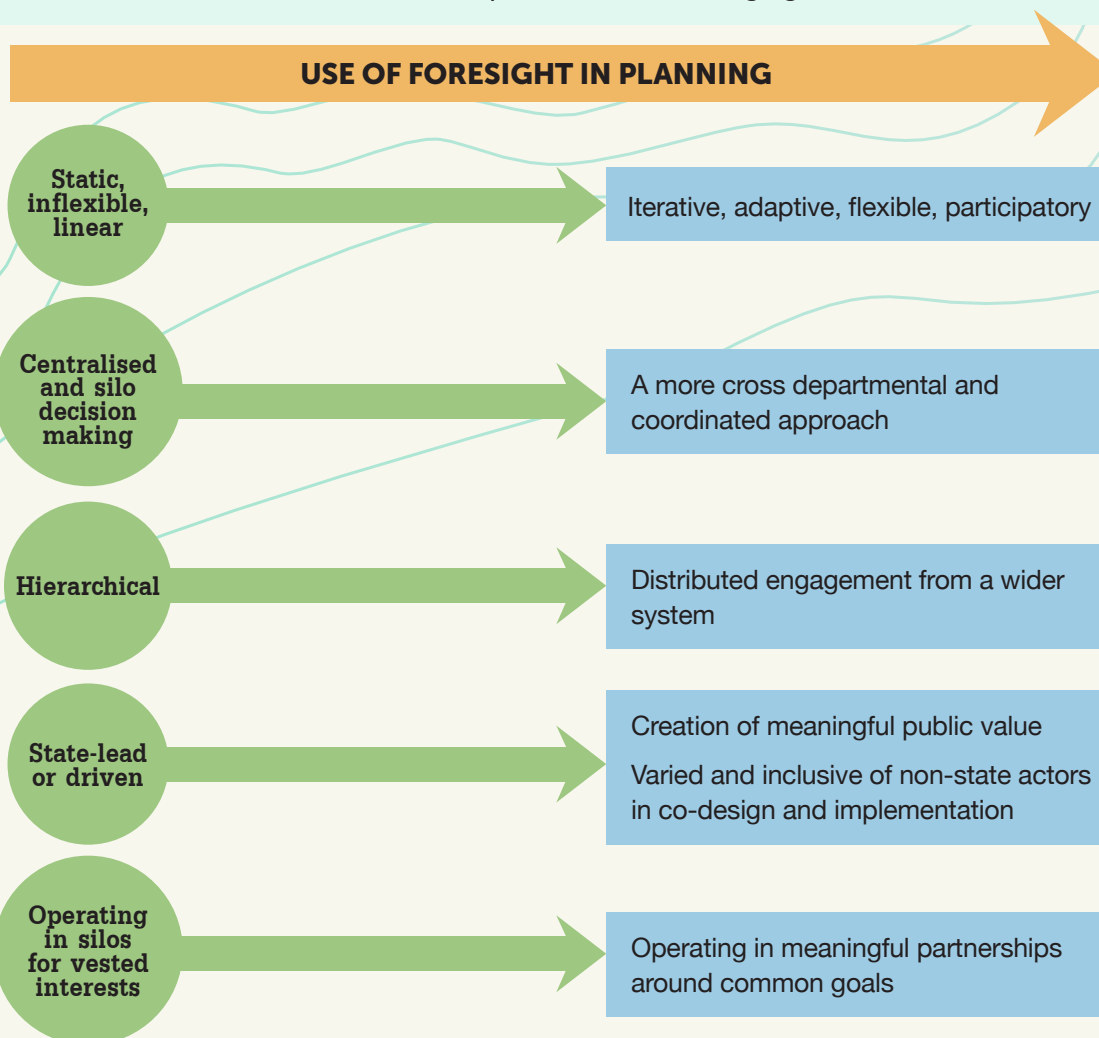
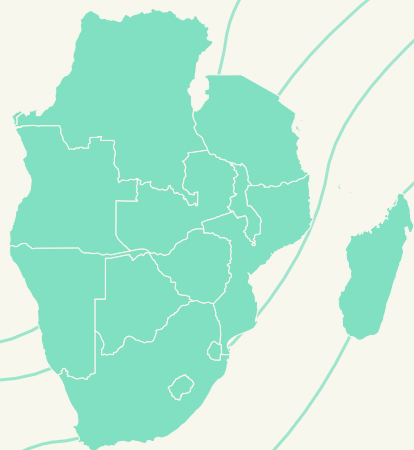
As is soil fertility and biodiversity, this is further compounded by climate change.  
(SADC, 2019)



## How can foresight be used to enhance the resilience of the SADC agricultural sector to climate change, to improve future food security?

Foresight is undertaken when a country, region or organisation faces a specific challenge. It implements a process of systematic reasoning to develop 'visions', understood as possible future states of affairs that can be reached (or avoided) through action in the present. Each foresight exercise is based on its own specific premises and will have a number of objectives, functions, limitations, outcomes and benefits (European Foresight Platform, n.d.). In this light, by using the foresight process policy planners and decision-makers in the SADC region can work together through a facilitated process to systematically investigate the future so that they can create resilient agricultural strategies and policies that are action oriented and responsive to our changing climate.

### Applying foresight processes to influence policy and strategic planning







# How Do We 'Do' Foresight?

Foresight is not conducted by a small group of experts or academics but involves a number of different groups of actors concerned with the issue in question (European Foresight Platform, n.d.). The results of a foresight exercise are shared with a large audience from which feedback is actively sought.

Furthermore, foresight is based on the principle that the problems faced cannot be entirely understood if reduced to one dimension. Therefore, foresight provides a multidisciplinary approach that captures realities in their totality with all the variables influencing them, regardless of the type (quantitative and qualitative) (European Foresight Platform, n.d.).



## Questions & Answers

**Regarding inclusion of women, how best can we ensure that women are actively engaged and have equal power relations considering the gender relations in SADC countries, for example in terms of decision making on access to agriculture finance? They are often the majority in local discussions, but they do not participate. How do we address this in foresight?"**

It takes specific attention to **actively engage and get the input of women** into these processes. From a trainer's/facilitator's perspective, we often work with both mixed gender groups as well as allow women to talk among themselves and provide input. Sometimes in mixed groups you may find that women get relegated to writing the cards or keeping notes.

- Step 1.** Make sure women are present
- Step 2.** Encourage women to speak (e.g. call on them)
- Step 3.** Create opportunities for women to work with other women

Another opportunity may be to host a meeting among powerful women working in agricultural finance and others in advance of participation in broader stakeholder gatherings.



Photo: Jessica Joye, Fintrac Inc (USAID)



## Four Key Questions Foresight Exercises Aim to Answer



What might happen?

What seems to be happening?

What is really happening?

What do we need to do?

Foresight frameworks and tools help to **guide decision makers through the action-oriented approach**. The four guiding questions above form the basis of the foresight framework used in this training.



Each stage of the foresight framework consists of a **series of tools and methods** that will be applied as the toolkit unfolds.



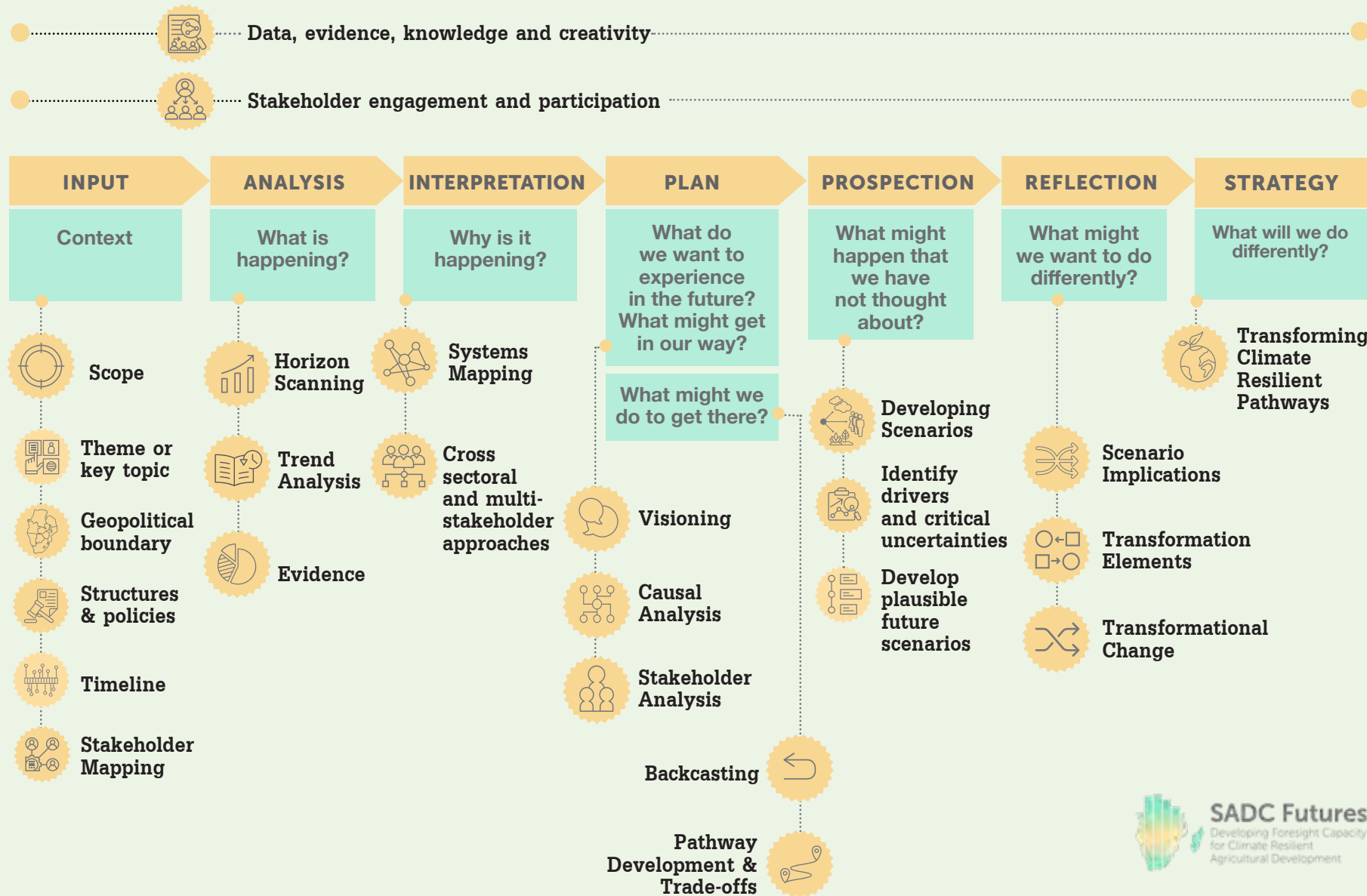
Concepts from each stage are carried **throughout the framework** i.e. the framework stages should not be viewed in isolation or only applied in the order of the framework.



The set of tools and methods chosen depend on the **specific way a user may want to apply a Futures approach** and use foresight methods.



# Foresight Framework





# Learning Exercise



When undertaking a foresight exercise the first step is to think of the key topic at hand and then apply the **four guiding questions** to improve your understanding of it. The COVID-19 pandemic provides a useful example:

We are living through the effects of the COVID-19 pandemic and it is having a large impact on how we see the future. Think back to what you expected the future to be like **BEFORE** the COVID-19 pandemic and compare that with the future you expect **AFTER** the pandemic started.

*The responses given below are from the SADC Futures webinar series which was attended by participants from across the SADC region.*

## What seems to be happening?

Think back to what you were expecting you would be doing in the year 2020 before the COVID-19 pandemic started...

- 'I would've travelled to several countries for field work and attended planning workshops, and conferences.'
- 'I would've carried out fieldwork involving farmer interviews.'
- 'I started an internship, expecting to work in an office.'

## What is really happening?

How different is your situation now? What has changed with the pandemic?

- 'Social distancing restrictions, we can't go to the field or interact with farmers.'
- 'No holiday.'
- '...now it's just home office'!!!

## What might happen?

Now think ahead to 2021, describe what you think your working environment will look like or what your personal activities will likely entail...

- 'The farming community will be more into saving and not expending.'
- 'Work environment is likely to be more virtual with less travelling.'
- 'Living a new normal, whatever that is going to be.'

## What do we need to do?

Think back to December 2019 when you were planning 2020...what would you have done differently if you had known that COVID-19 was coming? What changes would you have made to your plans for the year?

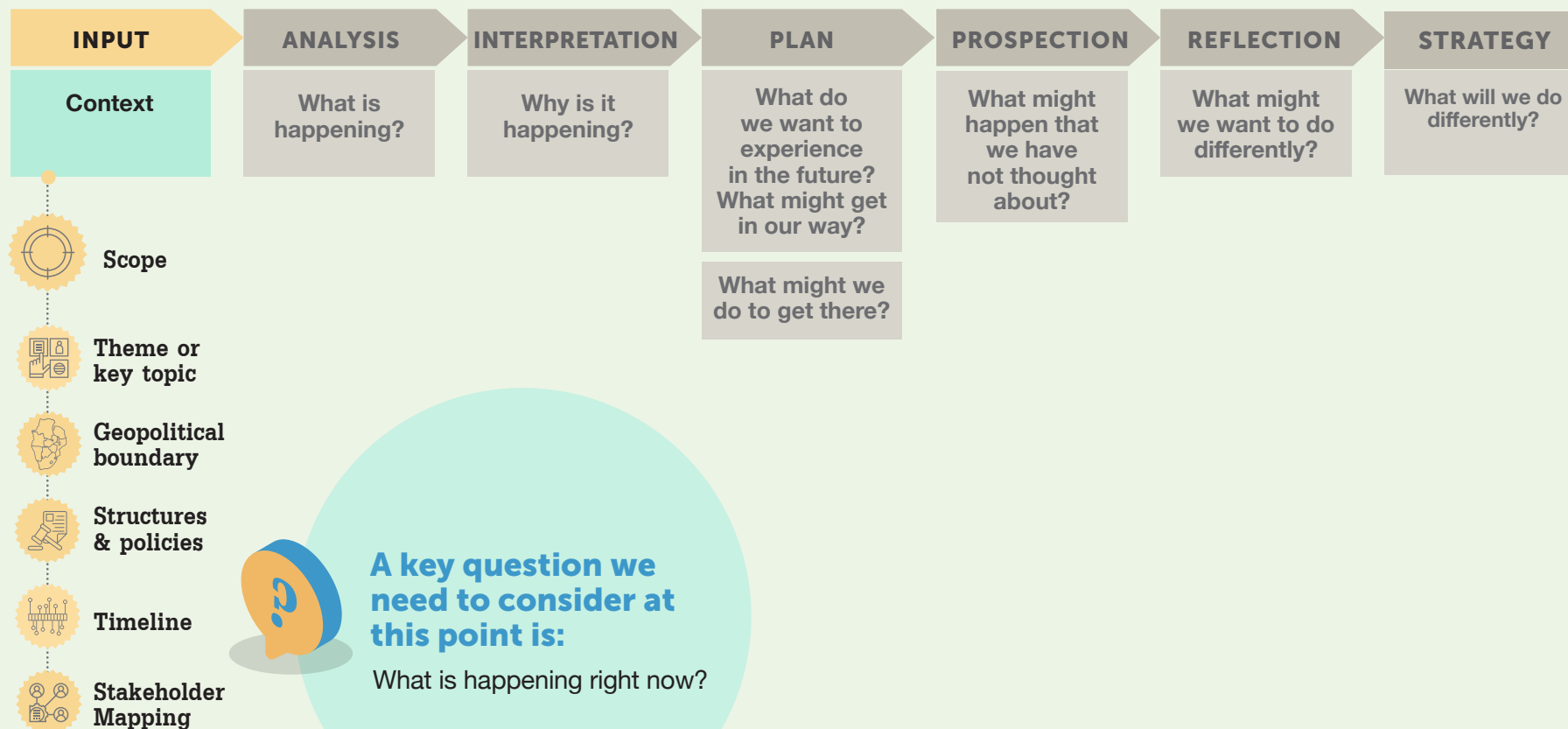
- 'Should have saved more money'!!
- 'Would've done my field work earlier on, would've done most of my travel related activities in December-January'!!
- 'Would have changed my workshop schedules and set up proper tools for virtual meetings.'





# Setting up a Foresight Exercise

The first stage of the foresight exercise is 'input', this is where we are developing our understanding of the chosen context using the scope method.





# Defining Your Scope

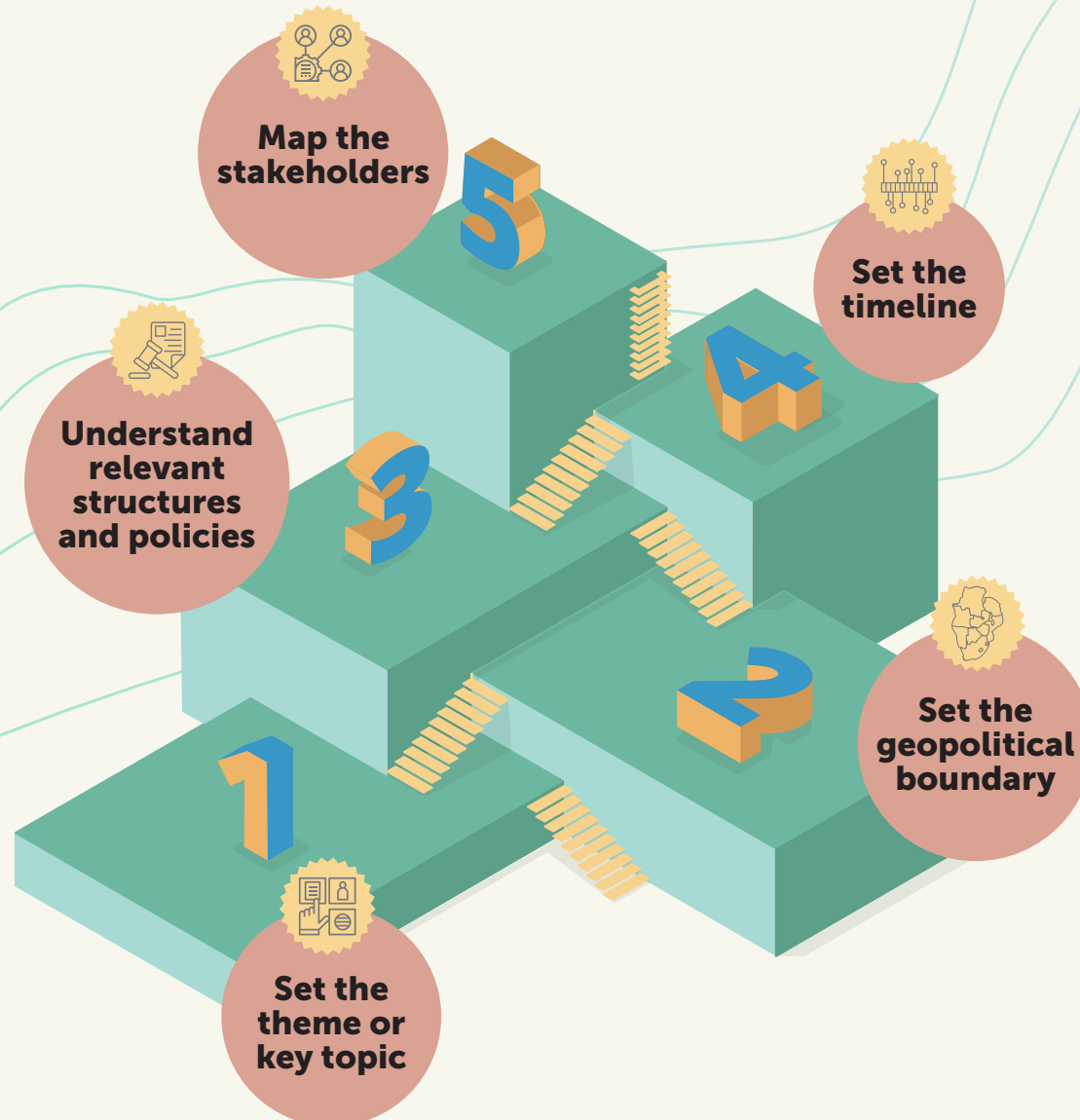
An integral component of the input stage is **defining the purpose of the foresight exercise**. The scope method includes defining what your foresight activity is intended to address as well as trying to understand the context you are planning within and for. This essentially provides the boundaries that you want to work within. However, it is important to note that the **boundaries can change as your understanding of the context deepens**.

## What is the method?

Defining the purpose of the foresight exercise and what it is intended to address. Establish the boundaries within which you are working and envisioning a future.

## Why apply it?

To understand the context we are planning within and for.





# Step 01 Setting the Theme

‘**Setting the theme**’ is Step 1 of the scope method. This is where we consider what is happening around us. This means we need to understand as much as we can about the subject matter and the context of our theme. This involves gathering data and evidence and ensuring we can clearly define the current elements of the systems at play.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The overall goal of applying **foresight techniques** in this context is to allow for planning to **reduce the vulnerability of the SADC region’s agri-food systems to climate change** and retain the ability of the systems to adapt and transform, not only now but in the future.



## How should we go about designing and implementing climate resilient agricultural development in the SADC region when there are so many uncertainties around how the world will unfold in the near future?

Foresight techniques that encompass **innovative policy formulation and solution design methods** give us a process for considering alternative possible futures and enable us to plan for uncertainties.



**Uncertainty** - is used to describe drivers we often don’t know how they will emerge.

Firstly, it is important to set the theme by **investigating the context of climate resilient agri-food systems in the SADC region**. This is done by describing the status quo and identifying the drivers and trends within the sub-systems that shape the way the agri-food systems develop and respond to stressors and shocks in the future.

Furthermore, the relationships between these systems and sub-systems need to be understood and mapped out to start framing the way we think about climate resilience within the agriculture sector in a more holistic way.



**Drivers** - are factors that cause change, thereby affecting or shaping the future.



**Trend** - is a general tendency or direction of a movement/change over time e.g. increasing erratic seasonal rainfall patterns.

The **SADC agri-food systems are complex, consisting of many different interconnected sub-systems and sectors that affect outcomes such as production and food security in the region**. The agri-food systems sit within and amongst other ecological, social, political, economic systems. As the theme is complex it is important to break it down further before considering the elements and possible drivers of the systems. The theme can be broken down into two parts: ‘agri-food systems’ and ‘climate resilience’.



Photo: Neil Palmer (CIAT)



## Learning Exercise



Think of your theme...what question are you trying to answer?  
Is it a complex topic that needs to be broken down further?



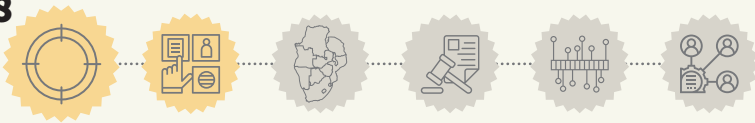
### Questions & Answers

#### How important is it to differentiate between direct and indirect drivers?

To really **make a transformative change in the system**, one must look beyond the direct drivers (e.g. land management on land degradation) and look at options to intervene in what indirectly influences that driver (e.g. tree and land tenure, information and awareness, need for short term production, and mindsets).

While we will not get too detailed in this course on differentiating between **direct and indirect drivers**, we will be looking at systems as well as carrying out **causal analyses** to unpack the underlying causes which can be direct and indirect.





## Agri-Food Systems

The main aspect of the chosen theme is agriculture. This requires considering:



What is happening within the agricultural system?

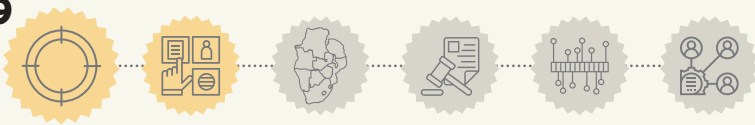
Can it be unpacked further?

What are the core elements and how do they relate to external systems and drivers of change e.g. technology, politics, natural environment, economy, and socio-cultural environment?

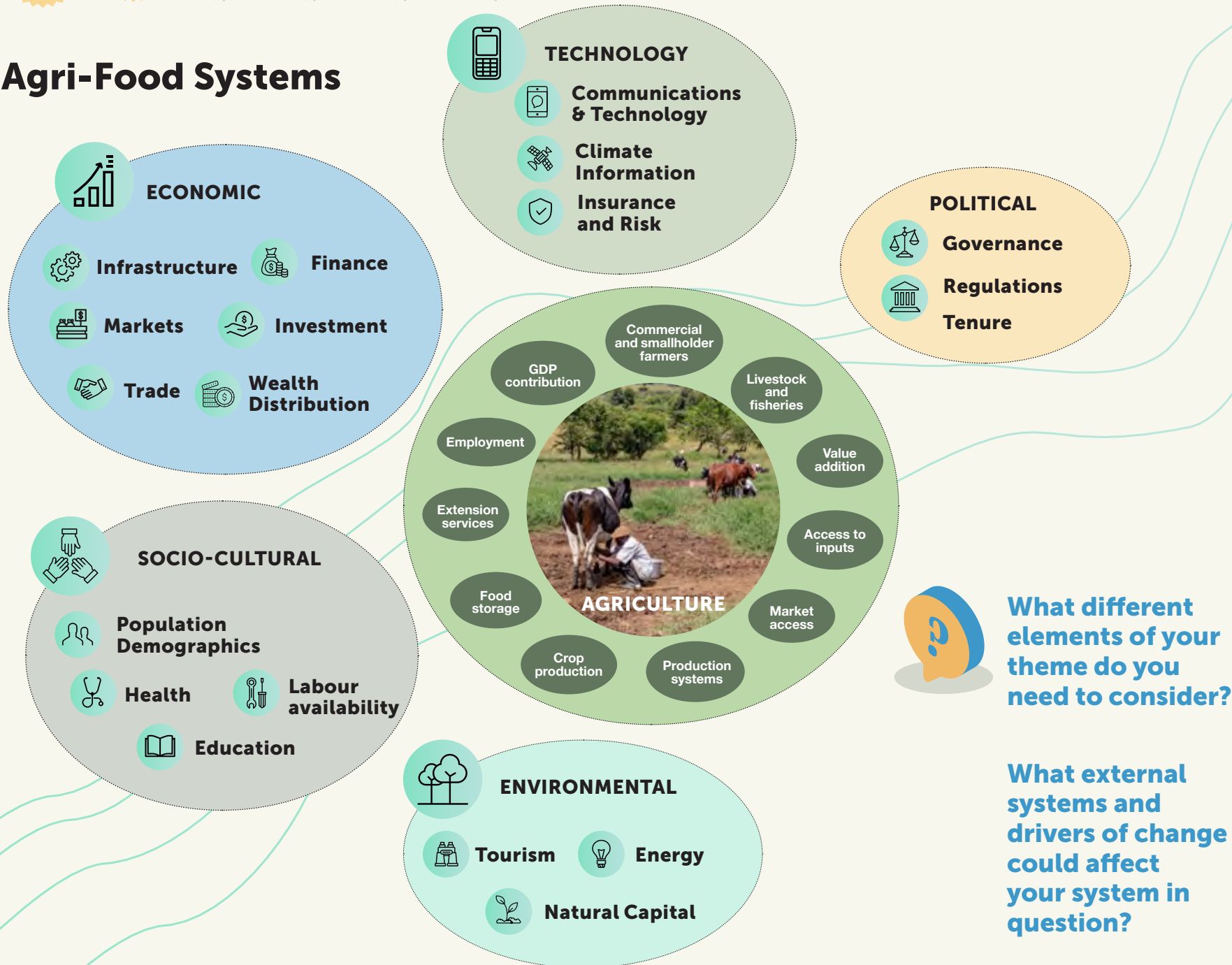
What data do we need to provide evidence to our question-what is happening?

The theme suddenly seems a bit **more complex**, it is not one dimensional. (A useful foresight tool for unpacking your theme is '**systems mapping**' which is covered under Module 2.)

Photo: Sonja Leitner (ILRI)



# Agri-Food Systems



## MODULE 01

### Introduction to Foresight



## Learning Exercise

Using a white board or a large piece of paper, start to write down your thoughts on what makes up, affects, or is affected by, the system at the core of your theme. Group the external systems and drivers of change according to categories for example technology, economic, political, environmental, or socio-cultural. The agri-food systems diagram provided on the previous page and the image provided and the associated questions can help to guide your understanding of this process.

**Now, let us break down the external systems and drivers further. For example, let us look at 'energy' within the 'environmental category' and start to unpack it. We could ask ourselves questions such as:**



- What is important to understand in terms of regional energy?
- Who has access to it and is there a divide between rural and urban access?
- How does access affect agricultural production?
- What is the regional demand for electricity like and is it changing?
- How is the region's electricity generated?
- Is it from predominantly non-renewable resources such as coal?
- How does this impact on climate change and ultimately agricultural production?
- What does the non-renewable energy sector look like?
- How is it changing?
- Is it affordable?





## Learning Exercise



Try to unpack the 'population demographics' and 'infrastructure' categories further. You can use the examples below to prompt you.

### Energy

- Access
- Electrification
- Demand growth
- Access to off grid solar technology

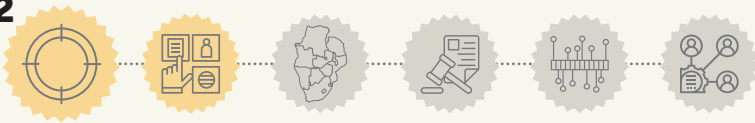
### Population Demographics

- Migration
- Growth
- Age
- Urbanisation

### Infrastructure

- Roads
- Dams
- Ports (trends, plans, status)
- Export zones
- Industrialisation trends/plans





We can now move on to the second part of the theme, '**climate resilience**'. To unpack climate resilience, we are first going to consider '**climate change**'.



## Climate Change

**Climate change** - is a **change in the state of the climate** that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer (IPCC, 2012).

**Climate change may be due to natural internal processes or external forcings**, or to persistent anthropogenic changes in the composition of the atmosphere or in land use' (IPCC, 2012). A key question to ask at this point is:



**What is the impact of climate change on the productivity of agri-food systems?**

Firstly, you need to **identify the different agricultural production activities** e.g. cropping, livestock rearing, and fisheries. The next step is to brainstorm how future climate change could affect these activities.



Photo: Geraldine Klarenberg (ILRI)

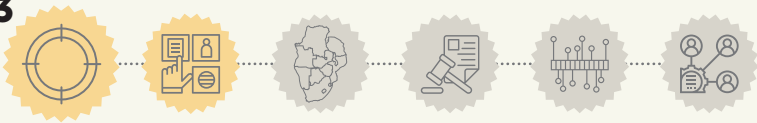
**You could ask questions such as:**

What impacts will change in ambient temperature, rainfall, extreme weather events, soil erosion and pests and diseases have?

How will climate change affect post-production activities such as harvesting, storage, and transportation?



**The results of the brainstorming session need to be documented, such as in the figures on the next page.**



### Production Activity

### Examples of Climate Change Impacts

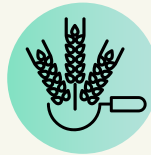
### Production Activity

### Examples of Climate Change Impacts



Growing Crops

Reduction in yields and quality of produce



Harvests

Post-harvest losses, difficulty in scheduling harvests, increase in pests and diseases



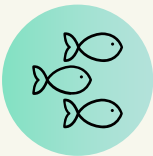
Livestock

Reduced availability of grazing in rangeland systems



Storage

Low rainfall affecting hydro energy production needed to power cold chains



Fisheries

Changes in ambient sea temperatures reducing fish stocks



Transportation

Damage to infrastructure due to flooding



Food Safety

Increase in infectious disease and mycotoxins



Marketing, Retail and Consumption

Limited agricultural produce with a high demand resulting in increased food prices



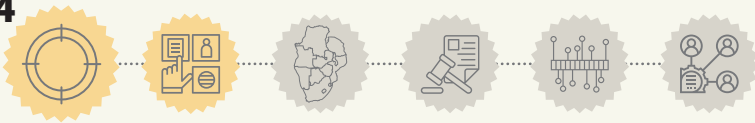
Overall System

Reduction in water availability and loss of soil fertility



**What other impacts can you think of?**





On the other hand, we also need to consider which processes in the agri-food systems release emissions that contribute to climate change. These could again be categorised according to production and post-production e.g. production - fertilisers, animal feed, agricultural practices, and post-production - processing, packaging, transportation, refrigeration, and consumer waste.



## Climate Resilience

Now that we have unpacked ‘**climate change**’ and how it affects, or is affected by, the **agri-food systems** we can investigate ‘**climate resilience**’.

**Climate resilience can be seen as a set of capacities that enables a system** (such as a farm, or a community / district, country or region) to prevent or respond to climate shocks and stresses. As mentioned previously, it is the ability of a system to ‘bounce back’ from the impacts of climate-related stresses or shocks.

In this light, the next step is to unpack **climate adaptative capacities of agri-food systems in the SADC region**.

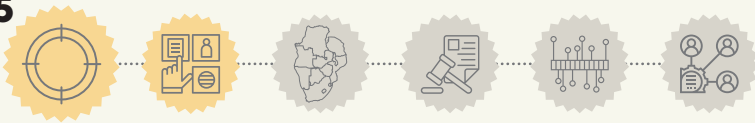
### Climate adaptative capacity

is a **combination of the strengths, attributes, and resources available to an individual, community, society, or organisation** that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities (IPCC, 2012).



Photo: Brigitte L. Maass (ILRI)





Firstly, group the adaptive capacities into **key categories** for example **infrastructure, governance, livelihoods systems and farm systems, people, and ecosystems**. Next, consider the following:

## Capacities to build a climate resilient agriculture system

What parts of the agri-food systems can be adapted to enhance resilience to climate change and how?

### INFRASTRUCTURE



Adaptive structures

### GOVERNANCE



Proactive institutions & organisations

### LIVELIHOODS & FARM SYSTEMS



Enhanced livelihoods and farm functioning



Capacity of people to adapt

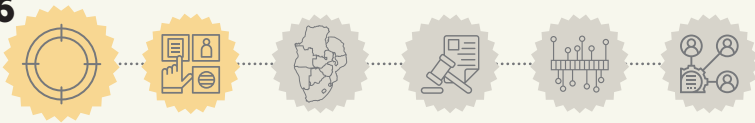
### PEOPLE



Ecosystem service that built resilience

### ECOSYSTEMS





**Examples of adaptive capacities for enhancing climate resilience within agri-food systems.** This is expanded upon over the following pages.

## INFRASTRUCTURE



Adaptive structures resilient to shock weather events e.g. increased water storage capacity for times of drought or coastal town infrastructure for handling flooding associated with cyclones.

## PEOPLE



Capacity of people to adapt e.g. harvesting locust swarms in East Africa for processing as chicken feed.

## GOVERNANCE



Proactive institutions and organisations e.g. capacity of local institutions to plan and prepare for extreme weather events.

## ECOSYSTEM



Ecosystem services that enhance resilience e.g. wetlands provide a buffer in the case of flooding.

## LIVELIHOODS & FARM SYSTEMS



Enhanced livelihoods and farm functioning e.g. alternative income sources from off-farm employment or diversification of agricultural produce.

## Themes and associated adaptive capacities that could be implemented to enhance climate resilience within agri-food systems.



### INFRASTRUCTURE



#### Physical Infrastructure



- Maintenance, early warning systems
- Land under irrigation
- Management of natural infrastructure e.g. wetlands, aquifers
- Water storage capacity
- Structural adaptation e.g. seawalls



#### Information, Knowledge & Technology

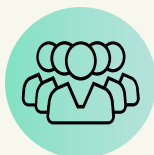


- Government expenditure on rural extension
- National statistical systems
- Climate information monitoring systems
- Number of researchers in science and technology (S&T), research and development (R&D)
- Level of tertiary education
- Mobile phone penetration
- Fixed broad-band internet subscribers
- Government expenditure on R&D



Photos: World Agroforestry (Left) Neil Palmer-CIAT (Right)

## MODULE 01 Introduction to Foresight



## PEOPLE



### Socio-cultural



- Values (equity, intergenerational responsibility, commitment to reducing climate change)
- Social awareness (of climate change, climate events, climate impacts)
- Level of health (especially malnourishment)
- Access to water/sanitation
- Gender equality
- Level of education



### Human Innovation



- Government expenditure on rural extension
- Government expenditure on R&D
- Mobile phone penetration
- Fixed broad-band internet subscribers
- Climate information monitoring systems
- Level of tertiary education
- Number of researchers in S&T and R&D
- National statistical systems



Photos: Olivier Asselin-FAO (Left) Neil Palmer-CIAT (Right)

# MODULE 01

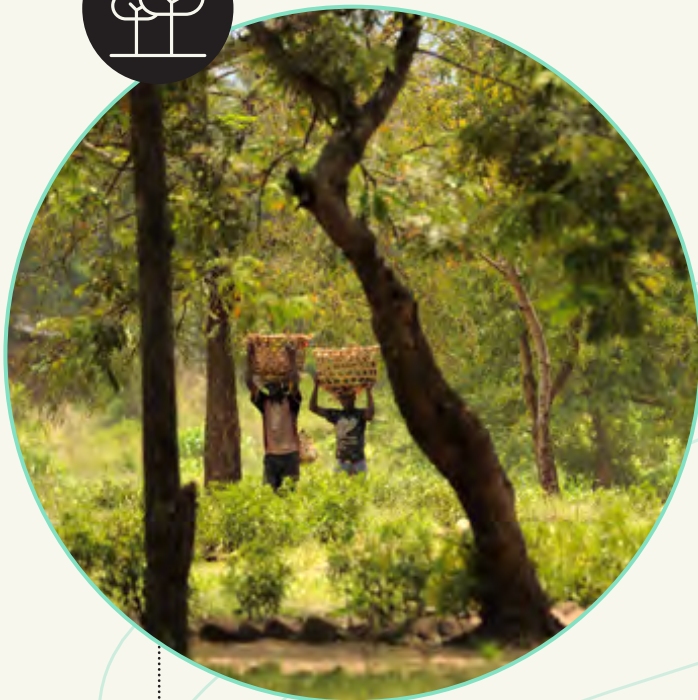
## Introduction to Foresight



## ECOSYSTEM



### Natural Resources



- Managing water availability and quality
- Diversity of crops / livestock / land use patterns
- Practice of sustainable land management (conservation agriculture (CA), climate-smart agriculture (CSA), agroecological approaches)
- Level of biodiversity
- Functioning of ecosystem services
- Intact forested areas and trees on farms



Photos: Daniel Hayduk (FAO)

# MODULE 01

## Introduction to Foresight





## GOVERNANCE



### Finance



- Ability to access climate finance
- Institutions and systems for managing funds, resource mobilisation and effective delivery
- Household access to financial institutions and services
- Household insurance coverage



### Governance



- Climate mainstreaming within policies and strategies
- Level of decentralisation and capacity of local institutions
- Flexibility within policy, legal, and institutional structures
- Land tenure policies
- Effective management of shared and cross-boundary resources
- Social networks (farmers associations, Civil Society Organisations (CSOs), cooperatives, social support systems)



Photos: C. Schubert-CCAFS (Left) Aulia Erlangga-CIFOR (Right)

# MODULE 01

## Introduction to Foresight



## LIVELIHOODS & FARM SYSTEMS



### Economy



- Flexible economic system to absorb internal migration, seasonal migration
- Off-farm employment opportunities
- Diversity of the economy
- Household savings and income



### Agricultural Assets



- Level of agricultural commercialisation/market integration
- Grain stores and livestock reserves
- Access and penetration of modern farming technologies, resilient crop varieties, fertilisers, irrigation



**Now that the theme is unpacked, we should have a more in-depth understanding of the context within which we are working.**

# MODULE 01

## Introduction to Foresight



Photos: S.Kilungu-CCAFS (Left) Neil Thomas-EADD (Right)





## Step 02 Setting the Geopolitical Boundary

**High-level gathering of data**, knowledge, and evidence is important in understanding the context of the chosen theme. The next step of the scope method, **Step 2, is to set the geopolitical boundary**. It is important from the outset to clearly **define the scale of the intended foresight exercise**. Are we zooming in to a specific project zone, or even a department in a Ministry, or are we scaling up and looking at a broader system with multiple layers and actors?



**At what scale does the theme occur i.e. is it at a global, continental, regional, national, district or project level?**

It is also important to **understand the dynamics of the scale** that you are working at, to do this you need to know **what is contained within your selected boundary**, this information can be split into categories such as:



**Geo-political** e.g. geographical situation of a country relative to other countries (and to the sea), topography;



**Socio-cultural** e.g. homogenous or heterogenous populations, rural-urban divide, migration;



**Environmental** e.g. diverse farming systems, natural resource availability, climatic conditions; and



**Economic** e.g. statistics related to Gross Domestic Product (GDP), poverty, inequality.



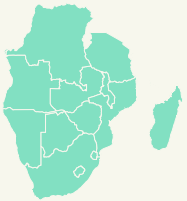


## Learning Exercise



To understand the dynamics within your geo-political boundary, print out or draw a map of the area covered by your theme.

1. Identify characteristics that are relevant to your theme.
2. Use information sources such as websites, knowledgeable persons, or books to provide detail on the characteristics of the area in question.
3. Add this information to the map so that you can visualise it. See the map on the following page as an example of how to do this.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the context of SADC climate resilient agri-food systems, the SADC regional boundary was selected. To enhance understanding of the region we investigated why it was formed and when. SADC is a regional economic community that was founded in 1992, it contains 16 member countries. The purpose of SADC is to facilitate regional integration, trade, and financial harmonisation, for a more competitive region.

**Regional characteristics** of interest in the context of the chosen theme include **population dynamics, land use and composition, poverty, food security** and **agricultural** systems.

The **SADC region** has a collective **population of approximately 345 million** people spread across a vast area.

The **population is young (55%), predominantly rural (55%) and poor** (43 million people living in acute poverty).

The average **GDP growth rate** is **2.9% annum, 38% of the land is agricultural** and **41% is forested**.

**Other examples of characteristics that could be considered include:** shared water systems e.g. the Zambezi River system, shared ecosystems e.g. the forests in the Chimanimani Transfrontier Conservation Area between Zimbabwe and Mozambique, as well as regional infrastructure such as the road and railway networks that connect neighbouring, member countries.



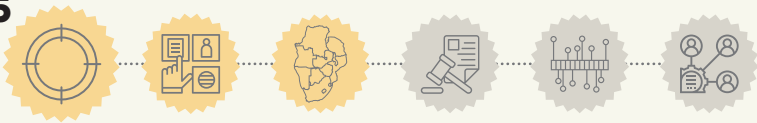


## What does the data tell us about the region?

The **socio-economic indicators** highlight the inherent **vulnerabilities, challenges, and opportunities** in the **geographical scope area**.



To develop a more **detailed understanding** of the region when envisioning potential future states, **we need to appreciate the national and local level differences, circumstances, priorities, and climate change impacts as each country** within the **SADC region** differs vastly from its neighbour, whether it be physically, biologically, socially, technologically, politically, or economically.



## Learning Exercise



Gathering information on each country requires further research, this can be done using online resources, knowledgeable persons, or books.

Again, it is useful here to print out or draw a map and add annotations to understand the different characteristics and where they occur.

For example, a small island state such as Mauritius would likely generate large portions of its GDP through its tourism and fishery sectors. Or as noted on the map provided, South Africa (the strongest economy in SADC) has lower poverty levels than Madagascar.

### MADAGASCAR



Agricultural Land Area  
71.2% of total



Forested Area  
21.4% of total



Agricultural GDP Contribution  
3.4%



Poverty  
81% of people earn less than \$1.25 per day



People Acutely Food Insecure  
44%

### SOUTH AFRICA



Agricultural Land Area  
79.8% of total



Forested Area  
7.6% of total



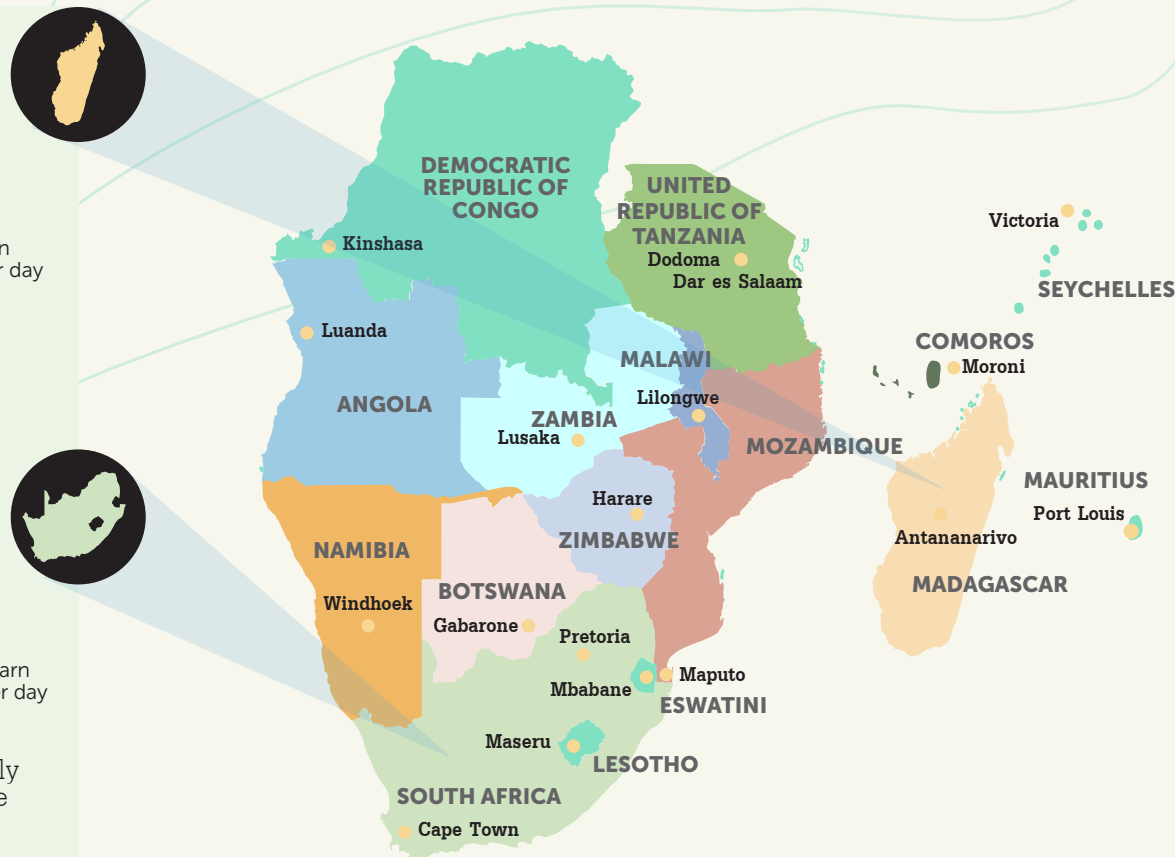
Agricultural GDP Contribution  
2.2%



Poverty  
18.9% of people earn less than \$1.90 per day



People Acutely Food Insecure  
29.2%





**Gathering information on your geographical area is an important step towards building a desired future**, by carefully looking at what leverage points one needs to tackle to create the change we want. In the context of the chosen theme, it is crucial to consider the diversity of the region such as the farming systems, climate resilience, and changing weather patterns (temperature and rainfall).

**Information gathered could include maps such as the farming systems map to the right.**

Other maps could be collected to understand weather systems, rainfall, and temperature patterns. The data and maps gathered for understanding the geo-political boundary and the dynamics within it provide 'evidence' for the foresight exercise.



Now that we have unpacked the geo-political boundary and have a **better understanding of the internal dynamics and member country diversity**, it should make sense as to why each country has different development plans and strategies.



*Figure 1.1 The farming systems of Africa.*

Source: GAEZ FAO/IIASA, FAOSTAT, Harvest Choice and expert opinion.

Note: The map refers to the year 2015; the island and the urban and peri-urban farming systems were not mapped.



## Step 03 Understanding Relevant Structures and Policies

The next step, **Step 3, of the scope method**, is to develop an understanding of the policy environment and governing structures at play, as foresight strategies are typically built on existing structures.



### Learning Exercise



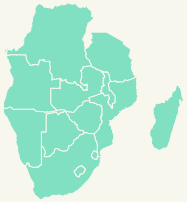
**This means thinking about your theme and identifying the institutions and key players in planning and decision making, and at what level(s) (global, continental, regional, national, provincial, project level) they are relevant to your objective.**

This step may require further information gathering using search engines or knowledgeable persons. It is important to pay attention to the publishing date, to determine the most recent policy and structural information.

Draw the different institutional levels on a piece of paper and indicate with arrows how they feed into each other. Annotate the diagram with information on key players such as those involved in decision making or policy implementation.







## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

**Climate change and agriculture related visions and policies occur at and transcend multiple scales** (global, continental, SADC, member state, provincial and local). Although the scope of this exercise focuses on the institutional levels of the SADC region and member countries, their respective policies and programmes feed into overarching continental and global aspirational visions.

For example, at the global level, the **United Nations Sustainable Development Goals (UN SDGs)** provide aspirational targets relevant to future agricultural development in SADC. These include:



These goals occur at the highest decision-making level, they are aspirational and long-term in nature. They seek a voluntary commitment from member countries (of which SADC countries are parties to) around the world and work towards a common vision. A similar global example is the **UNFCCC Paris Agreement on Climate Change**. Relevant examples

of implementing agents for the **UN** include the **World Food Programme, the Food and Agriculture Organization (FAO)** and the **International Fund for Agricultural Development (IFAD)**.

At the continental level, the **African Union (AU)** strives for regional cooperation at a broader scale than SADC. The **AU Agenda 2063** is an example of a climate change and agri-food systems related vision to which SADC members are a party to. Another example which involves the SADC member countries is the **AU's Comprehensive African Agricultural Development Programme (CAADP)**. These AU agendas and programmes feed into the global level visions mentioned previously as well as provide aspirational goals for the different African regions to aim to meet. The implementing agent for the AU's agriculture development and climate change related programmes is the **New Partnership for Africa's Development (NEPAD)** Planning and Coordinating Agency.

Examples of overarching global and continental aspirational visions and implementing agents relevant to climate resilient agri-food systems in the SADC region are provided in the diagram on the next page.



## GLOBAL LEVEL GOALS

SUSTAINABLE DEVELOPMENT GOALS



## UNFCCC Paris Agreement on Climate Change



## CONTINENTAL LEVEL GOALS



## AU Agenda 2063 - Comprehensive African Agricultural Development Programme



## REGIONAL LEVEL GOALS



**SADC Vision 2050**

**RISDP 2020-2030**

**SADC Climate Change Strategy and Action Plan**  
**Regional Agricultural Policy**



## NATIONAL LEVEL - POLICY EXAMPLES

**MOZAMBIQUE'S - Agricultural Policy and Implementation Strategy (1995)**

**SOUTH AFRICA'S - National Climate Change Response Policy (2011)**

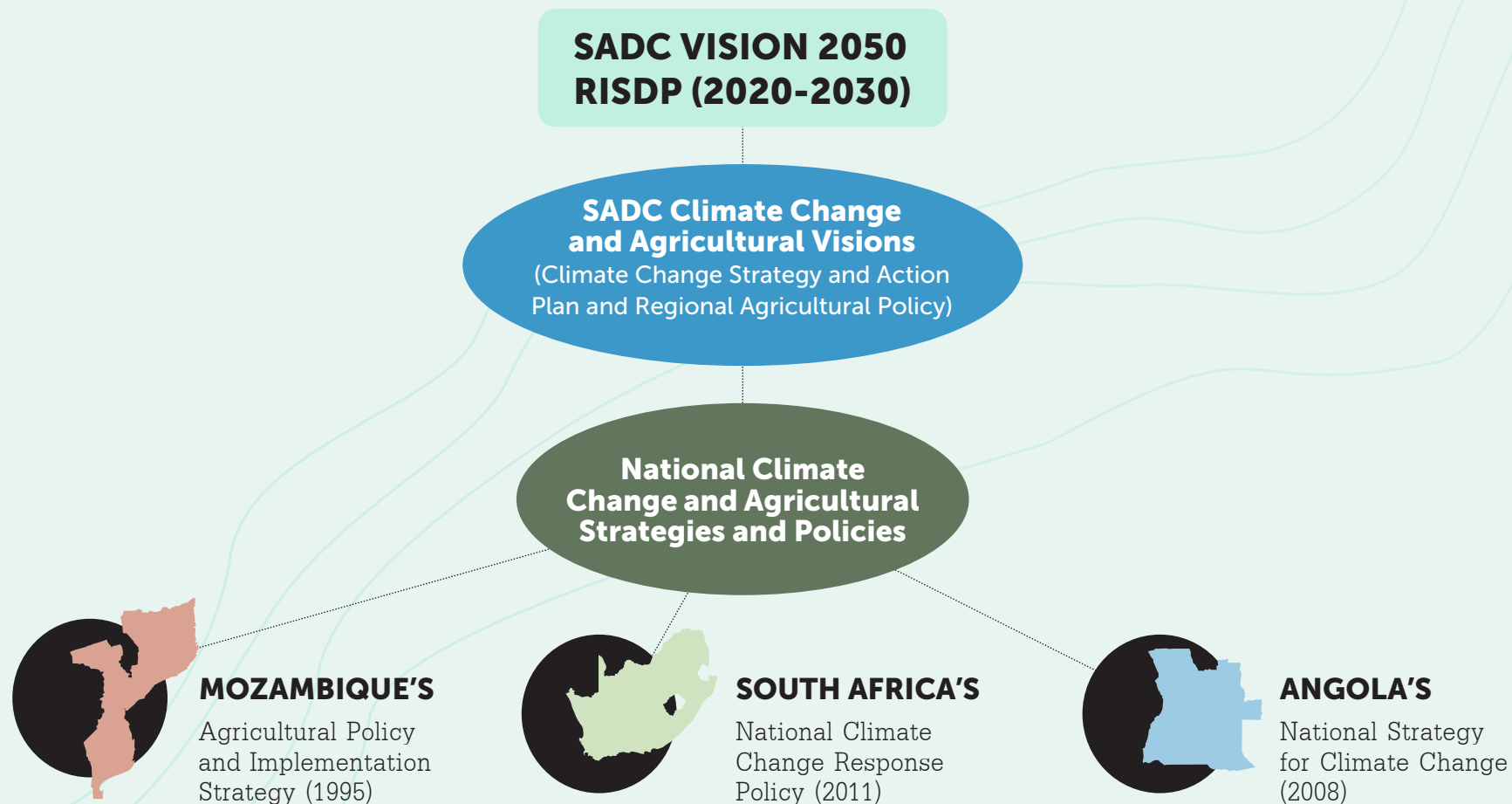
**ANGOLA'S - National Strategy for Climate Change (2008)**

We then consider the regional level, which includes examples such as **East African Community (EAC)**, **Economic Community of West African States (ECOWAS)** and **SADC**. The SADC region is specific to the scope of this foresight exercise. At this level we find important development visions such as the SADC Vision 2050 and the Regional Indicative Strategic Development Plan (RISDP) 2020-2030.

The RISDP is a 10-year road map that provides a strategic agenda for regional development and seeks to find common development aspirations and priorities for member countries inclusive of the thematic areas of climate change and agriculture. Other climate change and agricultural visions specific to the SADC region include the Climate Change Strategy and Action Plan 2015-2020 and the Regional Agricultural Policy (RAP) of 2014. These visions and plans feed into the continental level visions above as well as provide aspirational goals for member countries to strive to meet.



Examples of SADC visions and implementing agents relevant to regional climate resilient agri-food systems are provided in the diagram below.



**As part of Step 3 of the scope method we need to determine who defines the rules and who the key players in planning and decision making are.**





## Learning Exercise



**This step requires further information gathering using search engines or knowledgeable persons.**

Again, it is important to pay attention to the date when the information was published, to determine the most recent structural information. It is recommended that you draw or print out organogram structures relevant to your theme to visualise where the key players sit.

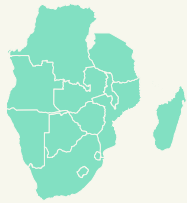
Highlight areas on the organogram that are of interest in the context of your theme.

The **SADC structure is split into two functions, steering (decision making at the highest level) and operational (where implementation occurs)**. The structure we are interested in for the purpose of the theme is the operational function which includes the SADC secretariat, directorates and associated thematic units that they are responsible for.

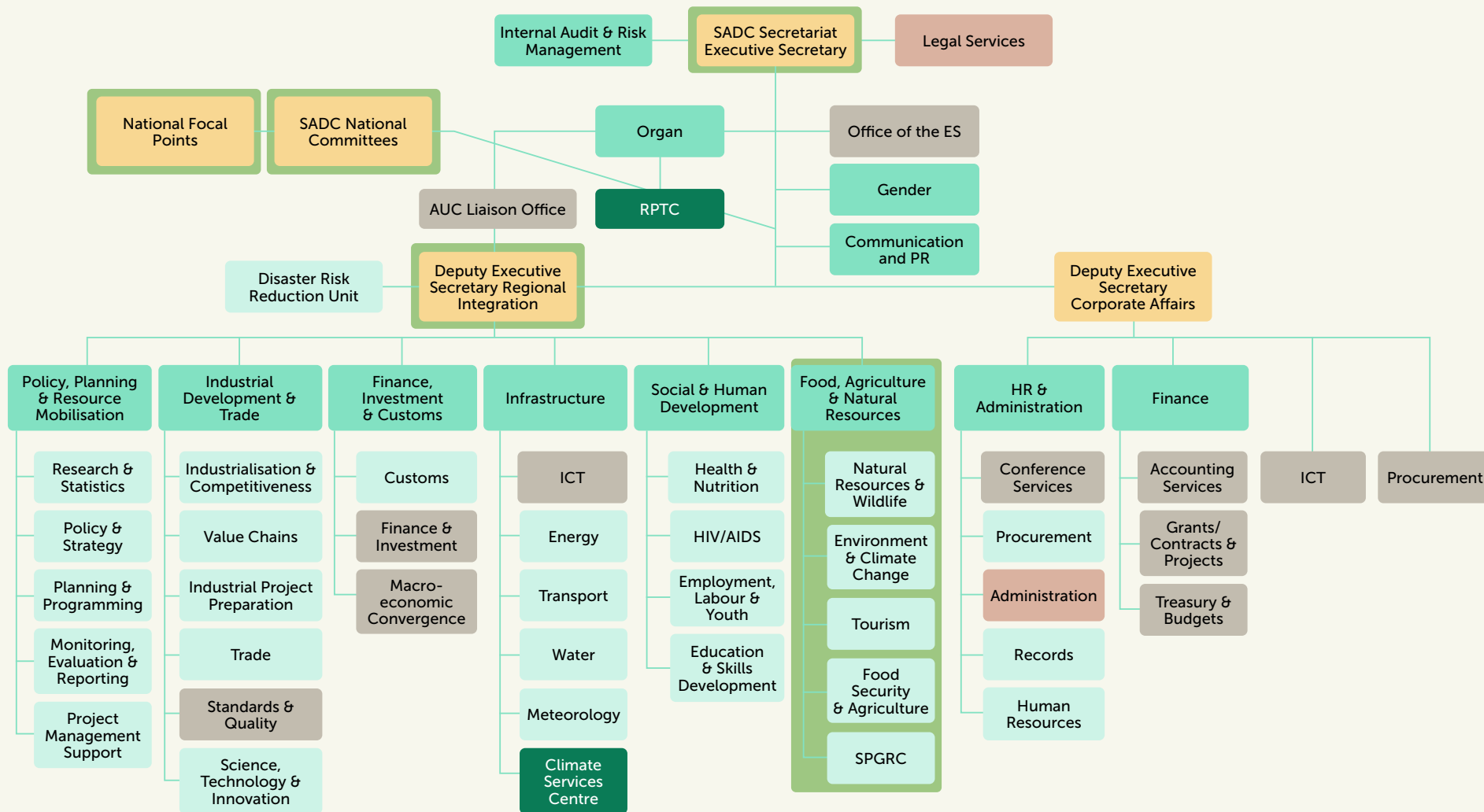
More specifically, we need to **focus on the Food, Agriculture and Natural Resources Directorate (FANR)** and the associated thematic areas of natural resources and wildlife, environment and climate change,

food security and agriculture and the **SADC plant genetic resource centre (SPRGC)**.

The FANR is responsible for the development and facilitation of agricultural and climate change related plans and policies for the region. However, other directorates such as 'Infrastructure' also house thematic areas of interest to the theme for example, energy, water, and transport development. We need to know where the thematic units relevant to the theme are positioned so that we know who makes the decisions and who to include in the foresight process.



## SADC Organisational Structure (SADC, 2017)

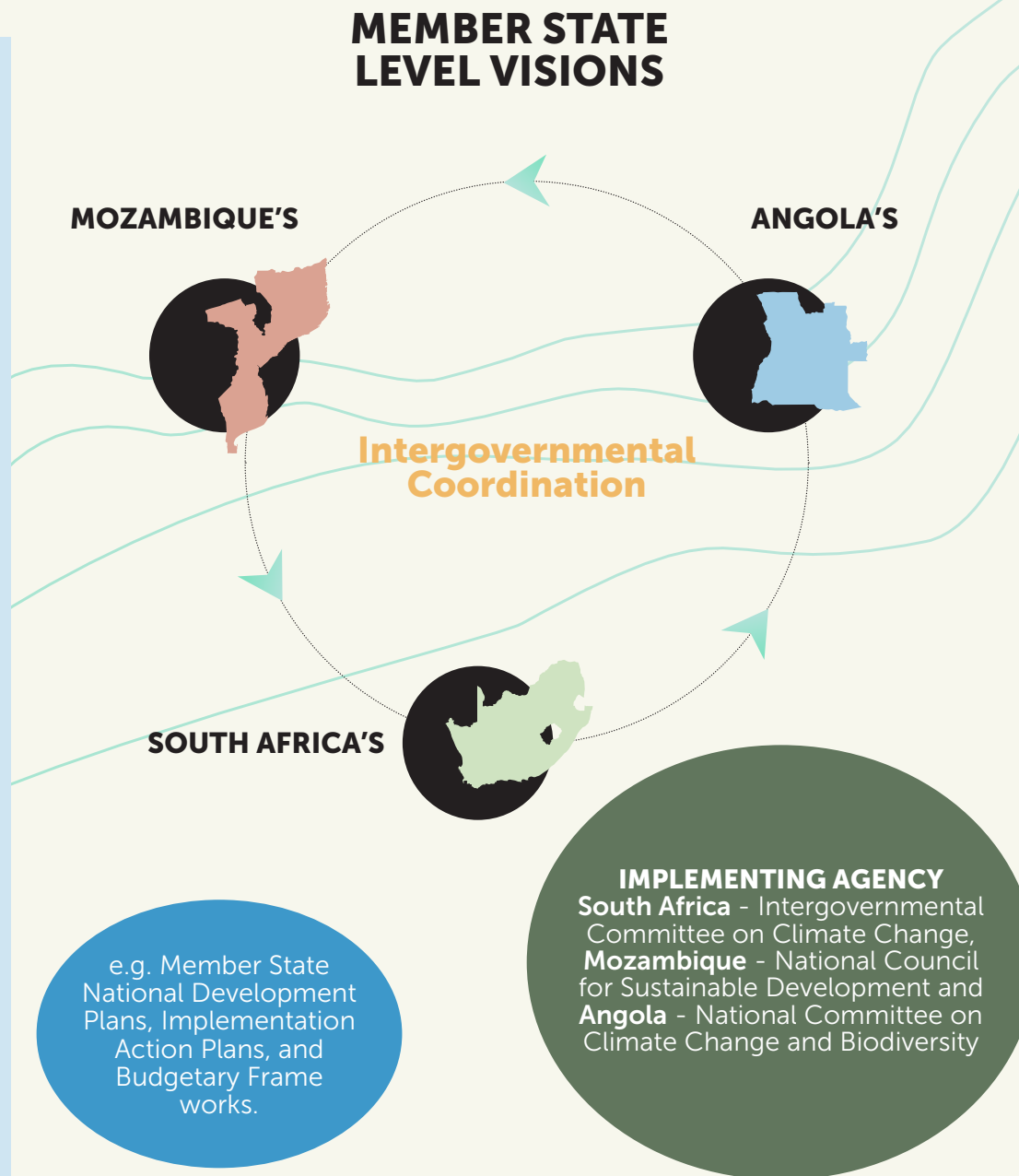




As we move down another level, we consider the SADC member country level. **Each member country has their own national vision as defined in their respective National Development Plans and accompanying Implementation Action Plans and Budgetary Frameworks.** Also, it is at this level that you would find the **Nationally Determined Contributions (NDCs)**, which are policies that domesticate the Paris Agreement.

The strategic plans at this level are short, detailed and are specific to the country in question. **The implementing agents for climate change matters vary by the country** for example South Africa's mandated body is the Intergovernmental Committee on Climate Change and Angola's is the National Committee on Biodiversity and Climate Change. All the member country national development plans speak to the SADC level visions, which in turn feed into the continental and global visions.

Examples of member country plans and implementing agents relevant to **climate resilient agri-food systems** are provided in the diagram on the right.

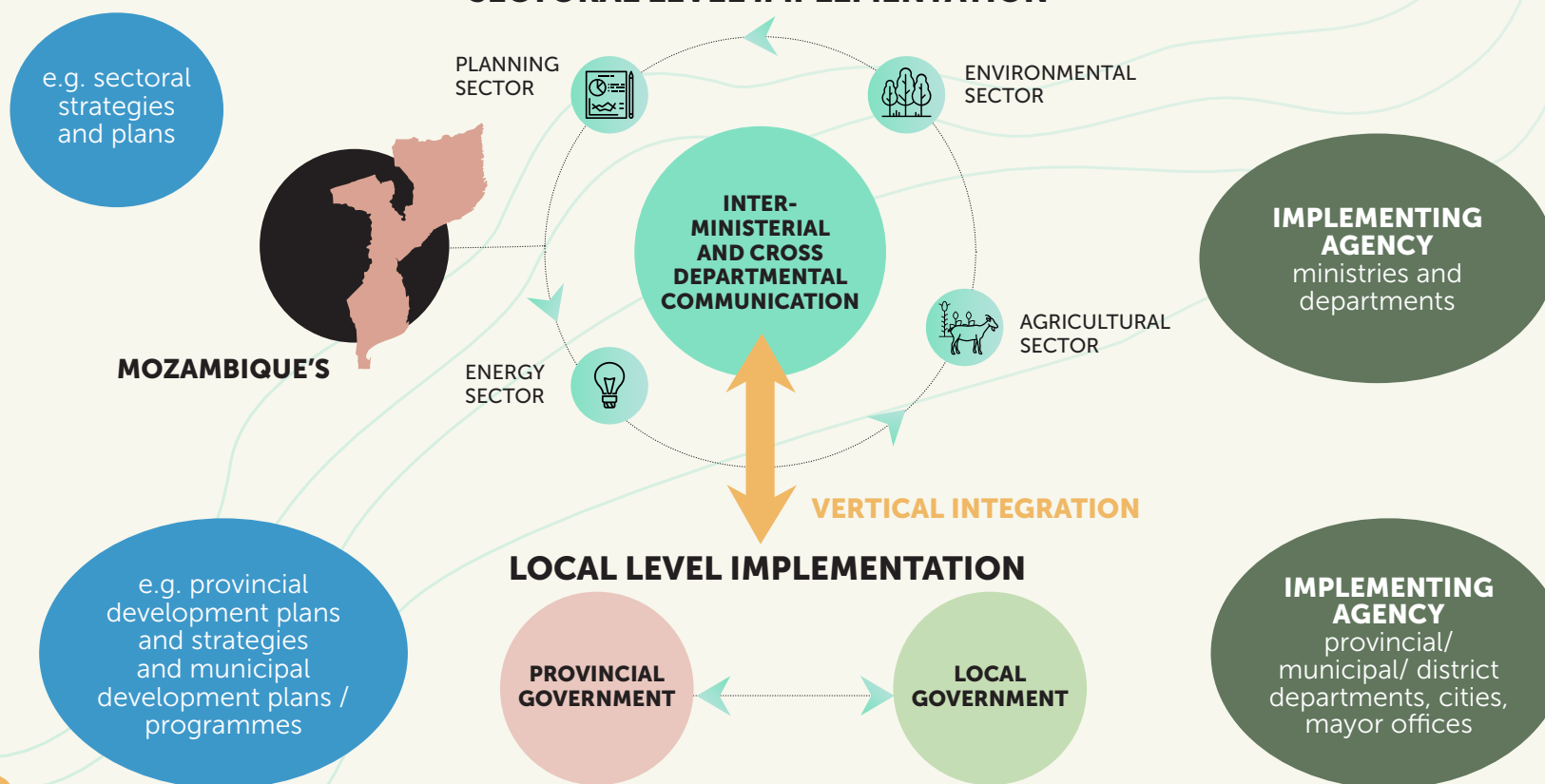






The last layers to consider, when attempting to understand the structures and policies relevant to the theme, are the **sectoral and local levels**. These levels are crucial for implementation. They include the **sectoral strategies and plans** into which provincial and **municipal development or local action plans feed**. Sectoral strategies and plans are aligned with the overarching national visions. Key implementing agents at the sectoral level include ministries and departments and at the provincial or local level they could comprise district/ municipal departments or mayoral offices. Examples of sectoral and local level plans and implementing agents are provided in the diagram below.

### SECTORAL LEVEL IMPLEMENTATION



Now you have a better understanding of the complex structures and policies relevant to SADC climate resilient agri-food systems, how they consist of multiple layers that feed into each other and how they incorporate numerous decision-making and implementation-level personnel. **Unpacking existing policies and structures to understand them is important in determining their relevance and applicability** to the futures envisioned during the foresight exercise.



## Step 04 Setting the Timeline

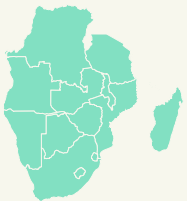
Still within the scope method of the foresight process, the next step is to choose a time frame relevant to the theme. **Foresight planning is often based on the time frames of existing strategic plans or policies.**



### Learning Exercise

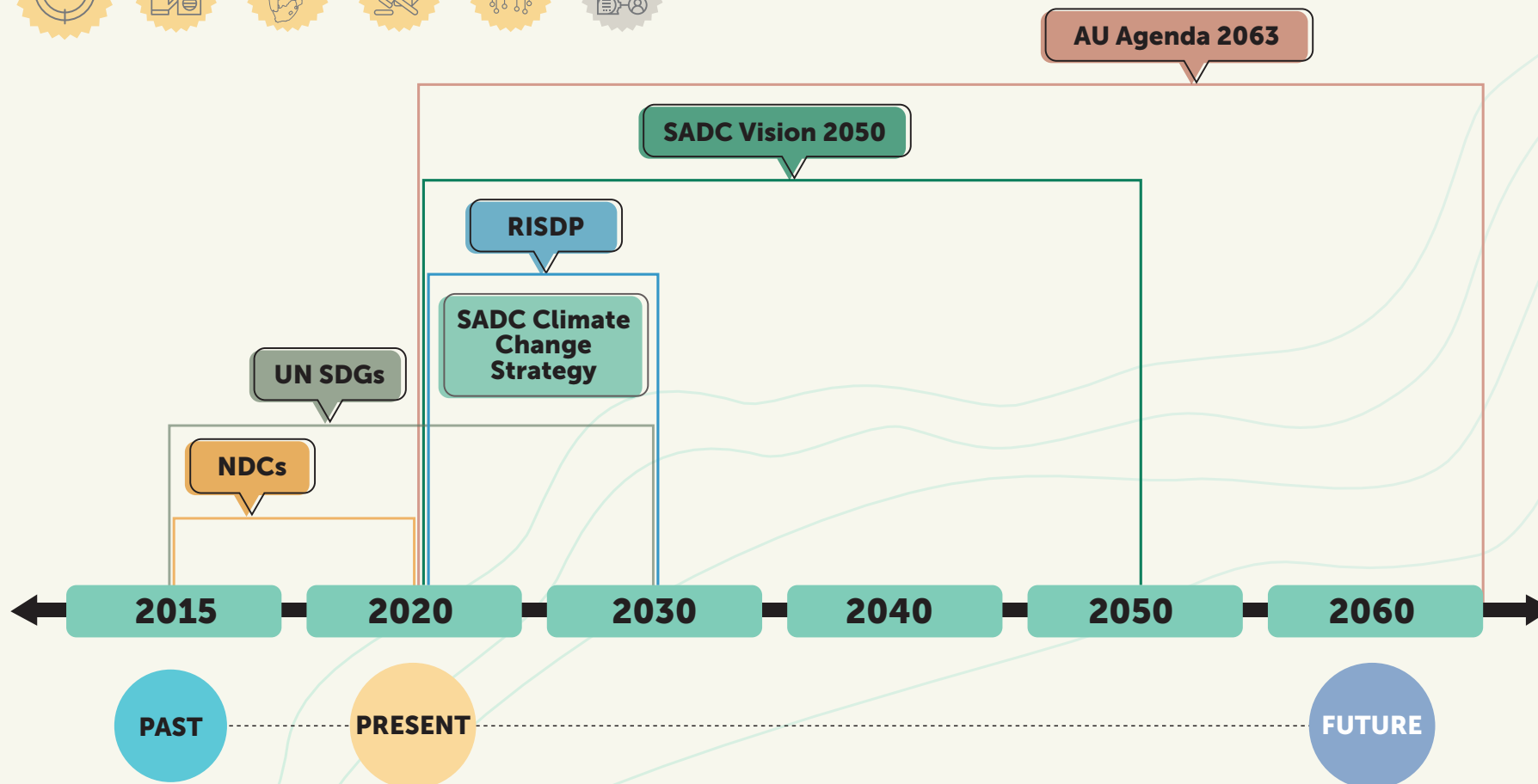


**Now that you have gathered information on the various visions, policies and plans relevant to your theme, draw a timeline on a piece of paper and display their different time frames and how they overlap. Which time frame best suits your theme?**



**Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region**

There are **multiple existing time frames to consider** in the context of **climate change and agricultural development in the SADC region**, see the time frame illustrated on the following page. These time horizons provide us with the **freedom to think about alternative futures.**



The time frame for the chosen theme could be based on the **UN's SDGs 2020-2030**, the **SADC RISDP 2020-2030**, the **SADC Vision 2050**, or the overarching **AU Agenda 2063**.



**Which strategic plan or policy do you think the SADC climate resilient agri-food theme should be based on?**

The existing plan and associated time frame determined to be most **relevant to the SADC climate resilient agri-food theme** is the RISDP. The **RISDP is one of the most important strategic documents for the SADC region** with a time frame that extends to 2030.



## Step 05 Mapping the Stakeholders

The **final step** of the scope method is ‘**stakeholder mapping**’. This is the process of **gathering information about the stakeholders** that are important to include in the foresight process. Stakeholder mapping is an exercise that enables us to **understand who the main actors are in the theme and how they relate to and influence one another**.



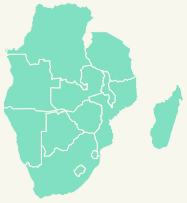
### Questions & Answers

#### What is the ideal stakeholder composition?

It is most important to clarify your theme and the **type of system** (e.g. community production for food security, policy development for increasing green jobs) you are working on. You can use **system mapping and stakeholder mapping** (Module 2) to identify key actors and look at **causal relationships** around key issue areas to identify key stakeholders to be involved in implementation. We are not inviting stakeholders just to have many actors in the room, we can work to understand those stakeholders that will be more strategic in terms of representation.

Bringing stakeholders to the table has its own transaction costs, but if you can get strategic stakeholders, what we do know from a trainer's/facilitator's vantage point, is the more diverse the stakeholders, the more perspectives and the more creativity. Think about the **perspectives** needed and the **potential relationships** you can be building in the foresight process.





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The **key groups of stakeholders** identified that are relevant to the theme include:



The stakeholder group list needs to be continuously reevaluated, by asking questions such as:



**Who needs to be at the table?  
Who has been excluded?**

**Who needs to be emphasised based on influence?**

Each stakeholder group plays an essential role for example, scientific communities generate knowledge, evidence-based information and bridge the science-policy interface. Government's role includes, but is not limited to, policy and legislation development, leadership and strategic decision making.

**What roles do you think the stakeholders relevant to your theme would play?**



**Commercial / Private Players**

Partnerships, innovation, economic perspectives, commercial resources



**Civil Society**

Advocacy, information sharing, awareness creation, advisory, capacity building, network building, change agents, voice of the people, affected and interested people



**Media and Journalists**

Advocacy, information sharing, awareness building, alternative perspectives



**Financial Institutions**

Project finance, understanding long-term investment risk, market solutions



**Not only do you need to identify stakeholders to include in your foresight process, it is also important to understand their relationships with each other i.e. what are they giving and what are they getting?**

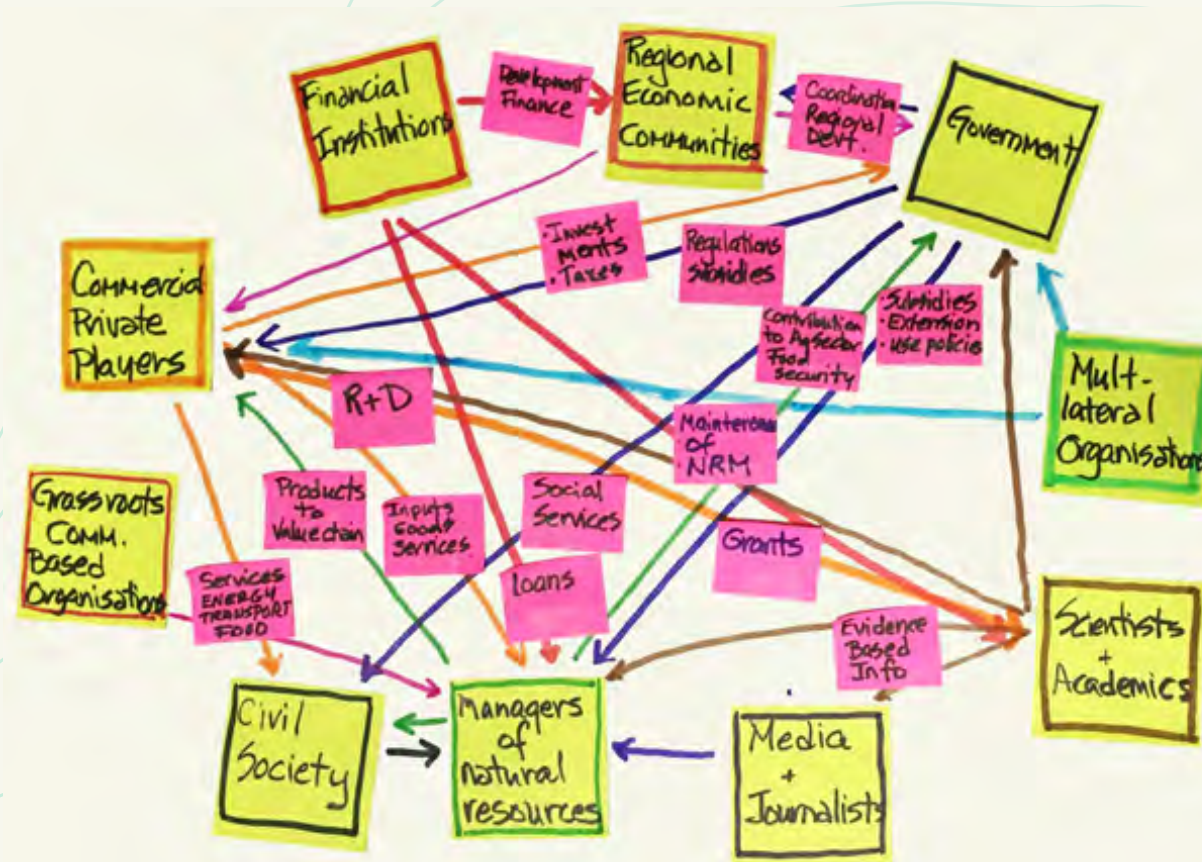


## Learning Exercise



For the stakeholder mapping activity, you need a white board, or Post-It notes and a large piece of paper. Using different coloured pens list the stakeholders relevant to your theme. Draw arrows between stakeholders that interact and label the relationships. Use colours to illustrate the driver of the relationship.

For example, in the stakeholder map below, the scientist and academic community (brown box) provide evidence-based information (brown arrow) to the media and journalists group.





When you are **identifying stakeholders relevant to your theme** you need to think out of the box and ask questions such as:



### Who are we missing?

### Who else needs to be included when considering future decision making?

Examples of stakeholder groups that are likely to be crucial to future decision making are women and youth, this is explained further below.



**Women disproportionately shoulder the risks and physical burden of agricultural production across SADC.** If women had equal access to land/other productive resources this could lead to improved food security and nutrition for small children at the household level.





**Youth have a renewed interest in intergenerational justice**, frustrated by the state of the world that has been left behind for them and future generations. Additionally, with the growing youth population in SADC it is going to be important to engage with them and receive their input for inclusive decision-making.

Lastly, it is important to understand and map influence. The exercise should document vested interests and power dynamics.



### When would it be best to use the foresight tools we are learning about, in terms of determining the role of youth in future food systems and building resilience towards climate change?

We are going to continue to stress youth and their role in climate resilient agriculture as we go along. **Youth unemployment and youth as consumers are important drivers in the agricultural food system** and the impact of climate change. There are several options that come to mind. It is as important as ever to have youth both involved in local and national decision making and of course involved in looking at their opportunities as we define our vision, our plausible scenarios, and the transformational elements that can increase their involvement and solution finding.

As you can imagine, developing green jobs and entrepreneurial opportunities that contribute to adaptation and mitigation to climate change will need to be operationalised and they will need to be done in a transformative way. So, determining the roles of youth in building resilient and sustainable food systems will be spread across our analysis, interpretation, plan, prospection, reflection, and strategy stages. The opportunities should start to emerge particularly in the last four stages.





Photo: Axel Fassio (CIFOR)



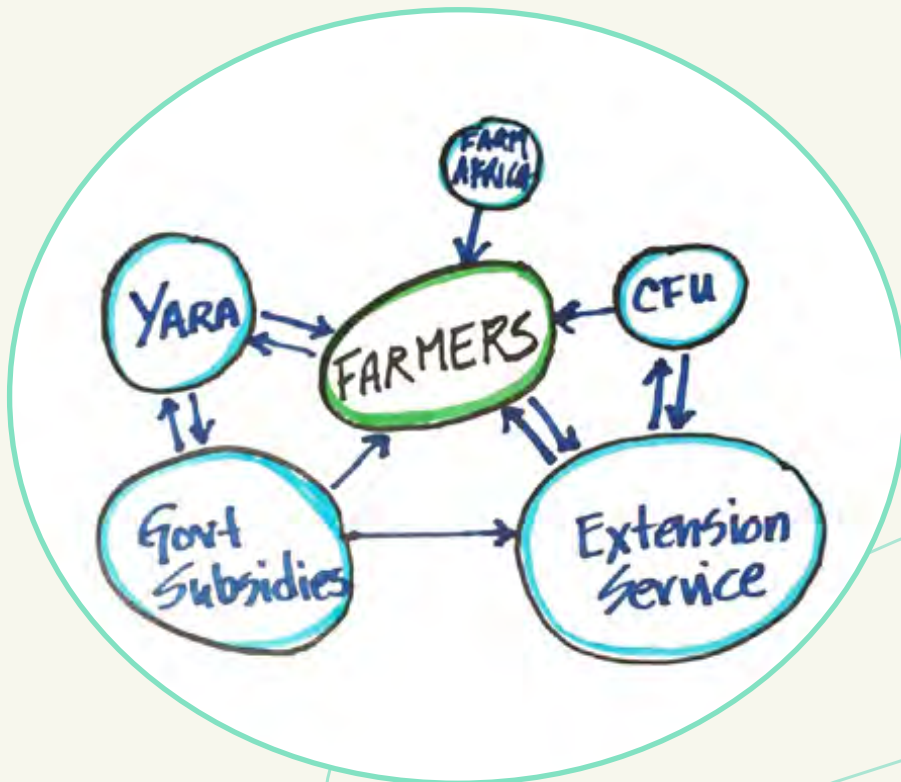
## Learning Exercise




**To map influence, draw your chosen stakeholders as circles, the size of the circles should correlate with the perceived importance or level of influence of that stakeholder in the theme. For example, extension service providers are drawn as a large circle in stakeholder map below as they are crucial to farmers.**

**The 'Conservation Farming Unit (CFU)' circle is smaller than that of the 'extension services' and 'government subsidies' but larger than 'Farm Africa' the non-governmental organisation (NGO).**

Next, you need to draw the relationships. The diagram on the following page shows that relationships can be one-way or reciprocal. For a one-way example you will see that 'government subsidies' are allocated to 'farmers'. For a reciprocal example, consider 'Yara', a company that manufactures and sells agricultural inputs that the farmers purchase.



It should be noted that the **stakeholder engagement process must be practical** and needs to take into **consideration several constraints** such as **finances, travel capacity, time, language barriers, and other access issues**. It is important to consider these constraints when identifying stakeholders and deciding on how many people to engage.



**You should now understand the process for setting the scope for foresight work and the dimensions of climate resilience in the SADC region.**

For further information on the geo-political boundary, structures, policies and stakeholders relevant to climate change and agriculture in the SADC region refer to the SADC Futures knowledge series supplementary report 'Structures, Policies and Stakeholder Landscape Relevant to Climate Change and Agriculture in the SADC Region'.





Photo: Axel Fassio (CIFOR)

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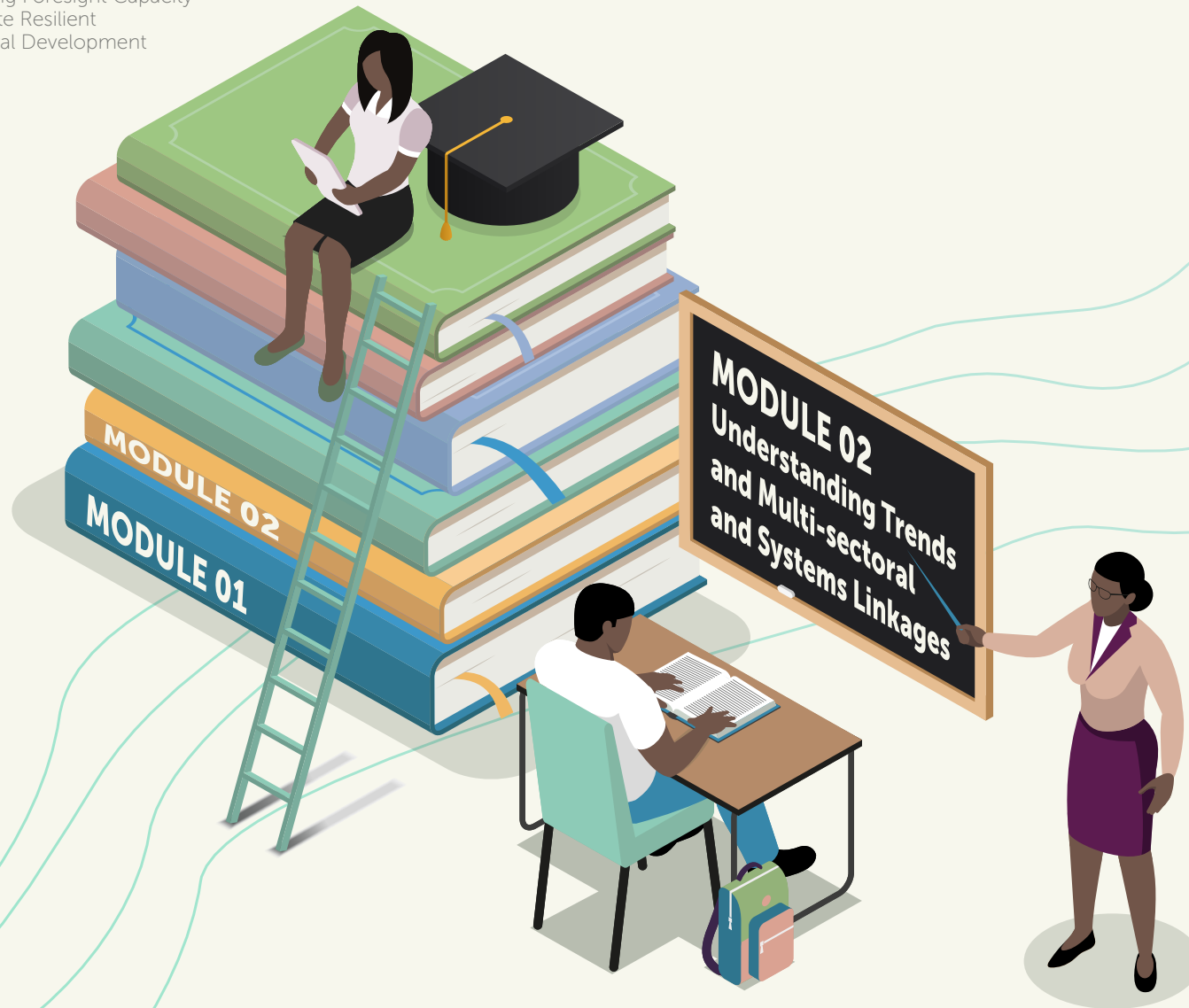
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## SADC Futures

Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



# MODULE 02 Understanding Trends and Multi- sectoral and Systems Linkages



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



Implemented by:







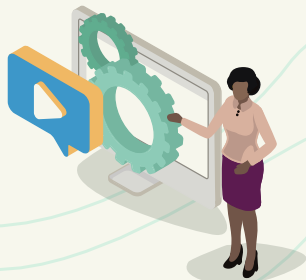
# What Will You Learn?

Module 2 covers the **analysis and interpretation stages of the foresight process**. The analysis stage is important for understanding ‘what is happening’ by using trends analysis, horizon scanning and evidence gathering. The interpretation stage then investigates ‘why it is happening’. The interpretation stage incorporates systems mapping as well as cross-sectoral and multi-stakeholder linkages. Throughout the module, examples of application of the foresight methods in the context of climate-resilient agricultural development in the SADC region are provided.

## The following steps will be taken:

- A historical analysis including the development of timelines to identify emerging patterns or signals of change;
- Interpretation of information obtained from trends analyses and horizon scanning activities, identifying where there may be gaps and how to deal with data uncertainty;
- An assessment of trends and drivers and how they may play out; and
- The importance of multi-stakeholder and cross-sectoral relationship building and engagement in foresight planning.

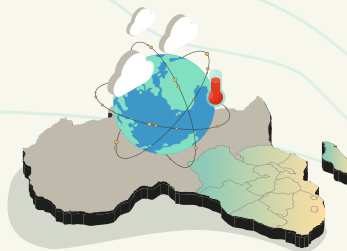
### Analysis Stage



Trends and Horizon  
Scanning Method



Evidence



Understanding  
Climate Risk

### Interpretation Stage



Mapping Systems  
and Sectors

## MODULE 02 Understanding Trends and Multi- sectoral and Systems Linkages



# Test Your Learning of the SADC Futures Foresight Framework

Before diving into Module 2, test your understanding of foresight and information provided in Module 1 by answering the questions below:



**What is your understanding of foresight and how do you define it?**

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## **Foresight is:**<sup>1</sup>

‘How one thinks about and anticipates the future.’

‘An estimation of best-case scenarios.’

‘Planning tools that help create clarity of sight into the future.’

‘A strategic approach for approaching future scenarios.’

‘Anticipating the future and planning to mitigate risks.’

‘The appropriate use of data to predict future scenarios.’

‘Helpful with future predictions.’

‘A system used to establish how to move towards a desired future.’

## MODULE 02 Understanding Trends and Multi- sectoral and Systems Linkages

<sup>1</sup>These responses are from the SADC Futures Webinar Series which was attended by participants from across the SADC region.

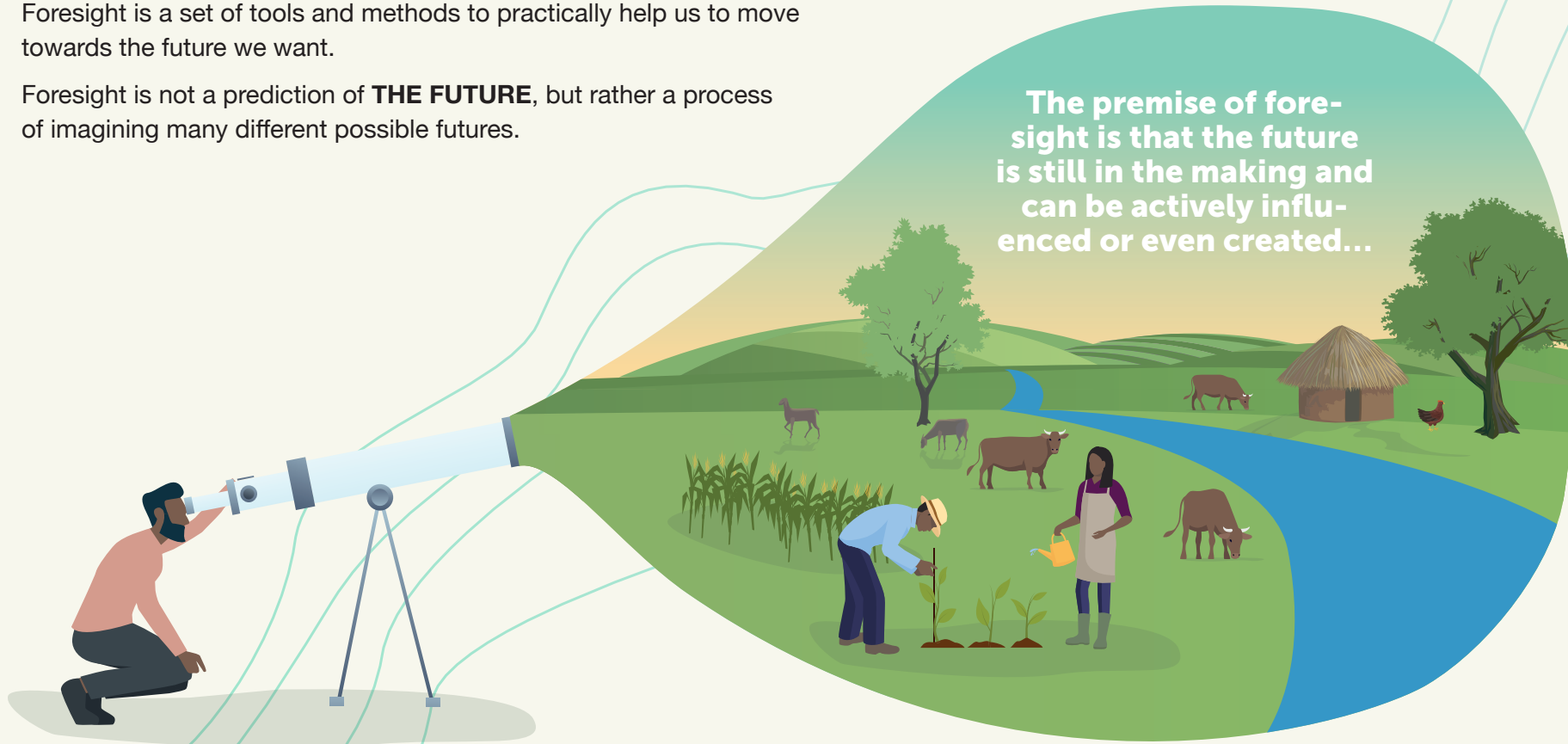


# Foresight

Foresight is a set of tools and methods to practically help us to move towards the future we want.

Foresight is not a prediction of **THE FUTURE**, but rather a process of imagining many different possible futures.

The premise of foresight is that the future is still in the making and can be actively influenced or even created...



## MODULE 02

### Understanding Trends and Multi-sectoral and Systems Linkages





# Analysis Stage

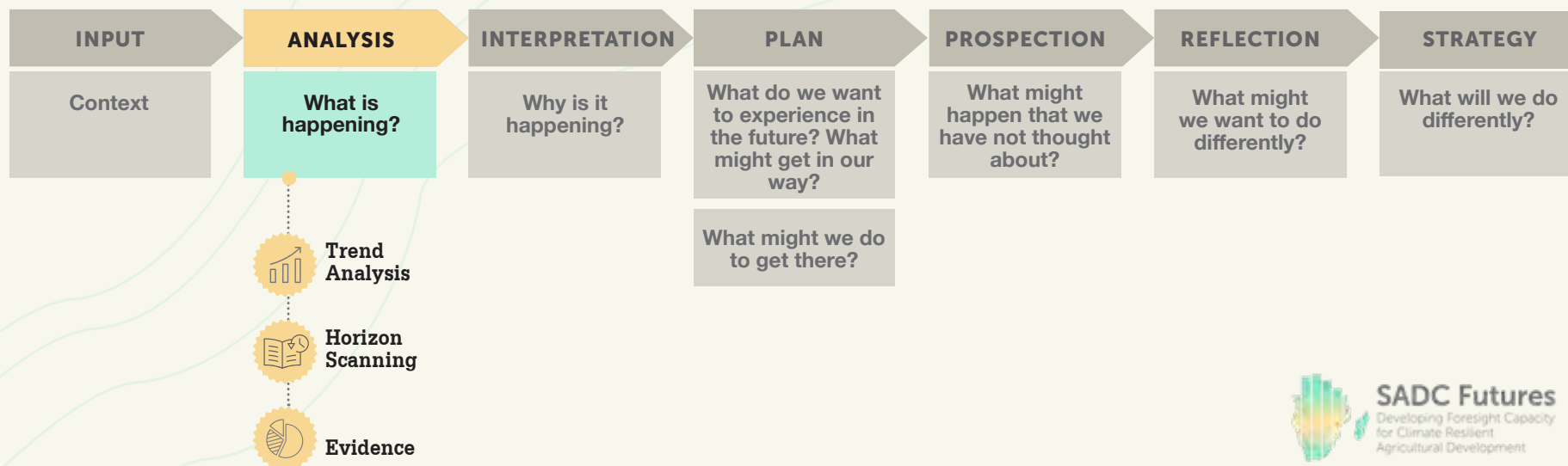
**The analysis stage of the foresight process follows on from the input stage.** The analysis stage deepens our understanding of what is happening around us in terms of influential historical events and key trends. Essentially, this stage involves the analysis of environmental scanning results to determine major change shifts that need to be explored to identify potential strategic implications (Thinking Futures, 2020). As this stage continues to explore the chosen context or theme, the key question remains the same as for the input stage:



## What is happening?

It is important to reiterate that concepts from each stage are carried throughout the framework i.e. the framework stages should not be viewed in isolation or only applied in the order of the framework given. Furthermore, there is no standardised way of doing foresight, the methods and tools chosen depend on the specific topic or theme, the scale and objective(s) of the foresight process and the questions to be answered (Bourgeois, 2012).

## Gathering and assessing information





# Trends Analysis

**Foresight planning involves identifying possible futures based on key uncertainties and trends of the past.** Trends analysis falls within the analysis stage of the framework, this is where we are trying to review key trends in relation to the scope we set for the foresight exercise.



**Trend** - is a general tendency or direction of a movement or change over time (Forward Thinking Platform, 2014).

Trends vary, they can be strong or weak; they can increase, decrease or be stable; they may continue into the future or they may not. Trends create broad parameters for shifts in attitudes, policies, and business focus over periods of several years that usually have a global reach. Therefore, they tend to affect everyone but most players, organisations or even nations cannot do much to change them (Saritas & Smith, 2011).

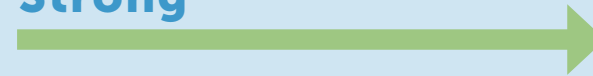
Drivers, trends, and megatrends are important components of foresight tools.



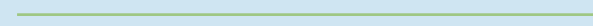
**Megatrend** - a trend that is apparent at a large or global scale e.g. growing youth population across the African continent.

When interrogating the future, it is important to examine the impacts of trends and drivers and their interactions, and the changes that would occur if different trends strengthened or lessened.

**Strong**



**Weak**



**Increase**



**Decrease**



**Stable**





### What is the method?

- **Collecting information on drivers and trends** and identifying which are most critical for consideration within the given topic.
- Trend analysis is a method that involves **reviewing historical data** to understand potential trends going forwards and what this means for shaping the future.



### Why apply it?

- This is when we are trying to review **key trends in relation to the scope** we have set for the foresight exercise.
- Foresight planning involves **identifying possible futures based on key uncertainties** and trends of the past.



## Historical Analysis

There are two key steps for undertaking **trends analysis**, these include historical analysis and reviewing existing data. The review of existing data is carried out in multiple stages of the foresight process. These steps are broken down further as follows:

### Key Steps to Analysing Trends

#### Historical analysis:

- Developing timelines.

#### Review existing data:

- Desktop study;
- Statistical models;
- Key informant interviews;
- Surveys; and
- Workshop discussion.



**What time frame is relevant to the chosen theme? How far back do I need to go? What should I focus on?**

**Historical analysis involves looking at what has happened over a relevant, prescribed timeline** to try to understand why current and future patterns are emerging. This is done by reviewing relevant events, stakeholders involved, processes, and patterns that occur within the chosen historical timeframe. Ideally the research is conducted with the involvement of a wide range of actors to gather information on events as experienced by them. To carry out this step you need to build a timeline, this requires thinking about:



## Learning Exercise



**Think about your theme** and what your time frame should be. Consider how valuable data from 10, 20, 50 years ago would be.

Think about when you were **unpacking your theme in Module 1**, what drivers of change did you identify?

**Use this information to develop topics for your timelines.** Draw a line on a piece of paper, the first marker on the line should denote the furthest point in time that you need to revisit. The last marker should be the present year. Based on how far back in time you want to go, split the timeline into sections e.g. decades. Use information gathered from books, knowledgeable persons, journals, and reputable websites to populate the timelines. Annotate the timelines with information on the scale or magnitude of the occurrence e.g. did the disease outbreak cause the loss of 2 lives or 2000?

**Use the timelines given below to guide you.** Now study your timelines, what are they showing you? Are there any obvious patterns or signals of change?



## Questions & Answers

### Who should do a trends analysis – a specialist?

It depends, sometimes no data is prepared before the workshop is held. From experience, it is preferential to **prepare data beforehand as it allows people to get involved in the analysis and discuss findings**, which is valuable to the process. If the scale of the analysis is small e.g. district level, it can be beneficial to meet with community members prior to contracting a specialist, as the community input can assist in focusing the analysis.





Photo: Ake Mamo



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The **historical time frame selected as appropriate to the theme of climate resilient agri-food systems in the SADC region** is 50 years. The focus of the timelines are on external systems or drivers of change likely to impact the productivity of regional agri-food systems. Subsequently, the chosen topics for the timelines include climate change (droughts and flooding), agricultural pests and diseases, human health, trade, political past, and conflict. Refer to the supplementary report 'Historical Analysis of Climate Change and Agricultural Events in the SADC Region, 1970-2020' for the historical timelines and detailed descriptions of events. Examples of some of these timelines are provided in the following pages.



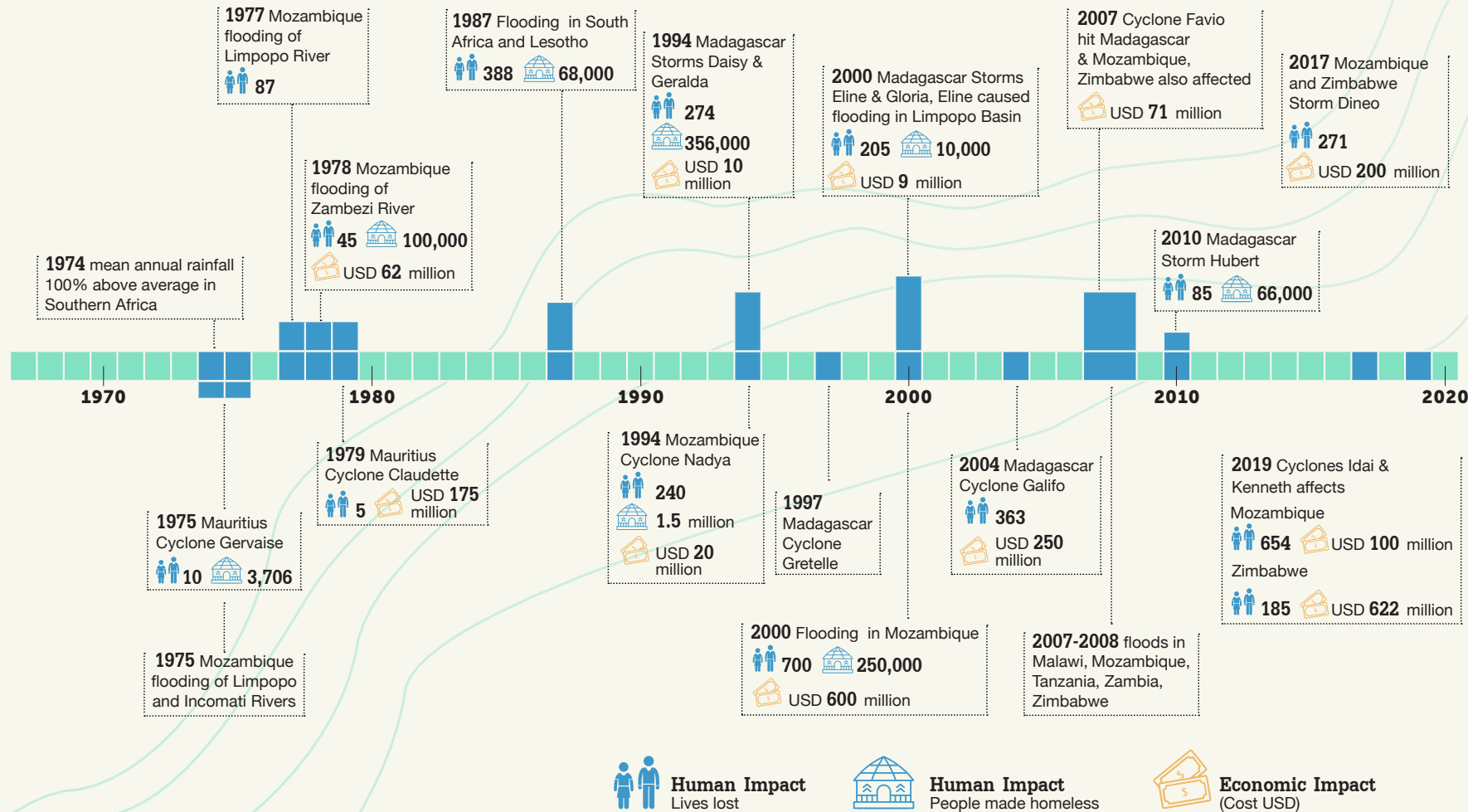
Over the period 1980-2015, SADC experienced 491 recorded climate disasters that resulted in 110,978 deaths, rendered 2.47 million people homeless and affected an estimated 140 million people (Davis-Reddy & Vincent, 2017). Floods disproportionately affect communities with poor infrastructure and health services where they often result in a loss of life, damage to property and infrastructure as well as disease outbreaks such as malaria and cholera.

This timeline provides evidence on the frequency of cyclone and flood occurrence in the SADC region. It is evident that the coastal country of Mozambique and the islands of Madagascar and Mauritius are repeatedly affected.



# Cyclones and flooding

This timeline provides **evidence on the frequency of cyclone and flood occurrence in the SADC region**. It is evident that the coastal country of Mozambique and the islands of Madagascar and Mauritius are repeatedly affected.

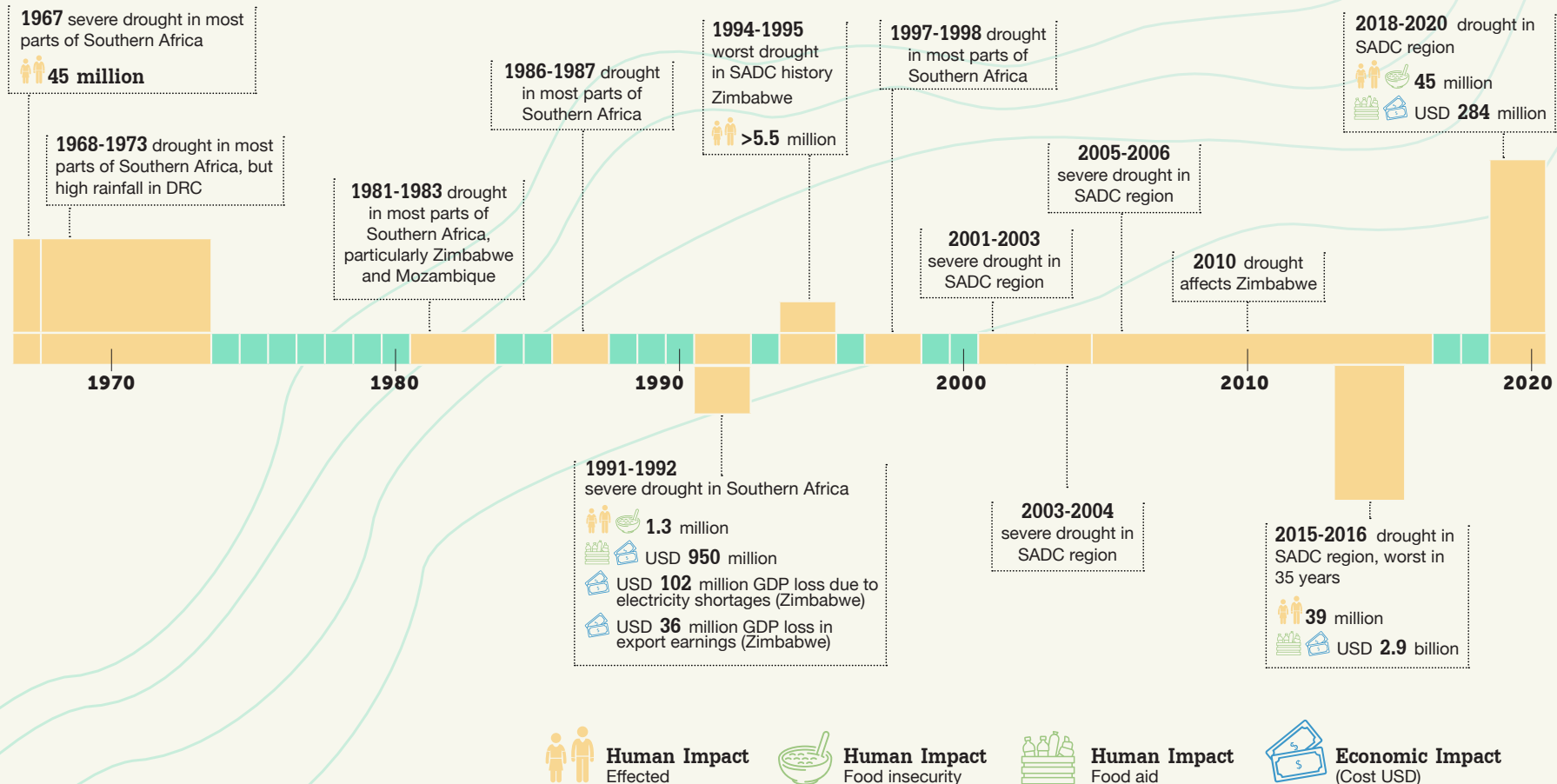


The pattern of severe droughts in Southern Africa (such as those of 1982-1983, 1991-1992, 1997-1998 and 2014-2015) has been linked to the El Niño-Southern Oscillation (ENSO) phenomenon (Davis-Reddy & Vincent, 2017). The impacts of droughts in the region are exacerbated by land degradation, poor water conservation practices as well as political instability and poor economic growth. As Southern African economies are dependent on rain-fed agriculture they are more vulnerable to droughts.



# Drought

The historic timeline shows that **drought has been a common occurrence in Southern Africa and the SADC region** in particular, over the past 50 years. In comparison with the cyclones and flooding timeline, drought appears to impact larger areas, often affecting whole regions or multiple countries at a time.

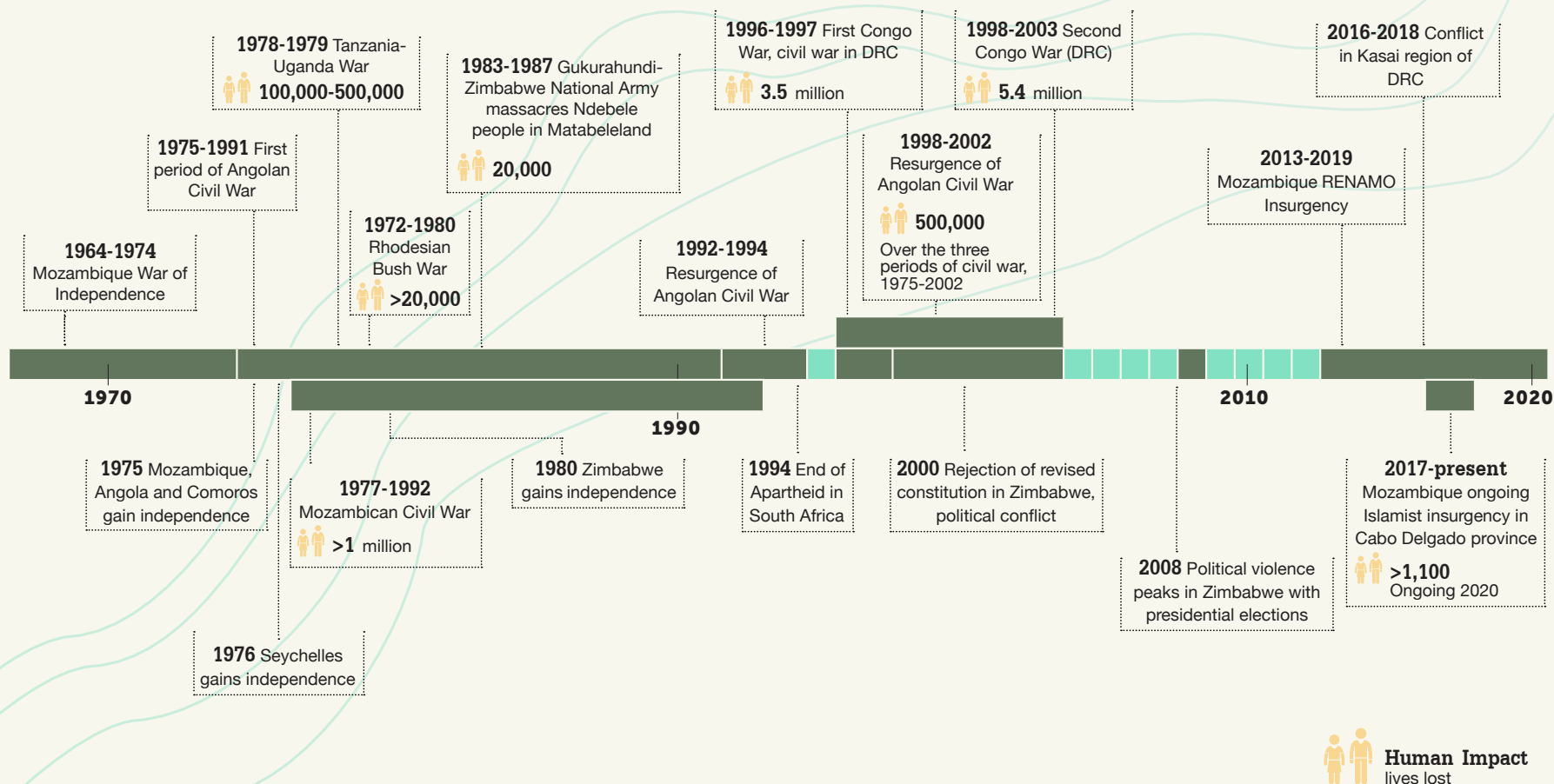




# Political Past and Conflict

Africa's politics are famous for instability with military coups, genocides, and civil wars. **Agricultural production tends to drop substantially in regions affected by conflict**, due to adverse effects on labour supply, access to land and access to credit and/or direct effects on capital such as theft and destruction. On the other hand, food shortages and price increases are often perceived as due to poor governance and can result in a breakdown of state authority (Martin-Shields & Wolfgang, 2018).

The political past and conflict timeline shows that conflict has been a reoccurring issue in Angola, Zimbabwe, Mozambique, and the Democratic Republic of Congo (DRC).





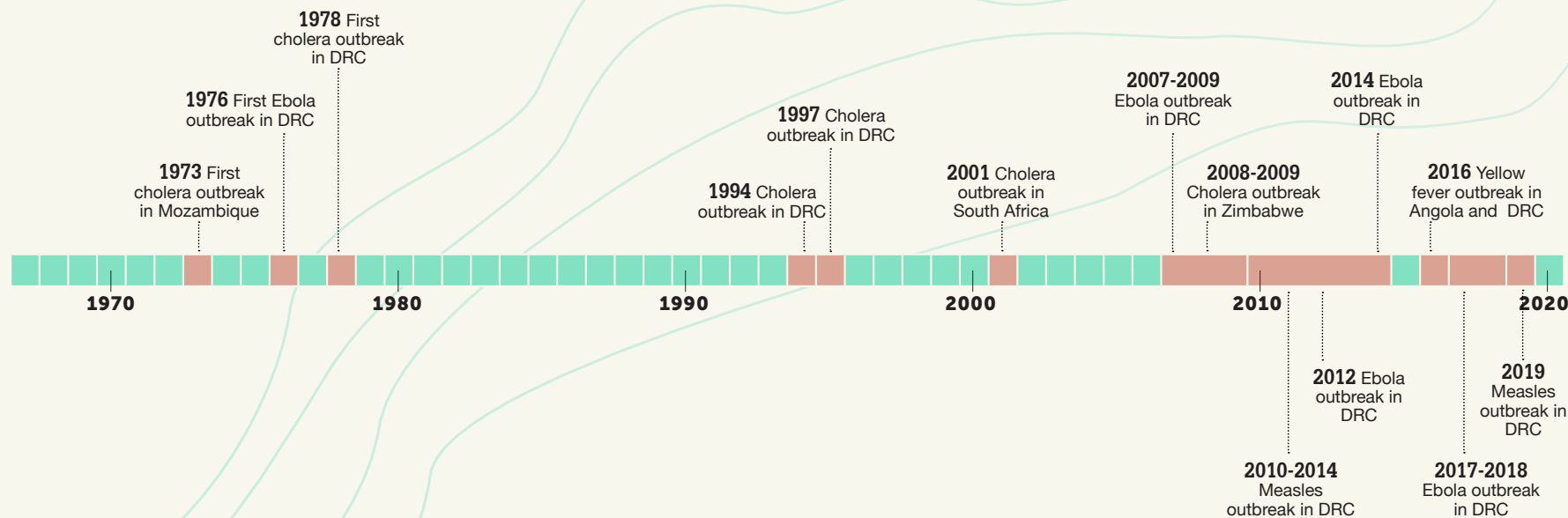


# Human Health

**Climate change has both direct and indirect impacts on human health.** Flooding provides breeding grounds for insects and causes water contamination, leading to the spread of vector-borne and diarrheal diseases such as cholera. Furthermore, droughts and floods affect crop yields resulting in food insecurity and malnutrition thereby lowering immunity and enhancing the vulnerability of affected communities. Studies have shown that people suffering from food insecurity are at a higher risk for infectious and noncommunicable diseases and have poorer health outcomes (Kelly et al., 2018).

Food shortages can force poverty-stricken people to consume alternative foods such as bushmeat. According to USAID, 'nearly 75% of all new, emerging, or re-emerging diseases affecting humans at the beginning of the 21st Century are zoonotic', meaning they originate in animals. Such diseases include AIDS, SARS, H5N1 avian flu, H1N1 flu and presently, COVID-19.

The human health timeline shows that the DRC is a hotspot for communicable disease outbreaks, this trend may also be linked to the reoccurring issue of conflict.



## Learning

**Historical analysis through building timelines enables you to see if there are emerging patterns or signals of change.** The patterns and signals provide 'tips' on where the system is heading.



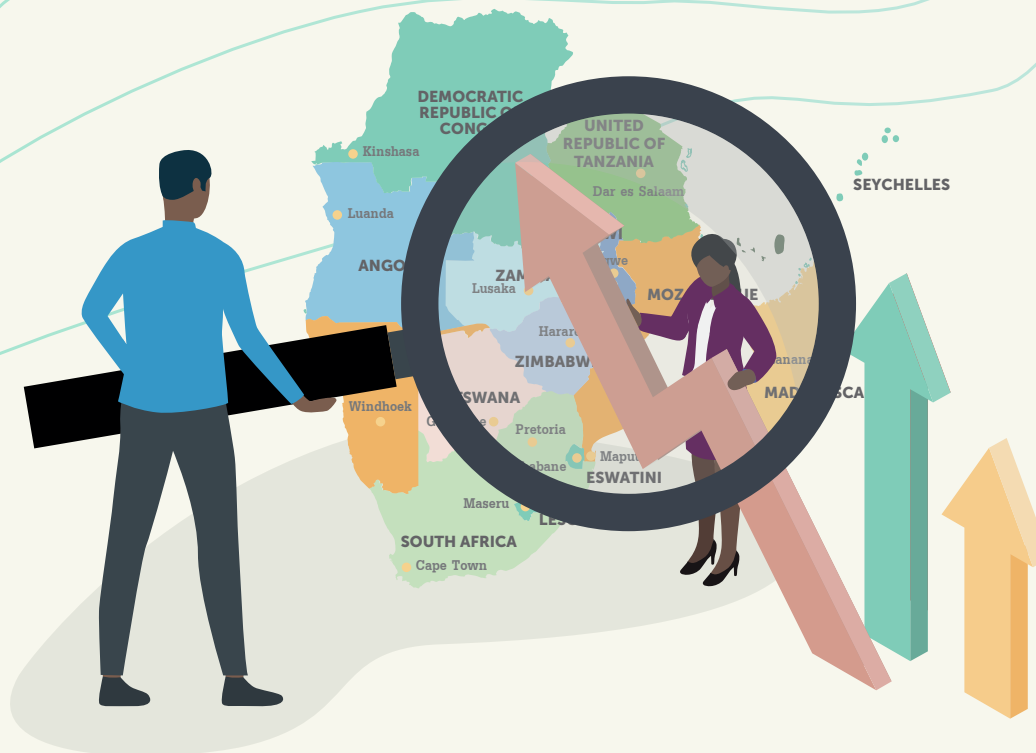
## Reviewing Existing Data

For this key step, think back to when you **defined the scope**, the context of the issue at hand and what could influence it. Here you want to **gather information on how the drivers that are influencing your system** are changing it i.e. the trends.



### How are the drivers that are influencing the system in question changing it?

Much of the information needed to carry out this step comes from existing data or published reports but may also require interviews. **It is important that information and data gathered comes from reliable sources.** The topic of trends will be explained in more detail in the section on horizon scanning.





# Horizon Scanning

Horizon scanning is still within the analysis stage of the foresight framework. **Horizon scanning is essentially a process of pulling together information from a variety of reliable sources** (e.g. literature reviews, online surveys, quantitative models, or expert opinions) to identify potential signals of change and future impacts resulting from identified trends. The information gathered should be summarised into major categories to help facilitate understanding of how drivers may impact outcomes.



## What is the method?

- It requires undertaking a **rigorous analysis** of trends to explore their impacts.
- It is a process of **examining diverse information** sources to identify potential signals of change and future impacts from trends identified.
- It explores how **trends** and developments might combine and what impacts they might have.



## Why apply it?

- It is **complementary to trends analysis as a method** and deepens a trends analysis to scan horizons for emerging issues and analyses their potential impacts

Two key steps for undertaking horizon scanning are provided below, these are just two of many methods that could be used.

## Key Steps for Horizon Scanning



Summarise trends into major categories; and



Analyse key questions.





# Step 01 Summarise Trends into Major Categories

Horizon scanning information is summarised into major categories to help facilitate the understanding of how drivers may impact outcomes. Categorising trends in accordance with given themes forces us to consider unfamiliar areas and cover all bases. It ensures that we think beyond our subject of specialty or interest. A commonly used categorisation method is 'STEEP' which denotes Social, Technological, Economic, Ecological/Environmental, and Political. It is possible that some trends will fit into more than one category, this is normal.



## Questions & Answers

### Do you have to consider all the categories or just those that apply to your question?

Yes, as you may not be aware that a category does apply. There are other categorisation systems slightly different to STEEP that may be more relevant to your theme. Whichever you choose to use, the purpose is to assist you in thinking out of the box. Go through all the categories at least once, you may discover something you had not thought of previously.



## Learning Exercise

**Write STEEP vertically on a piece of paper.** What trends can you think of that are relevant to your theme that fit into these categories?

Are there trends which fall into **more than one category**?

Thinking of the categories, which one are you **most likely to omit when thinking of the future**?







## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Here we explore **megatrends relevant to consider in the context of building plans and investments to support climate resilient livelihoods in the Southern African region**. Megatrends are associated with driving appreciable change, whether through attitudinal, behavioural, economic, or environmental mechanisms. Megatrends influence a wide range of activities, processes, and perceptions, both in government and in society, over long time periods (Forward Thinking Platform, 2014). For detailed information on this topic refer to the supplementary course report, namely 'Megatrends in the Southern African Region'.



**What are some of the drivers, trends and megatrends impacting the agricultural sector in the SADC region?**

According to Davis-Reddy and Vincent (2017), factors affecting the agricultural sector in Southern Africa include:

- **The demand for food** - including population growth, changes in consumption patterns, and urbanisation;
- **Environmental factors** - including climate change and environmental degradation; and
- **External or governance factors** - including agricultural support, trade policies, and conflict.

Using the STEEP categories, let us now unpack some these factors. (Climate change and risk is excluded here as it is covered in detail later in the module.)



## Social Category

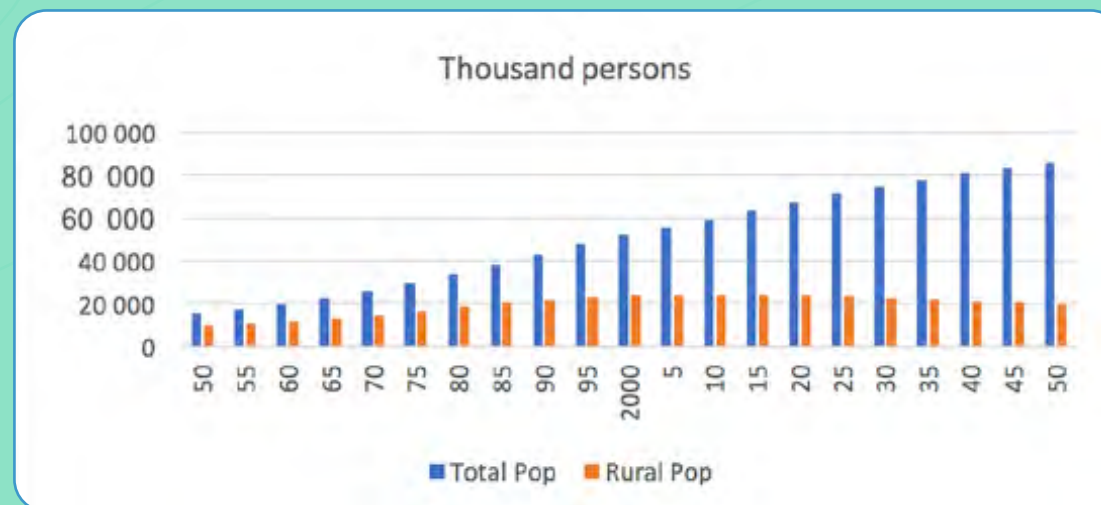
For the purposes of this training manual the **indicators analysed within the social category include population demographics, urbanisation, and poverty**. Other social indicators that would be important to consider in the context of climate resilient agricultural development in the SADC region (as covered in the supplementary report on megatrends in the southern African region) are dietary transition, health and food security, land distribution, gender issues and education and skills development.



## Population Demographics

Sub-Saharan Africa (SSA) is expected to experience the **highest rate of population growth globally in the coming decades**, although there is considerable range in the level of projected increase, depending particularly on changes in total fertility rate.

According to the projection below, the population growth rate in the Southern African Region<sup>2</sup> is expected to increase at a decreasing rate from around 2035, arriving at a total over 80 million by 2050. The population in rural areas is expected to decline slightly to just under 20 million by 2050.



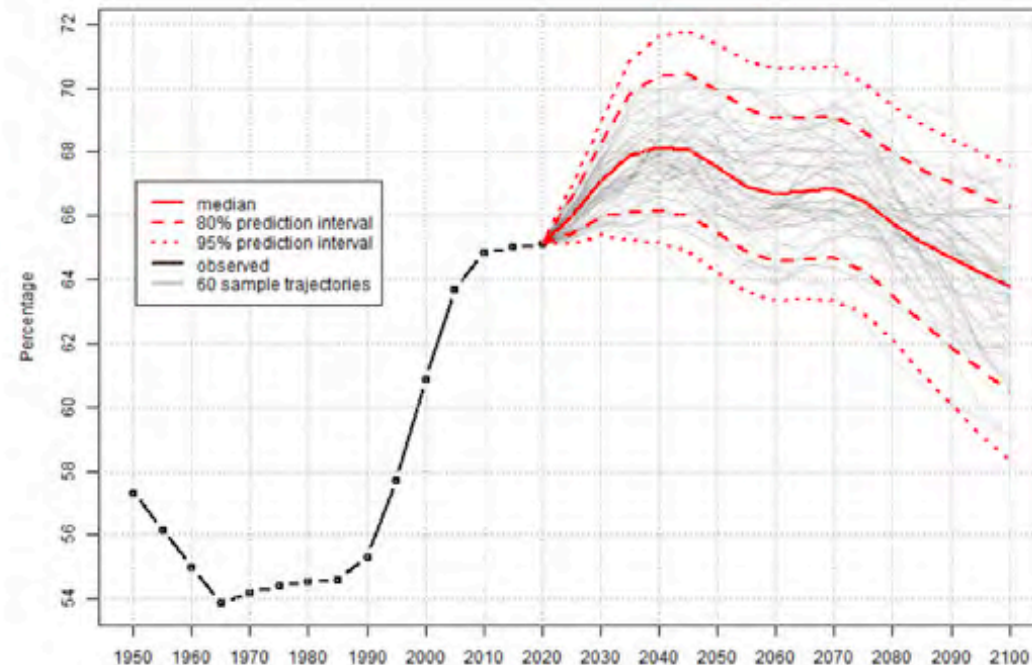
**Total and rural population projections to 2050: Southern African Region, from (United Nations, DESA, Population Division, 2019)**

<sup>2</sup>Includes: Botswana, Eswatini, Lesotho, Namibia, South Africa, Zimbabwe



Photo: E.W. Gordon (ILRI)

**Projections of the percentage of population of working age or labour force for the Southern African region** can be seen on the right. The median projection indicates high increases up to 2040 with a gradual decline thereafter. Although there is some uncertainty in the level of growth, there is clearly an expansion of youth into the labour force in the next 10 to 20 years.



© 2019 United Nations, DESA, Population Division. Licensed under Creative Commons license CC BY 3.0 IGO.  
United Nations, DESA, Population Division. World Population Prospects 2019. <http://population.un.org/wpp/>

**Percentage of population aged 15-64 years: Southern African Region, from (United Nations, DESA, Population Division, 2019)**



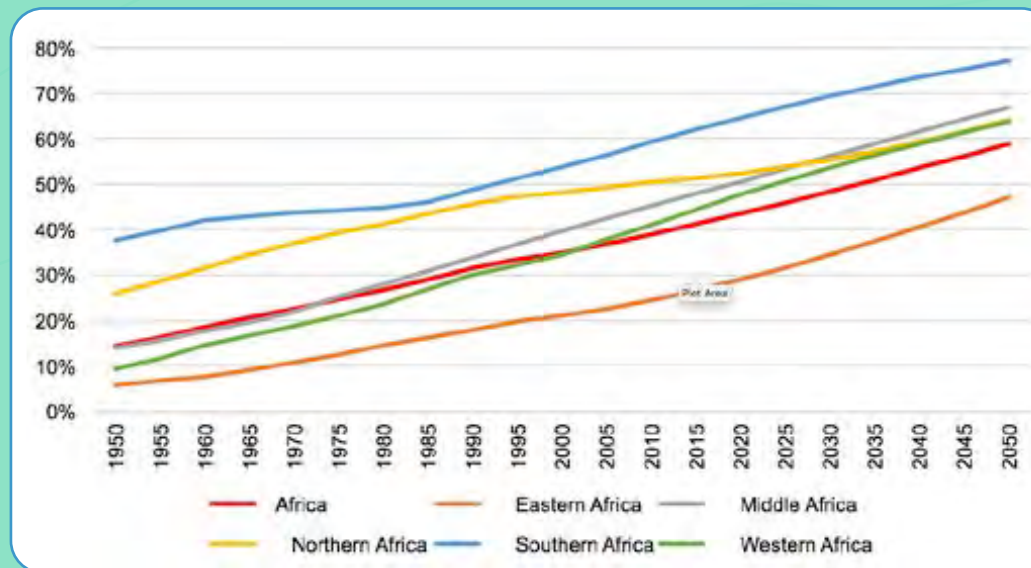


## Urbanisation

Africa's urban population is projected to expand around three-fold from 360 million in 2015 to 1,137 million by 2050 (Jayne et al., 2017). Around 55 % of the continent's population will live in urban areas by the middle of the century (Cleland & Machiyama, 2016). Most of this growth is from urban population growth rather than migration, or areas that were previously considered rural being reclassified as urban as population densities increased (Jayne et al., 2017).

In the SADC region, the overall trend has been towards increasing urbanisation of the population in most countries except for Mauritius and Swaziland, which exhibit de-urbanising trends. However, in contrast to the situation in other areas of Sub-Saharan Africa, in-migration to urban areas is a major source of urban population growth in the SADC region (SADC, 2013).

The graph on the right shows projected urbanisation rates for the United Nations (UN) designated Southern African Region. It indicates that the level of population living in urban areas is higher in the Southern African Region compared with all other African regions, and it is projected to remain so up to 2050.



**Urbanisation rates 1950-2050: All African regions, from (United Nations, DESA, Population Division, 2018)**





## Poverty

**Southern Africa has a heavy burden of extreme poverty (measured as living on less than USD 1.90/day).** A drop in the percentage of the population living in extreme poverty from 45% in 2017 to 41% by 2040 is expected (Porter, 2017). However, the absolute number of people living in extreme poverty is expected to increase to nearly 130 million (an addition of 40 million people), as is evident in the graph below. The reasons for this increase in number are population growth, high inequality, and slow growth in the agricultural sector (on which most poor people rely for their livelihoods). It should be noted that this projection was conducted prior to the COVID-19 pandemic which is expected to worsen poverty levels in Africa.

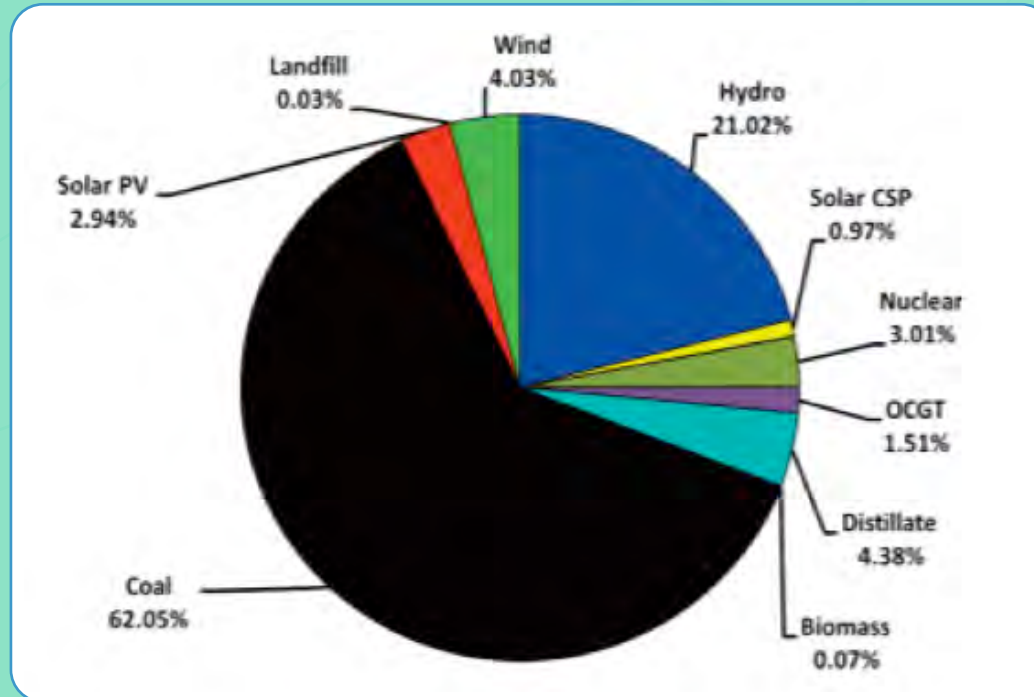


**Extreme Poverty Forecast for Southern Africa (2015-2040)**  
(Porter, 2017)



## Technological Category

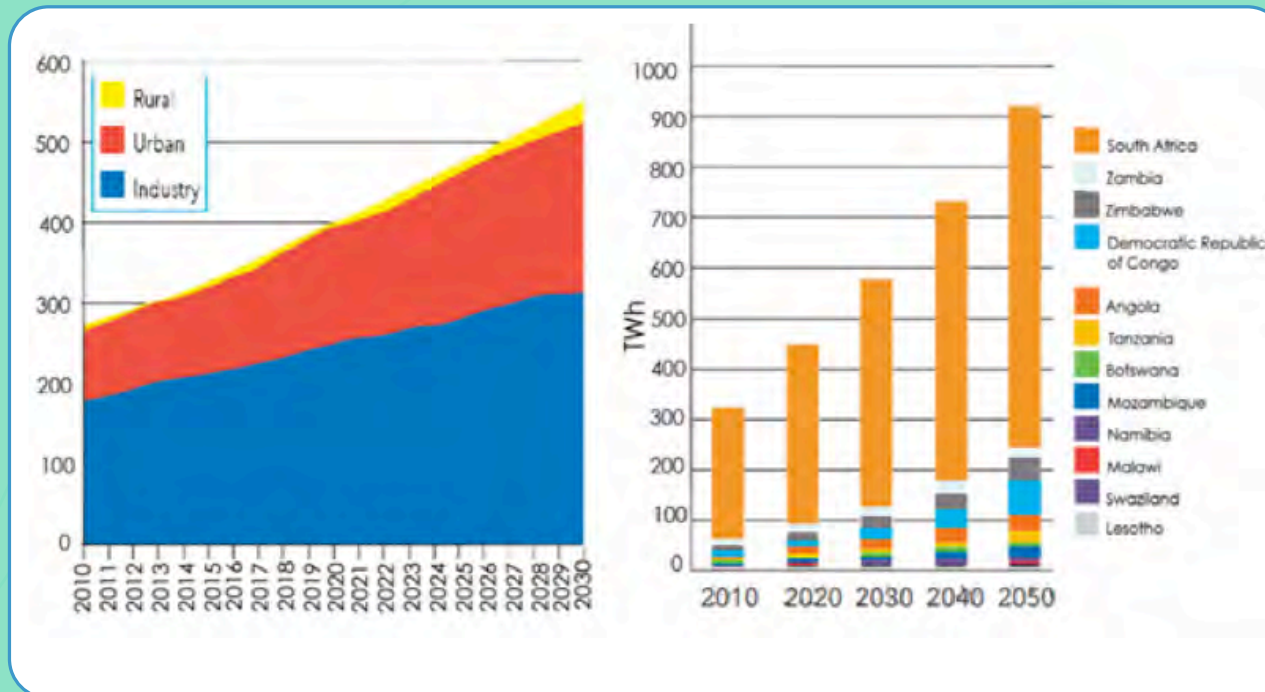
Within the technological category, the indicator ‘energy production’ is considered, as it is a key developmental sector. The pie chart shows that the Southern African Power Pool (SAPP) (which includes the power utilities of several SADC countries) relies heavily on coal but that there is also a large share of power generated by renewables such as hydropower (21.02%) and wind (4.03%). When taking into account the commissioned capacity, hydropower in the form of conventional and pumped storage accounted for 43 %, gas 24 %, solar systems (photovoltaics (PVs) and concentrated solar power) 11 %, wind 10 % and coal occupied only 7 % (SADC, 2018). The pie chart provides a snapshot of the situation. Trends cannot be determined from it.



**Southern African Power Producers (SAPP) Installed Generation Mix 2017 (SADC, 2018)**

**The energy mix may change rapidly, due to the decline in prices of renewable energy systems.** Solar power is essentially on par with the costs of hydropower and are increasingly cheaper than any fossil fuel form of electricity generation.

Access to energy in the SADC region is still highly constrained, particularly in rural areas where electricity is accessible to only 34% of the population (SADC, 2018). The projected increase in energy demand in the SADC region up to 2050 is shown in the chart below. The projection indicates that there will be a large increase in energy demand, most of which will be due to industrialisation. Based on the existing pattern of limited access to electricity in rural areas and existing policy frameworks, it is unlikely that the demand in these areas will be met in the future. The projection is based on expected economic development in different sectors of the region, which may or may not unfold in the future.



**Energy Demand Projections for 12 SADC Countries (2010-2050) (Mutanga & Simelane, 2016)**





## Economic Category

Within the economic category and the context of the foresight exercise, indicators important to **consider include economic growth, employment, and food prices in the SADC region**. The focus of this section is on employment. A key question to consider here is:

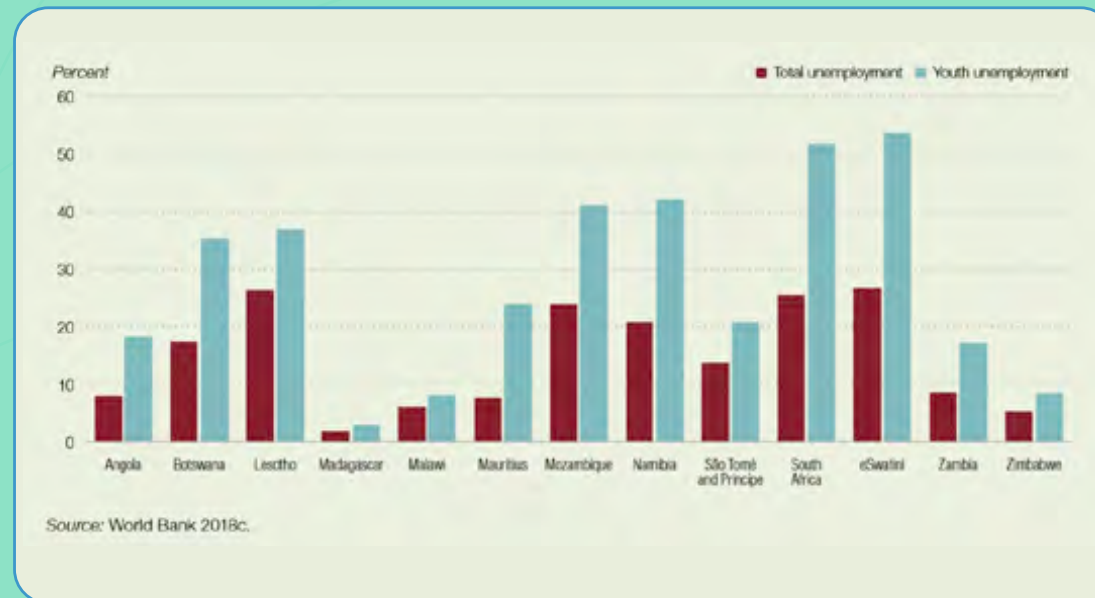


**Will wage employment in the agricultural sector meet the job demand of the rapidly increasing population?**

**Unemployment continues to be a major challenge in Southern Africa.** Root causes of unemployment include slow economic growth, poor skills of the labour force, weak institutions, and low labour absorption capacity in industries. Essentially there has not been sufficient importance given to employment growth in development policies.

The graph below shows high rates of unemployment (>10%) in seven

of the countries (six of which fall within the SADC region) and higher rates of youth unemployment (blue columns) in all countries considered (SADC, 2019). As the graph is a snapshot of the period 2010-2018, trends cannot be deduced. However, according to Jayne et al. (2017), even under the most optimistic growth scenario, employment opportunities are unlikely to be available for more than a small fraction of the rapidly expanding labour force. Furthermore, it is expected that the COVID-19 pandemic will exacerbate unemployment in the hardest hit sectors such as tourism and hospitality, entertainment, retail and trade and agriculture, where most of the people in the region are employed.



**Urbanisation rates 1950-2050: All African regions, from (United Nations, DESA, Population Division, 2018)**





## Ecological/Environmental Category

In the ecological/environmental category we consider the indicators of land degradation and agricultural productivity.

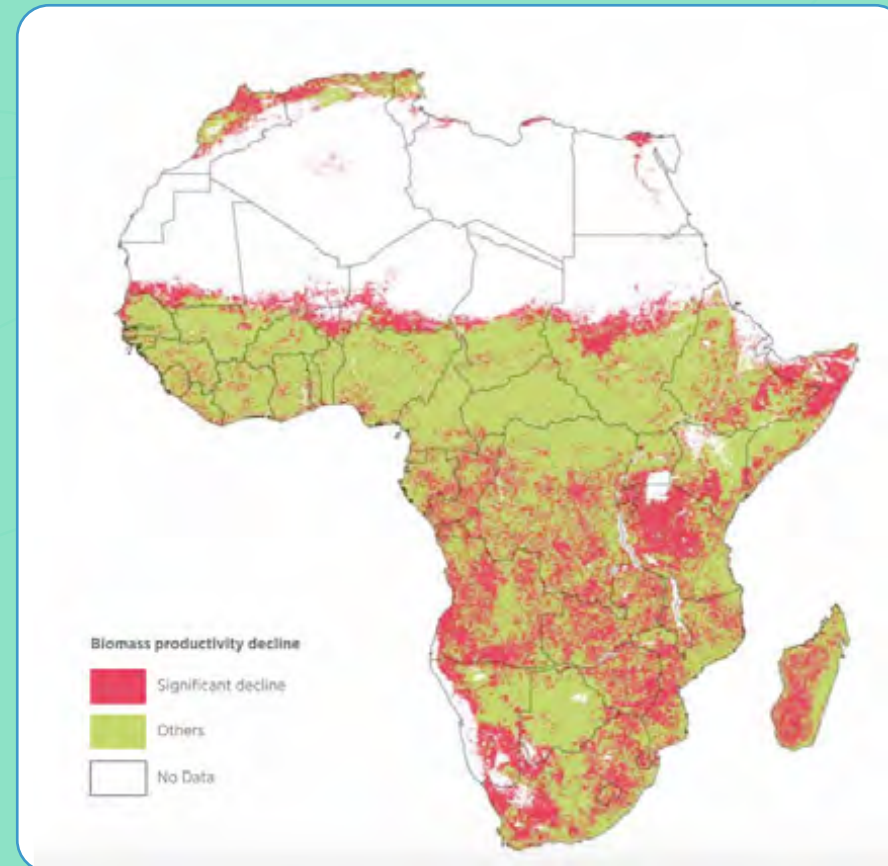


### Land Degradation

**The issue of land degradation is a fundamental issue in achieving resilient livelihoods in Southern Africa.** Land degradation is associated with poverty, given the importance of agriculture to the livelihoods of Africa's poor. A report by the Montpellier Panel published in 2014, indicates that around 65% of arable land in Sub-Saharan Africa is already degraded, which is costing more than 180 million smallholder farmers around USD 68 million in lost income annually (Montpellier Panel, 2014).

A map of land degradation hotspots based on biomass productivity indicates considerable degradation in Southern Africa, particularly in the SADC region. The degradation is due in large to increasing population pressures leading to a reduction in fallows and continuous cropping without inputs. Soil

fertility decline has led to a reduction in crop yields across the region (Vanlauwe et al., 2015). Again, as this map provides a snapshot of a point in time, we cannot determine trends from it.



**Decline in Biomass Productivity in Africa (Le et al., 2014)**



## Agricultural Productivity

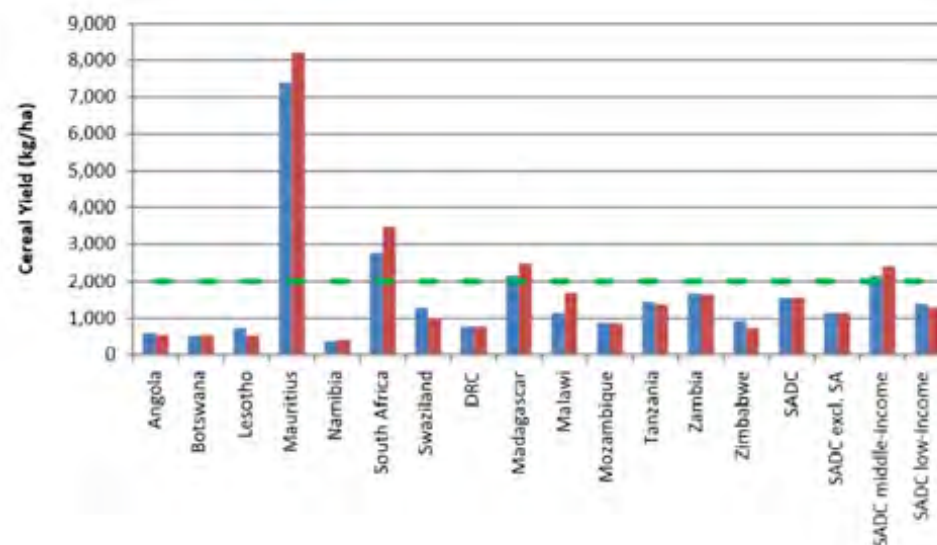
**Agricultural productivity is linked to land degradation but could also fit under the economic category.** As mentioned previously, some indicators and associated trends will fit into more than one **STEEP category** and requires the use of discretion.

Of the total area (986,246,000 ha) covered by the 16 SADC countries, only 6.11% is cultivated (Nhamo et al., 2019). Smallholder farming is the main source of livelihoods in rural areas and is mostly rainfed, relying on increasingly variable patterns of rainfall. Around 20 million hectares of land has irrigation potential, yet only 3.9 million is irrigated (Nhamo et al., 2019).

The graph below shows that cereal yields were stagnant for the SADC region over the period 2000-2010 and below the Regional Indicative Strategic Development Plan (RISDP) target level of 2,000 kg/ha, for most (11 out of 14) countries. The yields of low-income SADC countries fall below the RISDP target and are declining.



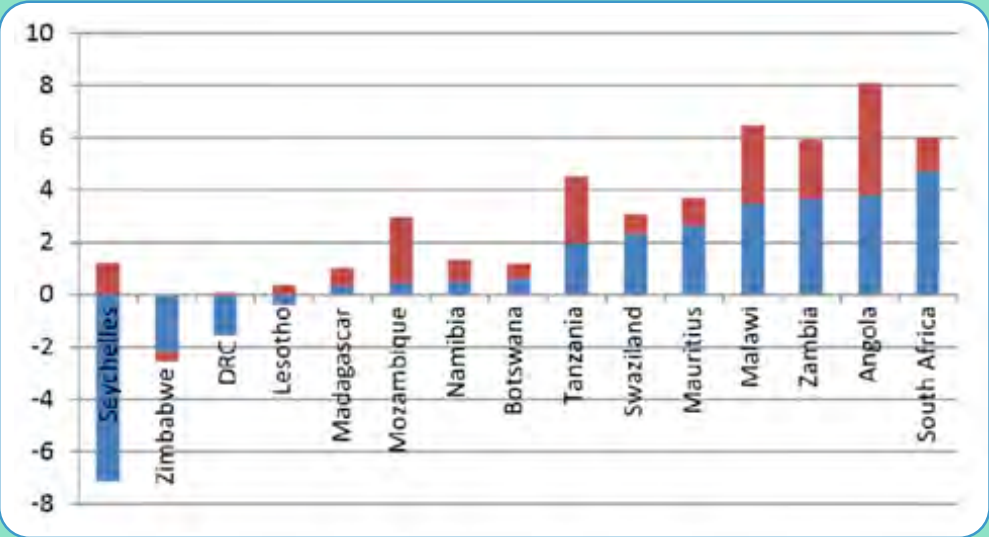
Photo: Georgina Smith (CIAT)



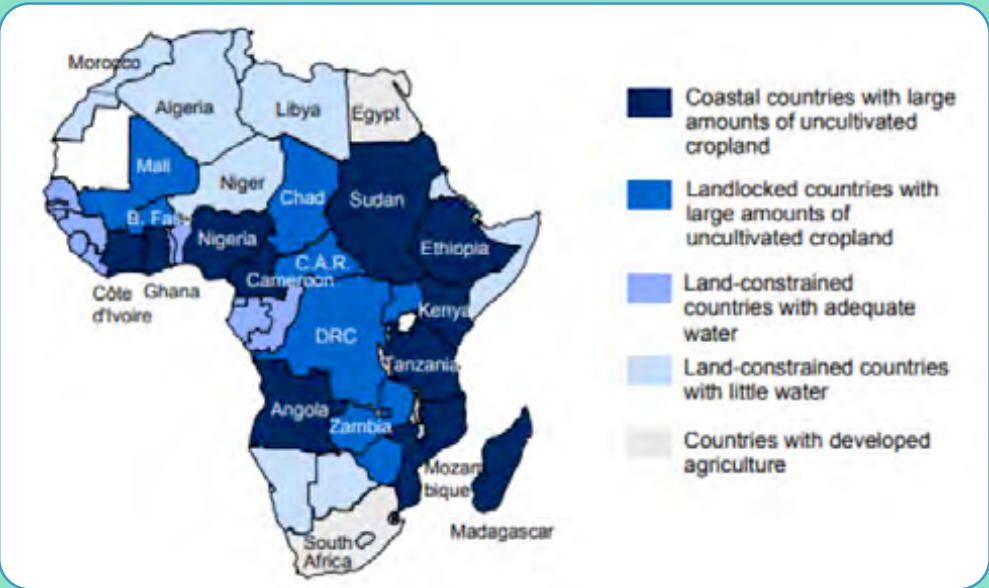
**Trends in Cereal Yields in SADC Countries (excluding Comoros and Seychelles), 2000-2010 (Chilonda et al., 2013)**

The graph to the right provides insights into the type of productivity growth or decline in agricultural cereal yields in the SADC region (excluding Comoros) over the period 2000-2010. There are two types of productivity growth: more cereal per hectare (yield), also known as land productivity; or more cereal per worker, also known as labour productivity. Low-income countries are generally higher on land productivity while mid-income countries are higher on labour productivity. This trend is important to understand as it indicates how profitable a farm in the region may be. From an ecological perspective it is important to consider how much of an increase in production is due to land expansion.

Lastly, the map on the below right provides **evidence of the great potential for increasing agricultural productivity in the northern SADC** countries in the future, as determined by the amount of uncultivated land and water available.



Labour and Land Productivity Growth Rates in SADC Countries (annual average 2000-2010 (Chilonda et al., 2013))



Africa Agricultural Growth Potential by Region



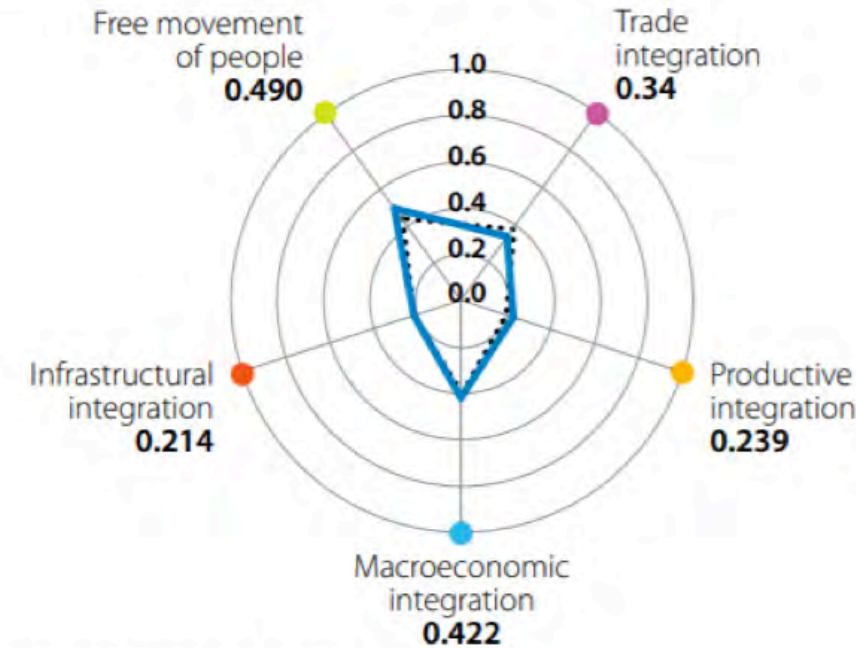


# Political Category

The indicator chosen for the political category is the effectiveness of regional integration, as it is a key gauge of governance. Regional integration has historically constituted an integral part of development strategies in Africa. It has been viewed as a means to achieve sustained economic growth and development and to overcome the region’s structural problems such as political fragmentation, lower per capita incomes, and small intra-regional markets.

The SADC region scored the lowest points (0.337) in an assessment of the level of integration across the continent’s regional economic communities. The region’s main weakness is identified as regional infrastructure and its strength is the free movement of people. As the chart represents a set point in time, no trends can be determined.

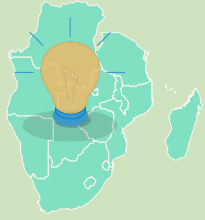
Average score	0.337
Strongest dimension	Free movement of people
Weakest dimension	Infrastructural integration



Dotted line represents Africa's scores.

Scores on Five Dimensions of Regional Integration for the SADC Region (African Development Bank; African Union; United Nations Economic Commission for Africa, 2020)





## Summary of SADC Megatrends Findings

Based on the evidence analysed, the following trends in the context of climate resilient agricultural development in the SADC region were identified:



### Social

- A large increase in population is expected, with many youths entering the job market; and
- Poverty levels in the region are high and the number of affected people is projected to increase.



### Technological

- Access to energy in rural areas is generally quite low and likely to remain that way, although potential for use of renewable energy is high.



### Economic

- Unemployment rates are high, particularly for the youth population, and unlikely to change given existing policy frameworks and the impact of COVID-19 on various sectors of the economy.



### Environmental/Ecological

- There is considerable land degradation in the region; and
- Agricultural productivity is low and declining.



### Political

- SADC's regional integration is low and could be enhanced with improved regional infrastructure.

In summary, the SADC region is one with considerable potential and achievements relative to other areas in Sub-Saharan Africa, but also one that is facing major challenges in terms of poverty reduction and climate change impacts. The overall picture that emerges from the direction of trends at this point is that of increasing inequality with rising poverty and food insecurity in rural areas.



## Learning

You should now be able to **categorise trends according to STEEP** and have a better understanding of the information, data, and evidence you need to collect to identify trends and patterns within your theme. You should also be able to determine future impacts resulting from the identified trends and patterns.

## Step 02 Analyse Key Questions

The next step in the **horizon scanning method is to analyse key questions**. This step is essentially a process of interpreting the information from the trends analysis and horizon scanning activities conducted thus far and identifying where there may be gaps. To do this we need to ask the following three questions:



- What questions are important to respond to?**
- What do we think we know (known knowns)?**
- What do we still need to find out (known unknowns)?**



## Learning Exercise

Think about these key questions in the **context of your theme**. What are the most important questions you need to consider when thinking of the patterns and trends you have identified as relevant to your theme?

What do you need to know about answering the questions i.e. **what information or evidence have you gathered?**

**What is still missing from your analysis**, what else would you still like to know?



**Brainstorm the questions and document your answers on a piece of paper**





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

As the theme chosen for the purposes of this foresight exercise is climate resilient agri-food systems in the SADC region and land degradation was previously identified as a problematic trend, we will take a closer look at it by answering the three key questions:

### What questions are important to respond to?

1. Is land degradation reversible? Are there examples in the region where it has occurred?
2. Will increased population growth in rural areas generate higher levels of land degradation?
3. Is the rate of land degradation increasing?
4. Is land degradation higher/greater on poor farmers land?

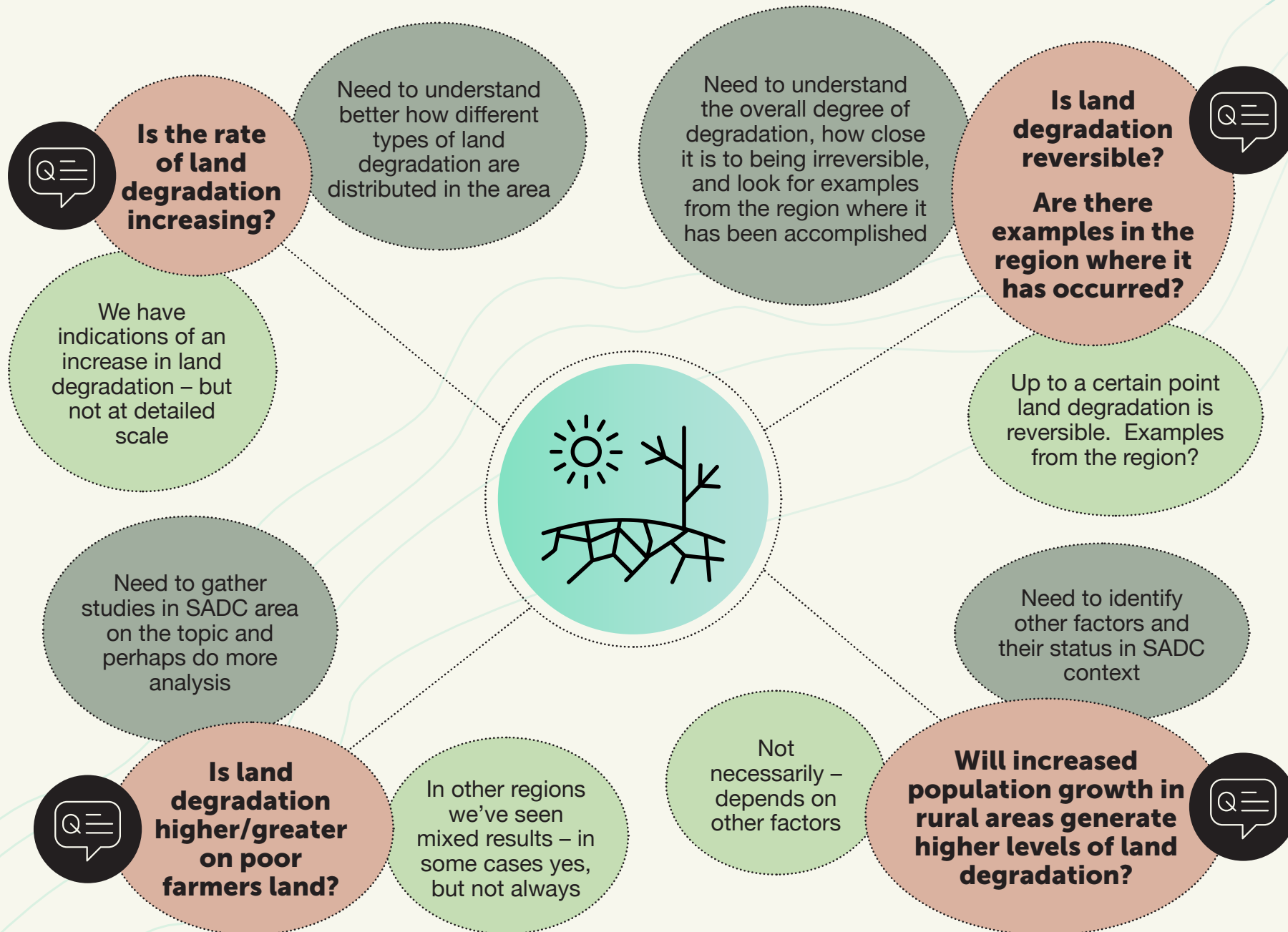
### What do we think we know (known knowns)? I.e. what do we know about land degradation in the SADC region?

1. We have indications of an increase in land degradation, but not at a detailed scale.
2. Land degradation is not necessarily linked to the income of the farmer.
3. An increased rural population will not necessarily cause land degradation, it depends on other factors too.
4. Land degradation is reversible up to a threshold.

### What do we still need to find out (known unknowns)? What do we still need to know about land degradation in SADC region in developing plans for climate resilient agricultural livelihoods?

1. Need to better understand how different types of land degradation are distributed in the area.
2. Need to gather studies in the SADC area on the topic and perhaps undertake further analysis.
3. Need to identify other factors and their statuses in the SADC context.
4. Need to understand the overall degree of degradation, how close it is to being irreversible, and look for examples from the region where it has been accomplished.

Mind mapping is a useful tool to visually organise information. The mind map below illustrates how you could use the tool to document your answers to the three questions.







# Learning Exercise



## Horizon Scanning



In this exercise we will **consider two megatrends in the SADC region** and will practice the three horizon scanning questions. Responses to the questions by participants of the SADC Futures Webinar Series (Webinar 2) are provided below to guide your thinking.



### What questions are important to respond to?

**Let us consider the megatrends of agriculture production.** Currently, agricultural productivity is very low for poor farmers in the SADC region. What do you want to know in working towards improving the situation? What do you need to know about agricultural production to plan for a climate resilient future? For example, how do we improve women's productivity? Jot down your answers on a piece of paper. You could use the following topics to guide you: youth, gender, environmental issues, political situation.

**'What agricultural extension services are available?'**

**'What are the major causes of reduced productivity?'**

**'What are the key constraints to raising agricultural productivity?'**

**'What technologies are available to improve productivity while not degrading the land?'**



Photo: World Agroforestry





### What do we think we know (known knowns)?

We now want to know how much do we know about the productivity of poor farmers in the SADC region? Can you share two things that you feel confident that you know a lot about?



‘Low technology adoption among the older small-scale farmers leading to lower use of technology in the small-scale farming areas, which ends up not attracting the youth. How do we change that?’

‘Environmental changes and fluctuations will affect agricultural production in SADC countries...’

Photo: World Agroforestry

## MODULE 02

### Understanding Trends and Multi-sectoral and Systems Linkages





### What do we still need to find out (known unknowns)?

What do we not know that we need to know? Where are the knowledge gaps? Give an example of a knowledge gap, e.g. we do not know the impact of technology on women's engagement in agriculture.



'What kind of technology should we use- imported technology or try to improve existing local technologies?'

'How do we plan risk mitigation for a pandemic like Corona virus when planning for agriculture production?'

Photo: Wilsan - Unsplash



## Learning

Using the three key horizon scanning questions you should now be able to **interpret information obtained from trends analysis and horizon scanning activities** and identify where there may be gaps.



# Bringing in Evidence

Still within the analysis stage, we move on to the next method where we draw upon knowledge sources to provide evidence.



## What is evidence?



**Evidence** - is the integration of raw data constituting numbers, words, images, and insights emerging from diverse knowledge sources (SHARED The Decision Hub, n.d.).



## What is the method?

- **Integrating information** (e.g. raw data) gathered on a common theme from a variety of reliable sources (e.g. literature reviews, online surveys, the use of quantitative models or expert opinion).



## Why apply it?

- To develop a holistic, unbiased understanding of a topic and to identify common patterns and trends.

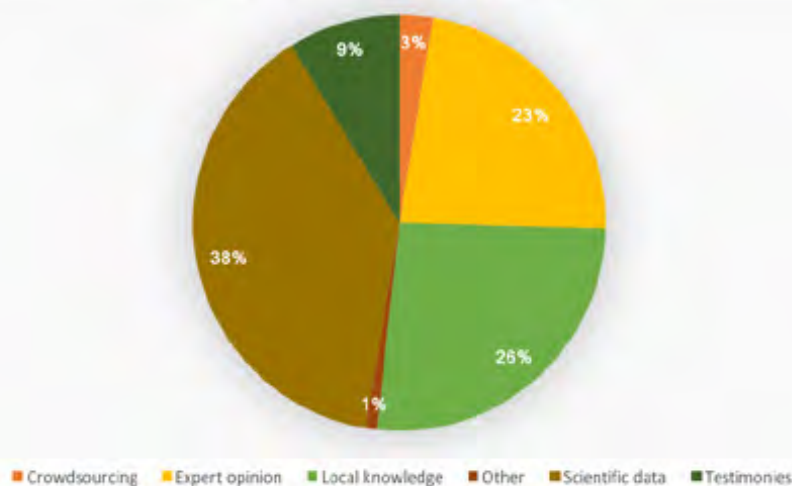




## A key question to ask when gathering information to provide evidence is: Which knowledge sources do I trust?

This question was posed to the participants of the SADC Futures Webinar Series. **The top three trusted sources were deemed to be scientific data (38%), followed by local knowledge (26%), and expert opinion (23%).**

Which knowledge sources do you trust?



As noted above, the **second most trustworthy data source given by the attendees was local knowledge (26%)**. Local or indigenous knowledge is commonly overlooked but provides a valuable source of information.

‘Local knowledge from indigenous people is usually proven as it has been practiced for many years.’

‘Local or indigenous knowledge is based on proven practices over time. Information is passed from one generation to the next.’

‘Often we miss out on how local people are responding to climate challenges and resilience because of over reliance on science. We need to capture lived experiences.’



**A key question to consider here is:**

**How do we include local knowledge when undertaking a foresight process?**

The following methods can be used to incorporate local knowledge:

- **Consultation processes using participatory tools** - hold dedicated meetings in local languages using tools that are suited to low literacy levels, as required; and
- **Capture and integrate local knowledge** - formalise input from a participatory consultation process into stakeholder engagement meetings - e.g. grazing routes mapped onto spatial development plans.



## Learning Exercise

Which of these **knowledge sources** are **relevant to your theme**: crowdsourcing, expert opinion, local knowledge, scientific data, testimonies, or other?

**Which of the knowledge sources would you trust?**

**Accessing data can prove problematic**, as was found through discussions with the SADC Futures Webinar participants:

**'Accessing data locally is a hustle due to protocols and it is also not up to date.'**

**'Data in the national agriculture research institutions is very scanty. We can't analyse and come up with reliable recommendations for future directions and planning.'**



### A key question to consider here is: How do we manage data gaps when undertaking a foresight process?

Reliable data is an issue not just in Africa but globally. The following methods can be used to improve data gathering for a foresight exercise:

- **Establishing a data focal point** - this requires a dedicated person in your team who can track down and undertake personal interactions to obtain data;
- **Value of evidence and addressing protocols** - it is important to think about what evidence you need to obtain and to understand the protocols for data sharing and how to address them; and
- **Data inclusion and creating a sharing culture** - this requires a combination of lobbying and advocacy around evidence, clarity of attribution of data and prompting data sharing through sharing.



### Questions & Answers

#### Climate events can have a high impact but data availability is poor, how do we manage this?

In the context of **climate data**, the **number of ground level weather stations has declined globally**. Fortunately, with advances in technology there are new data gathering methods. For example, remote sensing and other big data sources can be used in combination with existing ground level weather data (where available) to fill the gaps. Furthermore, some websites pull together household datasets such as from household weather stations around Sub-Saharan Africa.

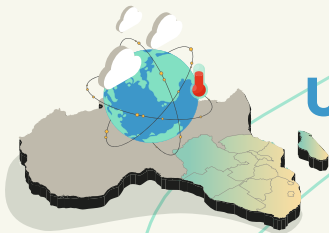




Photo: Curioso Photography



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region



### Understanding Climate Risks

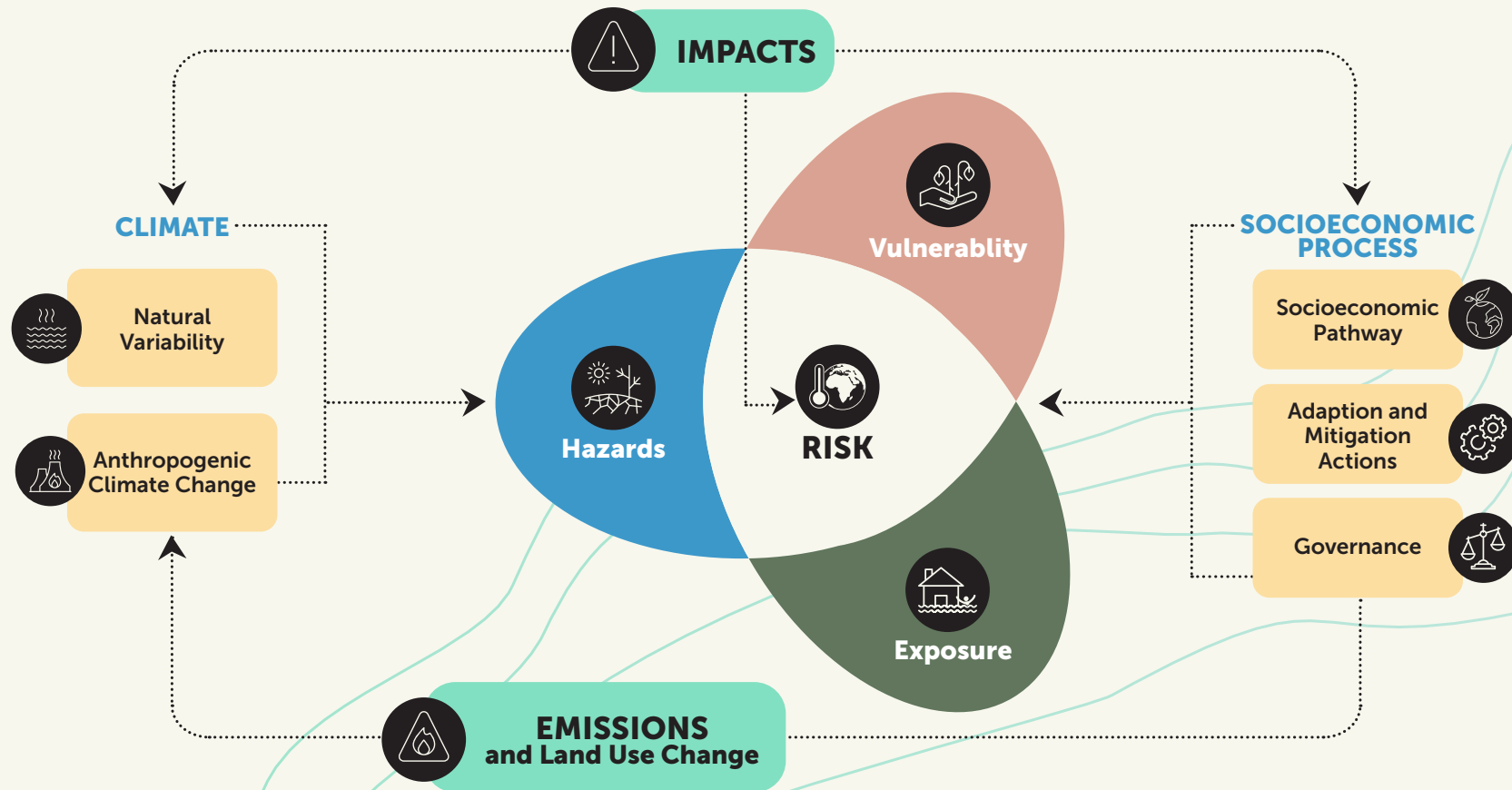
In the context of climate resilient agricultural development in the SADC region, evidence on future requires investigation. The supplementary course report 'Rapid Climate Risk Assessment for the SADC Region' provides detailed information on this topic.

● **Climate risk** - is the intersection of hazards, exposure and vulnerability associated with climate.

Climate risk is not solely a result of the hazard, it also requires consideration of the socio-ecological system i.e. exposure to the hazard and vulnerability of the system to the effects of the hazard.

**The International Panel on Climate Change (IPCC) developed a framework for understanding climate risk.**

It shows that natural variability and climate change create climate hazards. Socio-economic processes influence exposure and vulnerability to these hazards. The natural and social systems result in climate change impacts on society and on the other hand, activities within social systems such as those that generate emissions and land-use change result in impacts on the climate.



Climate Risk Framework (Oppenheimer et al., 2014)



## Questions & Answers

### Does the IPCC framework work at different scales and coverage?

The framework can work at different scales/coverage, but it would likely require different indicators or climate parameters specific to the scale/coverage in question.



Photo: USAID



## Climate Hazards

- **Hazard**- a possible, future occurrence of natural or human induced physical events that may have adverse effects on vulnerable and exposed elements (Cardona, et al., 2012).

Essentially, a climate hazard has a negative effect that has the potential to cause harm or loss.

Climate hazards identified by GIZ<sup>3</sup> in their Adaptation to Climate Change in Rural Areas in Southern Africa (ACCRA) programme include:



**Droughts;**



**Floods;**



**Extreme weather events;**



**Salinity intrusion;**



**Sea level rise;**



**Temperature changes; and**



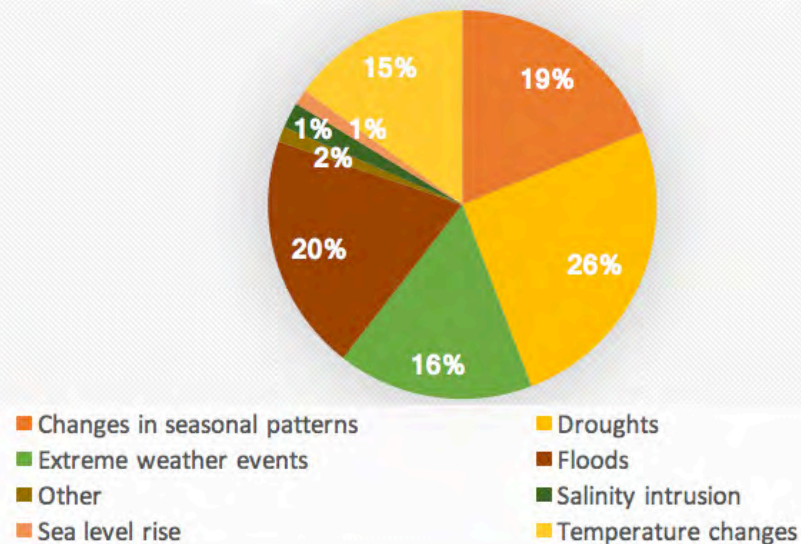
**Changes to seasonal patterns.**

When questioned on hazards of particular concern in Southern Africa, the SADC Futures webinar series participants mentioned drought most frequently (26%), followed by floods (20%) and changes in seasonal patterns (19%). Climate hazards that were deemed to be of least concern were salinity intrusion (1%) and sea level rise (1%).

<sup>3</sup>Deutsche Gesellschaft für Internationale Zusammenarbeit



Which Climate Hazards are of Particular Concern in Southern Africa?



When considering these hazards, it is important to contemplate their magnitude (size), extent (area) and rate of change (speed). So, let us consider the following question:



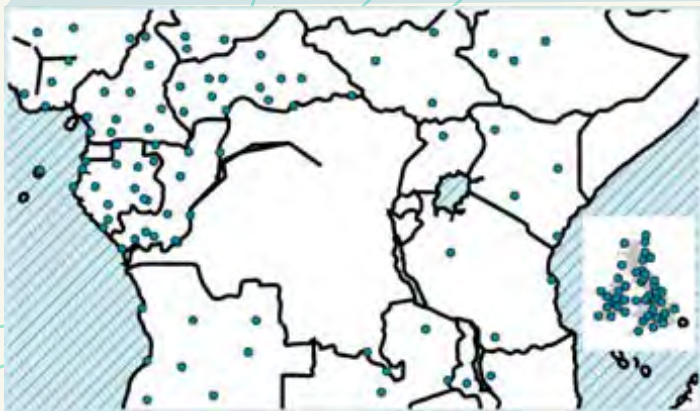
### What do we know about the future of climate change in Southern Africa?

Evidence suggests that Central Africa, the Congo River catchment in particular, affects the global climate system. However, the climate in the area is severely under recorded and studied. There are very few weather stations in the DRC, this is made apparent when comparing the country's collection points with evidence of those in the rest of Africa and the United Kingdom. This provides a good example of a knowledge gap.



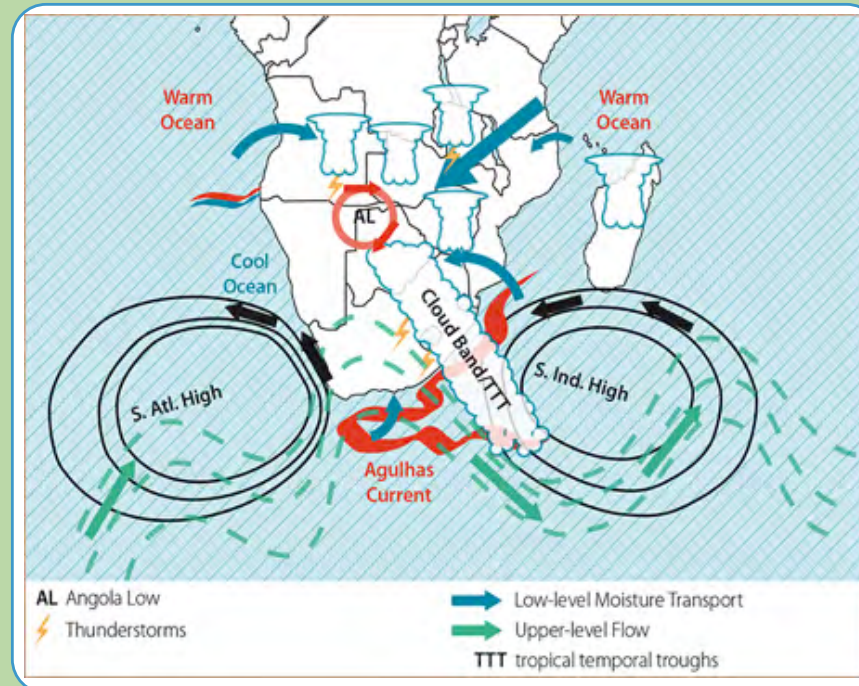


## Severely Understanding with a Lack of Current Climate Information

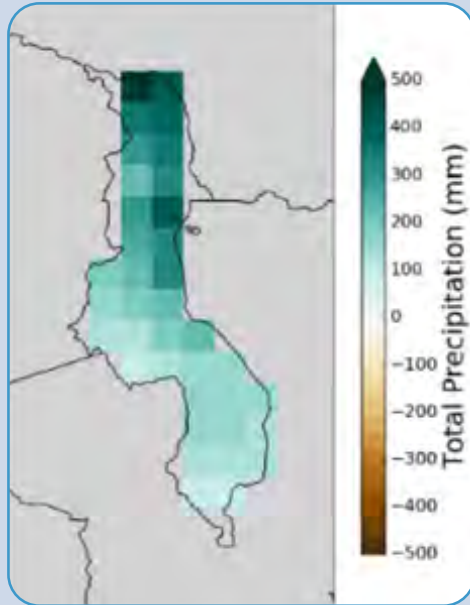


Severely understudied with a lack of current climate information

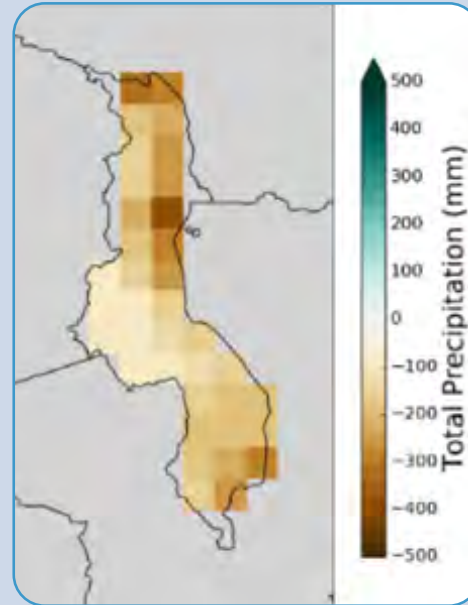
Climate in Southern Africa is subject to complex atmospheric and oceanic interactions such as the Southern Atlantic High Pressure System, the Southern Indian High Pressure System, the Angola Low Pressure System, tropical temporal troughs, the Agulhas current, the warm Mozambiquan current and the cool Benguela current. This creates uncertainty in projections.



Atmospheric and Oceanic Drivers of Climate in Southern Africa (UMFULA, 2019)



Model: IPSL-CM5A-LR



Model: HadGEM2-ES

### Disparity Between Precipitation Model Results for Malawi for the Year 2100 (Future Climate for Africa, 2020)

Here are two different model outputs for Malawi for the year 2100. The one on the left projects an increase in rainfall and the one on the right projects a decrease.

The Malawian precipitation model results further highlight that the evidence gathered may present uncertainties. In foresight planning we need to consider gaps and uncertainties in data.



**How do we deal with knowledge gaps and uncertainty in evidence during foresight planning?**

In the case of the Malawian precipitation models, it would be important to use an ensemble of models to balance out the uncertainty.



## Questions & Answers

### Does a lack of data affect our understanding of climate risk?

Yes, our understanding is constrained by data gaps for example, gender inequality is an important component of vulnerability and therefore risk but without data to map the inequality it cannot be built into a climate risk assessment.





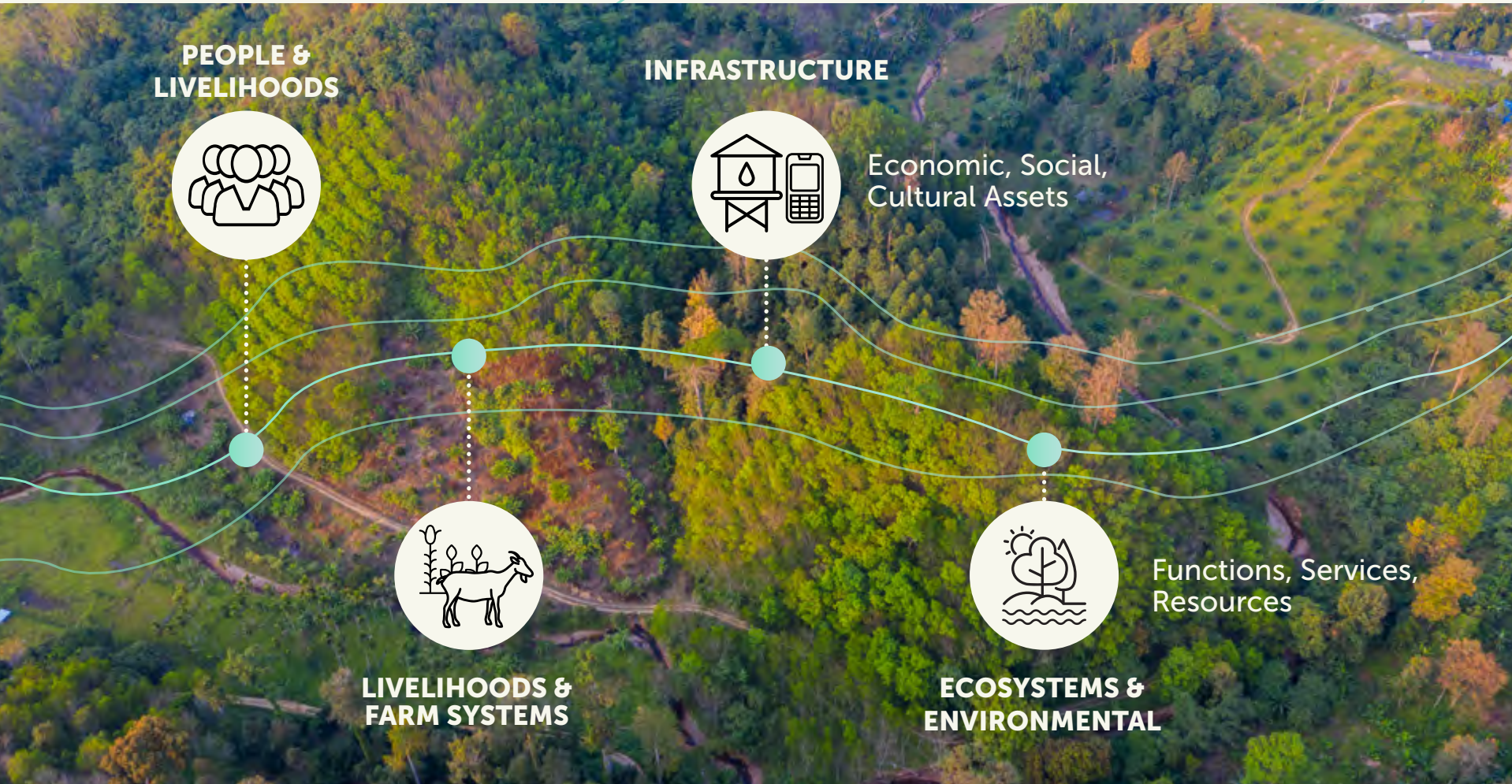
## Exposure

The next section of the IPCC climate framework to consider is 'exposure'.

● **Exposure** - refers to the inventory of elements in an area in which hazard events may occur.

In the case of climate resilient agri-food systems in the SADC region, these elements could include people and livelihoods, ecosystems and environmental functions, services, and natural resources, infrastructure (economic, social, and cultural assets) as well as agro-ecological systems.

### Unpacking Climate Exposure







## Vulnerability

Climate risk is not focused solely on the climate hazard, it also includes the socio-ecological system i.e. the exposure of the elements to the hazard and the vulnerability of the system to the effects of the hazard.

- **Vulnerability** - the propensity or predisposition of a system to be adversely affected by an event (Oppenheimer, et al., 2014).
- **Sensitivity** - is the degree (magnitude) to which a system is affected adversely or beneficially by climate variability or change.

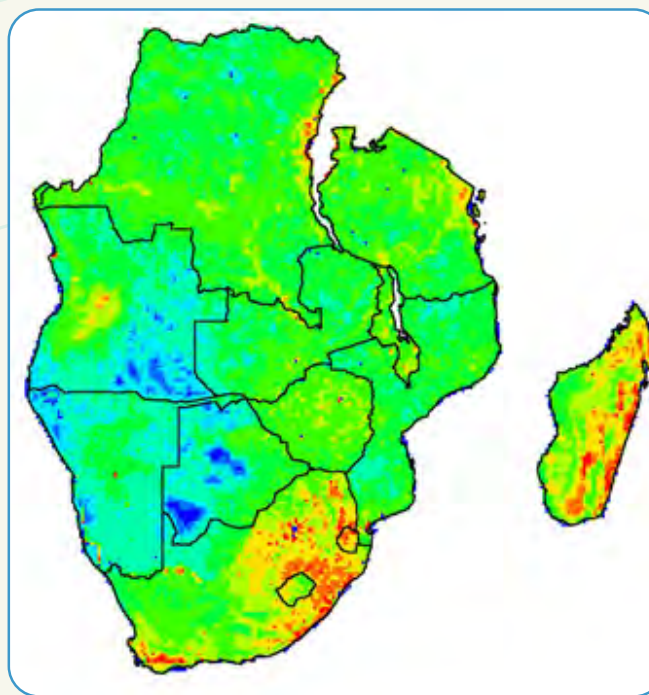


### What does this mean in the context of the theme?

Some systems or assets can absorb large impacts and continue to function whilst others are sensitive to even minor changes e.g. some plant species are very sensitive to temperature changes and become locally extinct, whereas others are more tolerant. This can be described as the 'adaptive capacity' of a system or element.

- **Adaptive capacity** - in this context is the ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

Some biophysical elements that are vulnerable to climate change include soils, ecosystems, habitats, and species. Some ecological systems are vulnerable because they require quite a narrow range of conditions and lack the capacity to adapt as conditions change. This vulnerability has been mapped for the SADC region. The blue areas on the map denote low biophysical vulnerability, the red areas are more susceptible such as fynbos vegetation in South Africa or the eastern forests of Madagascar.



**Biophysical Pressure Vulnerability in Southern Africa (Abson et al., 2012)**

**Climate change vulnerability also includes social elements** i.e. people and social systems. The level of vulnerability depends on a range of characteristics such as interactions, institutions, and systems of cultural values. Examples of social vulnerability to flooding are given below.



- **Demographic**
- **Health**
- **Coping Capacity**
- **Neighbouring Characteristics**
- **Risk Perception**
- **Socio-Economic**
- **Land Tenure**



## Questions & Answers

**Some climate risk models indicate both drought and flooding occurrence in the same area-how do we reconcile this?**

Drought and flooding can occur at the same location. A country or region could experience drought and then when it rains it is in the form of extreme rainfall events which causes flooding. Some areas are exposed to multiple climate hazards. It is important to consider all the hazards in planning.



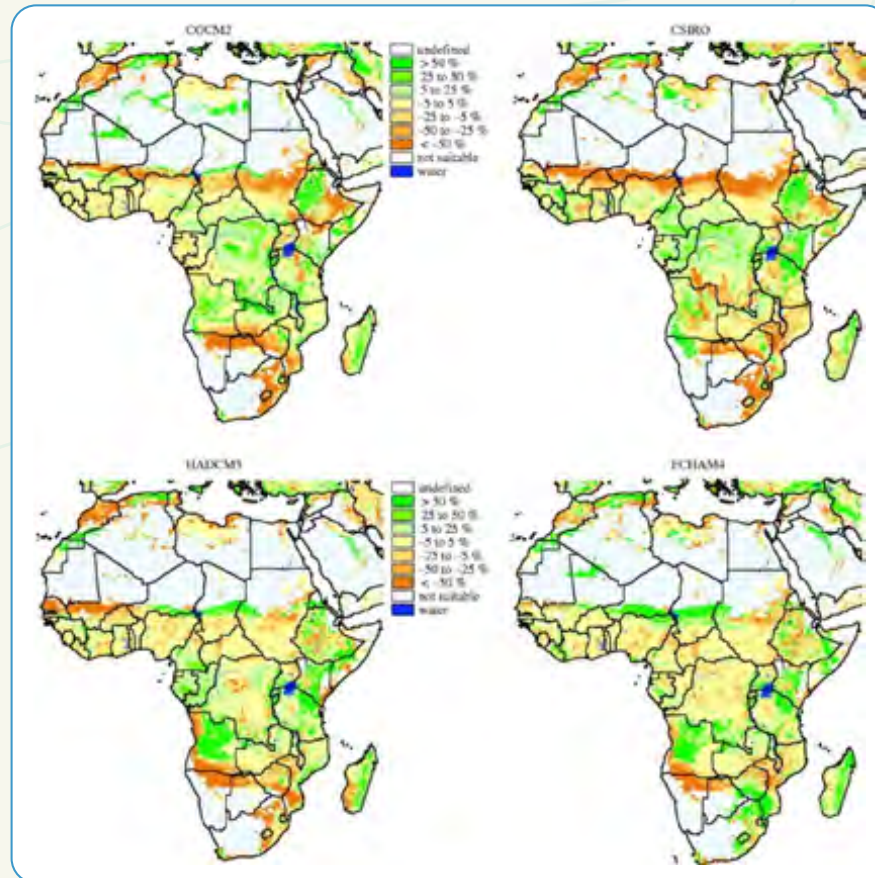
**We have now considered all elements of the climate risk framework.** These elements can be used to examine future climate risk in Southern Africa. We now ask ourselves:



**What is happening in Southern Africa in relation to future climate risk?**

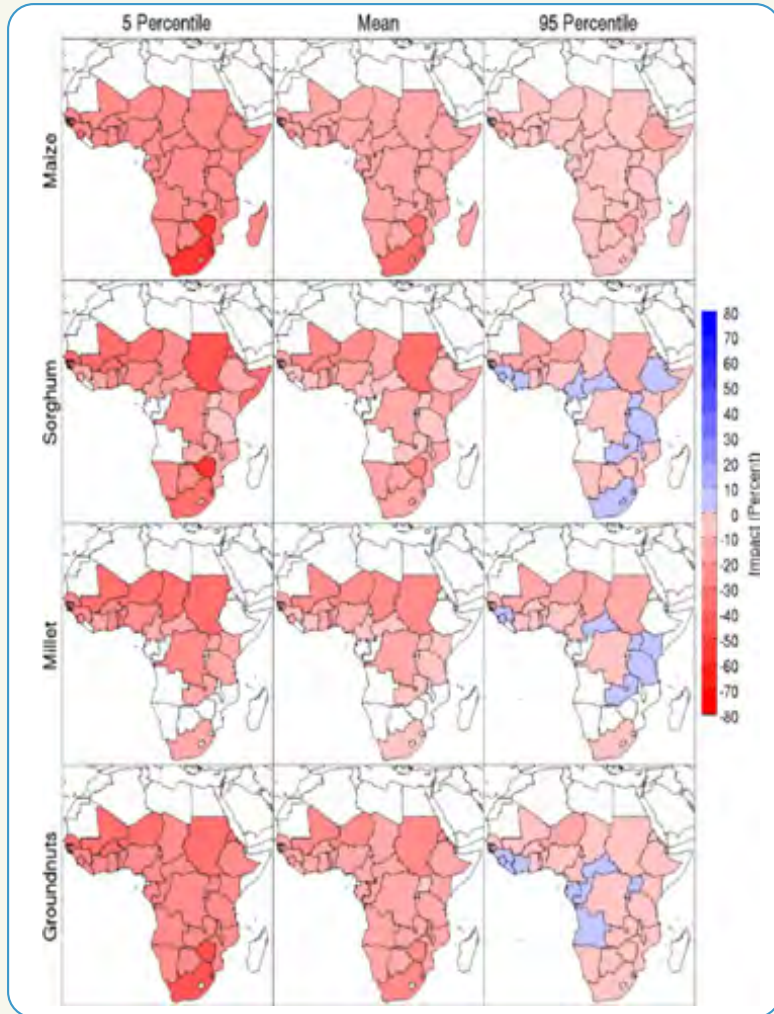
**Myriads of climate risk studies have been conducted for the region.** The approach by Fischer et al. (2005) uses climate models, crop models, and trade models to estimate future impacts on crop production. The model results show the spatial heterogeneity of climate impacts on cereal-production capacity, allowing for crop-switching and changes in crop calendars, in the 2080s relative to current climate, for climate projections by different GCMs, under SRES A2. Two important factors arise from aggregating the results. Firstly, the net balance of changes in cereal production potential for Sub-Saharan Africa was projected to be negative, with net losses of up to 12%. Secondly, there will be large variations in outcomes, with up to 40% of Sub-Saharan countries losing significant shares of their agricultural resources.

A study by Schlenker and Lobell (2010) incorporates crop and weather data as well as information from farmers such as switching planting calendars. The maps show the distribution of climate change impacts on yield (%) by country, the impacts are mostly negative (red). It is evident that the yields of four staple crops (sorghum, millet, maize, and groundnuts) in the region are likely to decline.



**Future Impacts on Cereal Productivity in Africa (Fischer et al., 2005)**



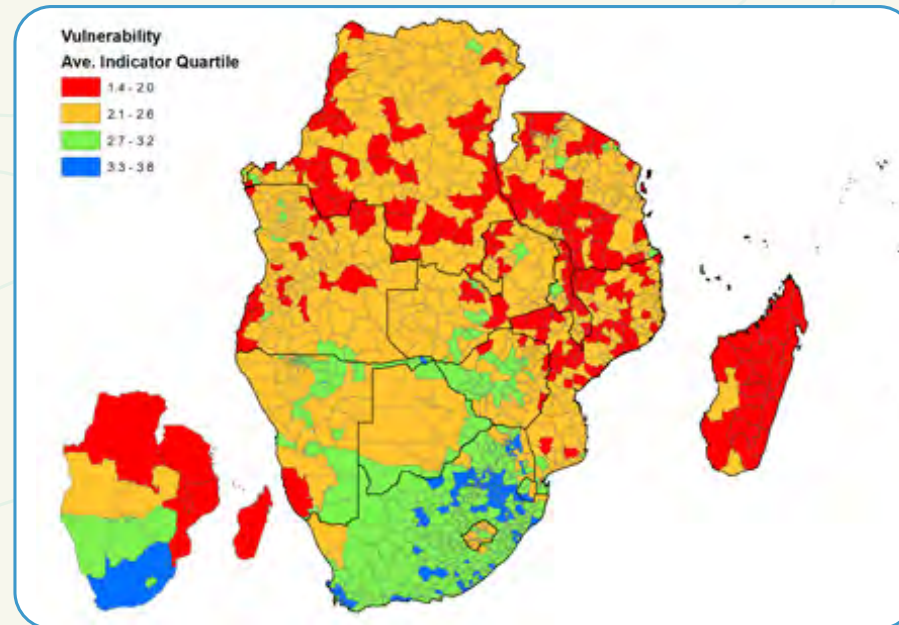


**Crop Yield Response Models (Schlenker & Lobell, 2010)**

**More recent modelling of climate risk in Southern Africa by GCRF- AFRICAP<sup>4</sup> researchers looks at equally weighted vulnerability indicators for biophysical** (crops and soils), social vulnerability (gender inequality, education, and governance), and economic (GDP) aspects. The study captures exposure as well as vulnerability. The research is based on current measures, not future projections. Data

ranges from a regional scale down to district level, although district data proved difficult to access.

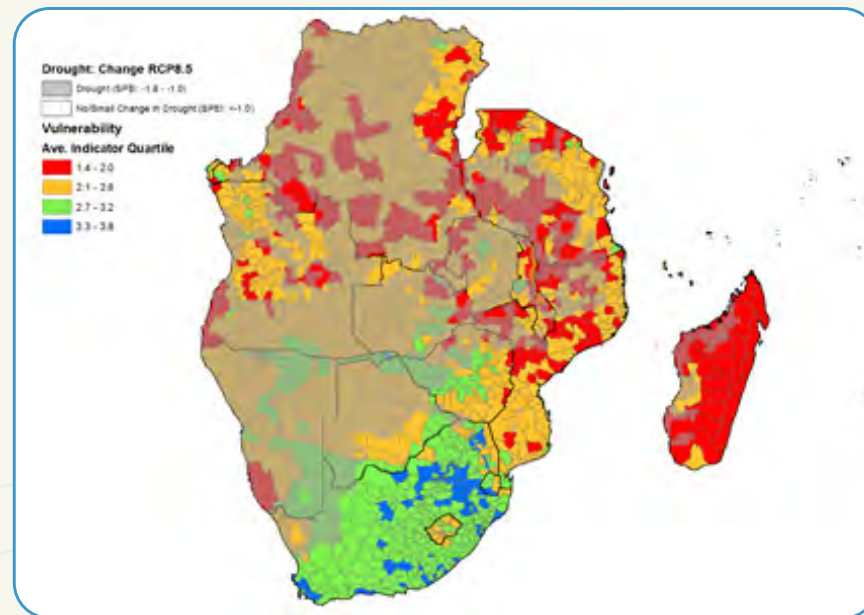
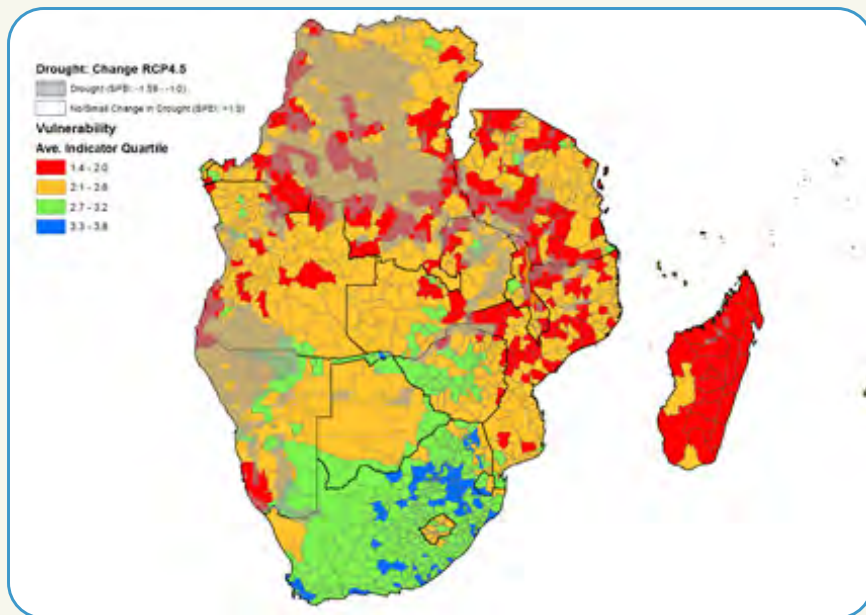
The results show areas of vulnerability and how they will intersect with hazards to create risk hotspots across the SADC region. The red areas indicate those that are most vulnerable, for example because of poor soils or low levels of education. The blue areas are the least vulnerable. The areas of SADC that are particularly vulnerable can be seen to be located to the north of the region, more specifically in Tanzania, DRC, Mozambique, and Madagascar.



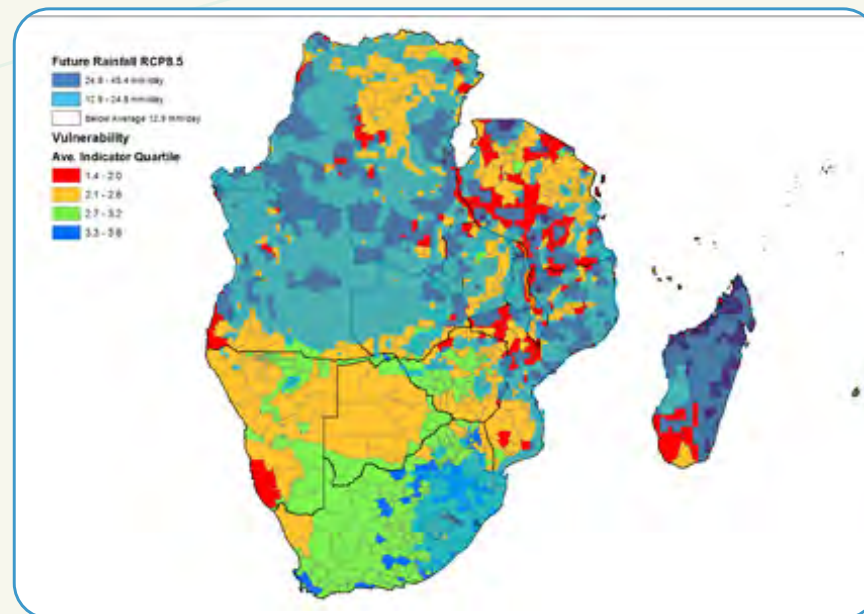
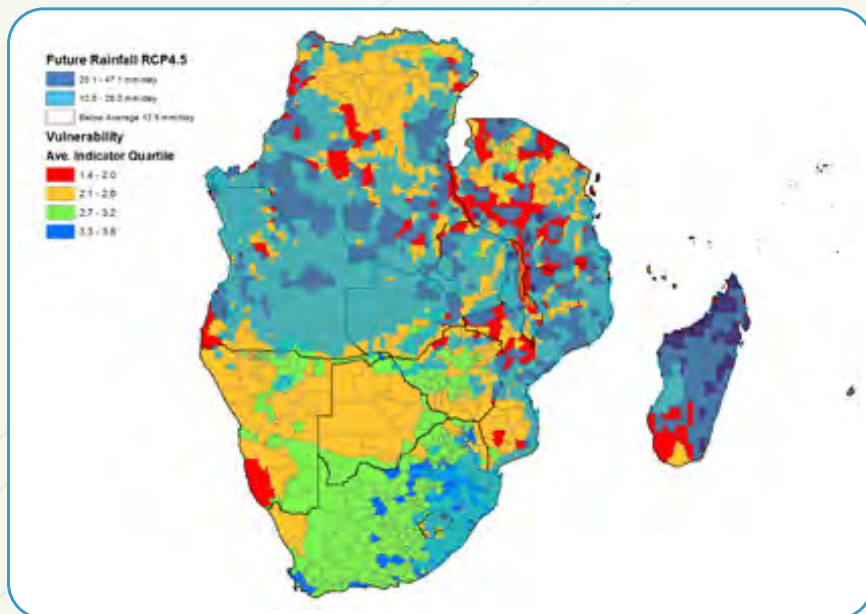
**Vulnerability Results for a Climate Risk Model on SADC Region (GCRF-AFRICAP, 2020)**

This map was then overlaid with data on drought and rainfall projections for the region. The map on the left illustrates an intermediate climate change scenario of a global temperature increase of 2.4°C by 2100. The map on the right illustrates a worse-case future scenario with a global temperature increase of ~5°C by 2100. The greyed areas show the extent of the region that will like experience drought in 2100. As the scenario worsens the area affected by drought expands.

<sup>4</sup>Ongoing research by Global Challenges Research Fund (GCRF)- Agricultural and Food-system Resilience: Increasing Capacity and Advising Policy (AFRICAP).



The map on the left below illustrates areas affected by extreme rainfall events in the SADC region in 2100, assuming the intermediate scenario of a global temperature increase of 2.4°C. The map on the right shows the areas affected by rainfall events in the SADC region in 2100, should the worse-case scenario of a global temperature increase of ~5°C be realised. These maps show that the DRC, Angola, Madagascar, and the coast of East Africa will be impacted by extreme rainfall events.







## Limitations of the Climate Risk Assessment

Gathering of evidence for understanding climate risk in the region was affected by:

- The availability of data for vulnerability indices;
- Uncertainty surrounding the types of climate modelling used; and
- A lack of climate data for Africa.

The evidence was used to identify hotspots i.e. areas where hazards, vulnerability and exposure intersect. These hotspots will allow for targeted adaptation interventions.



### Questions & Answers

#### How can we plan for weather characteristics such as rainfall onset, cessation and duration for decision making at the community level?

Essentially, you cannot plan for these weather characteristics due to the level of uncertainty, but you can plan for the unknown. Futures work is about understanding that there is more than one version of the future. Furthermore, what you do today affects the future, for example it is important to understand how the weather and its uncertainty affects the decisions you make today and what that means for the future.



### Learning

You should now know that **foresight techniques give us a process for considering alternative futures** by assessing trends and drivers and how they may play out. This process allows for medium to long term vision building to inform present-day decisions and actions. Furthermore, you have learnt techniques for dealing with data gaps and data uncertainty.

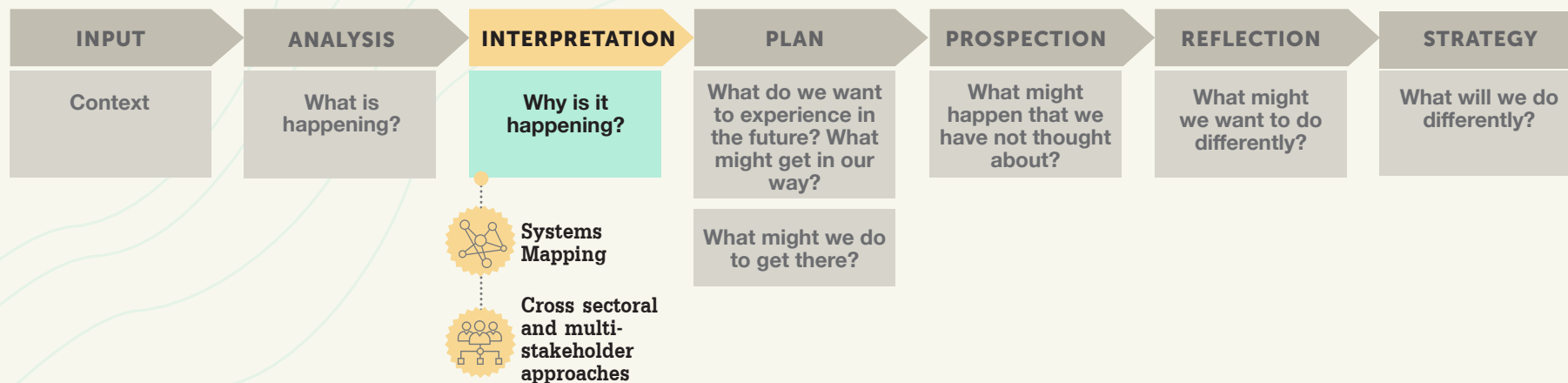




## Interpretation Stage



The interpretation stage follows on from the analysis stage. This is where foresight differs from strategic planning, here we include a 'pause' to understand why something is happening?



A systems approach incorporating systems mapping and cross sectoral and multi-stakeholder linkages is used to answer the key question:



**Why is it happening?**



## Systems Mapping

**Systems mapping is a tool that falls within the interpretation stage.** Systems, from a global level down to a local level, are shaped by different interacting factors or drivers. Drivers can be direct, in which case they undeniably influence a system, or indirect (underlying), where they alter one or more direct drivers (Forward Thinking Platform, 2014).



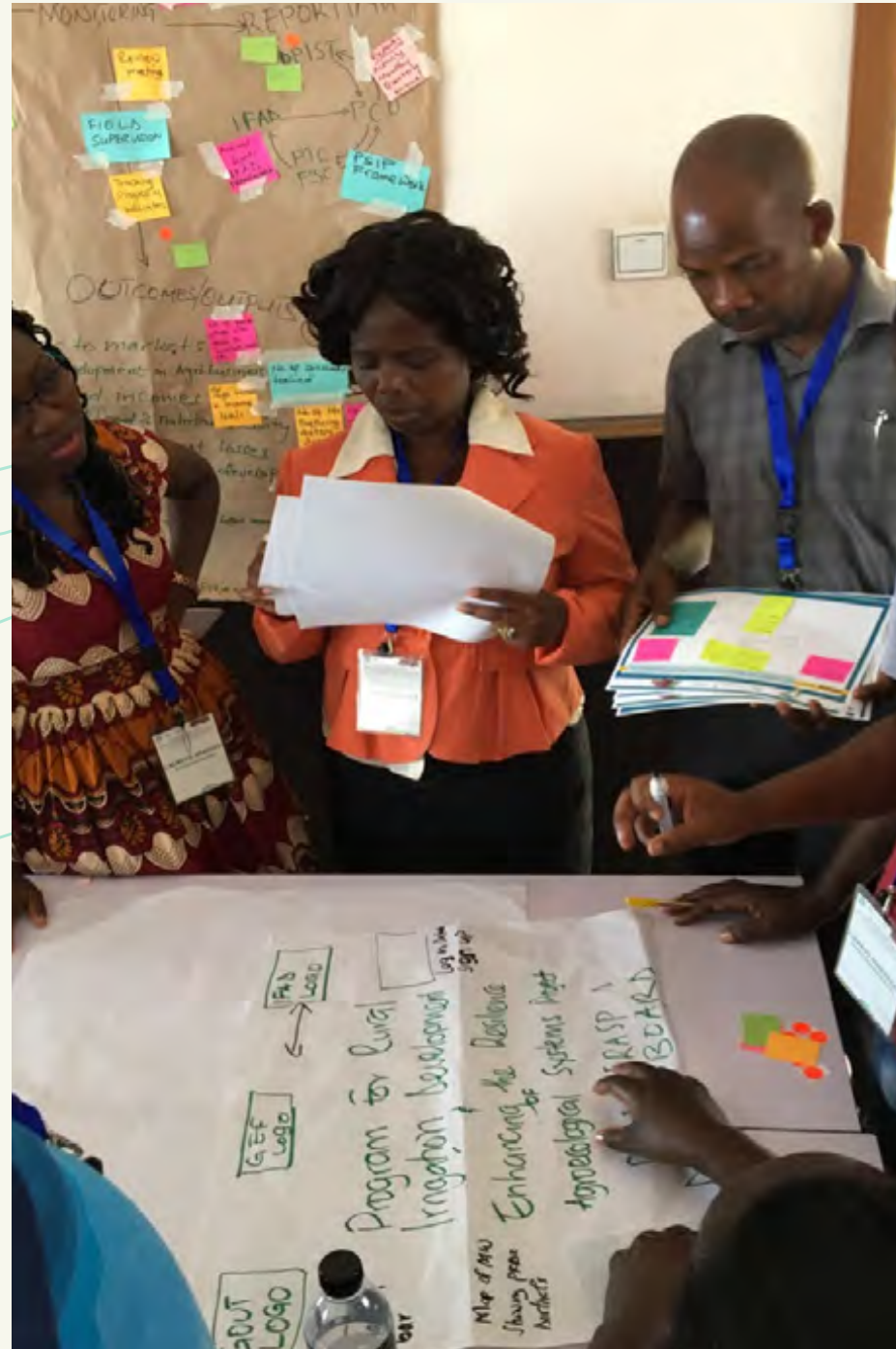
**What is the method?**

- Systems mapping provides a visual way of exploring the system, its elements, connections, and complexity.



**Why apply it?**

- Mapping systems can be used as a basis for understanding actors and their relationships, issues, and the influence of trends.



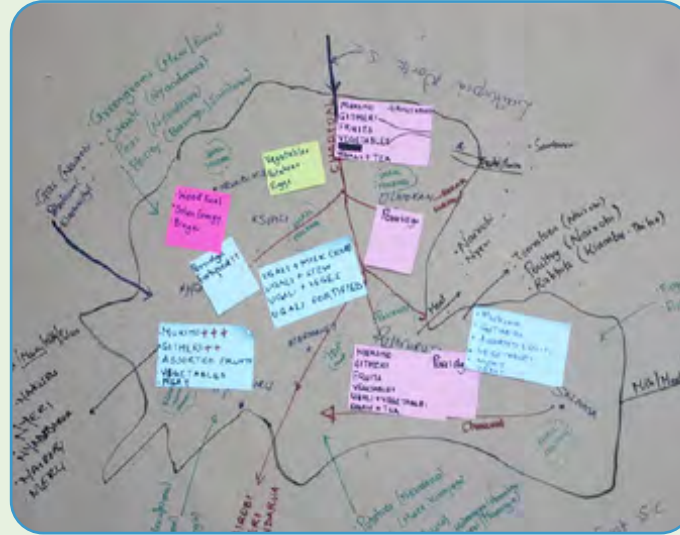
# MODULE 02

## Understanding Trends and Multi-sectoral and Systems Linkages



## Why do we do systems mapping in foresight?

Systems mapping allows us to look at the elements, actors, and relationships of a system. It serves in getting stakeholders to share their insights, potentially divergent perspectives, and interact and dialogue as the map is developed.



## Who does systems mapping?

As much as possible stakeholder representatives within the system of focus should be involved in mapping.

**System** - is an interconnected set of elements that is coherently organised in a way that achieves something (function and purpose).

**Systems view** - is an understanding of life as networks of relationships.

**Systems thinking** - is a mindset, tool and process that is reserved for complex problems.







# Learning Exercise



Using the above definition of a system, **think of a school**, **what elements does it consist of and how are they connected?** What is the purpose of the system? Using different coloured pens and a large piece of paper, map the elements of a school system and their relationships. Does your map look similar to the example on the right?

**Systems mapping is carried out following four key steps:**

## Key Steps for Systems Mapping

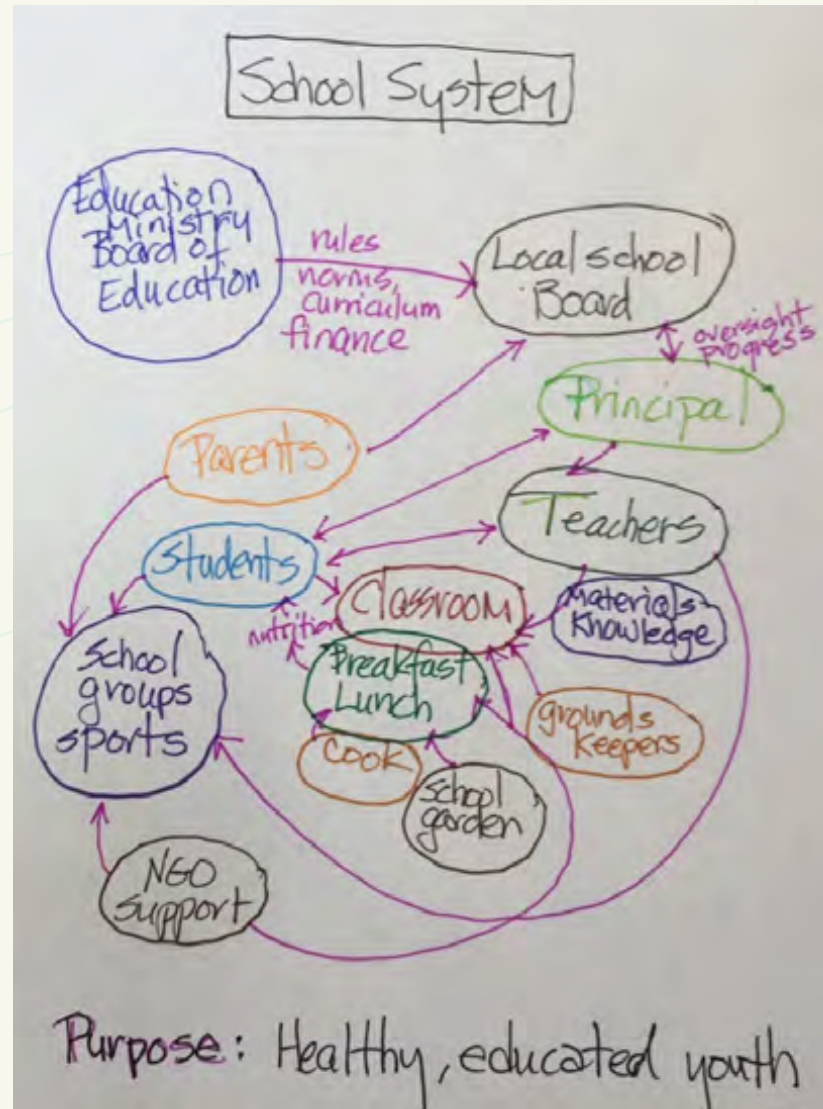
- Consider which system is relevant to the scope;
- Visualise the system and understand the stakeholders;
- Identify the drivers that are influencing the system; and
- Build multi-stakeholder and cross-sectoral relationships.

## Key terms related to a systems map include:

**Elements** - the different, discrete elements within the system (e.g. farms, organisations, inputs, and soil).

**Interconnections** - these are the relationships that connect the elements (e.g. rules, ideas, funding or service relationships, among others).

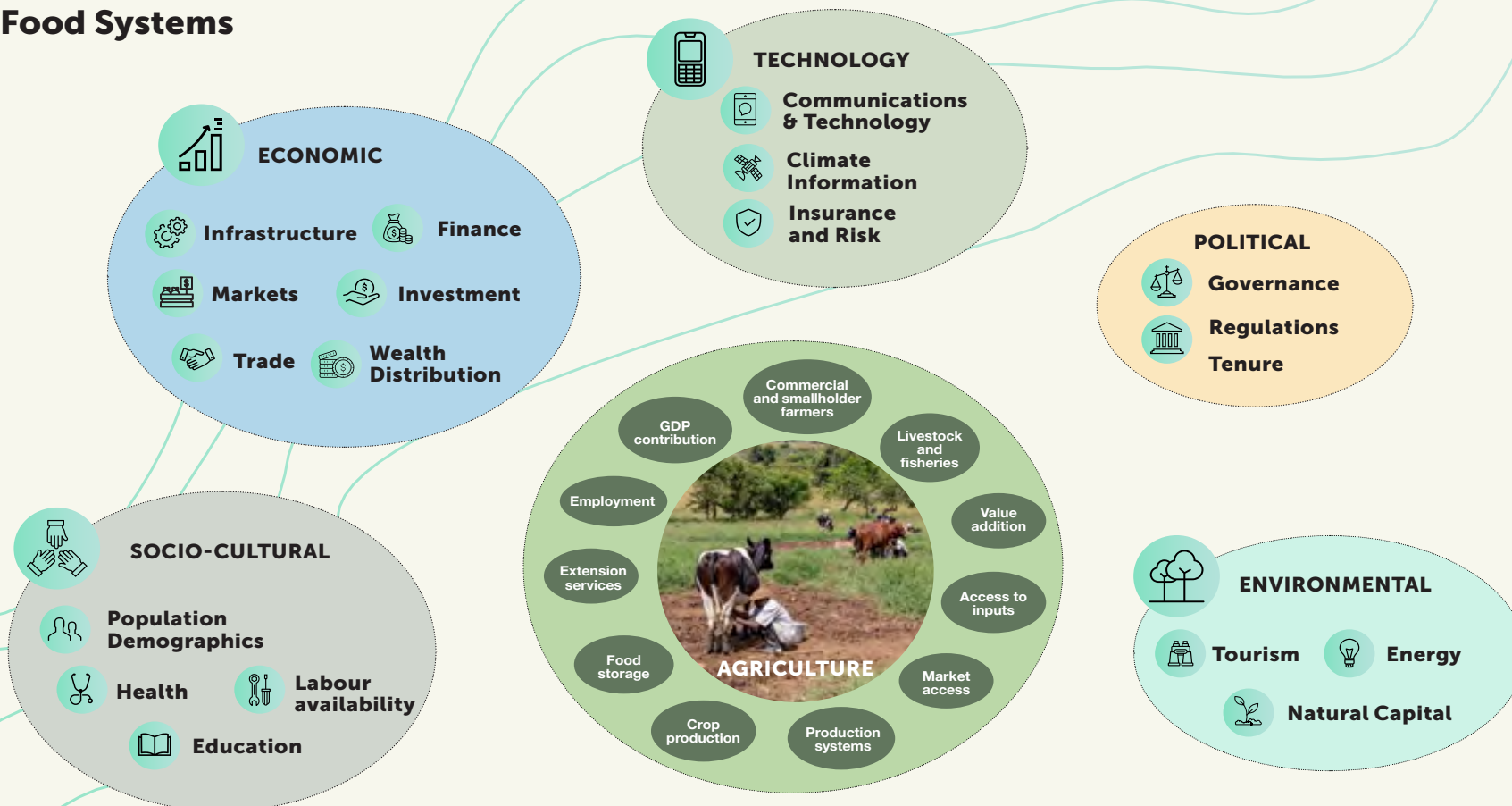
**Function and purpose** - the purpose of the system is around the outcomes the system is meant to achieve (e.g. food security outcomes and increased livelihood streams).



# Step 01 Consider Which System is Relevant to the Scope

Using the scope method, we unpacked agri-food systems. The core agricultural theme was found to be complex, constituting numerous different elements such as production systems, employment, and food storage. Furthermore, the agri-food systems sit within and amongst other ecological, social, political, and economic systems. These interconnected systems and sectors affect outcomes such as production and food security in the region. (For detailed information on this topic refer to the SADC Futures knowledge series supplementary report, 'Systems Analysis and Sectoral Linkages Impacting Climate Resilient Development in the SADC Region'.)

## Agri-Food Systems





## Learning Exercise



When setting your theme using the scope method, you wrote down your thoughts on what makes up, affects, or is affected by, the system at the core of your theme and grouped the external systems and drivers of change according to categories. Use this as a base for completing the systems mapping steps to follow.

## Step 02 Visualise the System and Understand the Stakeholders

Step 2 of 'systems mapping' is to **create a detailed diagram of the system**; this can be split into three activities:

- Establish the related elements and stakeholders;
- Make connections to show the relationships; and
- Show the outcome or the purpose of the system.

### Establish the Related Elements and Stakeholders

**Key questions to consider for this activity are:**



**Who works together?**  
**Who needs to work together?**





## Learning Exercise



**Consider the school system map.** Who are the key role players and who works together?

Who would **benefit from working together** with other stakeholders? Key stakeholders would likely include the principal, teachers, and students.

The principal and teachers work together to provide education to the students. To assist the students with achieving good results, it could be beneficial for the teachers and the students' parents to work together e.g. encouraging a set time for homework. Now consider the questions in the context of your chosen theme. Document your findings on a piece of paper.



Photo: Alex Fassio (CIFOR)



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the context of climate-resilient agri-food systems in the SADC region, the system in question could include the following related elements and stakeholders: the **farm**, the **residents**, **elements of production such as livestock, crops, trees, and aquaculture**. The farmer makes management decisions which affect the land and productivity. The family or labourers need to work with the farmer to implement the decisions to realise the preferred outcome.

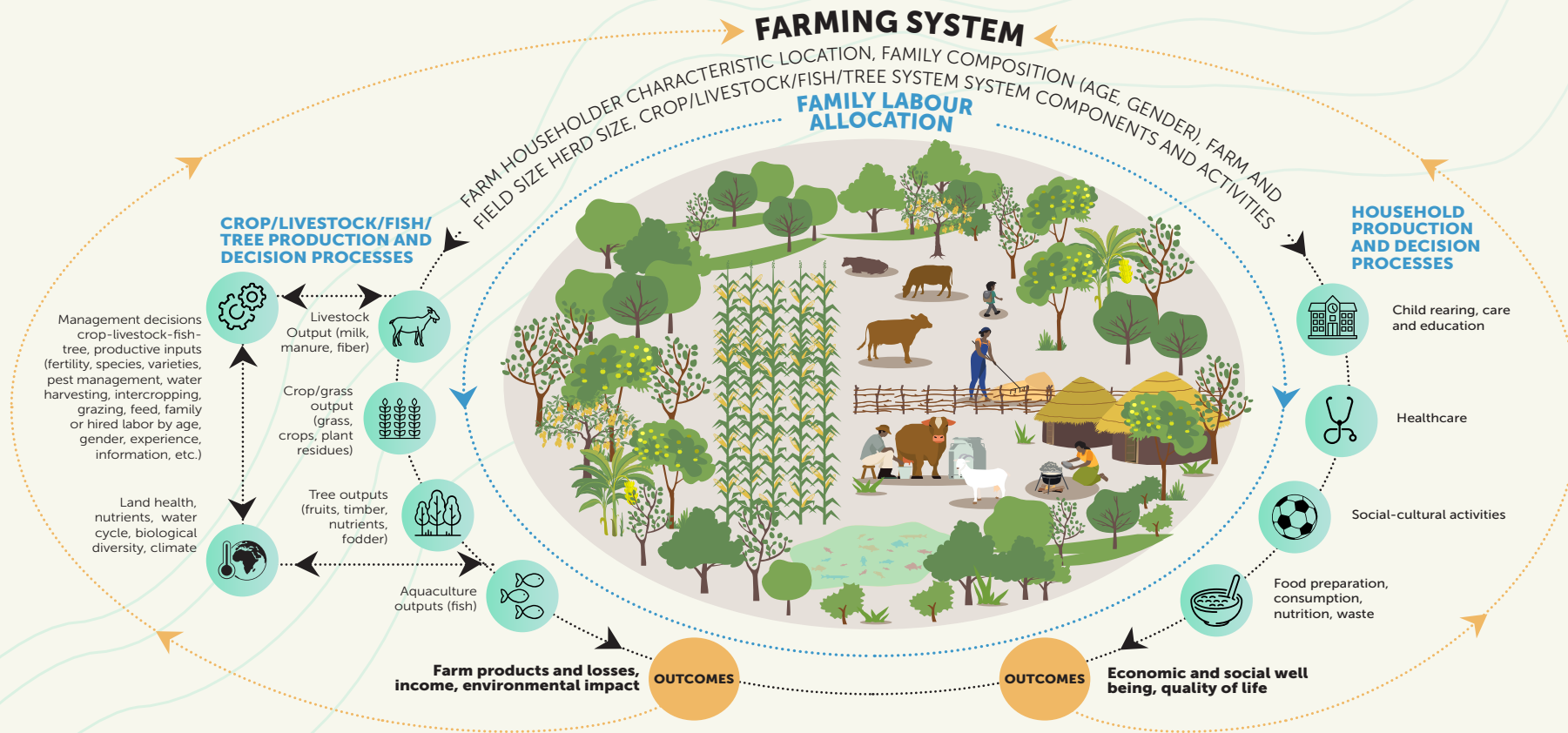






Photo: Neil Palmer (CIAT)

### Making Connections and Showing Relationships

Farming systems do not occur in isolation, there are other dimensions that either influence or are influenced by the farming system. It is important to show these connections and relationships to fully understand the system. For example, the diagram below shows that there is a connected environmental dimension which includes biodiversity, energy, and water. There is also a connected economic dimension which includes value chains for the products, exports, imports, consumption, labour, finances, and waste. The relationships between the different dimensions and the farming system are shown with connecting lines, arrows, and spheres.

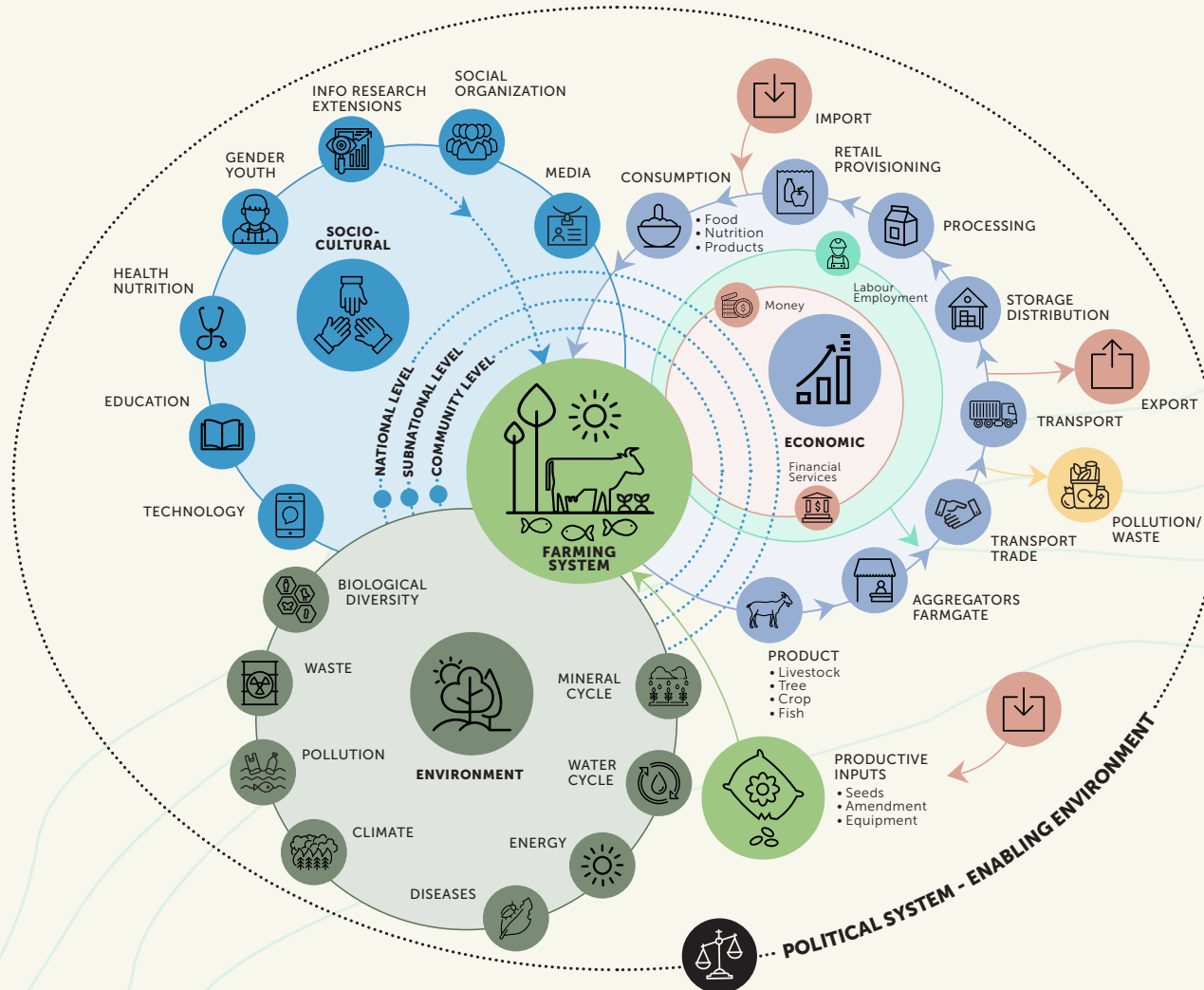


## Learning Exercise

Think of the **socio-cultural dimension in relation to the farming system**, unpack the elements and determine the connections. What are the socio-cultural inputs and outputs? Think of the **STEEP categories**, what is missing? Use the diagram below to guide you.







## MODULE 02

### Understanding Trends and Multi-sectoral and Systems Linkages

#### Show the Outcome or the Purpose of the System

The purpose of an agri-food system could be to produce food products in return for financial gains. The outcomes of an agri-food system (can be positive or negative) include:

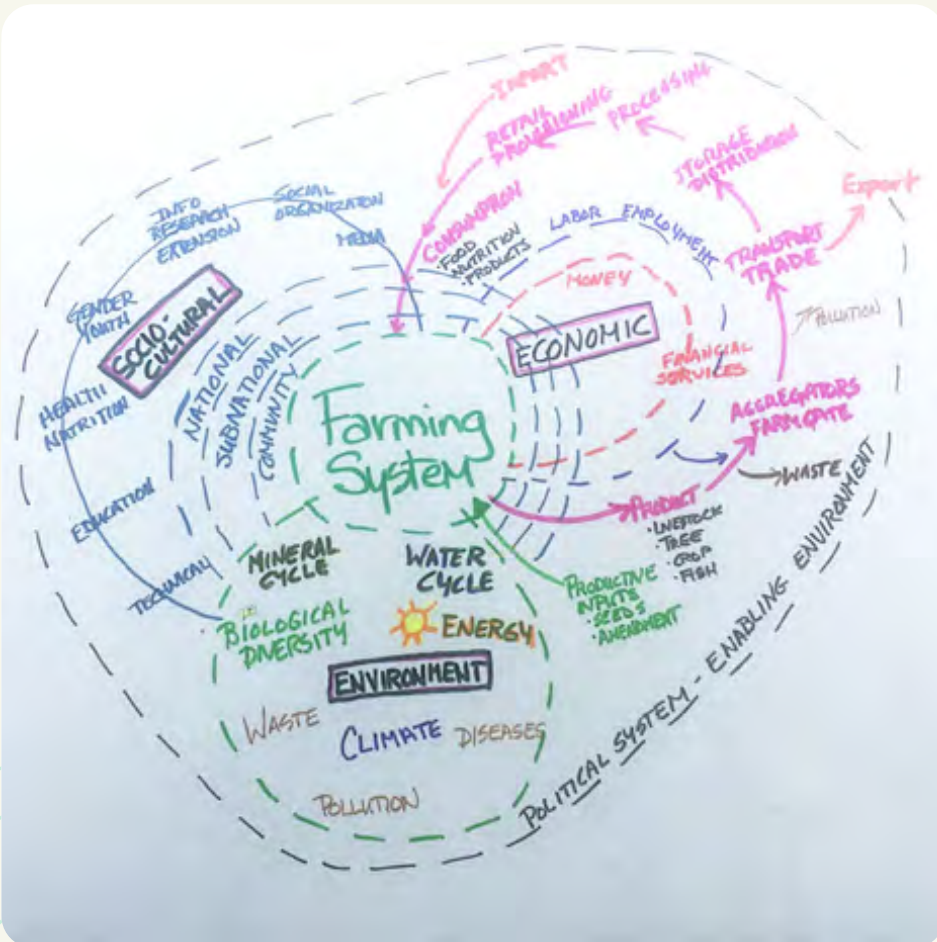
- **Food and nutritional security** e.g. cereal and dairy products;
- **Socio-economic outcomes** e.g. employment; and
- **Environmental outcomes** e.g. land degradation and water scarcity.



## Learning Exercise

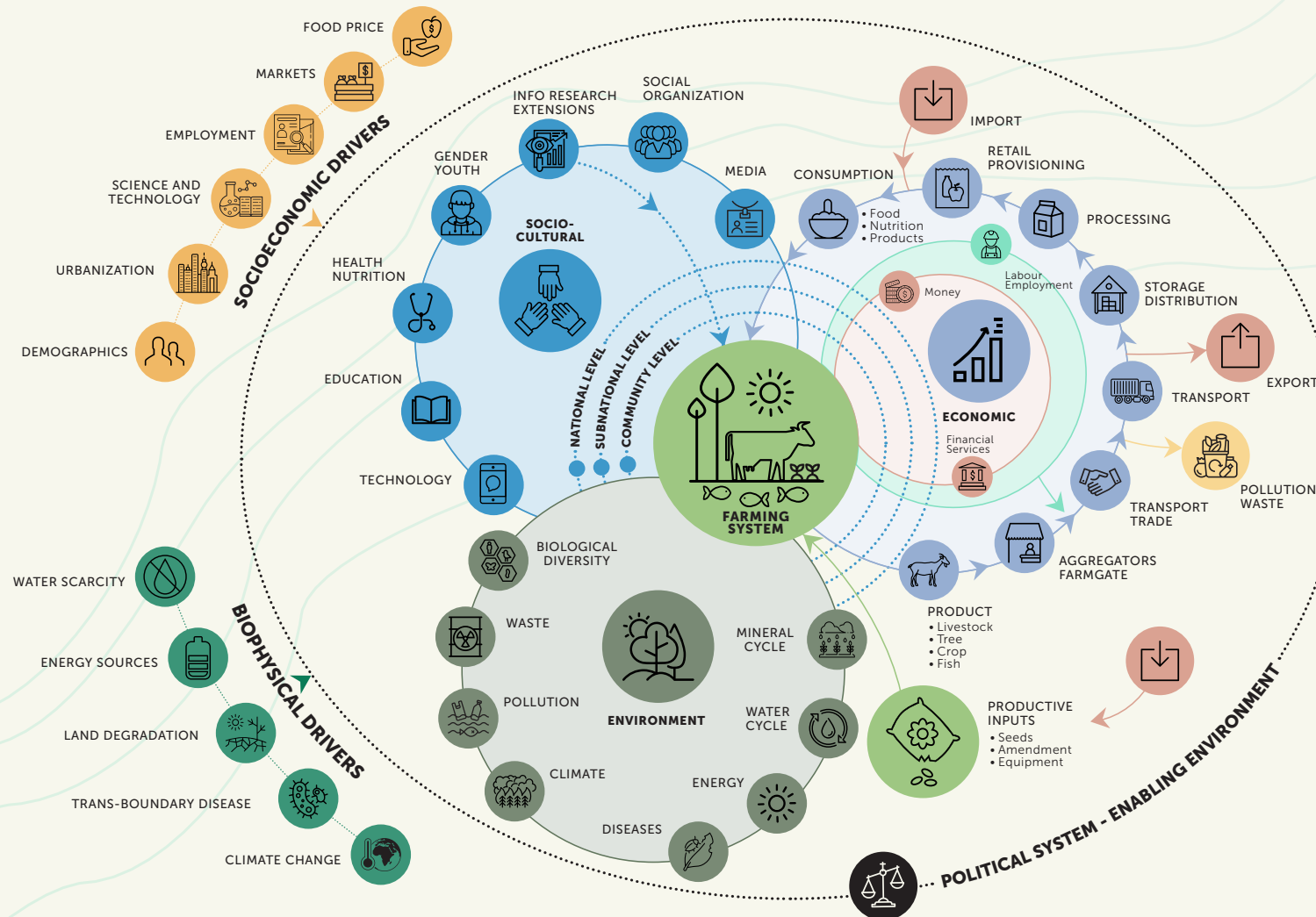


When developing your systems map, you would gather your foresight group for a brainstorming session. Using a white board or a large piece of paper and a multitude of coloured pens. **Group the dimensions that influence or are influenced by your system in question according to the STEEP categories explained previously.** Show the relationships and connections between them using arrows, connector lines and overlapping spheres. A hand drawn example of a farming systems map, that could be produced in a workshop, is provided below.



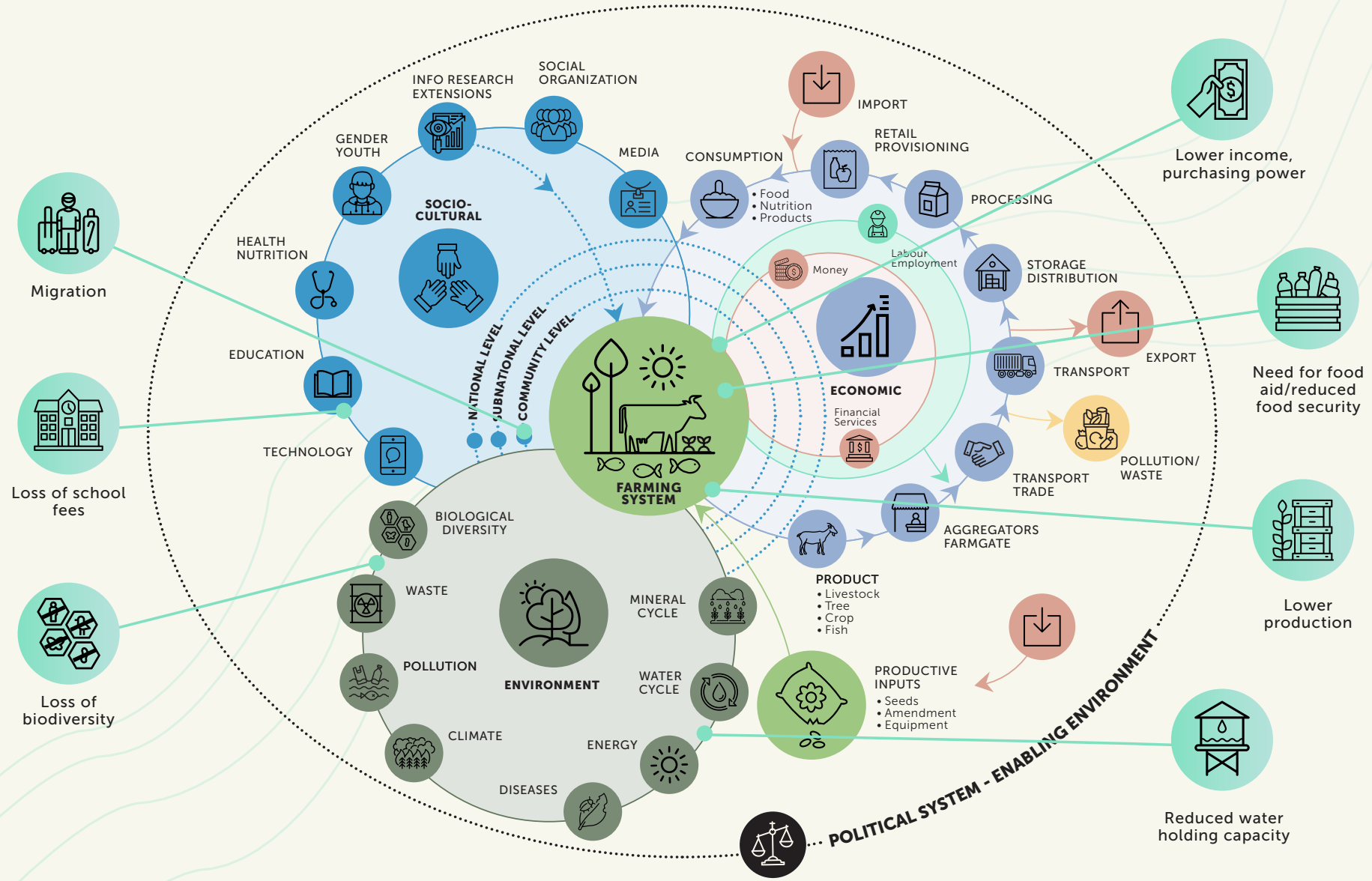
# Step 03 Identify the Drivers that are Influencing the System

The systems map can also be used to **document drivers of the system**. For example, as part of the agri-food systems there are socio-economic drivers such as employment, science and technology, markets, urbanisation, demographics, and food prices or biophysical drivers such as water scarcity, energy sources, land degradation, transboundary disease, and climate change. See the annotated drivers in the diagram below.





Once the systems map and drivers are complete it is important to **consider the drivers carefully and understand their implications**. For example, the driver 'land degradation' could result in negative outcomes such as lower income, reduced food security, lower production, reduced water holding capacity, migration, loss of school fees, and loss of biodiversity. See the diagram below for the possible outcomes of land degradation and how to map them.

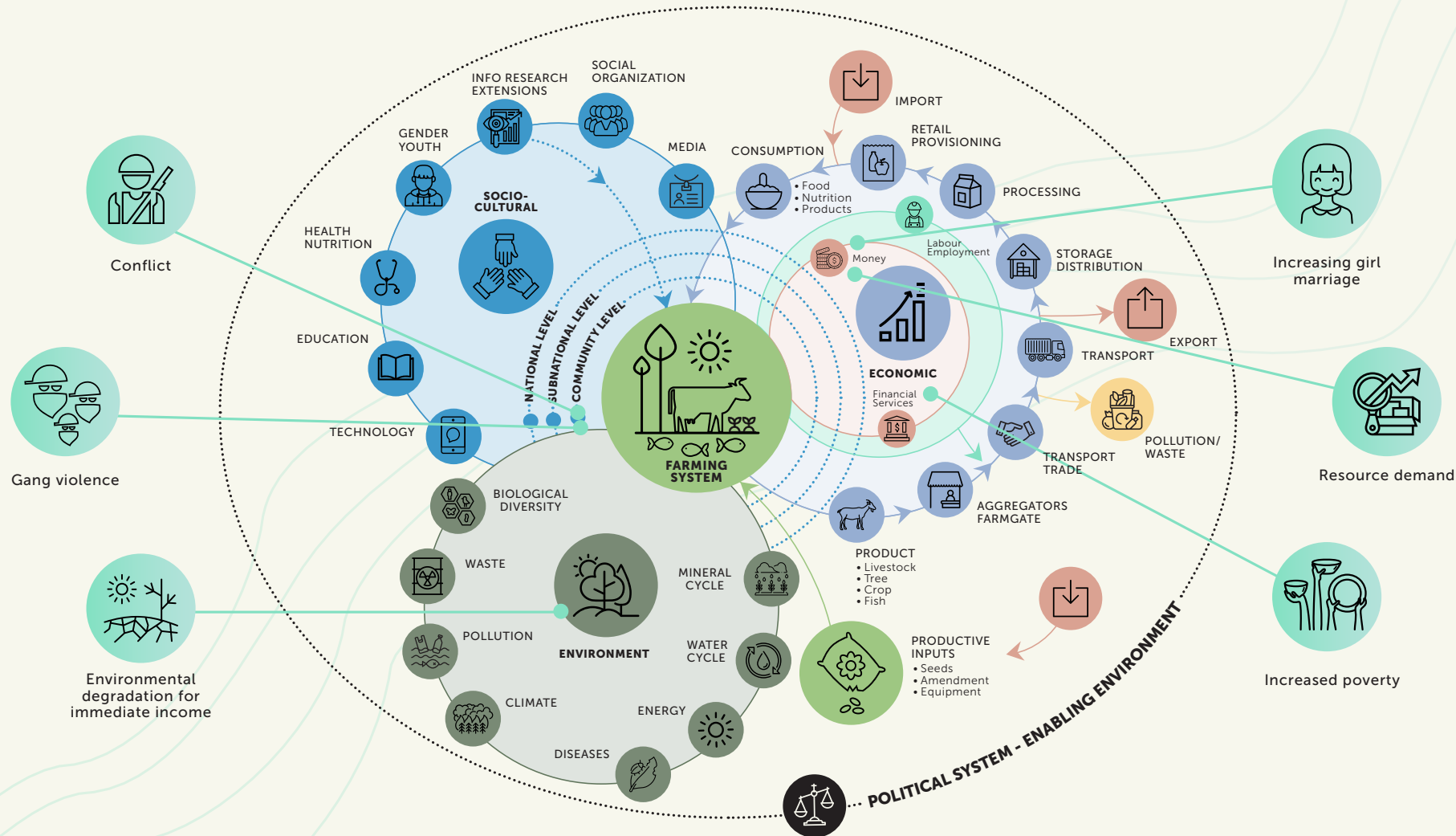


**MODULE 02**  
**Understanding Trends and Multi-**  
**sectoral and Systems Linkages**



# Learning Exercise

Take a moment to consider what the outcomes of the **social driver youth unemployment** would be? How would **youth unemployment affect the farming system**? See the diagram below for some examples of outcomes.



It is important to recognise that a **driver will likely affect multiple dimensions of a system**. For example, as shown in the diagram above, youth unemployment impacts on the environmental, socio-cultural, and economic dimensions of the farming system.



## Step 04 Build Multi-Stakeholder and Cross-Sectoral Relationships

As mentioned previously, the **foresight tools and methods learnt can be applied across multiple stages in the foresight framework**. In this light, the next step is to build multi-stakeholder and cross-sectoral relationships.

- **Multi-Stakeholder Collaboration** - consists of a mix of representatives or stakeholders from public, civil, and private domains of society.
- **Cross-Sectoral Coordination** - the engagement, management, planning and implementation of activities conducted across different thematic sectors to deliver development outcomes (e.g. food security, nutrition, sustainable landscapes, and agriculture).



### Learning Exercise

In defining the scope, you identified and listed stakeholders relevant to your theme. You drew a basic stakeholder map showing the relationships between key stakeholders. Use this work as a base for carrying out the steps that follow.







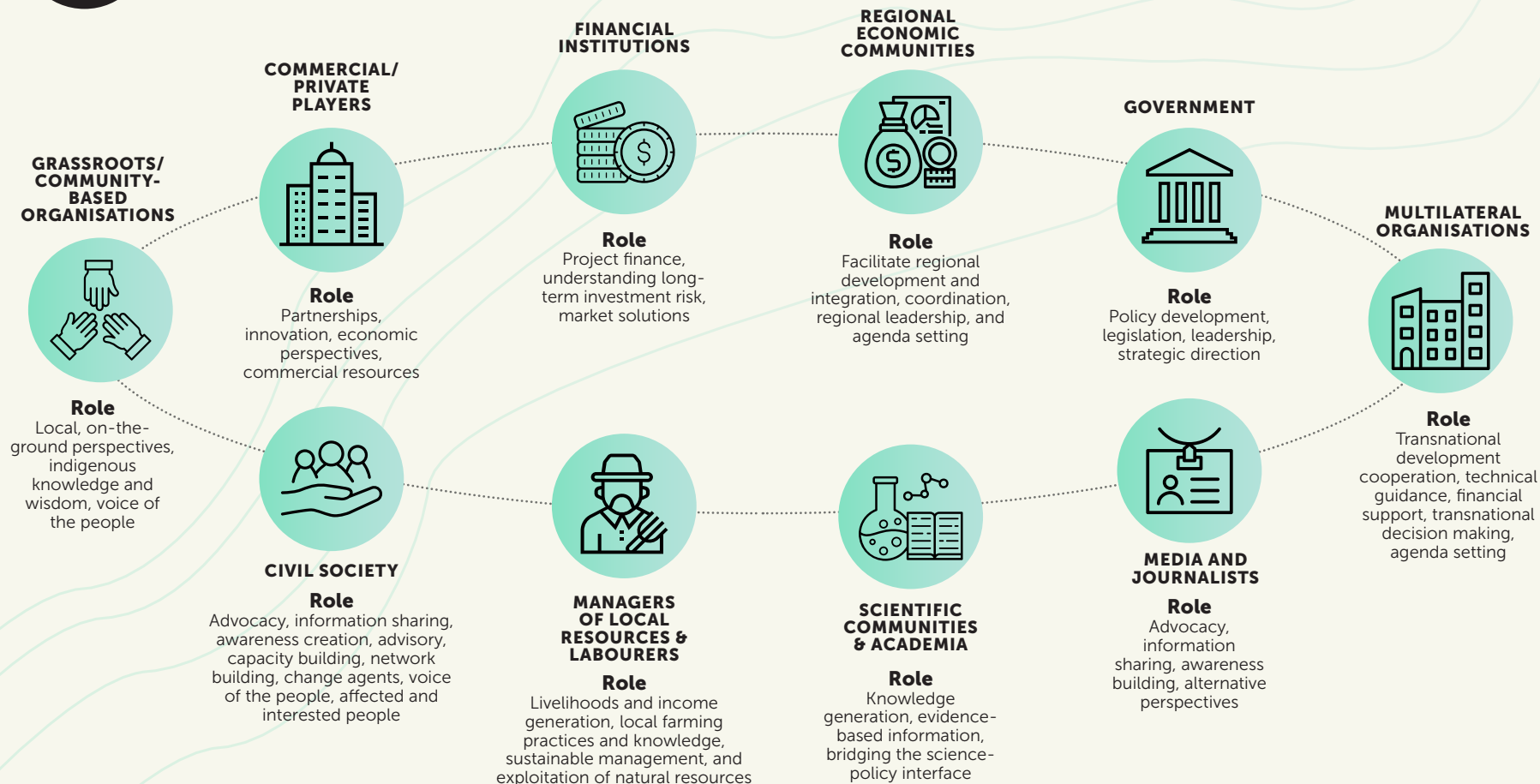
## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

For the purposes of the **climate-resilient agri-food systems** theme, **multi-stakeholder collaboration** consists of a mix of **representatives or stakeholders** from public, civil, and private domains of society. Cross-sectoral refers to the different themes and for the purposes of the context of this foresight exercise, predominantly those associated with government sectors.



### Multi-Stakeholder Collaboration

The **stakeholder groups** that would be important to include for the purposes of climate-resilient agri-food systems in the SADC region are provided in the figure below.





**Key questions to consider when identifying stakeholder groups core to your theme include:**

Who is at the table when you are planning your foresight process? Who is at the table when you are conducting the foresight exercise?



**Questions & Answers**

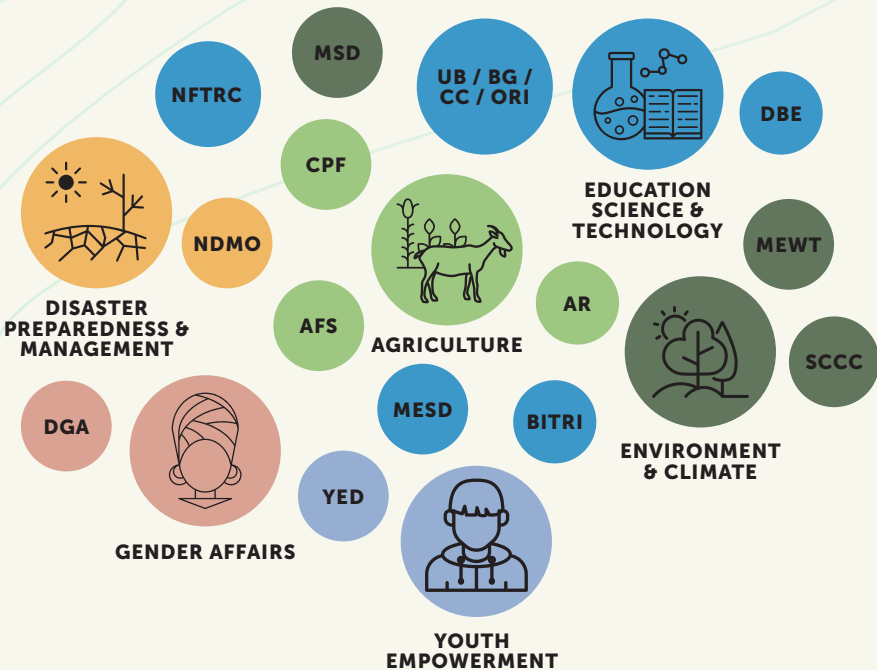
**Should systems mapping incorporate both interested and affected stakeholders?**

Yes, it is important to use an integrated approach to systems mapping that incorporates interested, affected and influential stakeholders.

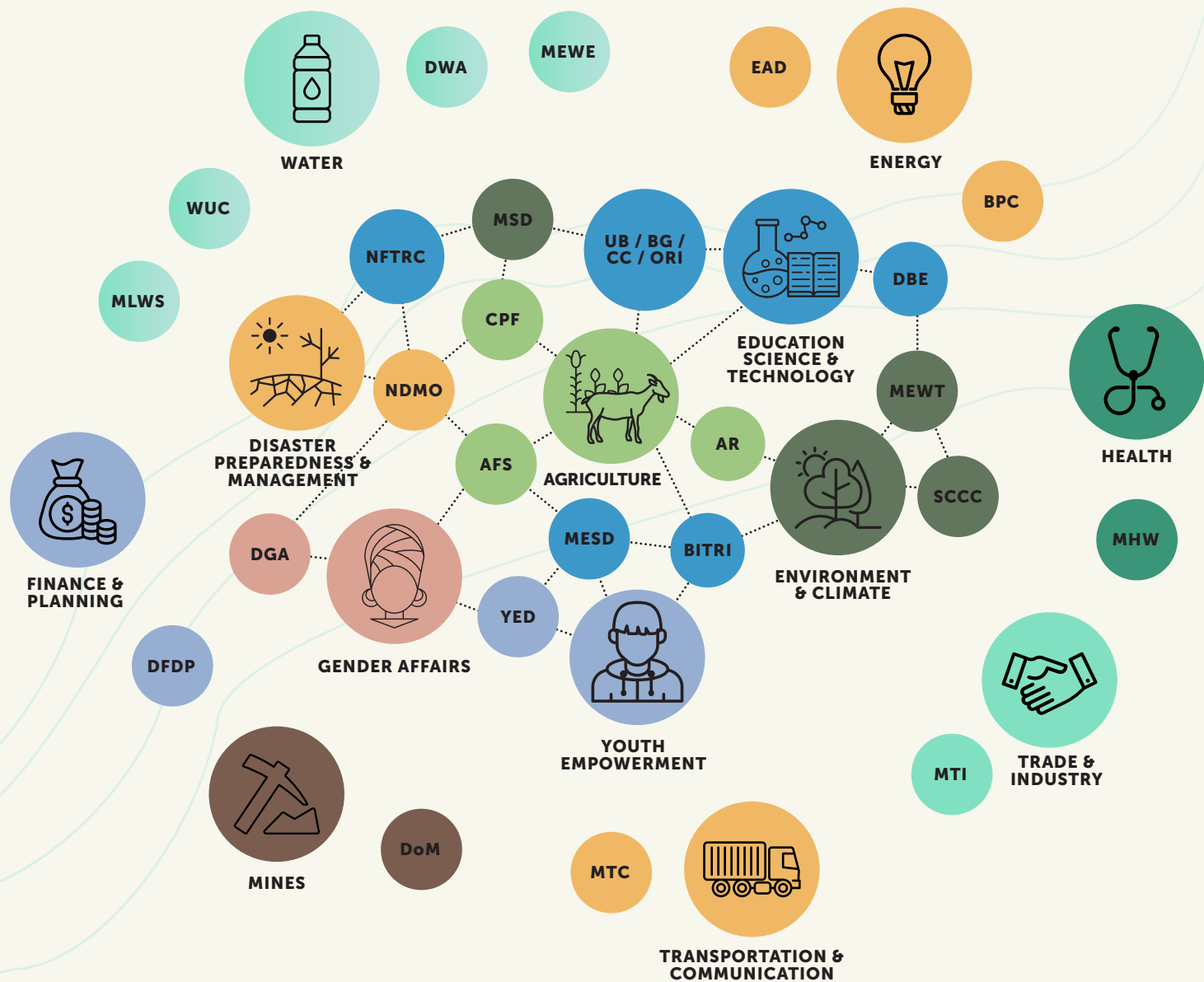


**Cross-Sectoral Collaboration**

For the purposes of the chosen theme it is important to look at the **‘government’ stakeholder group** in more detail. Systems mapping can assist with this. Firstly, the focus is narrowed as we consider core ministries and departments working on climate change in Botswana e.g. education, science, and technology; environment and climate; agriculture; disaster preparedness and response; gender affairs and youth empowerment. It is important that the ministries and departments in these different sectors have an integrated approach to climate change in the country. They need to know each other’s roles and responsibilities within the context of systems thinking.



There is a much wider **network of ministries and departments across other sectors that would also need to be included due to the nature of climate resilience**, for example, finance and planning, water, energy, and health. These networks and relationships need to be built upon so that the right people are brought to the table.



**MODULE 02**  
**Understanding Trends and Multi-**  
**sectoral and Systems Linkages**



**In an ideal situation you would include stakeholders from all sectors, and they would have a systems view.** They would focus on their respective area but understand, respect, and interact with the other stakeholders. The outcome of this would be the ability to talk freely about what stakeholders give and what they get from each other i.e. the different sectors, ministries, and departments, within the given theme.

In summary, **building relationships throughout the foresight exercise is important for enhancing cross-sectoral coordination and stakeholder collaboration** for strategy development and implementation. The end products are transformative strategies for development which are much more inclusive.



## Questions & Answers

### How can we use systems mapping to better understand climate risk?

The IPCC framework shows the interaction between socio-cultural and environmental processes. This highlights the need for a multi-stakeholder and cross-sectoral approach. Specialists can gather data for in depth assessments within their areas of expertise and bring the evidence to the table for discussion with people from different backgrounds and with different perspectives. They can use systems mapping to identify areas that have not been thought of.

#### Systems mapping can also be useful in understanding:

- How different stakeholders perceive how the system functions;
- Where knowledge about the system is underdeveloped;
- What evidence is available; and
- What will happen if we intervene in one aspect of the system i.e. what repercussions will the actions have on other areas of the system.



## Learning

You should now understand the **importance of multi-stakeholder and cross-sectoral relationship building and engagement in foresight planning**. You know that a systems' understanding among stakeholders is the first step to creating meaningful change in the system and for developing robust strategies through the foresight process.



Photo: Axel Fassio (CIFOR)

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## MODULE 02

### Understanding Trends and Multi-sectoral and Systems Linkages

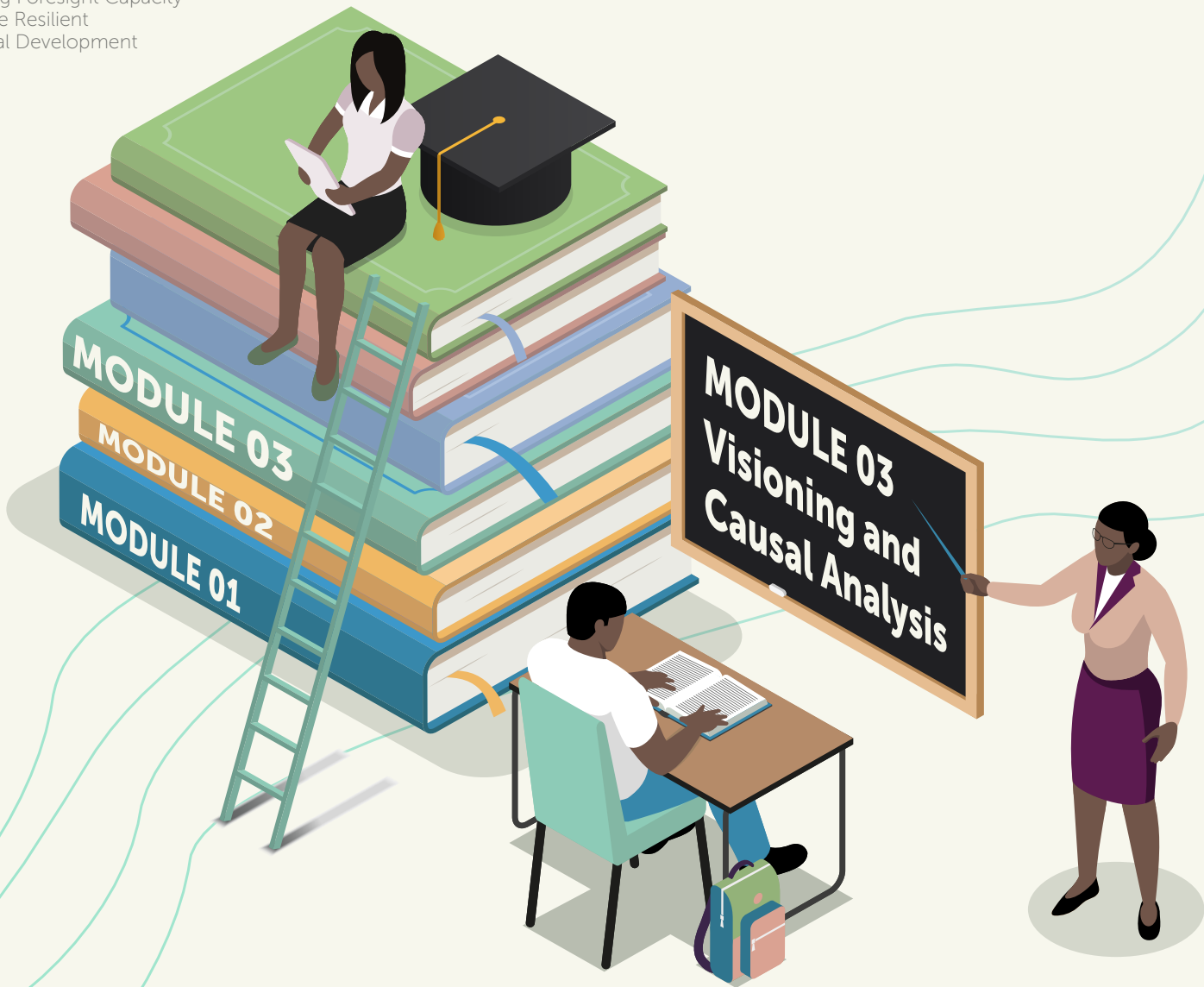


Photo: Axel Fassio (IFOR)





**SADC Futures**  
Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



**MODULE 03**  
**Visioning and Causal Analysis**



RESEARCH PROGRAM ON  
**Climate Change,  
Agriculture and  
Food Security**



Implemented by:  
**giz** Cooperative Implementant  
für internationale  
Zusammenarbeit (GIZ) GmbH



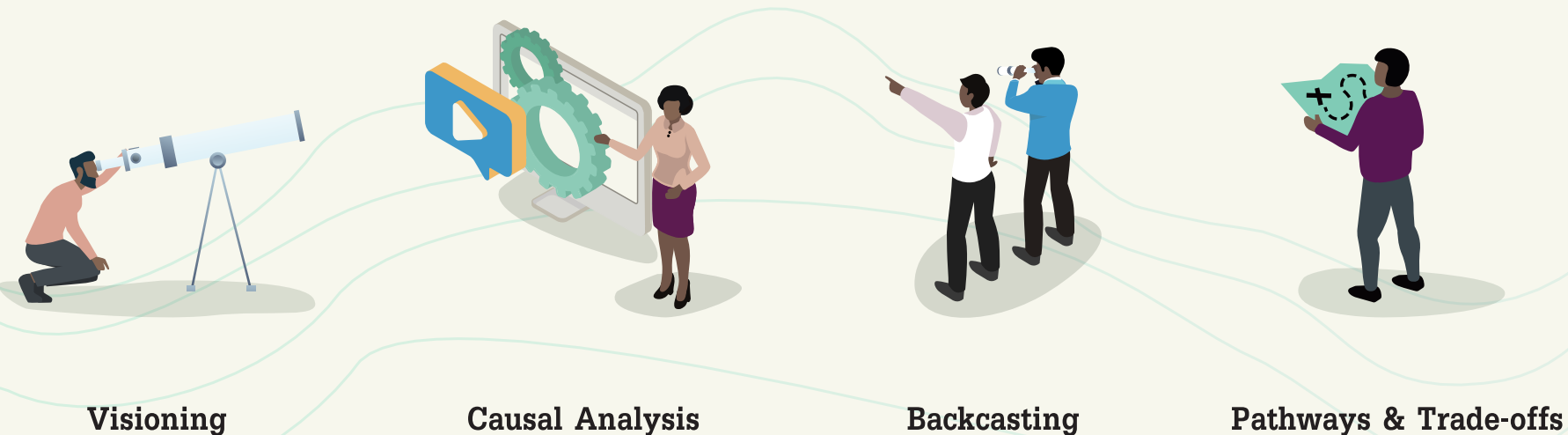


# What Will You Learn?

Module 3 covers the **plan stage of the foresight process**. A key focus here is to shift thinking to what might be possible, as opposed to business-as-usual thinking around what is believed to be possible and will occur. The module presents a variety of methods and tools, namely, visioning, causal analysis, stakeholder analysis, backcasting, pathway development, and trade-offs.

## On completing Module 3 you will:

- Understand visioning as a tool within the foresight approach;
- Be able to identify barriers and use causal analysis to understand underlying issues;
- Understand the concept of climate-resilient pathways as a future planning tool and key steps to developing pathways; and
- Be able to identify potential trade-offs.





# Test Your Learning of the SADC Futures Foresight Framework

Before getting started with Module 3, test your knowledge of foresight and information from the previous module by answering the following questions:



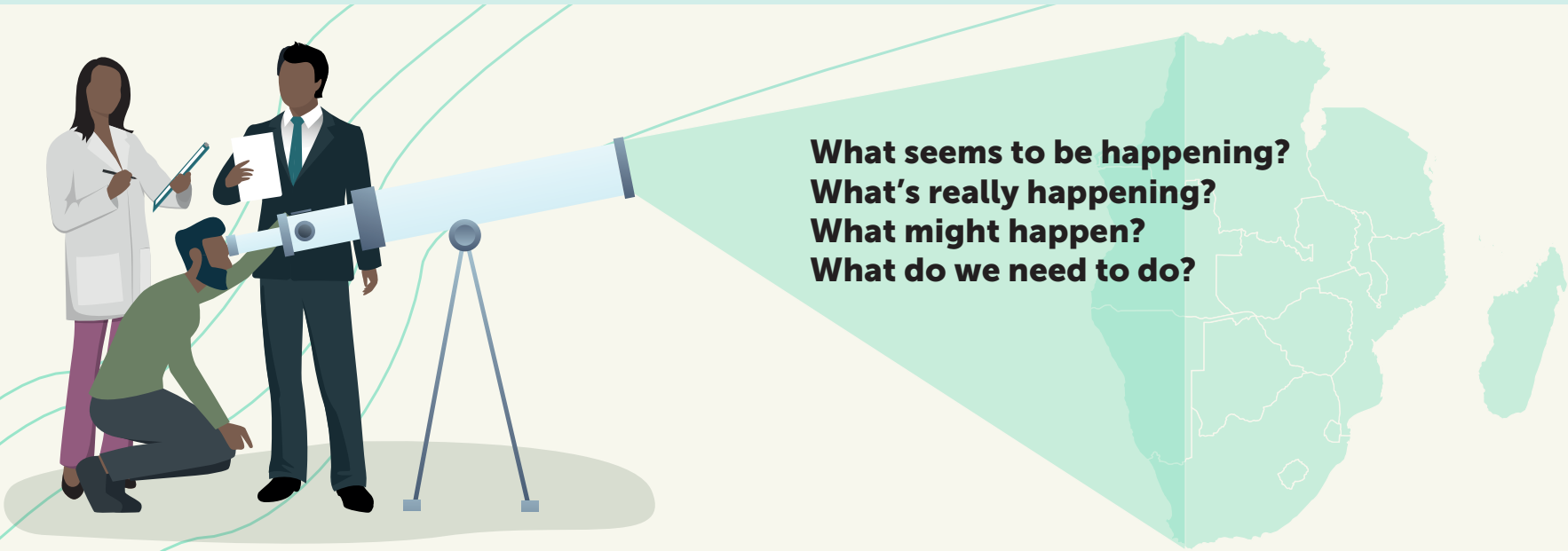
What are the four guiding questions we are trying to answer with a foresight process?

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What seems to be happening?  
What's really happening?  
What might happen?  
What do we need to do?



In the scope method what information do you need to define?

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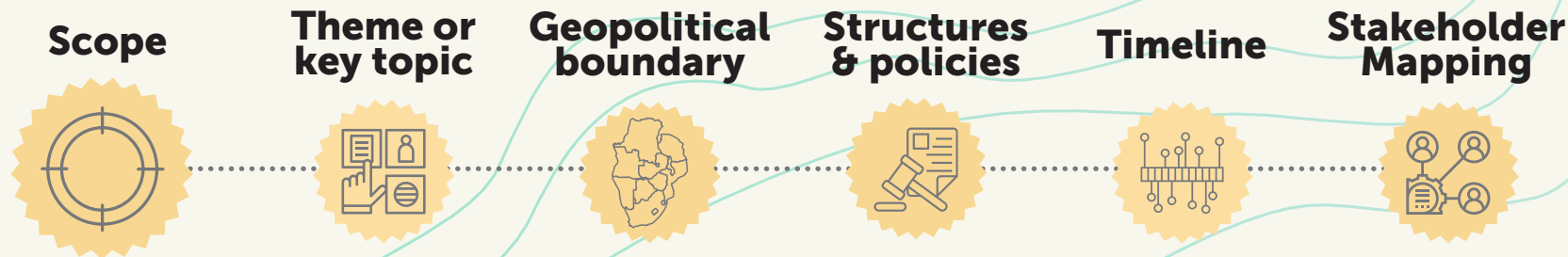
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What categories could you use for doing horizon scanning?

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- S**  **Social**
- T**  **Technology**
- E**  **Economic**
- E**  **Ecological / Environmental**
- P**  **Political**



# Plan Stage

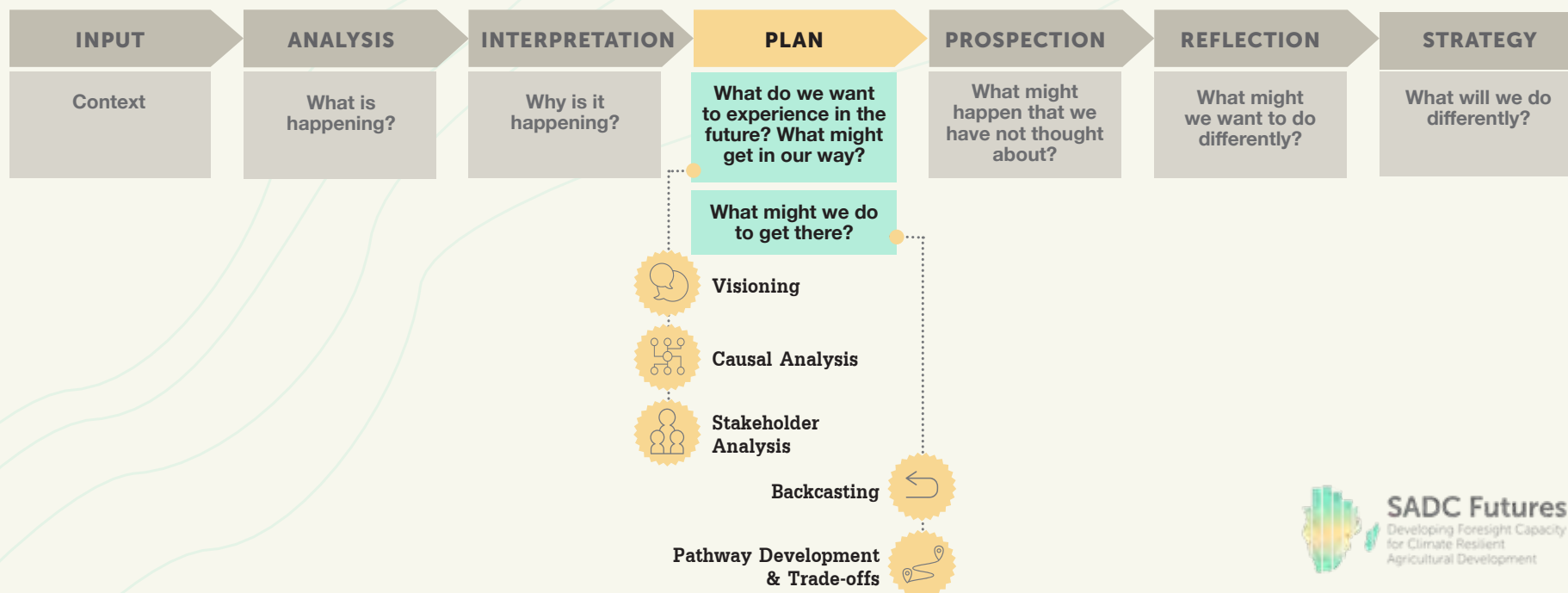
The plan stage of the foresight process follows on from the interpretation stage. A key focus here is to shift thinking to what might be possible, as opposed to business-as-usual thinking around what is believed to be possible and will occur. It is about shifting the focus and thinking from short term to long term (Conway, 2014). In the plan stage we investigate three key questions:



**What do we want to experience in the future?**  
**What might get in our way?**  
**What might we do to get there?**

These questions can be answered by applying a variety of methods and tools, namely visioning, causal analysis, stakeholder analysis, backcasting, pathway development, and trade-offs.

## Gathering and assessing information



**SADC Futures**  
 Developing Foresight Capacity  
 for Climate Resilient  
 Agricultural Development



# Visioning

**Visioning falls within the plan stage of the foresight framework**, it takes place after the situation analysis and interpretation and before the detailed planning and decision making process (European Foresight Platform, n.d.).

**Visioning** - is a participatory method for identifying, developing, and enriching a compelling, preferred future (UNDP, 2018).

**'Clarifying a vision is one of the most powerful mechanisms for engaging a team, organisation or community and getting them excited to push forward into new territory. Creating that clear vision is a precursor to planning, and a key to creating the conditions to mobilise a group of collaborators around a common goal. Ultimately, it is not about creating my vision, but about creating a shared vision'** (UNDP, 2018).



### What is the method?

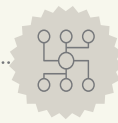
- Collaboratively outlining a compelling vision of a preferred future.



### Why apply it?

- Visioning a desirable future is the first step in creating a powerful strategy and provides the basis for developing interventions, services, policies, and partnerships that will be required to achieve that future.





## MODULE 03

### Visioning and Causal Analysis

**The aim of a visioning process is (UK Government Office for Science, 2017):**

- Focus groups on what a successful outcome looks like;
- Agree what the current reality is and what therefore needs to be done to deliver success; and
- Set out and prioritise the steps required to achieve the vision.

**Strengths of the visioning method (Jackson, 2013):**

- It inspires, engages, and enables most people; and
- It is excellent for generating ideas, encouraging interaction, and agreeing on common vision, values, processes, and goals.



### Key Steps for Visioning:

- **Define the theme;**
- **Set a clear timeline for the vision;**
- **Define the dimensions of the vision;**
- **Define the descriptors of the desired outcome in each dimension; and**
- **Identify supporting and sustaining elements for the desired outcomes.**



# Step 01 Define the Theme

**‘Define the theme’** is Step 1 of the visioning process where the parameters for the vision are outlined. It is necessary to consider for whom and in what situation or purpose the vision is being developed. It is important to remember that visioning in foresight is not about creating ‘my’ vision, but about creating a shared vision co-owned by the stakeholders (UNDP, 2018).



## Learning Exercise



**Think of your theme and try to answer the following questions:**

What issue are you trying to address?

What is the purpose of undertaking the foresight exercise?

For whom are you trying to resolve the issue?

Use your answers to develop a description of your theme which defines the parameters. It is important to understand that this exercise would normally be undertaken at a table with all members of a foresight organising group, as it is a participatory method. Document your defined theme; this will form the basis for the visioning steps to come. An example of a defined theme is provided below.





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the case of climate-resilient agricultural development in the SADC region the theme could be explained as:

**The SADC Secretariat wants to promote greater climate resilience in agri-food systems in the member countries and integrate climate resilience across sectoral plans.**

## Step 02 Set a Clear Timeline

In this step, **a timeline is applied to the vision**. This further denotes the parameters within which the work is intended. To do this, a timeframe from a relevant policy, project, programme, regional or global development goal or strategy can be used.



## Learning Exercise

In Module 1 you drew a timeline on a piece of paper, **displaying the different timeframes of various visions, policies, and plans and how they overlap**. You identified which timeframe best suited your theme. The chosen timeframe can now be included as a parameter in your vision.

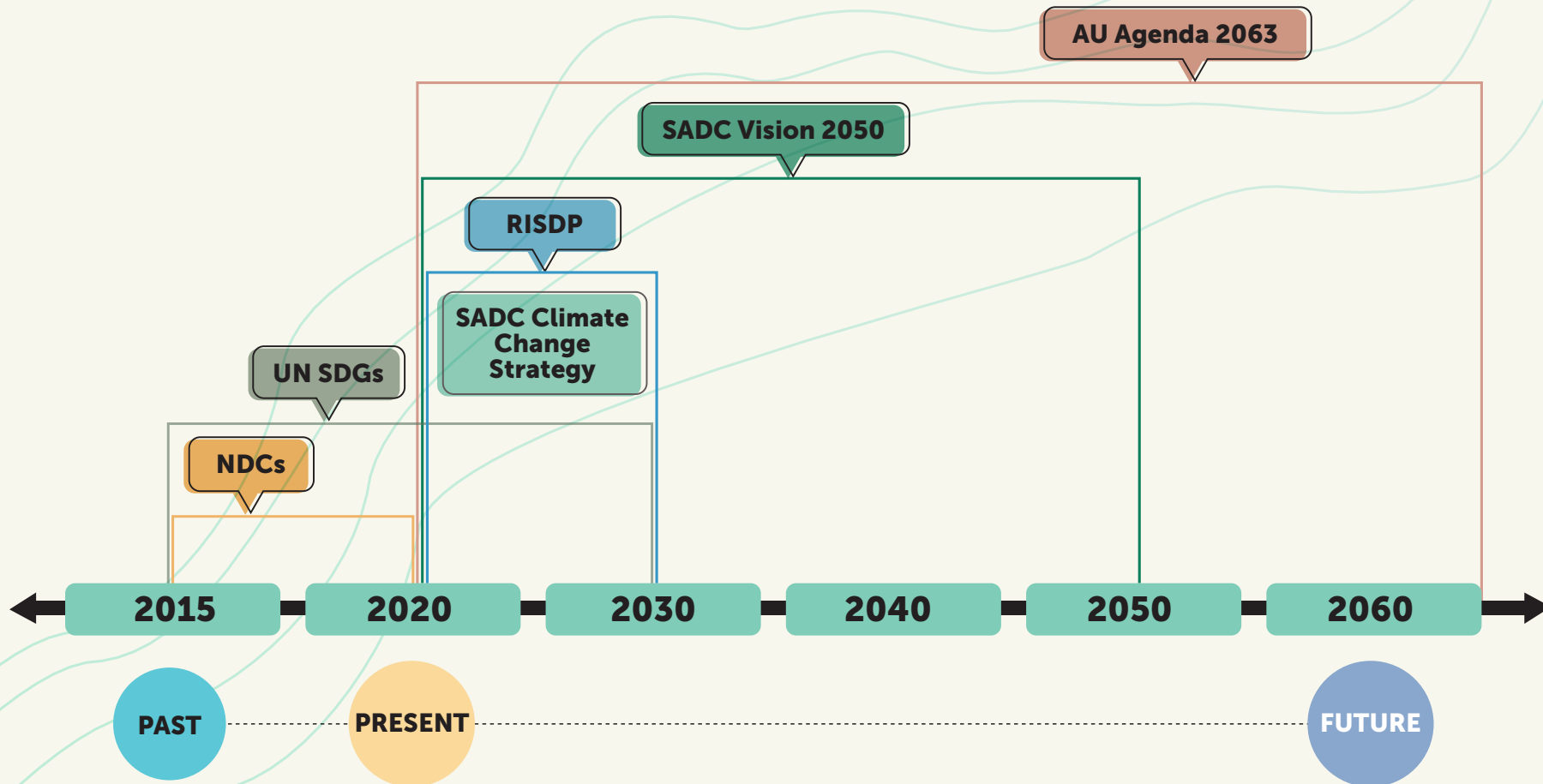






## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

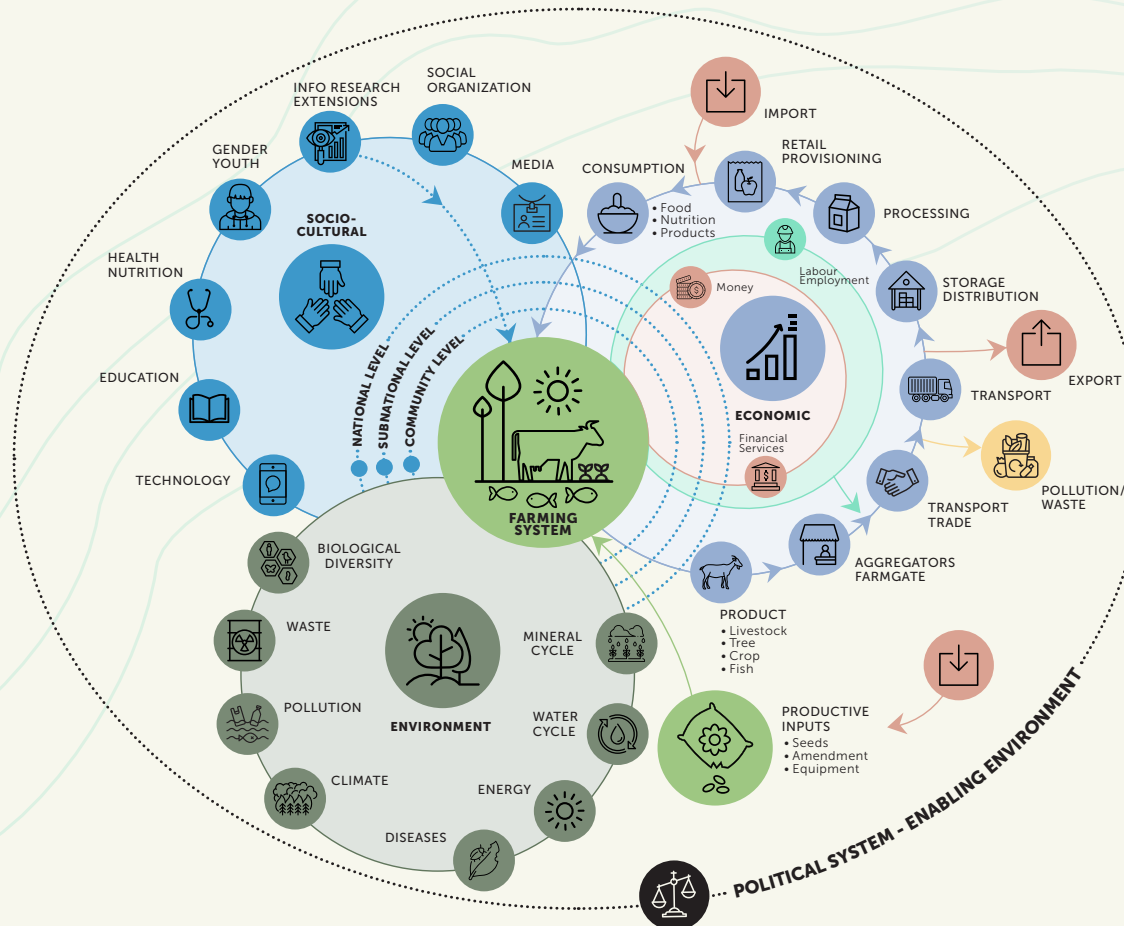
For the purposes of the chosen theme, 2030 was selected as the preferred end date for the vision timeframe as it is relevant to the Regional Indicative Strategic Development Plan (RISDP) and the SADC Climate Change Strategy.





## Step 03 Define the Dimensions

In defining the scope and in systems mapping, we **identified the elements, actors, and relationships in a system**. Essentially, farming systems do not occur in isolation, there are other dimensions that either influence or are influenced by the farming system. Using systems mapping, these connections and relationships are brainstormed and represented visually to fully understand the system. For example, the **diagram below shows that there is a connected environmental dimension which includes biodiversity, energy, and water**. There is also a connected economic dimension which includes value chains for the products, exports, imports, consumption, labour, finances, and waste. The relationships between the different dimensions and the farming system are shown with connecting lines, arrows, and spheres.





## Learning Exercise

In Module 2 you grouped the dimensions that influence or are influenced by your system in question according to the **STEEP categories**. You also showed the relationships and connections between them using arrows, connector lines and overlapping spheres. **You now need to unpack the different dimensions further and identify aspects that you feel are important to consider in the vision.** See below for guidance.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The SADC agri-food systems are complex, consisting of many different interconnected sub-systems and sectors that affect outcomes such as production and food security in the region. The agri-food systems sit within and amongst other environmental, social, political/institutional, economic systems and include elements and stakeholders such as the farm itself, the residents, education, health, biodiversity, energy, water, livestock, crops, and aquaculture. Based on this, the dimensions chosen as crucial to consider for the vision in the context of climate-resilient agri-food systems in the SADC region are listed below.

Within each of these dimensions there are aspects that need to be covered, those that are considered important in the context of the theme are shown in the figure below.



### Economic

- Finance
- Investment
- Subsidies
- Informal and formal market
- Employment
- Livelihood strategies



### Socio-cultural

- Education
- Health
- Nutrition
- Marginalized or underserved groups (women, youth, elders, disabled), cultural identities, diversity, communities)



### Agricultural productivity

- Crop, livestock, aquaculture
- Land management
- Supply/value chains
- Food security



### Environmental

- Natural resources
- Ecosystem function
- Water
- Land
- Biodiversity
- Energy



### Institutional

- Governance
- Government sectors
- Cross-sectoral relationships
- Communications
- Departmental or project units
- Planning approaches
- Multi-stakeholder platforms
- Ways of working
- Allocations





## Step 04 Define the Descriptors of the Desired Outcome in Each Dimension

The reason for investigating multiple dimensions is to **ensure that the bigger picture or broader perspective** is considered. In a workshop setting with multiple stakeholders the desired outcomes would be agreed upon and documented.



### Learning Exercise

Think about your theme and list the desired outcomes for each of your chosen dimensions. See the figure below for guidance.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

#### Desired Outcomes



##### Economic

Private sector and government invest in decent, green employment with a focus on women, youth and marginalized groups.



##### Socio-cultural

Nationally appropriate social protection systems (health and livelihoods) cover needs of poor, marginalized and vulnerable.



##### Agricultural productivity

Market-oriented diversified small farms will dominate Southern African agriculture.



##### Environmental

Energy sources are increasingly based in renewable resources.



##### Institutional

Climate change measures are built into national policies, strategies and planning. Sectoral plans adequately integrate climate risks and resilience and are clearly linked across sectors.



These desired outcomes can be defined in more detail. For example:



## Environmental

- Agriculture and natural resources are understood and managed as interlinked system elements in support of enhancing climate resilience;
- Energy sources are increasingly based on renewable resources;
- Sustainable intensification and diversification underpin functional farming and food systems with greater resilience to climate and market shocks;
- Agriculture and natural resources are managed with agroecological approaches for increasing biological diversity, land health, and functioning water cycles to sustain productivity; and
- Agriculture enables adaptive capacity to climate-related hazards and natural disasters in all countries.



## Institutional

- Climate change measures are built into national policies, strategies, and planning;
- Sectoral plans adequately integrate climate risks and resilience and are clearly linked across sectors and implemented through transformative, cross-sectoral plans;
- Ecosystem and biodiversity values are integrated into national and local planning, development processes, poverty reduction strategies and accounts; and
- Focused knowledge sharing and systems analysis by regional farming systems will be enabled by the establishment of multi-stakeholder consultative and evidence-based platforms, supported by existing regional and national bodies.



## Step 05 Supporting and Sustaining Elements for the Desired Outcomes

In Step 5 of the visioning process we **consider what would need to be in place to support and sustain the desired outcomes of the vision**. The following questions are key:



**What are the desired outcomes of the vision?**

**What supporting mechanisms need to be in place to achieve the desired outcomes?**

**What mechanisms need to be in place to ensure that the outcomes are sustained in the long term?**



## Learning Exercise

**Consider your list of desired outcomes for each of your chosen dimensions.** Now brainstorm and annotate your list with any mechanisms that would need to be in place to support or sustain these outcomes.







## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The supporting and sustaining mechanisms relevant to the outcomes identified for climate-resilient agri-food systems in the SADC region are provided as follows:



### Economic Outcomes

- Private sector and government are investing in decent, green employment with a focus on women, youth, and marginalised groups;
- There is full and productive employment for all women, men, and youth;
- Small and medium sized enterprises in value chains that create jobs for young people and women; and
- Sustainable and resilient infrastructure development in developing countries through enhanced financial, technological, and technical support to African countries.

### Supporting

- Mechanisms for investments to be focused on climate resilience; and
- Mechanisms are in place to support green jobs and entrepreneurship of youth.

### Sustaining

- Thriving local and regional climate resilient livelihoods and businesses.



### Agricultural Productivity Outcomes

- Market-oriented diversified small farms will dominate Southern African agriculture; and
- Sustainable food production systems are based on resilient agricultural practices that increase productivity and are ecosystem based, progressively improve land and water quality, and strengthen capacity for adaptation to climate change, extreme weather, drought, flooding, and other disasters.

### Supporting

- Means of enhancing capacities to support highly productive and ecologically sound practices in agriculture; and

Means of increasing nutrition and food security of the population.

### Sustaining

- Resilient ecosystems, functioning water cycles, high biodiversity, and healthy land.



## Learning Exercise

Now consider **ALL** the dimensions and determine 'what' supporting elements are needed. These 'whats' are particularly useful in guiding you to achieve your desired outcomes.



For example, in the chosen context of climate resilient agri-food systems in the SADC region these could include:

- Mechanisms for investments to be focused on climate resilience;
- Mechanisms in place to support green jobs and entrepreneurship of youth;
- Context appropriate social protection systems;
- Means of increasing nutrition and food security of the population;
- Mechanisms to build the information flows and capacity development for farmers and farmers organisations to implement climate smart and agroecological practices; and
- Mechanisms to incentivise and coordinate multi-stakeholder and multi-sectoral efforts.



## Learning Exercise

Now consider **ALL** the dimensions and determine 'what' sustaining elements are needed. These are 'underpinning whats', they are important for sustaining the desired outcomes of the vision.



For example, in the chosen context of climate resilient agri-food systems in the SADC region these could include:

- Thriving local and regional climate resilient livelihoods and businesses;
- Society respects and values the equity, education, and prosperity of all its members;
- Resilient ecosystems, functioning water cycles, high biodiversity, and healthy land;
- An appreciation of systems approaches and the natural resources foundation to underpin agricultural systems;
- Responsive, effective, and trusted government;
- Imbedded willingness to work in multi-stakeholder and cross sectoral platforms; and
- Long term outlooks.



# Vision Statement

Using the results from the visioning process (Steps 1-5), a vision statement can be defined.



## Learning Exercise

Having completed Steps 1-5 of the visioning process, draft and document a vision statement. This should be continuously referred to as the foresight process unfolds. For your reference, the figure below provides an example of a vision statement.



The figure below describes the vision statement drafted on the culmination of the visioning process Steps 1 to 5.

### DRAFT Vision Statement

**In the SADC region, we aspire to integrate climate resilience throughout the agri-food system where the government, civil society and private sector are aligned, committed and coordinated for a climate resilient future and opportunities are created for:**

- Investments in decent, green employment and climate friendly value chains
- Farming and pastoral systems are diversified to increasing productivity and enhance ecosystem functions;
- All citizens to be empowered, safe and resilient to climate threats; and
- Climate change information and measures are built into cross-sectoral and multi-stakeholder planning, decision making, and investments at all levels and all of this is underpinned by a leadership with integrity and a long term view and sustainable and resilient natural resources.



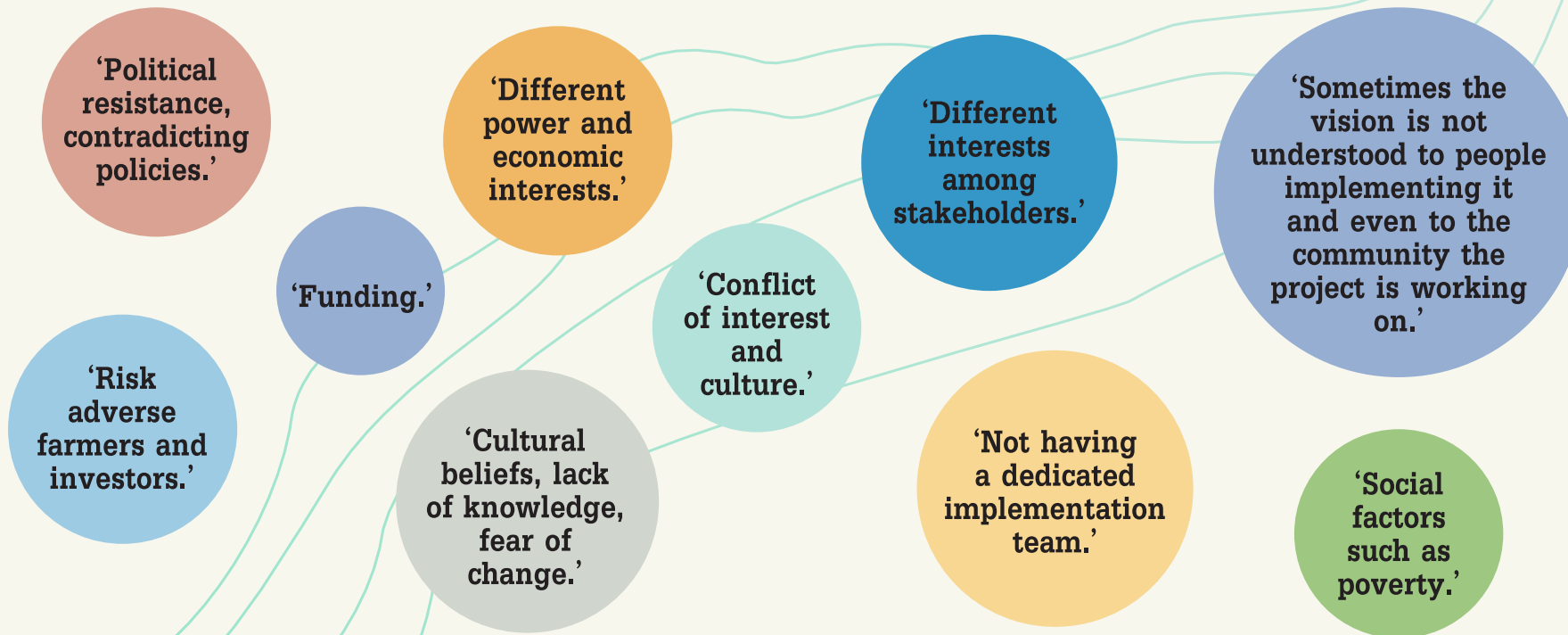


## Learning Exercise



**What barriers (identified obstacles that could stop the achievement of an activity) could prevent the achievement of the defined Draft Vision Statement? What are the underlying causes of the barriers i.e. why are the obstacles in place?**

Use the set of responses below from the SADC Futures webinar series to guide your thinking.



## Learning

**You should now understand the visioning method of the plan stage of the foresight process.** You would have followed the key steps and drafted a vision statement of a desirable future. This is the first step in creating a powerful strategy and provides the basis for developing interventions, services, policies, and partnerships that will be required to achieve that future.





# Causal Analysis

**Causal analysis or root cause analysis is a valuable method used in the plan phase of the foresight process** to highlight barriers that prevent the achievement of a vision or desired future state. Causal analysis is particularly useful for identifying how to co-ordinate policy responses to achieve the desired outcome (UK Government Office for Science, 2017).

Essentially, causal analysis **“identifies the driving forces and worldviews underpinning diverse perspectives about the future and what it means to different groups through discussion and deconstruction of conventional thinking. Based on that, causal analysis is able to produce a shared view of possible future outcomes that can break existing paradigms of thinking and operating. It is particularly useful when different groups hold different perspectives on the future of the policy area”** (UK Government Office for Science, 2017).



## What is the method?

- A root cause analysis or simple causal analysis is used to understand what issues underpin identified barriers to achieving a desired outcome.
- When a critical look at identified barriers is undertaken, there are often underpinning or root causes that reflect deeper economic, social, cultural, environmental, institutional, and political reasons as well as different world views or behavioural drivers.
- A simple causal analysis asks ‘what causes that’ again and again until the deeper underlying issues emerge.



## Why apply it?

- The root cause analysis is a valuable method to highlight the barriers that keep the group from achieving the vision or desired future state.
- When problem solving, the root cause analysis can be used to check and see if the team is looking at the problem or just a symptom of the problem.



## Causal analysis is used to (UK Government Office for Science, 2017):

- Uncover why things are not working today and develop potential and shared solutions;
- Question conventional future thinking;
- Develop shared organisational strategy;
- Explore issues from qualitative perspectives to strengthen understanding of the issue;
- Facilitate multi-cultural dialogue and understanding;
- Gain a better understanding of one's own worldview and ways of making sense of the world; and
- Develop different sorts of products and services and revised policies.

## The strengths of causal analysis are that it is (UK Government Office for Science, 2017):

- Collaborative and appealing to a wide range of participants;
- Integrative with other foresight methods;
- Supportive of the development of powerful and richer future scenarios;
- A useful check that constructed scenarios are robust across diverse perspectives;
- Useful for the development of shared visions of a preferred organisational future;
- Useful for issue transformation; and
- A method for linking short, medium, and long-term strategic thinking.



## Key Steps for Causal Analysis:

- **Brainstorm the different barriers;**
- **Prioritise the barriers to identify those that are most pressing and select one to three main barriers;**
- **Identify initial causes in a chain of levels to identify the root cause;**
- **Consider the implications of the barrier if it is not addressed;**
- **Looking across the root causes and implications, categorise those that are social, economic, institutional, political, cultural, environmental, etc.; and**
- **Consider the root causes and categorise the types of stakeholders that would have to be involved to solve the underlying causes of the barrier.**





# Step 01 Brainstorming Barriers

This **first step in carrying out a causal analysis exercise** could be conducted in a workshop setting with multiple stakeholders where potential barriers are identified through brainstorming.



**Barrier** - identified obstacle that could stop the achievement of an activity.

Once barriers have been identified that could prevent the achievement of the vision they need to be unpacked.

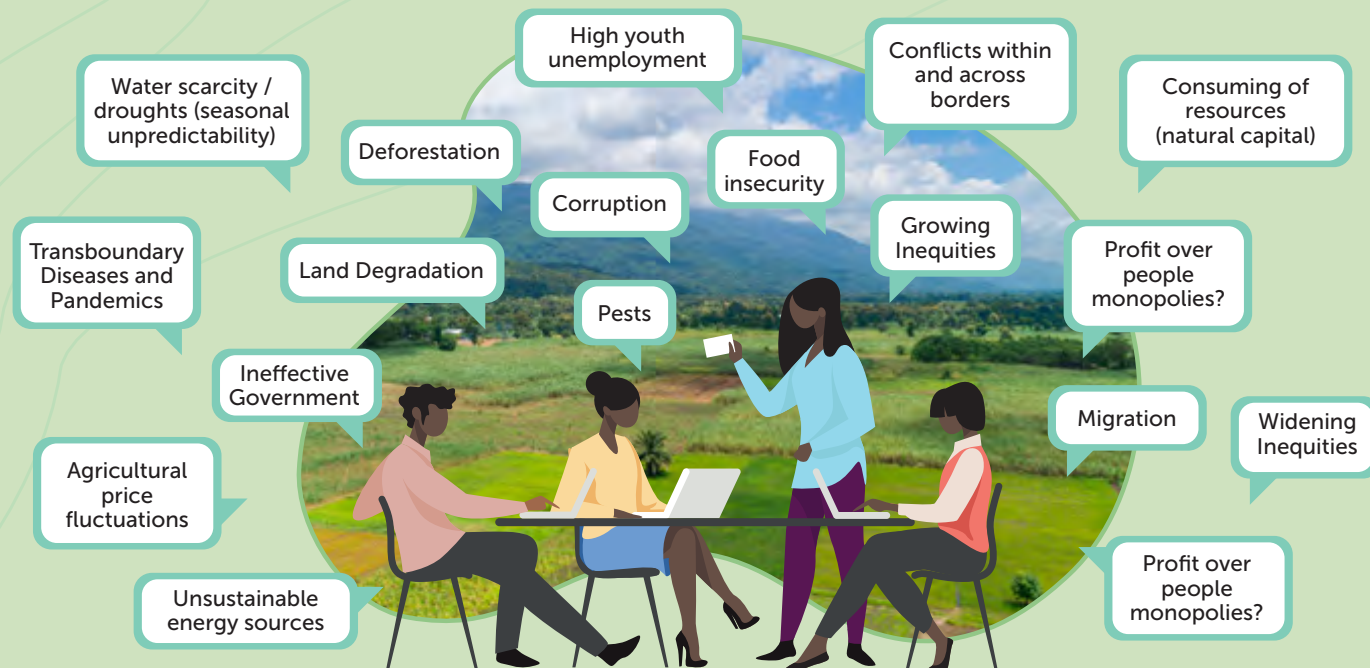


## Learning Exercise

Brainstorm barriers that could prevent the achievement of the vision you developed previously. Refer to the figure below for guidance.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region





## Step 02 Prioritising and Selecting Key Barriers

Step 2 requires **prioritising the barriers identified during the brainstorming session**. Two to three of the most pressing barriers are selected to unpack further.



### Learning Exercise

Of the barriers that you have identified as relevant to your vision, **which are likely to be the most prohibitive?** Select two or three of these barriers to take forwards into Steps 3 to 6.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

For example, in the context of climate-resilient agri-food systems in the SADC region, the **most important barriers to consider could be food insecurity, water scarcity/droughts (seasonal unpredictability), and transboundary diseases and pandemics**.



## Step 03 Identify the Root Cause

In this step we identify the root or underlying causes of the main barriers selected in Step 2.



**Underlying cause** - unpacking why that obstacle is in place.



### Learning Exercise

Consider the two to three barriers you have prioritised and brainstorm their potential causes. Document your thoughts.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

For example, the underlying causes of the barrier 'water scarcity/droughts (seasonal unpredictability)' may be:



#### Social

- Overuse of available water sources;
- Unequal access to water resources;
- Exploitation by large scale agricultural and other corporations;
- Lack of conservation orientation;
- Lack of awareness of urban users; and/or
- Greed.



#### Environmental

- Poor land management; and
- Reduced rainfall due to changes in weather patterns.



#### Political

- Lack of, or ineffective, water management policies; and/or
- Single sector orientation, lack of integrated development plans.



#### Institutional

- Unsustainable agricultural practices;
- Lack of education, awareness, and information availability; and
- Weak or ineffective extension services.



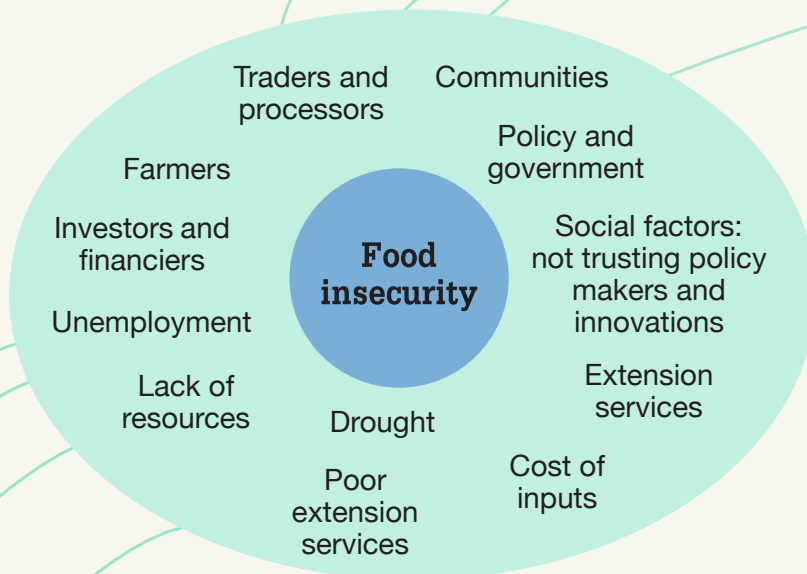


## Learning Exercise: Barriers and Root Causes

Consider the previously defined Draft Vision Statement. Identify potential barriers that could prevent the vision from being realised. Responses from participants of the SADC Futures webinar series are provided below to assist you:



From your list of potential barriers, **choose a key barrier to discuss**. List two to three **underlying causes of the barrier and stakeholders that you could involve in addressing it**. For example, the figures below provide the results from brainstorming sessions from the SADC Futures webinar series where the barriers of 'food insecurity' and 'fear of change' were chosen:





## Step 04 Consider the Implications of the Barrier

In this step we consider the implications of the barrier if it is not addressed. A key question in this step is:



**What happens if we do not address the barrier?**



### Learning Exercise

Looking at the key barriers you identified in Step 2 ask yourself - **what will happen if these barriers are not addressed?** Document your answers. Refer to the figure below for guidance.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the **context of climate resilient agri-food systems in the SADC region**, examples of implications for inaction against water scarcity include:



Increased time seeking water by women and girls;



Increased marginalisation of women and girls;



Loss of tourism;



Loss of livelihoods;



Migration;



Conflict over water resources;



Increased disease prevalence;



Lack of safe drinking water;



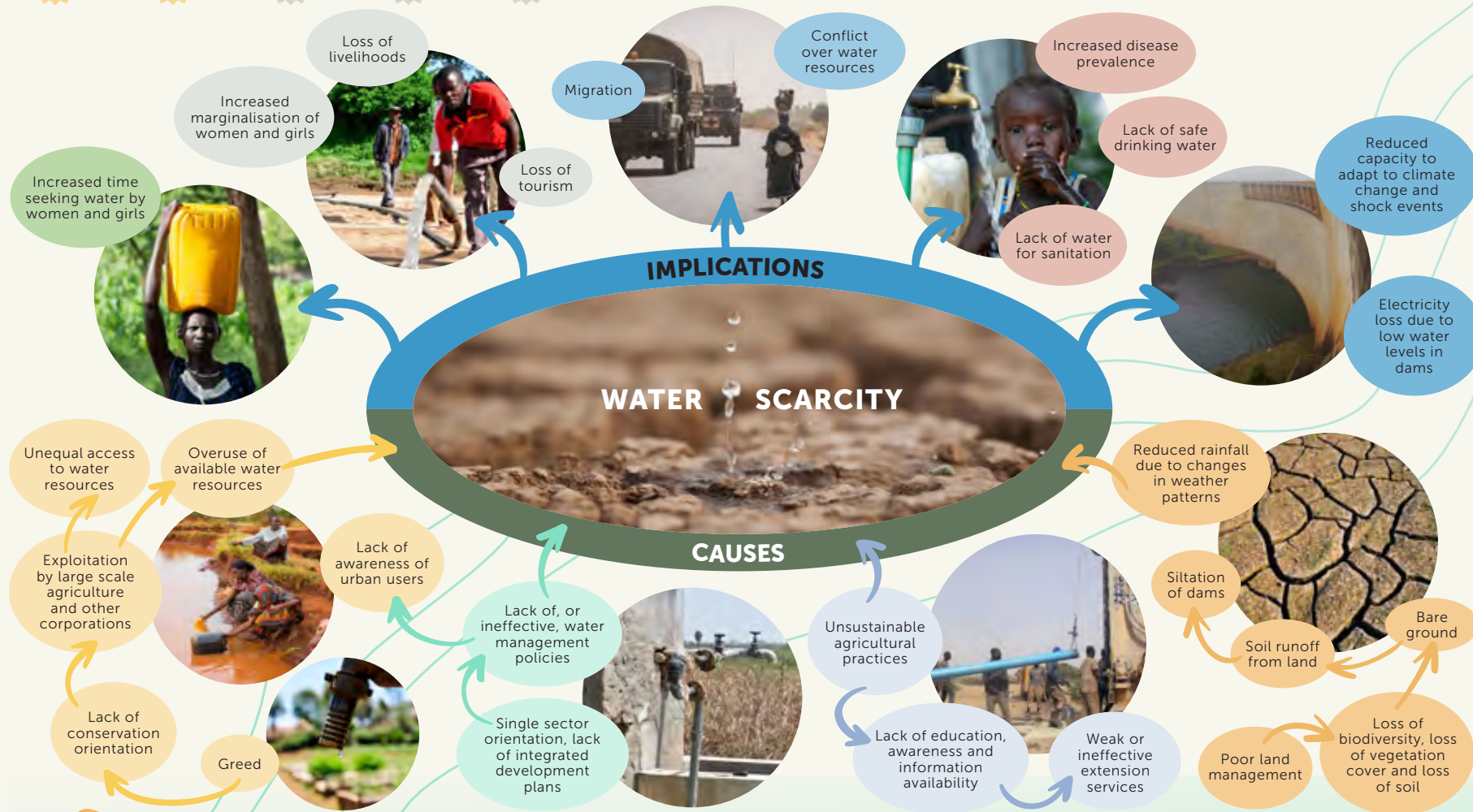
Lack of water for sanitation;



Reduced capacity to adapt to climate change and shock events; and



Electricity loss due to low water levels in dams.



## Questions & Answers

### Why is the marginalisation of women and girls listed as an implication for inaction against water scarcity?

It has been found that in the case of water scarcity or drought traditional pastoralists are forced to sell their cattle. When the drought is over, young women or girls are married off to receive bridal payments to allow for buying more cattle. Furthermore, as water becomes scarce, it takes women and girls more time to collect it as they are forced to walk greater distances. This time could be better allocated to education or income generating activities.





## Step 05 Categorise the Root Causes & Implications

The next step is to group the **root causes and implications** according to **categories** such as social, economic, political, institutional, cultural, and environmental.



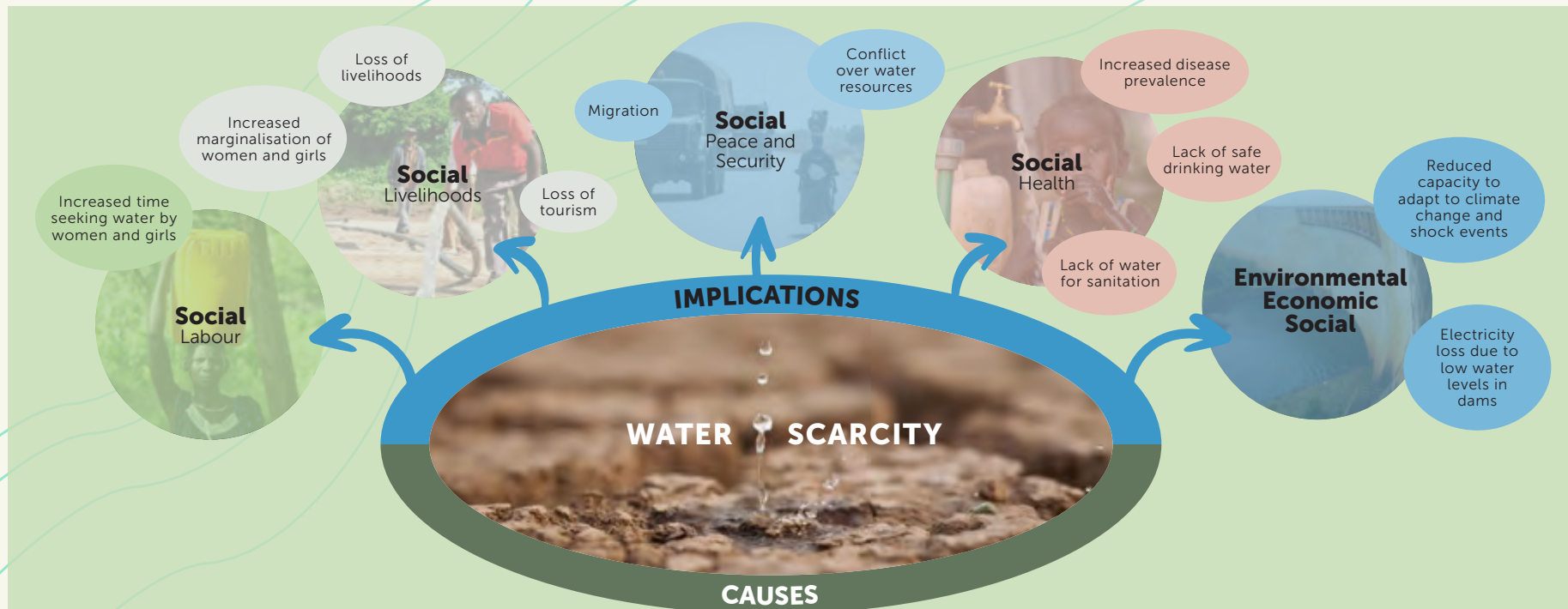
### Learning Exercise

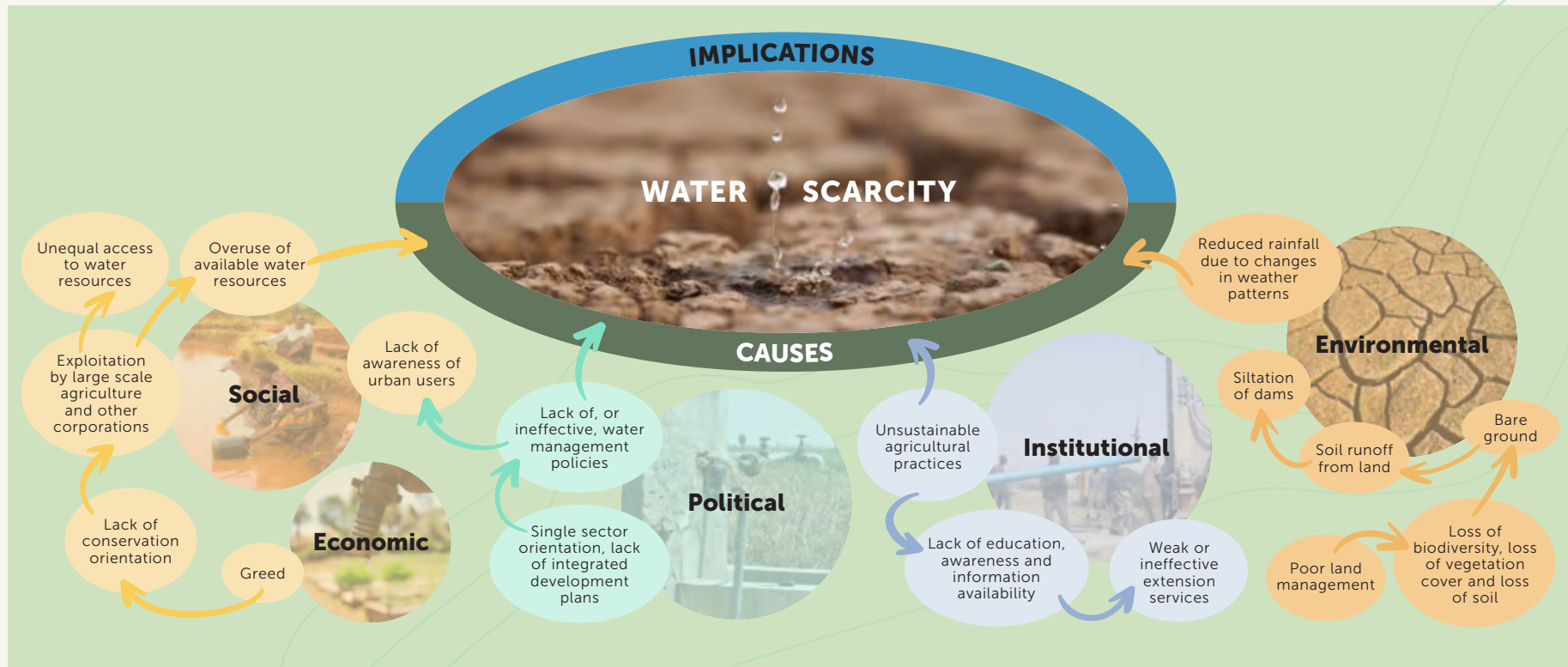
Consider the root causes and implications you identified in Steps 3 and 4 and categorise them according to social, economic, political, institutional, cultural, and environmental (where applicable). Document your answers. Refer to the figure below for guidance on this step.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The causes and implications of the barrier 'water scarcity' in the SADC region can be categorised as seen on the mind map below.





## Questions & Answers

**With such a broad vision with numerous barriers and root causes, how do you decide which to focus on or prioritise?**

The longer aspirational visions, as seen at the start of some policy and strategic planning documents, help to probe critical thinking. However, often after reading such visions one is left wondering where to start. In such a case, the vision should be broken down and topical areas should be allocated to stakeholder groups with the relevant expertise.



## Step 06 Categorise the Stakeholders

Here, we look at the **dimensions, barriers and their root causes and identify the types of stakeholders** that need to be involved to solve the underlying causes of the barriers. A key question to consider here is:



**Who are the stakeholders we need to include to drive interventions to address the root causes of the identified barrier(s)?**



### Learning Exercise

Consider the root causes you identified in Step 3, which stakeholders could drive interventions to address them? Who needs to be involved and who will take ownership of the process? Have you included stakeholders from varied backgrounds with diverse but relevant viewpoints? Document your answers. Refer to the figure below for guidance.











## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The stakeholders chosen to address the underlying issue of water scarcity come from multiple sectors and are grouped according to categories (e.g. government, civil society, private sector, and others). This ensures multidimensional viewpoints and non-biased, holistic approaches for addressing the issue at hand.

 <b>Government</b>	 <b>Civil Society</b>	 <b>Private Sector</b>	 <b>Others</b>
<ul style="list-style-type: none"> <li>• Water Department</li> <li>• Land Department</li> <li>• Agricultural Department (livestock, aquaculture, crop production, extension)</li> <li>• Environment/NRM Department</li> <li>• Health Department</li> <li>• Climate Change Directorate</li> <li>• Finance and Planning</li> <li>• Trade Department</li> <li>• Education Department</li> <li>• Department of Transport</li> <li>• Department of Culture, Youth, Gender</li> </ul>	<ul style="list-style-type: none"> <li>• Large, medium and small scale farmers' organisations</li> <li>• Health, education, agricultural,</li> <li>• Environmental International and National NGOs</li> <li>• Youth groups and entrepreneurs</li> <li>• Women's Organizations</li> <li>• Community Based Organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Large Scale Agricultural Companies</li> <li>• Grocery Chains</li> <li>• Aggregators and Processors</li> <li>• Local Farmers' Markets</li> <li>• Irrigation Vendors</li> <li>• Charcoal and Woodfuel Vendors</li> <li>• Transportation companies</li> <li>• Forestry, Wildlife, Tourism operators</li> </ul>	<ul style="list-style-type: none"> <li>• Research Institutions</li> <li>• UN FAO; UNDP; UNICEF</li> <li>• State electric providers</li> <li>• Media</li> <li>• Bilateral Donors</li> </ul>



## Questions & Answers

### What is the ideal stakeholder composition? Who needs to be involved?

Two groups need to be involved in the process:



**Foresight organising group** - this is a small core group in your foresight exercise that builds your foresight plan; and



**Foresight participating group** - this is a broad mix of key stakeholders you identify that need to be involved.

### Who needs to take ownership for implementing the outcomes of the foresight exercise?



To answer this, ask yourself the following questions

- Who will implement the 'strategy' phase?
- Who are your strategic stakeholders?
- Who are you trying to influence?
- Who is going to influence your process?



The following tools and skills can assist with understanding who to prioritise for stakeholder engagement:

**Sequencing relationships** - this approach is about shuttle diplomacy, designing which stakeholders you need to engage and 'get on board' in an order of priority and 'power', allowing you to leverage more partnerships;

**Social network mapping** - tool to identify the importance and influence of stakeholders as well as how they exchange information or are connected; and

**Negotiating power dynamics** - understanding at the outset who could impact your strategies and when you integrate into stakeholder processes you negotiate with power players about 'rules' of engagement.



### How intensive will the engagement be and how can you budget?

To answer this, ask yourself the following questions:

**Which categories of stakeholders need to be included?**

**Where are they based?**

**How can you contact them or meaningfully engage?**

**How often will you need to engage and in what formats?**

Ensure that you budget appropriately for the stakeholder engagement process:

**Engagement transaction costs** - use your initial stakeholder map to plan out engagement methods to set an initial budget for overall stakeholder engagement processes.



## Learning

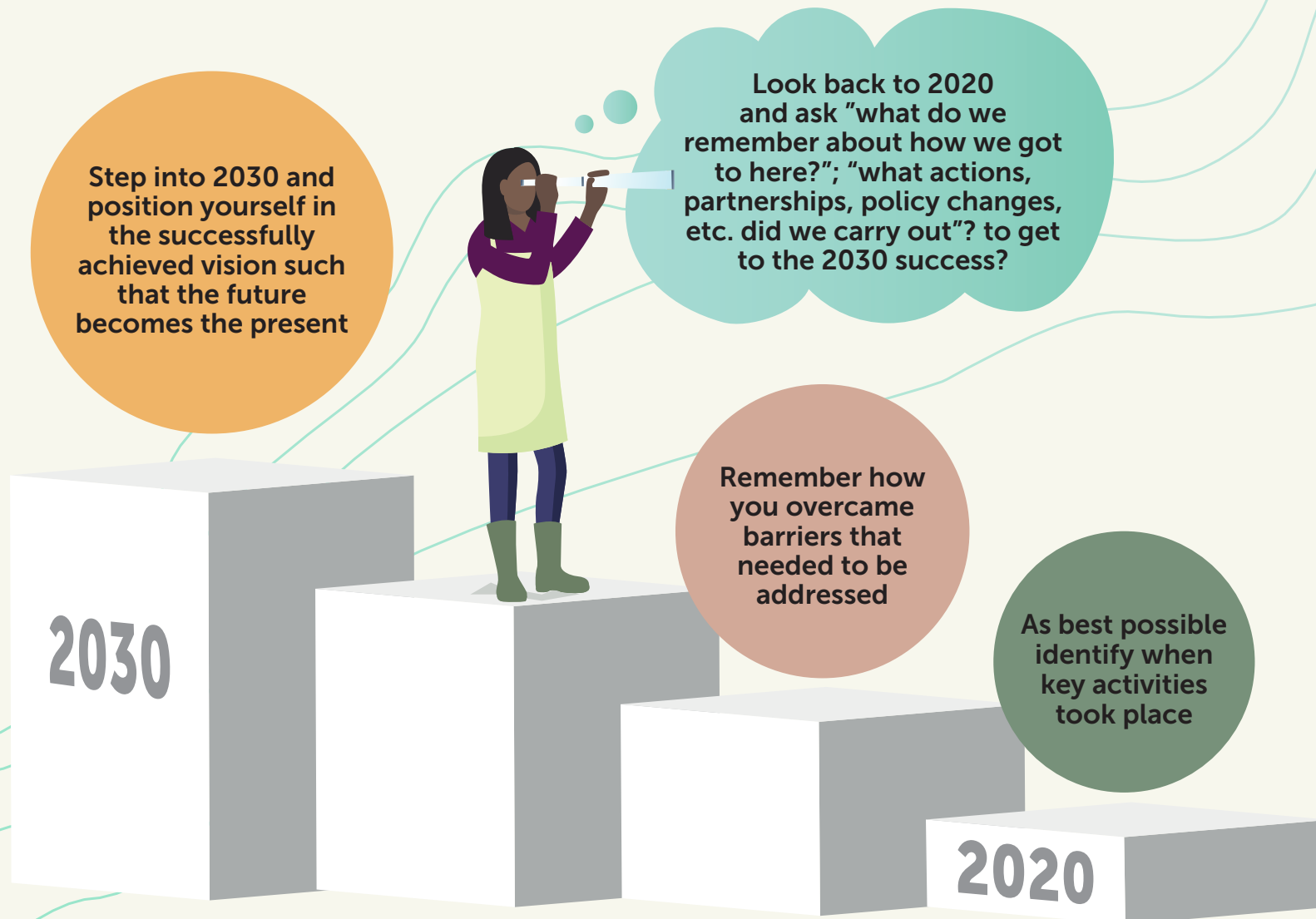
You should now understand causal analysis and how it fits into the plan stage of the foresight process. You have followed the key steps learning how to identify and prioritise barriers, identify root causes, understand the implications of inaction, and how to determine which stakeholders to include in addressing the root causes of barriers. This method should assist in clearing the pathway(s) to the desired future.





# Backcasting

**Backcasting reminds participants that the future is not linear and can have many alternative outcomes depending on decisions made and the impact of external events on a system.** It focuses on changing the present to try to change the conditions toward creating the desired future (UNDP, 2018). The thinking that emerges during this process strengthens the concept that there are many plausible futures, and that a system is not set on a linear path (Conway, 2014).





**Backcasting is used in complex situations involving multiple stakeholders where although there is a desired future vision**, it is unclear how to reach it. It leads to research plans for implementation of the actions needed and participation is an essential feature (European Foresight Platform, n.d.). It can be characterised as a social learning process and the long-term perspective provides a means of letting go of the present way of meeting specific social needs. The method is applied in cases where an objective is identified that could be influenced by uncertain future events.

Stakeholder participation is crucial, and the future vision cannot be realised by a hierarchical approach, or limited stakeholders. Furthermore, the desired future cannot be achieved by simply extrapolating from the present (European Foresight Platform, n.d.).



**Backcasting asks the question, 'how did we get here?'**



### What is the method?

- **Backcasting** is an approach that starts with **defining a vision or desirable future** and then works backwards to identify key efforts, partnerships, policy changes that will connect that future to the present.
- Backcasting asks the question, '**how did we get here?**' and uses that to be creative in our planning process.



### Why apply it?

- Backcasting is used both in the **plan and strategy phases** as input to the development of plans and **transformative strategies**.



## Key Steps to Backcasting

- Step into 2030 and position yourself in the successfully achieved vision such that the future becomes the present;
- Look back to 2020 and ask what do we remember about how we got to here; what actions, partnerships, policy changes, etc. did we carry out to be successful in 2030?
- Remember how you overcame barriers that needed to be addressed; and
- As best possible, identify when key activities took place.



## Learning Exercise: Backcasting



We are in 2030 and have successfully achieved this aspect of our vision:

**'Farmers and pastoralists across the 16 SADC member countries are using climate resilient, agroecological approaches and ably providing diverse sources of food to equitably meet food and nutritional security requirements of rural and urban populations'.** Now consider the three questions below, use the responses from the SADC Futures webinar series participants to guide your thinking.



### How did we get to where we are now?

Tell us what you remember about how we managed to successfully achieve this?

**'I remember how we developed local competence to record data relating to food safety.'**

**'I remember that participants in a foresight training course joined forces in a multi-stakeholder platform to address key barriers.'**



### How did we overcome the barriers on the way?

Tell us what you remember about how we were able to minimise the effects of drought in Zambia, Botswana, Namibia, and Angola in 2026?

**'SADC members made a big investment in extension services so that they could support farmers to implement climate smart practices.'**

**'Incentives were made available for farmers to conserve limited water sources.'**

**'Farmers used drought resistant seed and focused on drought resistant crops.'**



### Who were some of the new stakeholder groups we brought in?

To achieve our vision, what were some of the surprising new partnerships?

**'Partnerships between NGOs, private sector, and intergovernmental ministries.'**

**'Improved communications between researchers and farmers.'**

**'Increased collaboration between the private sector and farmers.'**

**The backcasting method is revisited in more detail during the latter stages of the foresight framework.**



## Learning

You should now have a basic understanding of the backcasting method and how it contributes to new mindsets about what is possible. You have looked back from the desired future and determined how you reached it. You opened your mind to the likely barriers that you overcame and how you achieved this. You considered who the key stakeholders included in the process were and which partnerships assisted in reaching the vision.





# Pathways

**Pathways, often called impact pathways or theories of change, are applied in the plan stage (as well as in the reflection and strategy stages) of the foresight process. The pathway development approach requires creating storylines that frame the analysis and discussion around possible future development trajectories.** To develop pathways that can lead us to a more desirable future, we need to understand the trajectory that we are currently on.

**The pathway concepts range from sets of quantitative and qualitative scenarios (or narratives) of potential futures to solution oriented decision-making processes targeting desirable societal goals (European Commission and European Environment Agency, n.d.).** Pathway approaches typically focus on environmental, technological, economic, and/or socio-behavioural trajectories and involve various dynamics, goals, and actors across different scales.



## What is the method?

- Pathways outline the **actions, actors, and timeframes** necessary to achieve the agreed outcome.



## Why apply it?

- Developing pathways allows for **improved understanding of the actions and stakeholders** required to reach a desired future.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

**A climate-resilient pathway for development is a continuing process for managing changes in the climate and other driving forces affecting development, combining flexibility, innovativeness, and participative problem solving with effectiveness in mitigating and adapting to climate change (Denton et al., 2014).** Based on the findings of the input and analysis stages, it is understood that the SADC region agri-food systems are affected by climate change and require the development of resilient pathways. However, the agri-food systems also enhance climate change through emissions generated during production (e.g. land clearing) and post-production (e.g. refrigeration and transport) activities. Therefore, the development of climate resilient pathways also needs to consider moving away from dangerous anthropogenic interference with the climate system by adopting sustainable development approaches. For further information on climate resilient pathways refer to the supplementary SADC Futures knowledge series report on 'Climate Resilient Development Pathways'.

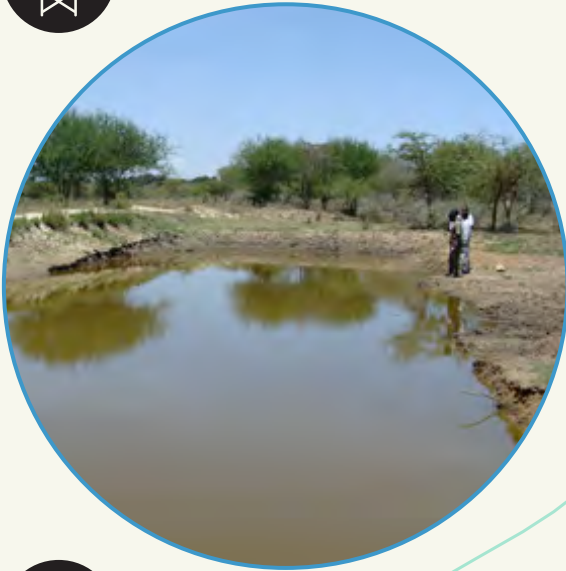
**Climate resilience is essentially viewed as a set of capacities.** The agri-food systems encompass several areas where resilience can be enhanced for example adaptive infrastructure, adaptive people, resilient ecosystems, proactive organisations and institutions and enhanced livelihoods and farm functioning. It is important to unpack the theme of climate resilience a bit further by thinking of actions and activities that could be used for future planning and climate resilient pathway building. For example, let us consider:



## What do we need to prepare for when considering future climate resilience?



## Physical Infrastructure



- Management of natural infrastructure such as wetlands or aquifers;
- Structural adaptations e.g. sea wall construction in the case of SADC coastal states;
- Maintenance of early warning systems; and/or
- Water storage capacities.



## Socio-cultural

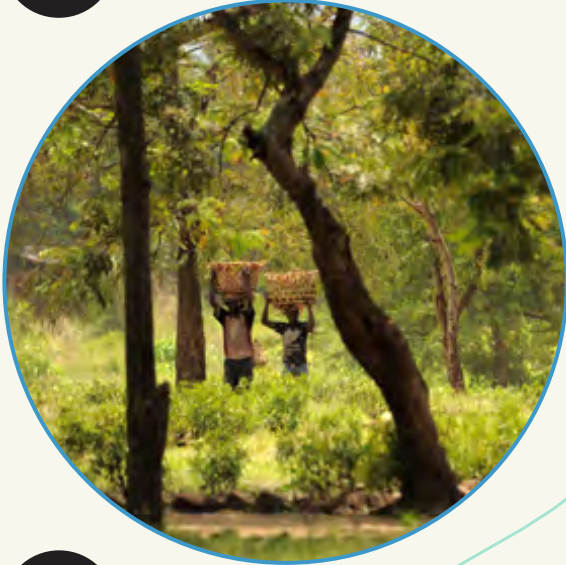


- Values such as equity, intergenerational responsibility, and commitment to reducing climate change;
- Social awareness of climate change, climate events, climate impacts;
- Level of health, especially malnourishment;
- Access to water and adequate sanitation facilities;
- Gender equality; and
- Level of education.

Photo: TOP World Agroforestry BOTTOM Olivier Asselin (FAO)



## Natural Resources



- Managing water availability and quality;
- Diversity of crops/livestock/land use patterns;
- Practice of sustainable land management such as conservation agriculture (CA), climate-smart agriculture (CSA), and agroecological approaches;
- Level of biodiversity;
- Functioning of ecosystem services; and
- Maintaining intact forested areas and trees on farms.



## Economy



- Off-farm employment opportunities;
- Diversity of the economy;
- Household savings and income;
- Flexible economic system to absorb internal migration and seasonal migration; and
- Ability to access climate finance.

# MODULE 03 Visioning and Causal Analysis





**This was a brief look at what can be done to move the SADC region agri-food systems** towards a more climate resilient future. By unpacking the theme, it becomes obvious that there are many different actions and activities to consider.



## Questions & Answers

**What is the difference between building a climate resilient strategy and a climate resilient pathway?**

**Although strategic plans include visions of where you want to be, they do not take account of the methods that are needed to get from where you are now to where you want to be.** Essentially, a strategy is a one-shot process; whereas a pathway is much more mindful of what happens along the way when moving from where you are to where you want to be. The pathway approach forces you to think not only about your ideas on how to get to your end point but what happens in the interleading time.



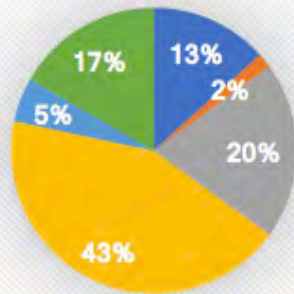
## Learning Exercise

Consider the pie chart on the next page (which was developed based on the opinions of the SADC Futures webinar series participants), what areas are lacking and what could this mean? It may be useful to carry out a similar workshop exercise in the context of your theme to identify which dimensions are lacking in your foresight approach. This may require a change in mind set and perspective or the inclusion of stakeholders from more varied backgrounds.





### What Kind of Climate Resilient Actions Have You Been Working On?



- Ecosystems: Ecosystem services that build resilience
- Governance: Proactive institutions and organizations
- Infrastructure: Adaptive structures and technologies
- Livelihoods and Farming System: Enhanced livelihoods and farm functioning
- Other

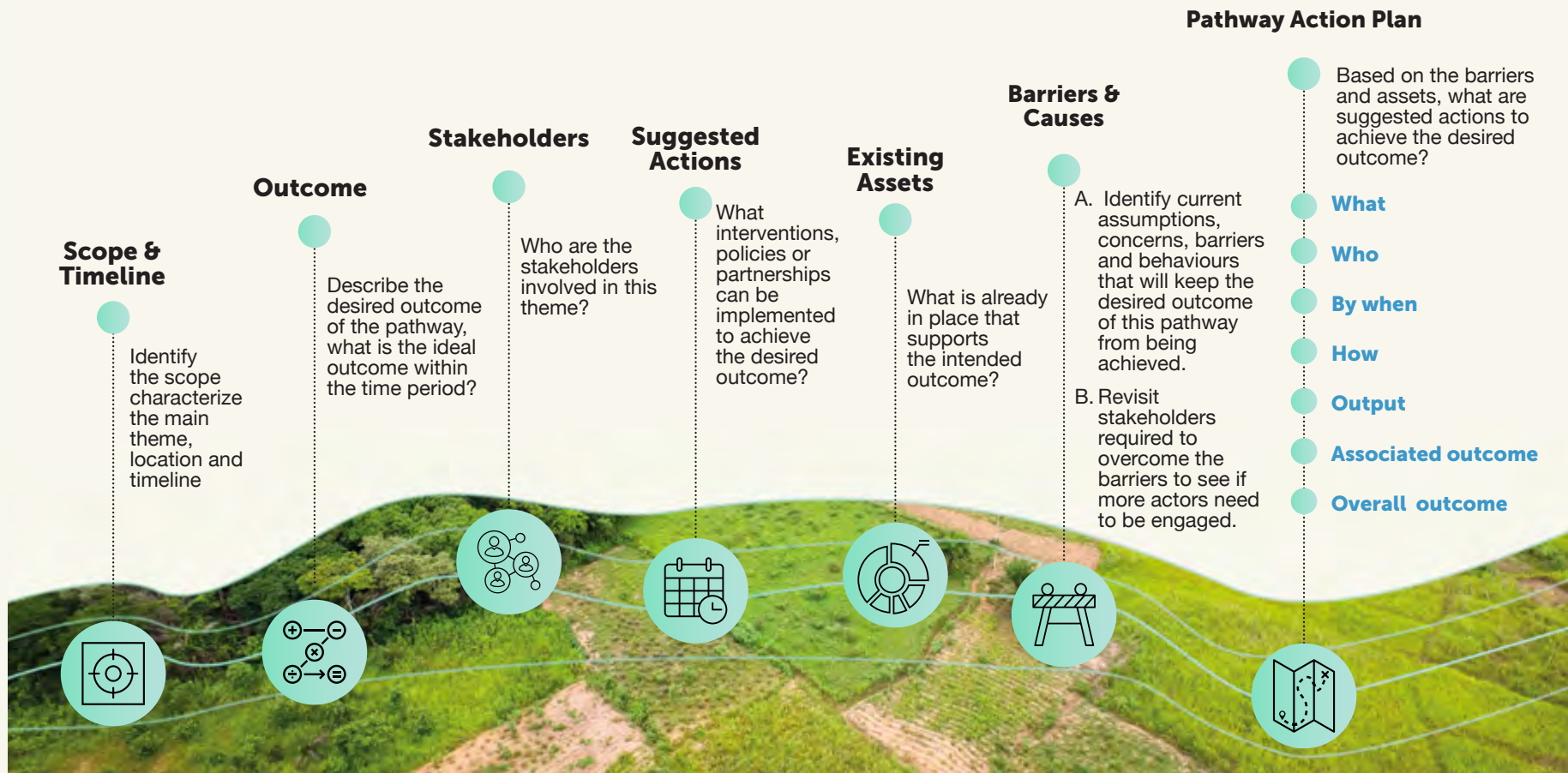
Now that we have **identified the actions and activities to consider in developing a climate resilient pathway** the following, non-explicit steps can be followed:

- Provide the scope and timeline;
- Identify the preferred outcome;
- Select the stakeholders that need to be involved;
- Identify which actions and activities need to be considered;
- Identify any existing assets that can be built off (in terms of planning this could include partnerships);
- Understand the barriers and causes; and
- Develop the pathway action plan, providing detail on activities such as who, how, what is the intended outcome, by when, and what is the overall outcome?

These steps can prove useful for brainstorming with a team. This process can start as a participatory exercise and then move to a written plan.



## Climate-Resilient Pathways



## Learning Exercise

Think of the theme you need to address and using the steps outlined in the figure above undertake a brainstorming exercise with a team of stakeholders with diverse perspectives. Process and document your ideas as actions in a Pathway Action Plan. Refer to the pathway development examples below for further guidance.







# Climate Resilient Pathway Example 01

## Agroecological Solutions

This section provides an example of how to build a climate resilient pathway following the steps given in the figure on the previous page. It requires a participatory process involving numerous stakeholders with diverse perspectives. The pathway is built as follows:



### What is the scope and time frame?



Climate smart, agroecological solutions to address water scarcity and build climate resilience in agricultural systems by 2030.



### What is the preferred outcome? What do we want to achieve from this agroecological pathway?



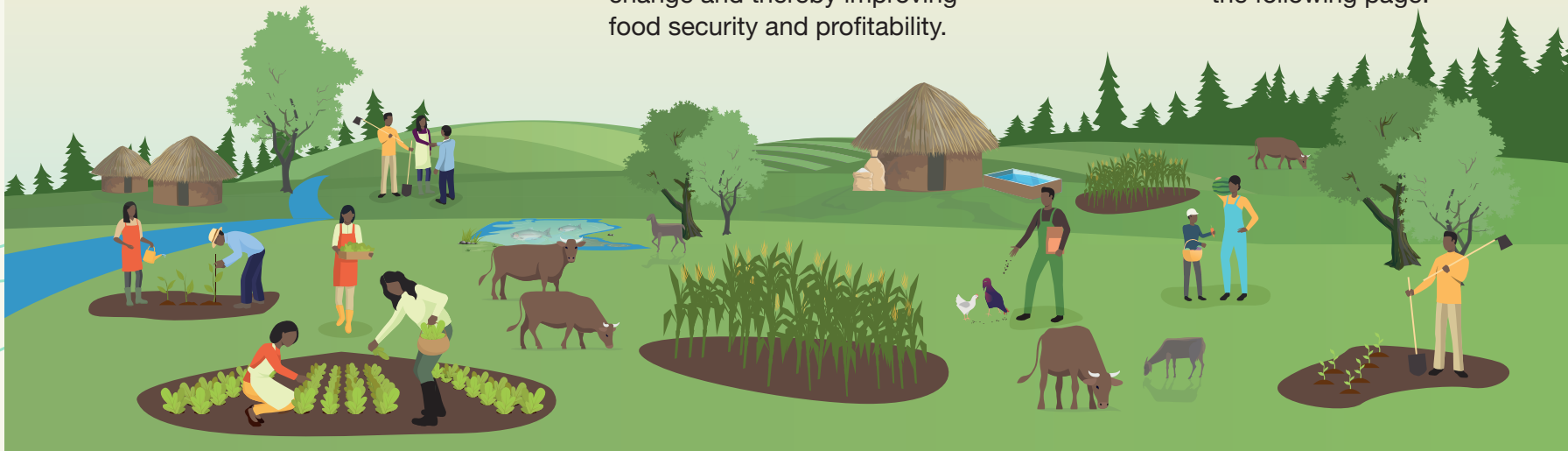
Farmers (women, men, and youth) are applying ecosystem based, agroecological, climate smart and water saving practices and technologies to adapt farming systems to the effects of climate change and thereby improving food security and profitability.



### Who are the stakeholders that we need to involve?

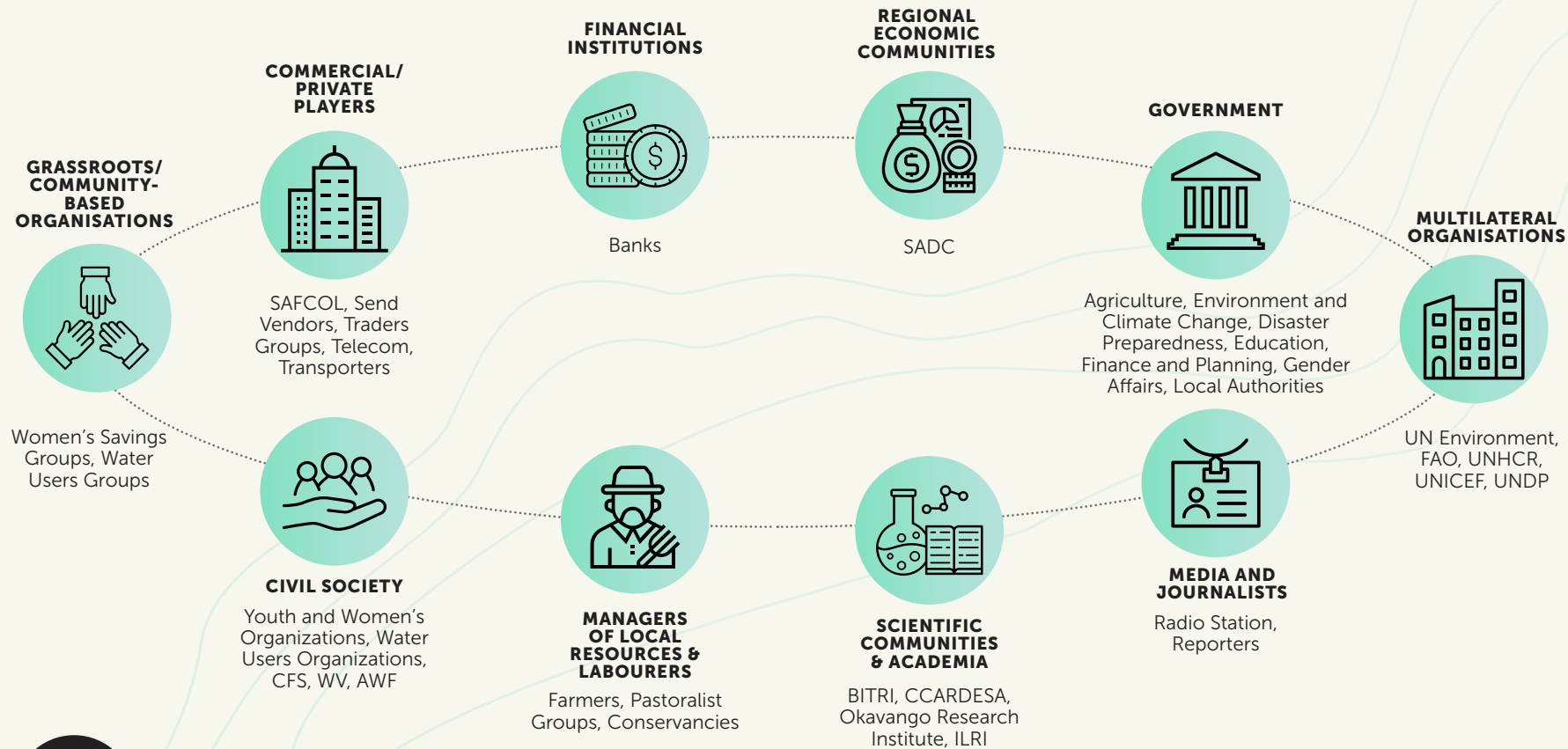


The stakeholder groups that would be important to include for the purposes of climate resilient agri-food systems in the SADC region, are provided in the figure on the following page.

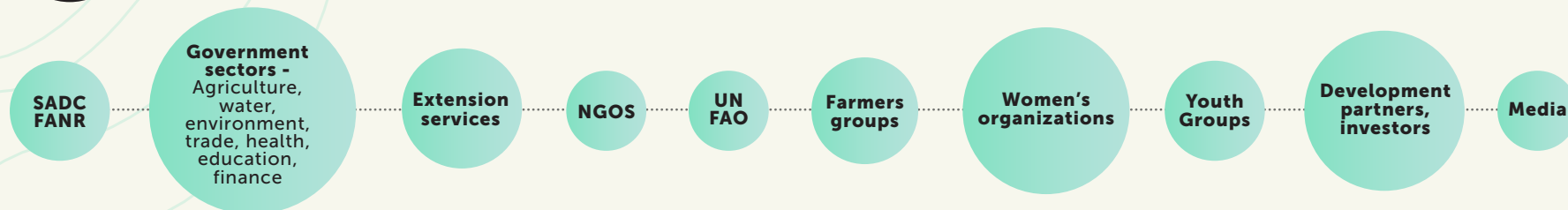




## Indicative Stakeholder Groups



## Stakeholders





**The next step is to brainstorm and document suggested actions.**

**For example:**



Promote short distribution webs and build local markets;



Promote integrated farming systems to increase diversification;



Build capacity for sustainable land management practices and water harvesting techniques;



Develop seed saving networks;



Pest monitoring and management;



Labour sharing across farms;



Promote participatory governance of food systems; and



Expand regenerative and conservation farming.



**Any existing assets that can be leveraged off are then identified.**

**Such as:**



Build off local community-based organisation (CBO) networks engaged in integrated farming training;



Identify local informal labour sharing agreements;



Identify agroecological practice promoters;



Identify conservation agriculture groups; and



Identify any relevant, existing projects and programmes.





### Then we identify the barriers and underlying causes:

#### Barriers could include:



Lack of understanding of the relationship between land management and water availability;



Lack of diversity in farming systems;



Separate sectoral advice to farmers (e.g. health, agricultural extension, nutrition, veterinarians, and irrigation); and



Lack of integrated water management policies.

#### Underlying causes could include:



Unsustainable agricultural practices;



Limited access to local and higher scale markets for diverse products; and



No cross-sectoral planning processes for water management and climate resilience actions.



### Develop pathway action plans.

**This step is built on the different actions and activities previously identified.** For example, consider the figure on the following page, to develop a climate smart, agroecological based strategy the pathway action plan could entail:



YEAR 01

**What**

Develop a climate smart, ecosystems based strategy / enabling environment.

**By when**

Year 1

**How**

- A technical committee / expert working group to provide evidence, technical backstopping and input into policy amendment process.
- Lobby and establish key relevant policy contacts and relationships.
- Draft practical guidance for implementation of climate smart and ecosystem based approaches.

**Associated outcome**

Policy and enabling environment that promotes a policy incentive and implementation path for ecosystem based approaches in farming systems.

**Output**

Amended language, targets and goals to relevant policy and strategic frameworks to explicitly mention ecosystem based and agro-ecological principles.

**Overall outcome**

Farmers (women, men and youth) are applying ecosystem based, climate smart and water saving practices and technologies to adapt farming systems to effects of climate change and improve food security and profitability.

**Who**

Agriculture, water, environment,

Research organizations working on livestock, aquaculture, climate smart agriculture and landscapes,

National Farmers Associations,

NGOs promoting agroecological and water saving approaches,

FAO.

**What is the overall outcome we want to achieve?**

Farmers (women, men, and youth) are applying ecosystem based, climate smart and water saving practices and technologies to adapt farming systems to the effects of climate change and thereby improving food security and profitability.

# MODULE 03

## Visioning and Causal Analysis



# Climate Resilient Pathway Example 02

## Developing Regional Value Chains for Climate Resilient Staples

A second example on building a climate resilient pathway, according to the steps given previously, is as follows:



### What is the scope and time frame?



Develop viable business plans for local level processing of small grains by 2022.



### What is the preferred outcome? What do we want to achieve from this pathway?



Successful local level processing of small grains by 2022.



### Who are the stakeholders that we need to involve?



- Market linkage associations;
- Local business associations;
- Micro-financing and loan agencies;
- Manufacturers;
- Ministry of Agriculture; and
- Ministry of Finance and Planning.





### The next step is to brainstorm and document suggested actions



- Draft a business plan as a basis for consultations across value chain actors;
- Assess viable locations to test elements of the business plan; and
- Connect financiers.



### Any existing assets that can be leveraged off are then identified.

Existing projects and programmes in the area.



### Then we identify the barriers and underlying causes.

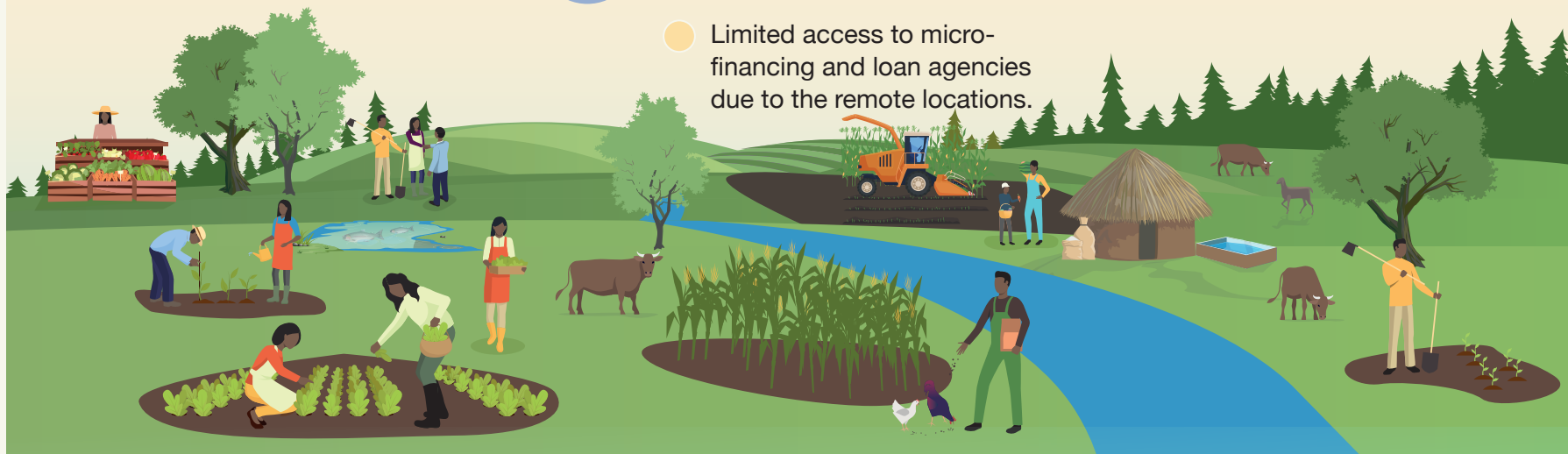


- Access to markets is restricted by poor infrastructure; and
- Limited access to micro-finance and loan agencies due to the remote locations.



### Develop the pathway action plan.

The figure on the following page outlines the proposed pathway action plan.



## Questions & Answers

### What is the difference between a trajectory and a pathway?

**Trajectories and pathways are essentially the same foresight method**, they both consider the journey to get to a desired end point. They both ask the questions: How do you get to the end point? What is the most appropriate way? Or in the context of climate resilient agri-food systems: **How can you maximise people's livelihoods and well-being as you make these changes?**



**What**

Develop viable business plans for local level processing of small grains.

**By when**

Year 2

**Output**

Demand-driven business plan tested in a number of pilot locations.

**Overall outcome**

Women and youth benefit from increased efficiency and effectiveness of production and processing of small grains/climate-smart crop options (millet and sorghum).

YEAR 02

**Who**

Market linkage associations,  
Local business associations,  
Micro-financing and loan agencies,  
Manufacturers,  
Ministry of Agriculture,  
Ministry of Finance and Planning.

**How**

- Draft business plan as a basis for consultations across value chain actors,
- Assess viable locations to test elements of business plan,
- Connect loan and financiers.

**Associated outcome**

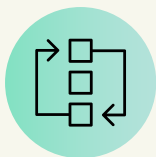
Local level enterprises established and functioning to allow ease of access to processing technology.

**What is the overall outcome we want to achieve?**

Women and youth benefit from increased efficiency and effectiveness of production and processing of small grains / climate-smart crop options (millet and sorghum).

**Learning**

You now understand pathways and how to develop a Pathway Action Plan which includes defining the actions, actors, and time frames necessary to achieve an agreed outcome. It is important to note that there are multiple pathways that can be followed to reach a vision.



# Trade-Offs

'Trade-offs' is the final method covered in the plan stage. This method can be used in multiple stages of the foresight framework. Trade-offs are required in this stage of the foresight process as we want to see what we need to take forwards in a foresight process i.e. what is viable, before we think about the different scenarios.



## What is the method?

- A trade-off is a situational decision that involves **diminishing or losing one aspect in return for gains in other aspects.**
- In simple terms, a **trade-off is where one thing increases and another must decrease.**



## Why apply it?

- Looking for trade-offs is valuable for **identifying conflicting elements across multiple pathways** toward the future state.

Trade-offs are a part of everyday life, to understand the concept better, review the last 24 hours and see what trade-off decisions you may have taken:



## Learning Exercise

**How did you spend the last 24 hours?** Over the last 24 hours, on a scale of 0-5 (where 5 is very good), how would you rate yourself in terms of the daily activities illustrated below?





### What did you give up and what did you gain?

In the last 24 hours, what did you give up to have more time on another aspect? Use the responses below from participants of the SADC Futures Webinar Series to assist you.



Photo: Jenny Vaughan for Mercy Corps



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The scale, scope, and complexity of agri-food systems and their linkages to natural and human systems mean that future development will result in inevitable trade-offs among and between dimensions or impact areas such as nutrition and food security; poverty reduction, livelihoods, and jobs; gender equality, youth, and social inclusion; climate adaptation and greenhouse gas reduction; environmental health and biodiversity (Antle & Valdivia, 2020). It is crucial that climate resilient agri-food systems development meets the needs of all members of society, and thus the development of pathways must involve broad stakeholder participation.

Climate-resilient adaptation and mitigation actions may introduce trade-offs such as between environmental and economic goals e.g. maintaining natural, forested areas versus expanding crop cultivation for enhanced food security and income or compromising water quality by increasing fertiliser usage for better yields. Furthermore, adaptation actions may increase greenhouse gas emissions e.g. increased fossil fuel powered cold storage in response to higher temperatures.

**For example, earlier we identified potential climate resilient pathways:**



Climate Smart, Agroecological Solutions for Climate Resilience; and



Developing the Regional Value Chain for Climate Resilient Staples.

**However, if we consider these pathways, trade-offs will likely occur such as:**



Vested interest in small grains could result in fertiliser subsidies that may disincentivise integrated farming systems or seed saving;



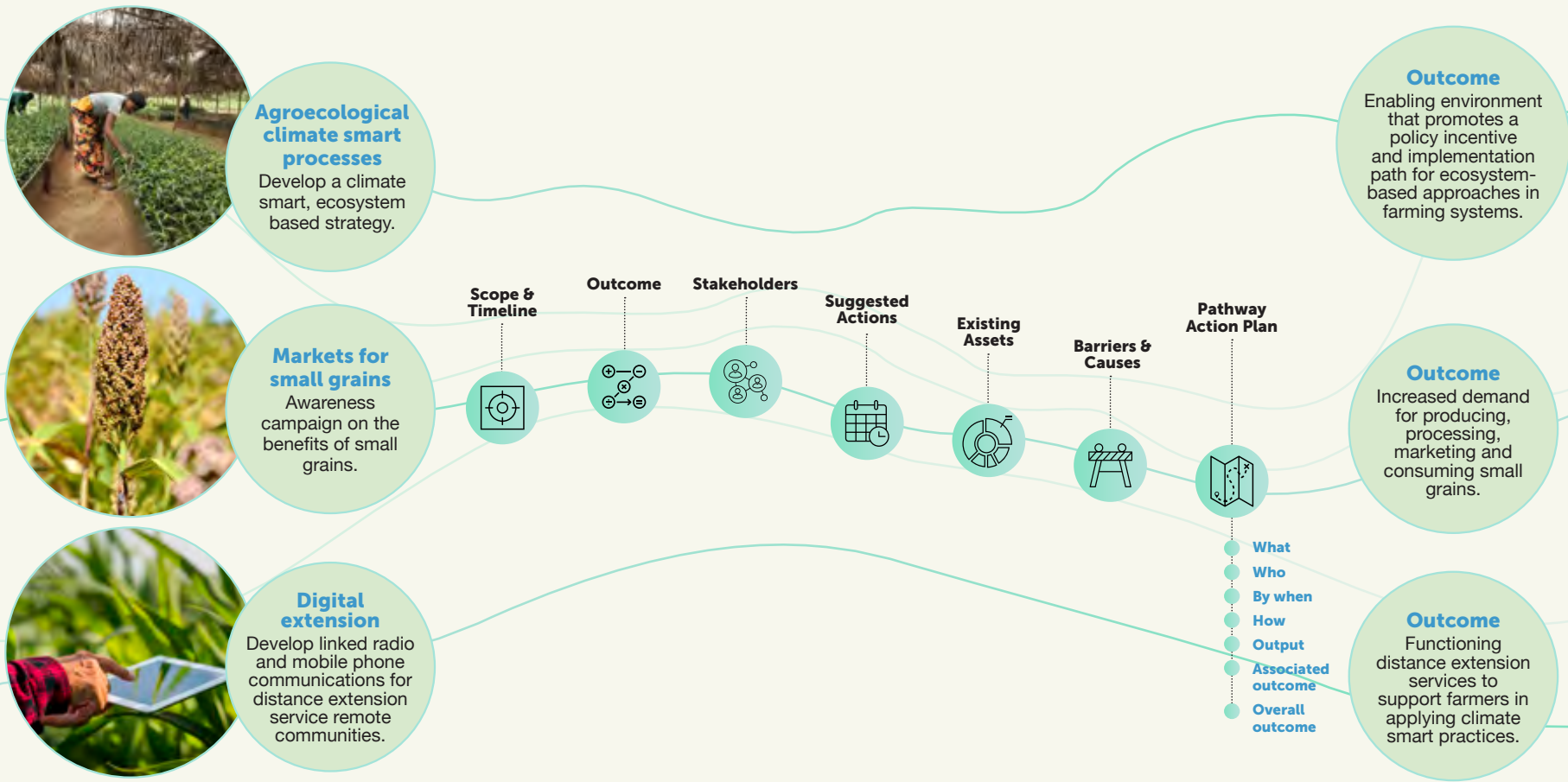
Farmers could potentially trade-off maize subsidies for drought resilient crops; and



Promoting subsidies and fertilisation versus agro-ecological approaches.



Climate Resilient Pathways



MODULE 03  
Visioning and Causal Analysis



Photo: Sonja Leitner (ILRI)



## Learning Exercise

Think of your theme and consider what the implications of gains in one area will have on other areas. Will the gains diminish outcomes in other areas? Would such trade-offs still allow for viable scenario planning? Document your answers. The key question to be addressed is:



**How do you reconcile trade-offs in a foresight process?**



**A valuable tool for assessing trade-offs in a foresight process is Trade-Off Analysis (TOA).** Essentially, TOA is a participatory process using qualitative and quantitative data and modelling tools to evaluate how technological and institutional innovations can improve system performance using foresight methods and relevant metrics described as impact indicators (Antle & Valdivia, 2020). An example of a farming system level trade-off analysis by Antle and Valdivia (2020) is provided below:

The results from a TOA study on the East Africa Dairy Development Project (EADD) show that while farm income increases and poverty decreases, and total assets owned by both male and women increase, the share of assets controlled by women declines, and water use and greenhouse gas emissions increase. Therefore, there are likely to be **trade-offs between the economic benefits of livestock intensification and key social and environmental impacts** that could be addressed in the research design for improvements in livestock management to reduce water use and greenhouse gas emissions. It was found that it will be important to design and distribute technology that is inclusive to mitigate possible adverse gender effects.

## Farming System Scale: Economic, Environmental and Social Impact Assessment of the East Africa Dairy Development Project in Kenya (Antle & Valdivia, 2020)

### Objective:

The goal of this study was to conduct an impact assessment of the practices promoted by the East Africa Dairy Development Project (EADD), using baseline data collected by the International Livestock Research Institute (ILRI). This analysis was designed as a proof-of-concept for use of the Environmental Matrix, developed by the Bill and Melinda Gates Foundation (BMGF), with the Tradeoff Analysis Model for Multi-Dimensional Impact Assessment (TOA-MD). The analysis highlighted some of the complex economic, environmental and social tradeoffs and synergies that are likely to be associated with dissemination of the EADD practices at farm, sub-regional and regional scales.

### Key Results:

Adoption rate  
76%

Water use EFF  
20%  
Total Water use  
20%  
CH4 Efficiency  
27%  
Total CH4  
Emissions 22%

Farm Income  
46%  
Poverty rate 7%

Women's asset  
share 8%  
Infant milk  
consumption 45%

### Tradeoffs and Synergies

The analysis shows that different EADD implementation scenarios result in different potential adoption rates and important tradeoffs and synergies across the outcome indicators. Increasing income reduces poverty and increases infant milk consumption as well as efficiency in the use of water and methane emissions. However, as farm income increases, the share of assets controlled is predicted to decline. Total water use and methane emissions also increase. See figure on the left.

### Indicators:

#### Economic

Poverty  
Farm household income

#### Environmental

Water consumption by livestock  
Livestock methane emissions

#### Nutrition and social

Milk consumption  
Men's and women's asset ownership

### Models/Approaches:

TOA-MD – Impact Assessment  
LifeSim – Livestock Model (CIP)

### Data:

EADD Baseline household survey data  
Secondary data (previous studies, literature)

### Reference:

Antle, John and Valdivia, Reberto 2011. Economic, Environmental and Social Impact Assessment of the East Africa Dairy Development Project in Kenya using the Tradeoff Analysis Model. Report prepared for the Bill & Melinda Gates Foundation. Available at: <http://tradeoffs.oregonstate.edu/>

## Learning

You now have a basic understanding of trade-offs. You know that looking for trade-offs is valuable when you need to identify conflicting elements across multiple pathways toward the future state.







Photo: Axel Fassio (CIFOR)

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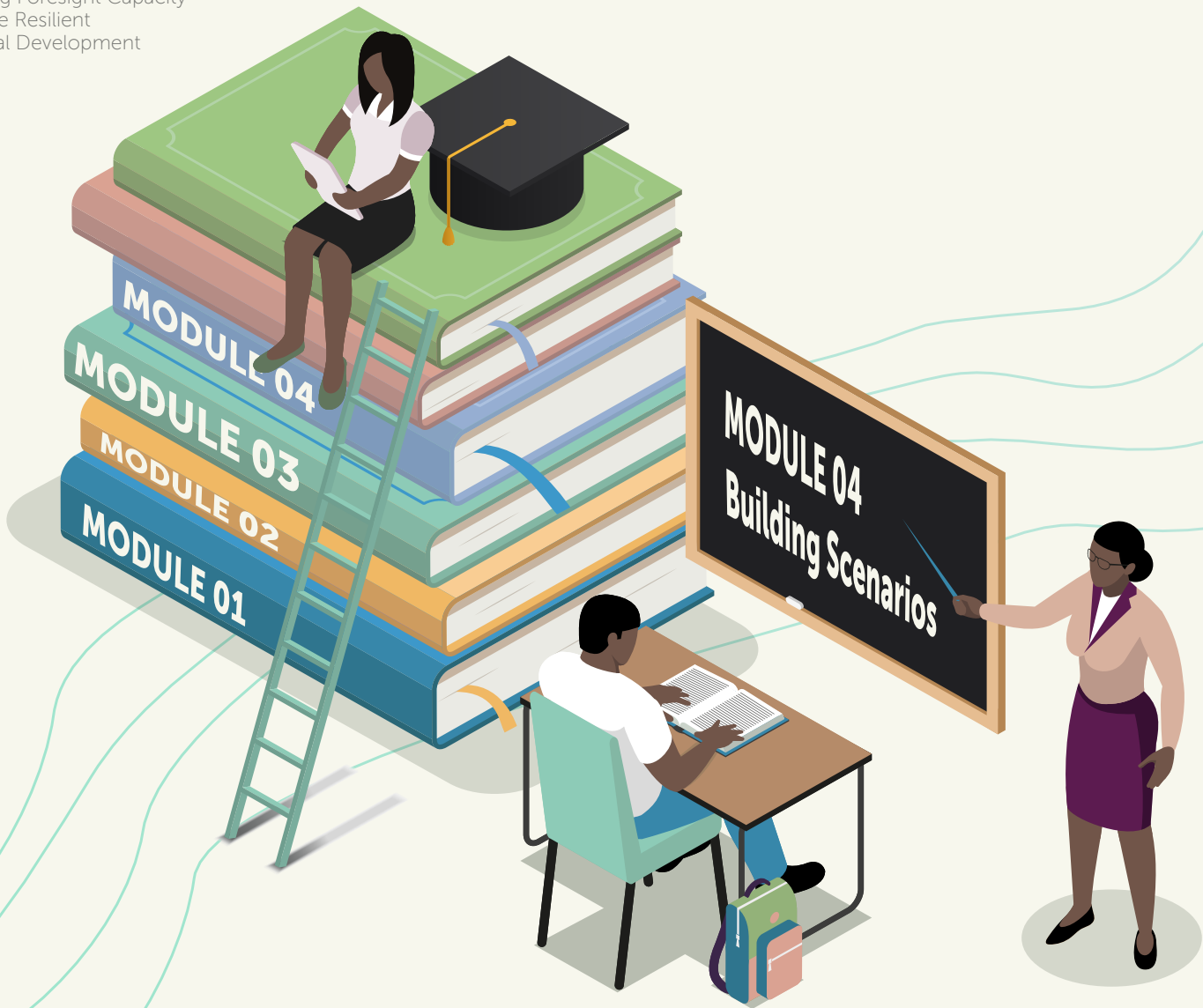
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**SADC Futures**  
Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



**MODULE 04**  
**Building Scenarios**



RESEARCH PROGRAM ON  
**Climate Change,  
Agriculture and  
Food Security**



Implemented by:



Endliche Ressourcen für  
intelligente  
Zukunftsaufbau (EIZ) Bonn





# What Will You Learn?

Module 4 focuses on the prospection stage of the foresight process. This stage requires thinking about what might happen in the future by identifying drivers and critical uncertainties and developing plausible, future scenarios.

This module starts by introducing scenarios and why the scenario methodology is one of the most widely applied methods for planning around uncertain futures. The module then outlines the process for identifying high impact and high uncertainty drivers and the development of rapid scenarios.

## On completing Module 4 you will:

- Understand the importance and application of scenarios as a foresight method;
- Understand how to categorise and identify high impact and high uncertainty drivers;
- Learn how to set up a scenario matrix and draft future narratives; and
- Learn of scenario work conducted in the SADC region.





# Test Your Learning of the SADC Futures Foresight Framework

Before continuing with Module 4, test your understanding of foresight and information from the last module by answering the questions below:



What are the seven different stages of the SADC Futures Foresight Framework?

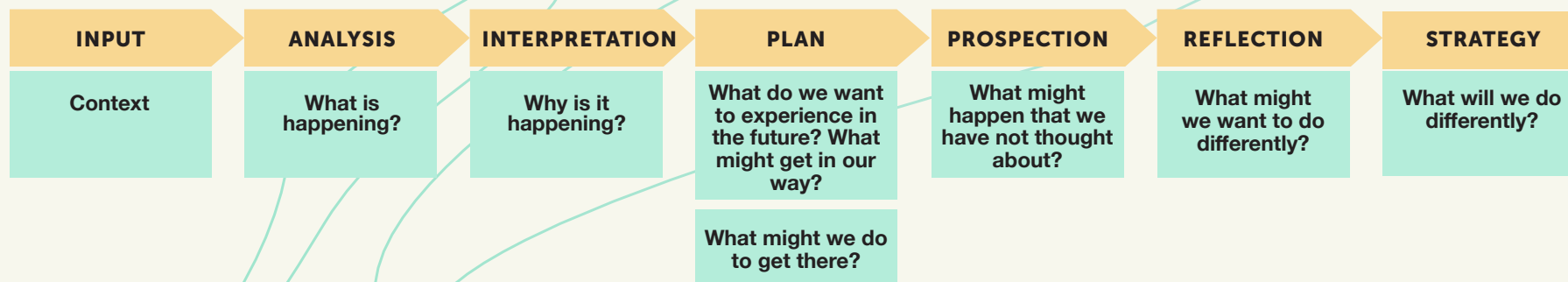
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Who needs to be involved in making a systems map?

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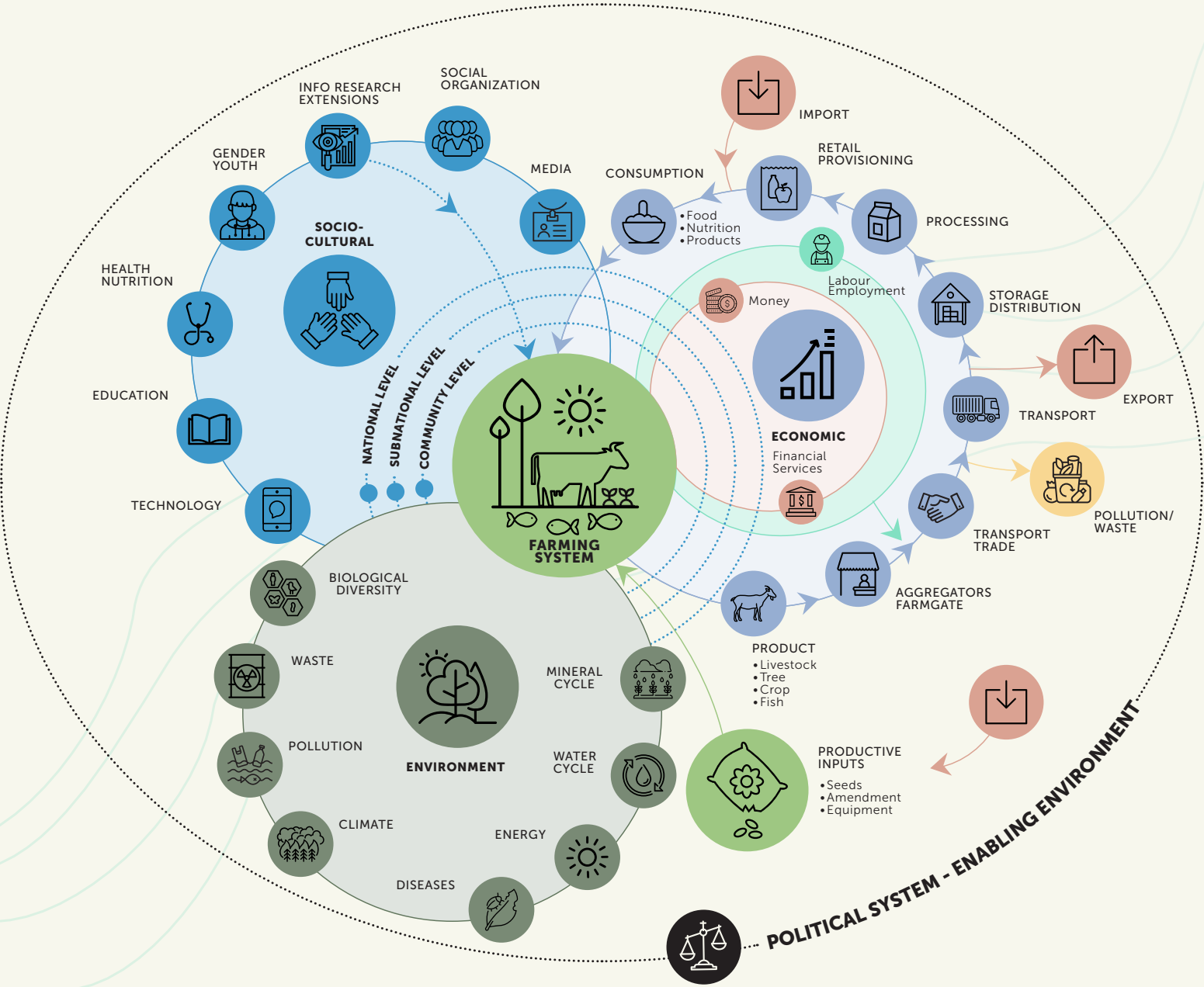
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# Those represented in the system and those influencing the system



## Describe one of the steps in the backcasting process



Step into 2030 and position yourself in the successfully achieved vision such that the future becomes the present.



Look back to 2020 and ask "what do we remember about how we got to here?"; "what actions, partnerships, policy changes, etc. did we carry out to get to the 2030 success?"



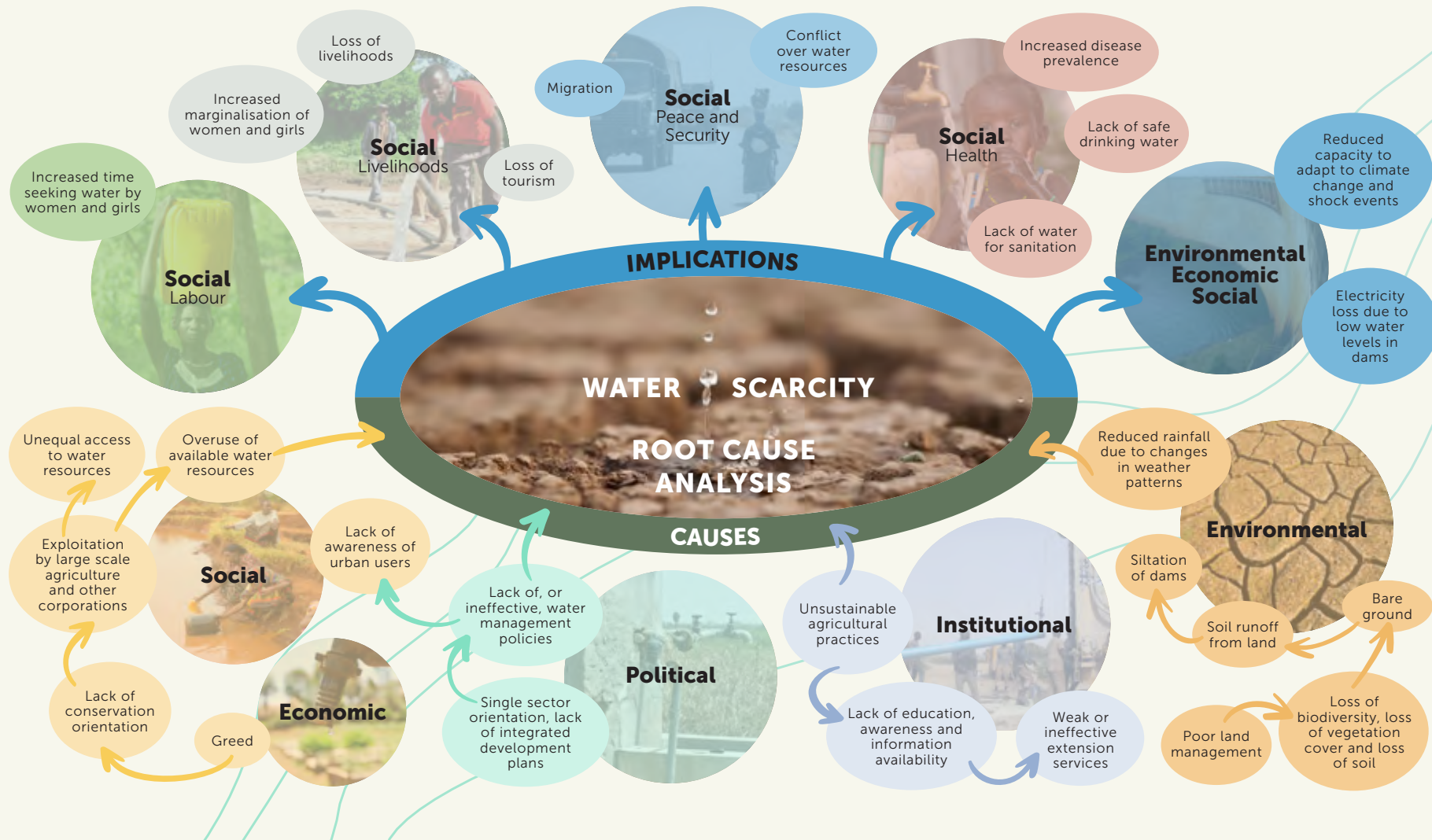
Remember how you overcame barriers that needed to be addressed.



As best possible identify when key activities took place.



## What tool could you use to understand the difference between symptoms and problems?



What is the difference between pathway, strategy, and trajectory?

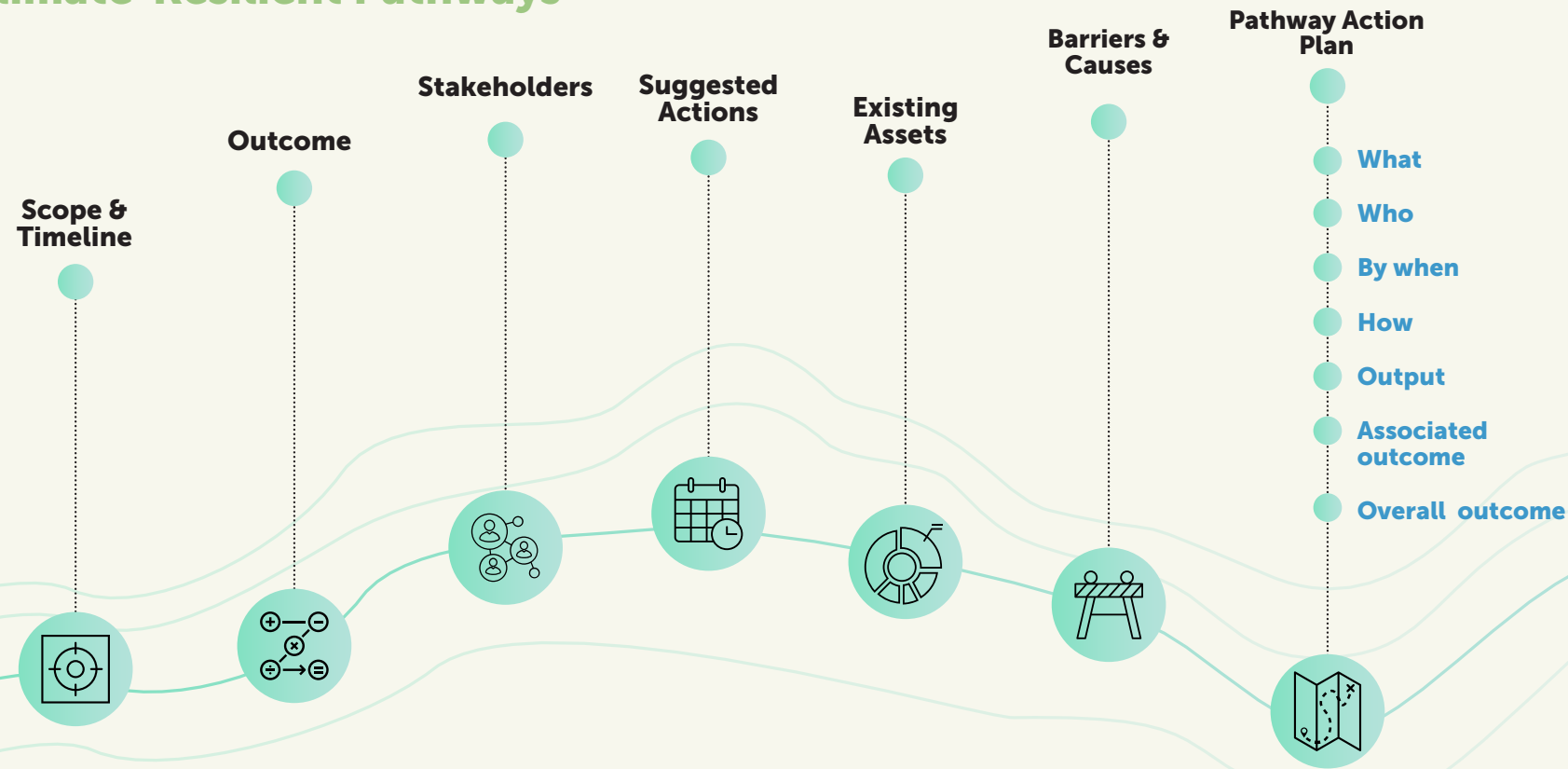
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## Climate-Resilient Pathways



- Climate-resilient development pathways are different from strategies.
- Strategies are a one stop / one shot process whereas a pathway is more mindful of what happens in between from where you are to where you want to be.
- Pathways force you to expand ideas to an end point and what happens in the intermediate time.
- Trajectories and pathways are both about the journey to the end point and what is the most appropriate way to get there.





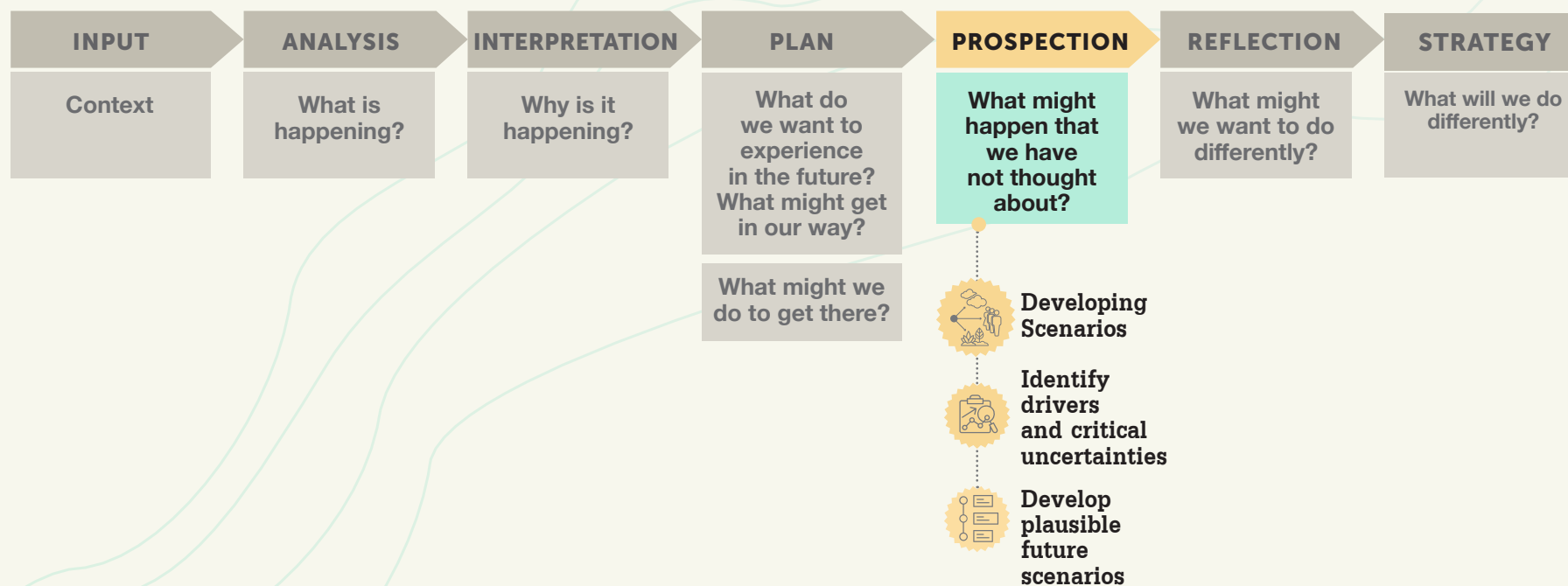


# Prospection Stage

The prospecting stage of the foresight process follows on from the plan stage. A key question in the foresight process we aim to answer through prospecting is:



**What might happen that we have not thought about?**



## MODULE 04 Building Scenarios



**SADC Futures**  
Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



# Introducing Scenarios

**Scenarios** - are storylines or narratives, answering ‘what if’ questions that describe multiple alternative futures spanning a key set of critical uncertainties. Scenarios identify future drivers of change and then plot out plausible directions that they may take (UNDP, 2018).

Scenario development is an approach to having a structured discussion or assessment of an uncertain future at one or more specified spatial and temporal level(s). Although they address uncertainty, scenarios are not predictions, forecasts, or projections. Thus, they are not ‘true’ or correct or wrong, only plausible (Ainslie, 2011).

**For scenarios to be effective, they must be plausible, consistent, and offer insights into the future (European Foresight Platform, n.d.):**

- Scenarios must fall within the limits of what might conceivably happen;
- The combination of logics in a scenario must not have any built-in inconsistency that could undermine its credibility; and
- Scenarios should contribute specific insights into the future that will lead to decision-making on the focal issue.

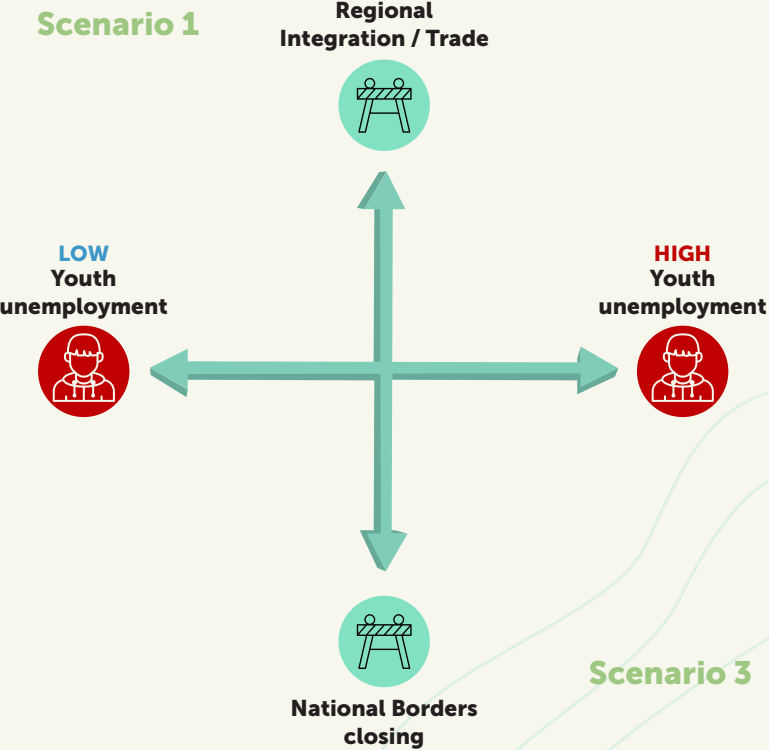
**Scenarios can be quantitative, qualitative or a mix of both methods.** Qualitative or participatory scenario planning is a process of collective sharing, learning, and interpretation (Le et al., 2018). Quantitative scenario planning uses raw data and computer models. Quantitative approaches are more focused and can be used to verify qualitative scenarios. Combining qualitative and quantitative inputs can enhance the robustness and consistency of scenarios.

**Multiple scenarios can be used to explore numerous plausible futures.** A combination or set of scenarios, consider broad future uncertainty for the testing of policies, investments and research innovations (Vervoort et al., 2013). For example, in the period from 2010 to 2016, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) Scenarios Project engaged with national and regional policy processes for scenario-guided policy formulation. This has resulted in a diverse set of policy outcomes in seven scenario regions. The expected outcomes of CCAFS’ scenario work are (Vervoort, n.d.):

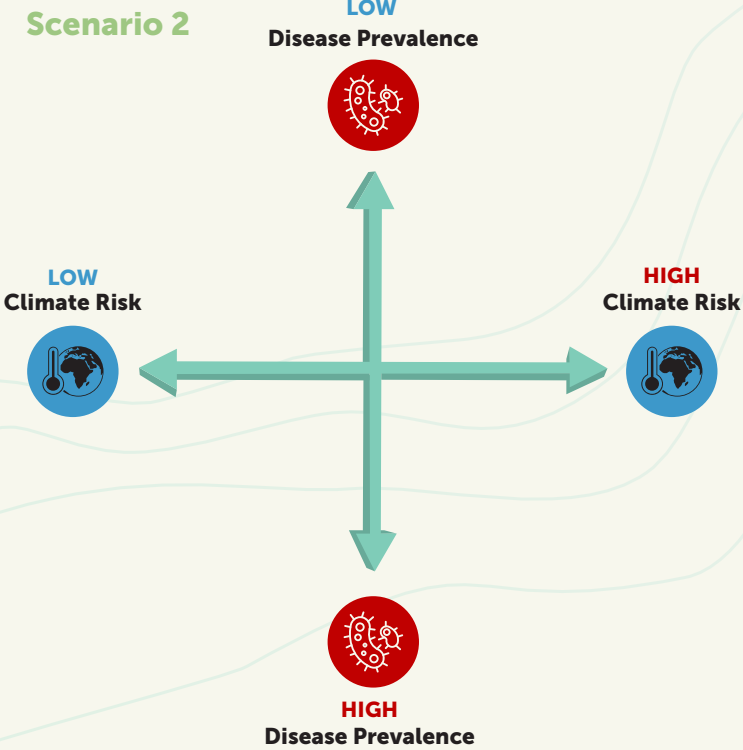
- Scenario-guided formulation of plans leading to more robust and more inclusive policies, implementation plans and investments;
- All Scenario Project policy guidance processes focus on both the inclusion of gender concerns in policy development, as well as the inclusion of stakeholders representing gender equality needs in the policy process; and
- Use of scenarios at the national level helps decision makers adapt plans and direct investment.

Multiple Scenarios

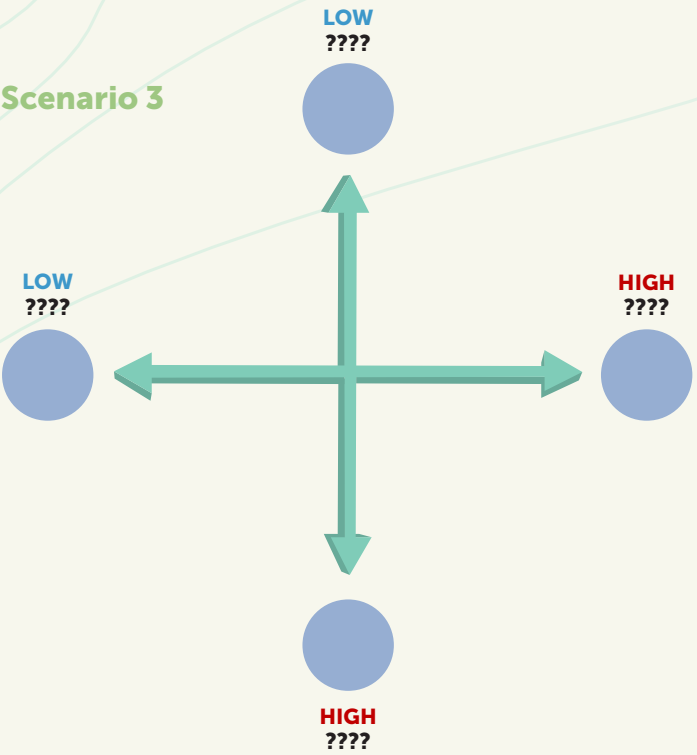
Scenario 1



Scenario 2



Scenario 3



## Importance of Scenarios in the Foresight Process

**Scenarios can be used as a learning tool to train decision makers in strategic planning and how to handle uncertainty.** They can therefore improve planning capacity at the national, regional, and local level. Two participatory scenario development case studies and two relevant learning reflections are given below. (For detailed information on scenarios refer to the SADC Futures knowledge series supplementary report, 'What Are Scenarios Telling Us About Developing Climate-Resilient Pathways in the Southern African Region?')

Since 2010, CCAFS has been collaborating with actors from West Africa, to develop socio-economic scenarios for the region (Palazzo et al., 2016). A series of workshops was held where regional stakeholders described major drivers of change in the region. This resulted in the development of four vastly different and plausible future scenarios for West Africa.

**These scenarios were structured along two main axes of uncertainty:**

- Whether governments and other actors focus on short-term or long-term priorities; and
- Whether state or non-state actors are driving change within the region.



**The regional stakeholders named the different scenarios as follows (Palazzo et al., 2016):**

- Cash, Control and Calories (upper left)** - is about short-term priorities with state actors as the dominant force in West Africa to 2050.
- Self-Determination (upper right)** - is a scenario where state actors are dominant and long-term priorities prevail.
- Civil Society to the Rescue? (lower right)** - is a scenario where non-state actors are dominant and long-term issues have priority.
- Save Yourself (lower left)** - is a scenario where non-state actors are the driving force and short-term priorities dominate.



Once the qualitative scenario narratives had been developed, the **stakeholders undertook a semi-quantitative assessment of key indicators for each of the four scenarios**. The scenarios were then linked to the Intergovernmental Panel on Climate Change (IPCC) global Shared Socio-economic Pathways (SSPs) and quantified using two agricultural economic models:

- GLOBIOM - developed at the International Institute for Applied Systems Analysis (IIASA); and
- IMPACT - developed at the International Food Policy Research Institute (IFPRI).

The resulting scenarios describe different futures of food security, environments and (rural) livelihoods providing challenging contexts for regional, national, and sub-national decision makers to test policies and plans and make them more robust in the face of future uncertainty. The scenarios have been used in a variety of policy design processes to date, including the Economic Community of West African States (ECOWAS) priority setting, reviewing the National Plan for the Rural Sector for Burkina Faso (PNSR), and district and national level policy processes in Ghana (Palazzo et al., 2016).



## Case Study: Using Scenarios for Stress Testing Climate-Smart Agricultural Investment Plans in Zambia



The Food and Agriculture Organisation (FAO) undertook a climate smart agriculture (CSA) workshop in Lusaka, Zambia in 2014 (FAO/EPIC, 2014). The purpose of the workshop was to stress test CSA investment proposals using multiple scenarios. The assessment of the CSA investment proposals was conducted over three main steps:

**Step 1:** Developing a CSA roadmap and investment plan with key steps over time;

**Step 2:** Using participatory scenario building to identify key indicators of interest where change is desired (e.g. farmer's food security and incomes) and key contextual factors (e.g. global markets and government support); and

**Step 3:** Using scenario working groups to discuss plausible outcomes on key indicators of interest for each scenario.

The drivers identified with the highest levels of uncertainty and impact were related to economic growth. Specifically, how will commodity prices move? Will the economy grow, diversify and be sustainable or will it be volatile? Based on these drivers, four different scenario narratives were developed to test the investment proposals:

**Yazanda (things are bad)** - a Zambia characterised by low economic growth and institutions that are weak and unresponsive.

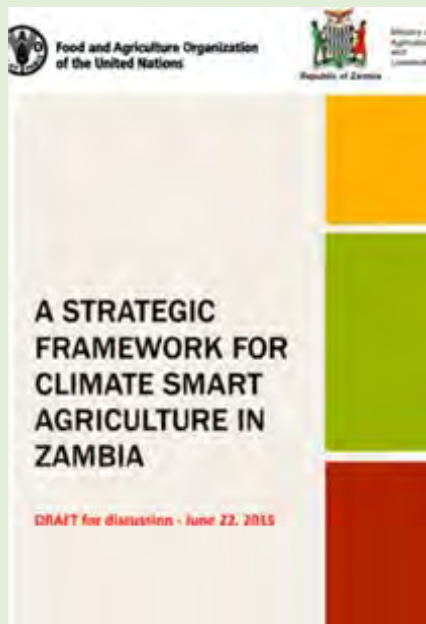
**Mwadyamweka (alludes to selfishness)** - a country with high and steady economic growth but institutions that are weak and unresponsive.

**Kudyela (having a good time)** - a Zambia characterised by high and steady economic growth and institutions that are efficient and highly adaptable.

**Nalimai (the unfortunate one)** - a country with low economic growth but with institutions that are efficient and highly adaptable.

### Each scenario working group read the investment proposals in the light of their allocated scenario narrative.

Each step or action in the investment proposals was assessed for feasibility in terms of the scenario (feasible, not feasible, or unclear). The group then made notes as to why the verdict was made and suggested possible alternatives. The group also commented on how policy conditions could be improved for each specific point. The output of the scenario development workshop was a robust investment plan for the agricultural sector based on the potential impacts of climate change.



**Step 1:** Develop climate smart agriculture roadmap and investment plan with key steps over time

**Step 2:** Participatory scenario building – Identify key indicators of interest where change is desired (such as farmer's food security, incomes) and key contextual factors (e.g. global markets, government support)

**Step 3:** Scenario working groups discuss plausible outcomes on key indicators of interest for each scenario

**Each group linked to their scenario takes time to read each investment proposal, and then goes through it point by point to say whether each step or action is feasible under their scenario (+), not feasible (-), or its feasibility is unclear (?). For each point, the group makes notes as to why this verdict was made, and suggests possible alternatives. The group also comments on how policy conditions can be improved for each specific point.**

## Reflection on the Importance of Implementation

**Scenarios have been used to develop response measures globally.** It is known that a national response strategy using scenarios was implemented by the United States of America (USA) to manage the outbreak of swine flu (H5N1) in 2005. The strategy proved effective. However, the success of the USA's response strategy to the ongoing COVID-19 pandemic has been questionable, despite it having been tested using multiple future scenarios. Global pandemics were considered as 'grey rhinos' i.e. not unexpected, just unknown as to when and where they will emerge. What went wrong? Despite all the planning, the strategy was not useful because it was not implemented.



**Wild cards** - are low-probability but high-impact events that seem too incredible or unlikely to happen.



**Black swans** - are events that could absolutely not be predicted.



**Grey rhinos** - are large, obvious dangers that will emerge sooner or later but whose exact timing is unknown.

**Over the last decades, scenarios have been used to develop response measures.**

### Example - US National Pandemic Strategy

Focused on "grey rhinos" instead of black swans

Responses used in 2005 H5N1 Swine Flu outbreak (where major outbreak avoided)

Scenarios used in development of national pandemic response strategy

For COVID - the warning system worked, but response strategies didn't







Photo: Tobias Meier (USAID)

## MODULE 04

### Building Scenarios

### Reflection on the Importance of Assumptions in Scenarios Development

**People tend to enter problem solving spaces with assumptions on how the world works, what is important, and where we are headed. It is therefore important to acknowledge that a mix of stakeholders will likely result in numerous, diverse perspectives.**

For example, in scenario workshops held by FAO, it was assumed that improvements in smallholder agriculture were considered important for economic growth in certain African countries. However, this assumption was not fully supported. Additionally, in a scenario planning workshop in Vietnam, foreign assistance by China in achieving desired economic growth was not seen favourably by all, some people had different preferences for the future. Another workshop conducted in South Africa found that stakeholders agreed on certain elements of a desired future such as decentralised governance and connectedness. However, the connectedness could come from either technology or social structures.

Understanding the importance of assumptions and different perspectives is a positive outcome of participatory scenario building which requires a change in mindset, a broadening of the mind, to see the world from the viewpoints of other people. Through effective communication it is possible to identify differing viewpoints and reach a consensus on how to address discrepancies moving forward.



## Learning Exercise

What has your experience been with developing scenarios? If you have been involved in scenario development workshops previously, what assumptions were made and were there different perspectives that needed to be considered? How did you decide on taking disagreements forward? If the workshop had a plan or strategy output, was it implemented?







# Developing Scenarios

Developing scenarios fits within the prospection phase of the foresight framework.



## What is the method?

- Foresight uses scenario development as an approach to understand high impact and highly uncertain drivers and to describe possible future states.
- Although they address uncertainty, scenarios are not predictions forecasts or projections, they are not 'true' or correct/wrong, only plausible.
- Scenarios are a means to test current policies, plans and decision-making processes in light of multiple potential futures.



## Why apply it?

- Scenarios have an explorative character, they describe a range of alternative plausible futures (future situations that may happen).

This training focuses on building rapid scenarios by identifying multiple high impact and highly uncertain drivers and defining the outcomes in the dimensions in which they meet. It is important to reiterate that scenario building is not a predictive exercise.



## Key features of scenarios:

- **Plausible** - it is reasonable to assume the scenario could happen. Plausibility does not mean that a future situation will happen.
- **Viable** - able to be done or could occur.
- **Feasible** - possible and practical.
- **Not predictive** - participatory with multiple viewpoints, bringing in quantitative and qualitative evidence but not predictive.

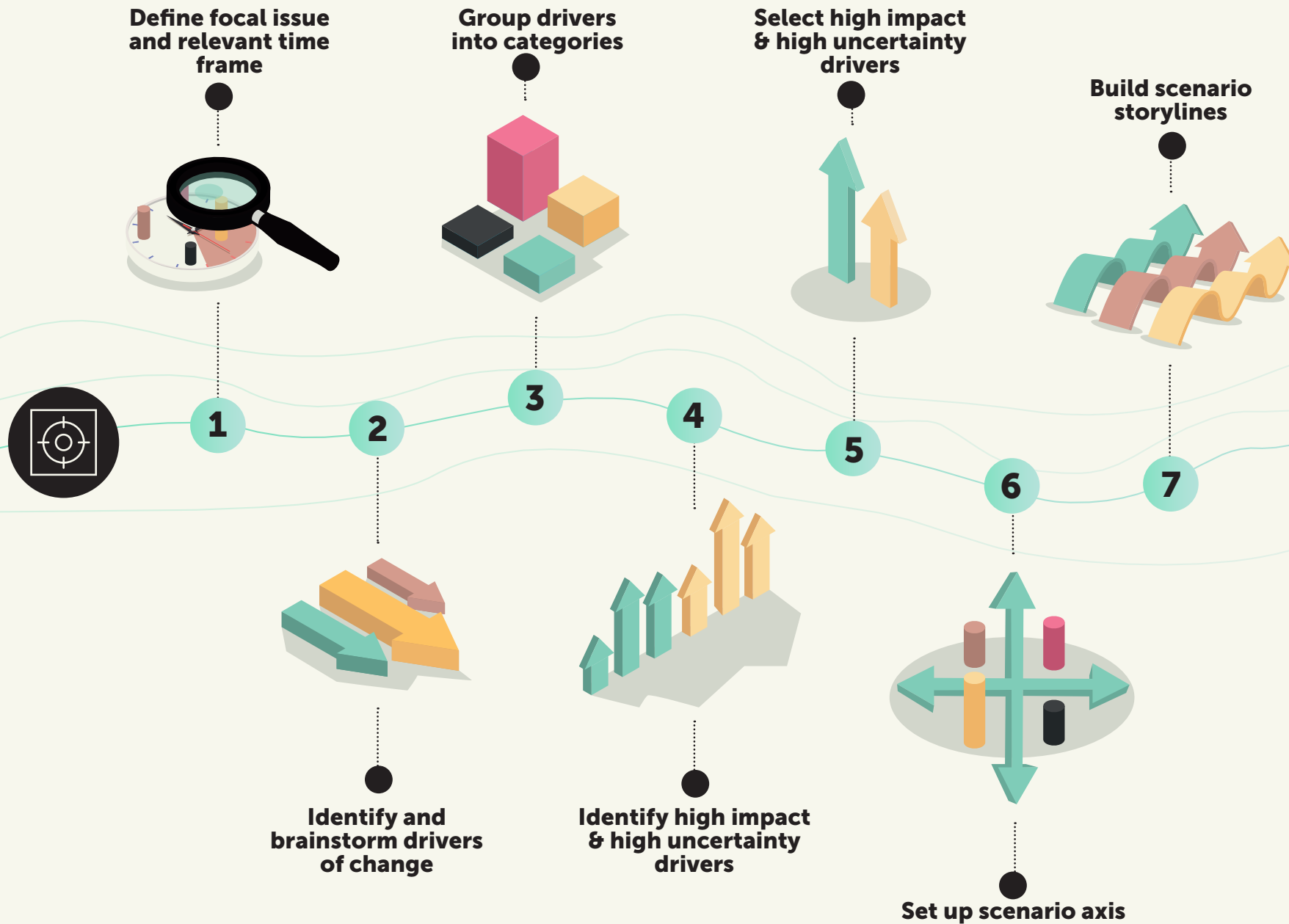


## Key Steps for Scenarios:

- Define the focal issue and relevant time frame;
- Identify and brainstorm drivers of change;
- Group drivers into categories;
- Identify high impact and high uncertainty drivers;
- Select high impact and high uncertainty drivers;
- Set up a scenario axis; and
- Build scenario storylines.



## Key steps for building scenario storylines





# Step 01 Define the Focal Issue and Time Frame



**Step 1 in developing scenarios requires defining the focal issue and appropriate time frame.** When deciding on the focal issue, it is important to address the range of uncertainties that might characterise the long-term future (European Foresight Platform, n.d.). You could start this step by asking the question:



**What are the key factors we would like to know about the future to improve the quality of our decisions?**

Defining the appropriate time-horizon is the next critical step in developing scenarios as it affects the range of issues to be considered (European Foresight Platform, n.d.).



## Learning Exercise

Based on the outcomes of the exercises you completed in Modules 1-3, **think of your theme, what is the focal issue that you are trying to address that you would like to develop scenarios for?** What time frame would you assign it? Some examples of focal issues and time frames given by participants of the SADC Futures webinar series are provided below to guide you.



- 'Deforestation and forest degradation, 25-year timeline.'
- 'Land restoration globally within 10 years.'
- 'Land degradation in rural communities, 20-year timeline.'
- 'Reduced crop losses in a region, 10-year timeline.'
- 'Crop suitability in West Africa by 2030.'
- 'Explore smallholder farmer responses to drought, 10-20 years.'
- 'Sustainable agriculture in one region of a country, 15-20-year timeline.'
- 'Generating electricity with low carbon emissions in 15 years.'

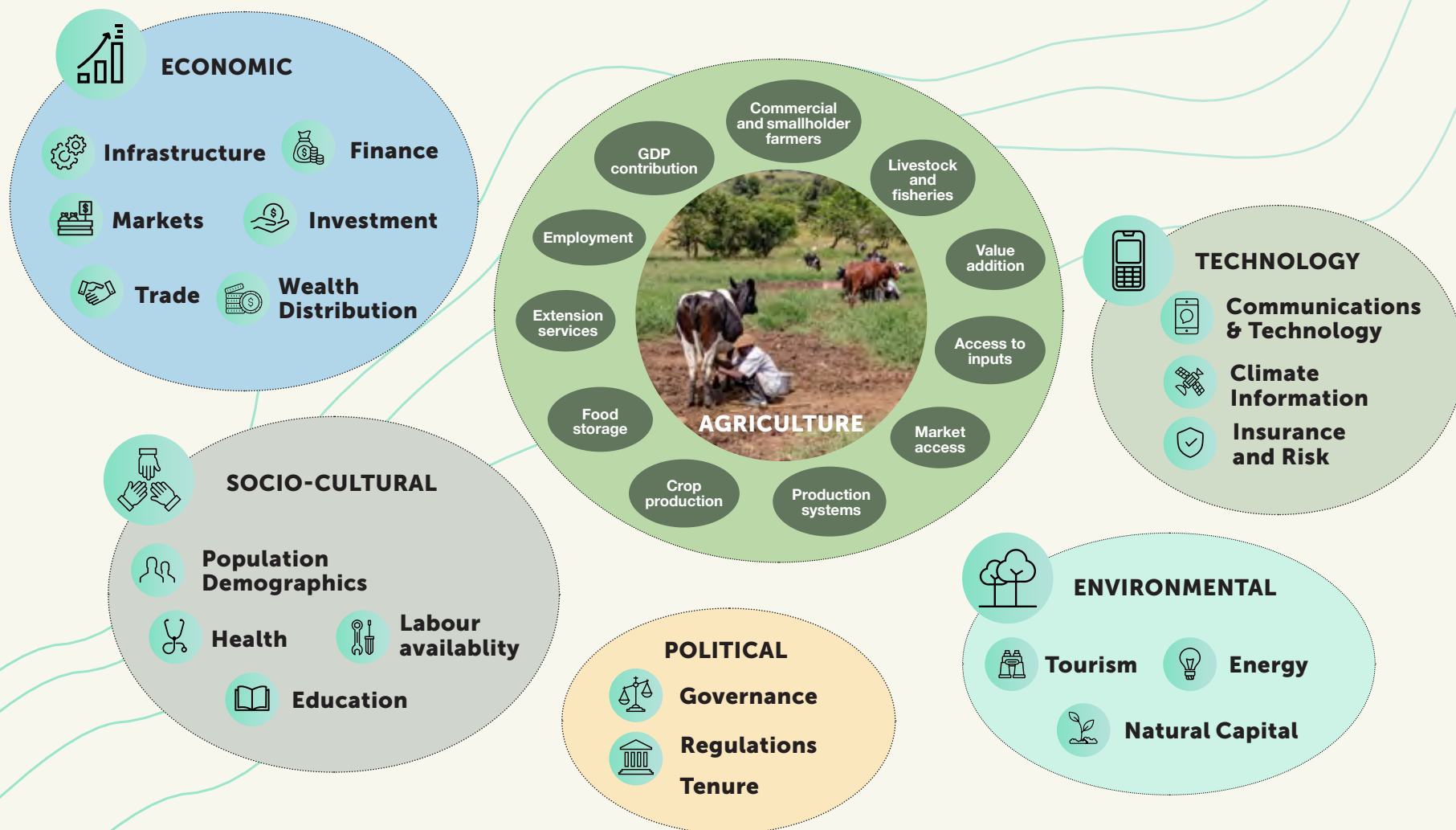


# Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The focal issue and time frame for the theme of climate resilient agri-food systems in the SADC region were defined over Modules 1-3. The focal issue to be addressed is:

**The integration of climate resilience throughout the SADC region's agri-food systems.**

The timeframe appropriate to the focal issue is 10 years i.e. 2020 - 2030. This time frame was chosen as it aligns with those of the Regional Indicative Strategic Development Plan (RISDP) and the SADC Climate Change Strategy.







## Capacities to build a climate resilient agriculture system

### INFRASTRUCTURE



Adaptive structures

### GOVERNANCE



Proactive institutions & organisations

### LIVELIHOODS & FARM SYSTEMS



Enhanced livelihoods and farm functioning



Capacity of people to adapt

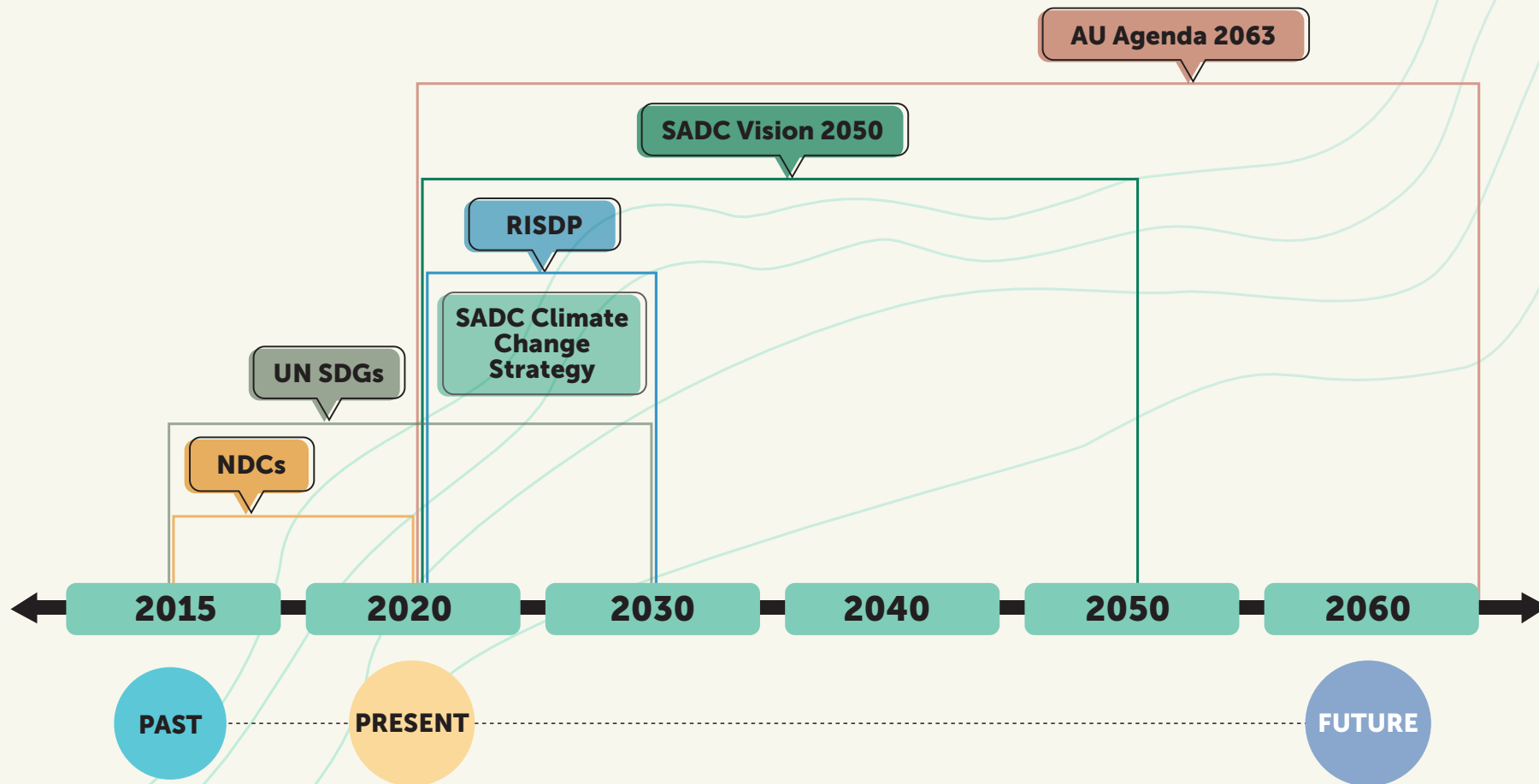
### PEOPLE



Ecosystem service that built resilience

### ECOSYSTEMS

## MODULE 04 Building Scenarios



## MODULE 04

### Building Scenarios





## Step 02 Identify and Brainstorm Drivers of Change



Step 2 of the scenario building process involves identifying and brainstorming drivers of change relevant to the focal issue.



**Drivers** - are factors, issues or trends that cause change thereby affecting or shaping the future.



**Internal driver** - internal force of change for example social drivers within a farm or community and directing decision making of a farmer.



**External driver** - external force of change, for example political or market drivers.



**Driving forces** - a cluster of individual trends on the same general subject moving in certain directions, broad in scope and long term in nature e.g. climate change or globalisation.

The aim of this step is to build a conceptual model of the relevant environment that includes critical trends and driving forces and maps out the cause-and-effect relationship among them (European Foresight Platform, n.d.). This step may require desktop research to adequately define the driving forces. For example, research could cover changing markets, understanding new technology, political factors, and economic forces.

It is beneficial to discuss the potential drivers of change in a workshop setting with stakeholders from diverse backgrounds. It should become obvious that not all the identified drivers are equally important or equally uncertain.



## Learning Exercise

Thinking of the focal issue that you wish to develop scenarios for, **what are the main drivers of change that comes to mind?** What is affecting the situation you want to understand more about? Brainstorm drivers and document them on Post-its or on a whiteboard (so that you can easily move them around in the next step). Some examples of main drivers given by participants of the SADC Futures webinar series are provided below to guide you.















- 'Climate change (rainfall).'
- 'Inflation.'
- 'Politics and economic uncertainty.'
- 'Drought and low soil fertility.'
- 'Demography and market prices.'
- 'Corruption.'
- 'Environmental degradation.'
- 'Technical barriers to trade e.g. standards compliance and records.'

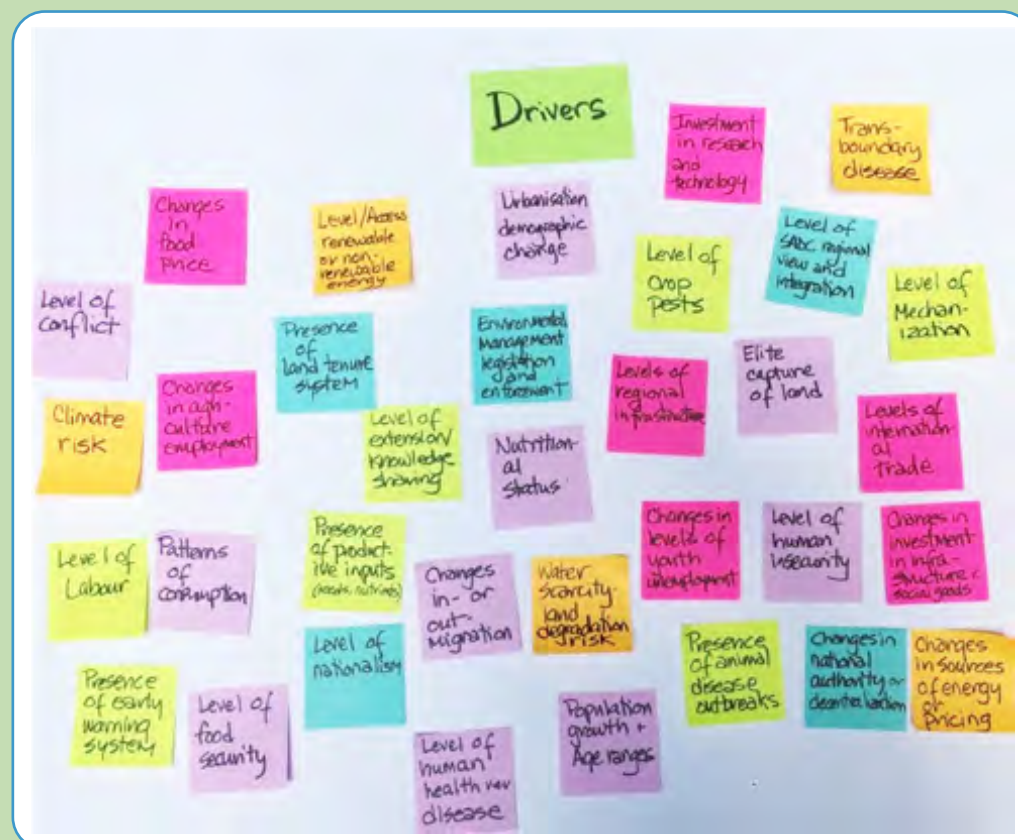




## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the context of climate-resilient agri-food systems in the SADC region, some of the drivers of change identified during a brainstorming session included:

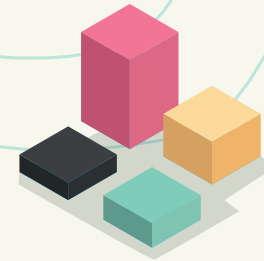
-  **Changes in food price;**
-  **Level of conflict;**
-  **Climate risk;**
-  **Level of labour;**
-  **Presence of a land tenure system;**
-  **Level of access to renewable/non-renewable energy;**
-  **Water scarcity;**
-  **Land degradation;**
-  **Level of human insecurity;**
-  **Presence of animal disease outbreaks;**
-  **Level of mechanisation;**
-  **Levels of international trade;**
-  **Transboundary disease; and**
-  **Level of SADC regional view and integration.**







## Step 03 Group Drivers into Categories



**In Step 3, the drivers of change are sorted into categories.** Using a categorisation system forces you to think outside of the box, or outside of your area of specialty. This ensures that you cover all bases and do not omit an unfamiliar area. It is normal to have drivers that fit multiple categories, it is often not a clear-cut process.

There are many different categorisation systems to choose from. The STEEP categorisation system denotes Socio-cultural, Technological, Economic, Ecological, and Political (van Notten, 2006). Another categorisation system distinguishes between socio-cultural, economic, environmental, and institutional dimensions (European Foresight Platform, n.d.).



### Learning Exercise

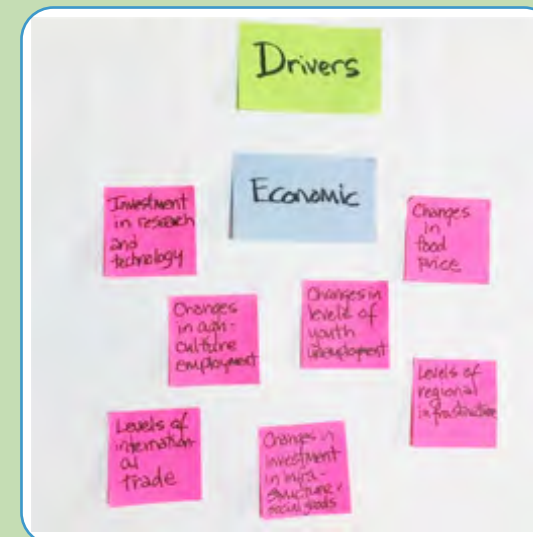
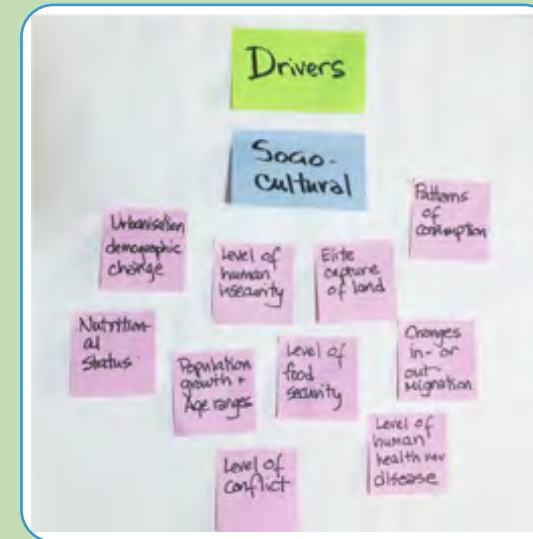
**Determine which categorisation system is most relevant to your focal issue and drivers identified.** Group your drivers (cluster your post-its or circle areas on your whiteboard) according to the categories. See the figures below for guidance.





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The drivers identified in the context of climate resilient agri-food systems in the SADC region can be organised into the following categories:







## Socio-cultural



## Agriculture Productivity



## Natural Resources and Environment



## Economic



## Governance/ Political/ Institutional

# MODULE 04 Building Scenarios



## Step 04 Identify High Impact and High Uncertainty Drivers



### MODULE 04 Building Scenarios

Foresight uses scenario development as an approach to understand high impact and high uncertainty drivers and to describe possible future states. This step requires ranking drivers based on two criteria: the magnitude of 'impact' on the dimension of the focal issue identified in Step 1, and the degree of 'uncertainty'. A method that can be used here is an impact/ uncertainty matrix with a simple 'high-medium-low' scoring system.



**Impact** - refers to the potential scale of impacts of the driver on your scenario theme.



**Uncertainty** - in scenarios refers to how much or how clear we are on how a driver will emerge or play out in the future. High uncertainty does not mean 'high improbability', high uncertainty can mean having little knowledge of how something may pan out.



**Critical uncertainties** - are drivers that are both high impact and high uncertainty.

Some examples of scenario building focus on (European Foresight Platform, n.d.):



**High importance/ low-uncertainty forces** - these are the relative certainties in the future for which current planning must be prepared.



**High importance/ high uncertainties driving forces** - these are the potential shapers of different futures for which your longer-term planning should prepare.

Subsequently, in this step of the scenario development process we need to determine which of the drivers we have identified and categorised are highly impactful and highly uncertain. These are the drivers that we will focus on in developing our scenarios.





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region



### Learning Exercise

Ranking drivers of climate-resilient livelihoods in the SADC region by impact and uncertainty.

In this exercise you will learn how to rank drivers according to high impact and high uncertainty. If possible, complete this exercise in a group setting. Consider the questions and drivers below, document and discuss your answers.



**Which of these drivers do you consider to be 'highly impactful' in determining climate resilient livelihoods in the SADC region?**

**Which of these drivers are we least certain on how they will develop in the future?**



Population growth;



Urbanisation;



Level of extreme poverty;



Unemployment rate;



Land degradation; and



Effectiveness of regional integration.

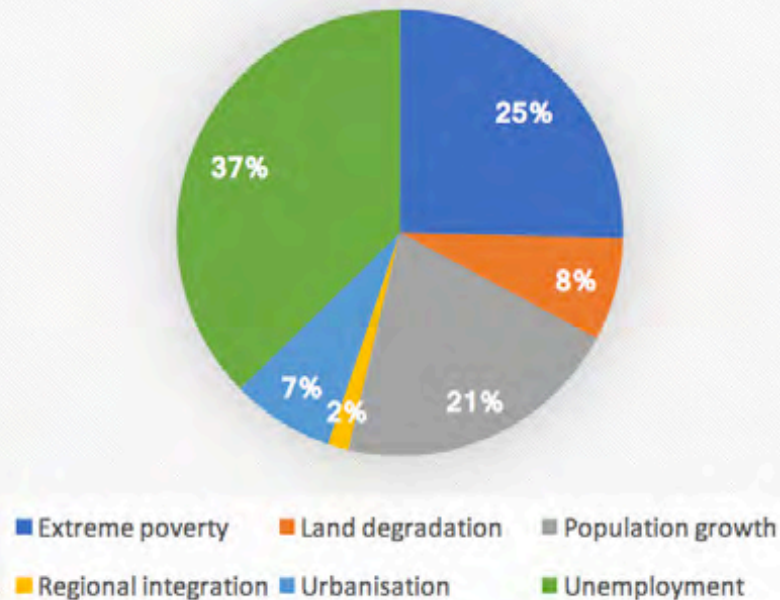


**Bearing in mind differing assumptions and perspectives, how do your results from the exercise compare with the findings from the SADC Futures webinar series as shown in the pie chart below?**

**Did you also consider unemployment, extreme poverty, and population growth to be the most impactful drivers?**

**Discuss your findings with your colleagues.**

**Which Drivers Do You Consider to be 'Highly Impactful' in Determining Climate Resilient Livelihoods in the SADC Region?**



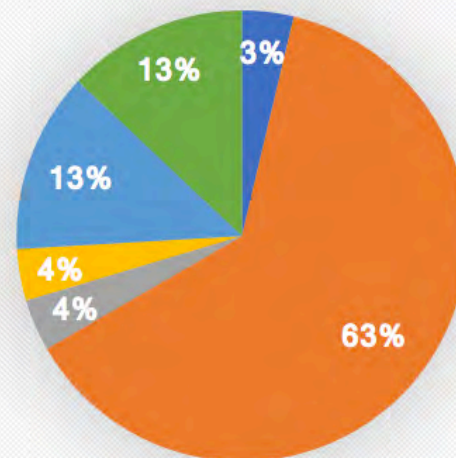


Now consider how your results on driver uncertainty differ from the findings from the SADC Futures webinar series as shown in the pie chart below?

Did you also consider land degradation, urbanisation, and poverty to be the most uncertain drivers?

Imagine you are in a workshop setting; how would you explain the reasoning behind your selection to other stakeholders with differing perspectives?


Which of These Drivers Are We Least Certain on How They Will Play Out in the Future?




■ Extreme poverty ■ Land degradation ■ Population growth  
■ Regional integration ■ Unemployment ■ Urbanisation



Now attempt to investigate the level of impact and level of uncertainty of drivers on the natural resources, agricultural productivity, and socio-cultural dimensions.

 **Impact** - how impactful they are (low, high); and

 **Uncertainty** - how well we know how they will play out (low, high).

Drivers		Impact (L,H)	Uncertainty (L,H)
Socio-cultural	Changes in- or out-migration	High	High
	Population growth + Age ranges	High	Low
Agricultural Productivity	Presence of animal disease outbreaks	High	High





To do this, complete the table below.



For example, for the first line ask yourself, what impact (low or high - the ranking of 'medium' is excluded here for simplicity) will climate variability have on natural resources in the SADC region?

Next, consider whether the uncertainty of this impact is low or high; ask yourself, how uncertain are you as to whether this impact will occur?

Move methodically down the table completing each line. Are there any other relevant drivers you would like to add?

NATURAL RESOURCES		
Driver	Impact (Low, High)	Uncertainty (Low, High)
Variability of climate or climate risk		
Transboundary disease risk (human/ wildlife)		
Level of water scarcity and land degradation		
Changes in sources of energy or pricing		
Level or access of renewable or non-renewable energy		



AGRICULTURAL PRODUCTIVITY

Driver	Impact (Low, High)	Uncertainty (Low, High)
Level of crop pests		
Presence of animal disease outbreaks		
Presence of productive inputs		
Level of labour		
Presence of an early warning system		

SOCIO-CULTURAL

Driver	Impact (Low, High)	Uncertainty (Low, High)
Level of food security		
Urbanisation / demographic change		
Population growth and age ranges		
Nutritional status		



This exercise was previously completed by participants of the SADC Futures webinar series. Their findings were as follows:

NATURAL RESOURCES		
Driver	Impact (Low, High)	Uncertainty (Low, High)
Variability of climate or climate risk	HIGH	HIGH
Transboundary disease risk (human/wildlife)	HIGH	LOW
Level of water scarcity and land degradation	HIGH	HIGH
Changes in sources of energy or pricing	HIGH + LOW	HIGH + LOW
Level or access of renewable or non-renewable energy	HIGH + LOW	HIGH + LOW



## AGRICULTURAL PRODUCTIVITY

Driver	Impact (Low, High)	Uncertainty (Low, High)
Level of crop pests	HIGH	HIGH
Presence of animal disease outbreaks	HIGH	HIGH
Presence of productive inputs	HIGH	HIGH
Level of labour	HIGH	HIGH
Presence of an early warning system	MIXED OPTIONS	HIGH

## SOCIO-CULTURAL

Driver	Impact (Low, High)	Uncertainty (Low, High)
Level of food security	HIGH	HIGH
Urbanisation / demographic change	HIGH	LOW
Population growth and age ranges	HIGH	LOW
Nutritional status	HIGH	LOW





How does the ranking of your drivers differ from that of others? How would you explain your rankings to other stakeholders with differing perspectives? Explanations given by the participants, for some of the rankings, are provided below.



### Natural Resources

**Climate variability or climate risk:** 'there is high uncertainty because our climate models are still working on regional level impacts' and 'the impact is high because production is still mostly rain fed.'

**Changes in sources of energy or pricing:** 'unsure, this does not change much for smallholder farmers, it mostly impacts commercial farmers.'

**Level or access of renewable or non-renewable energy:** 'using renewable energy is likely to have a lower impact than traditional non-renewable sources.'



### Agricultural Productivity

**Level of crop pests (looking specifically at locusts):** 'high impact as they can spread to other countries quickly and cause a lot of damage' and 'based on experience, we can say low uncertainty of impact of pests on yields.'

**Presence of animal disease outbreaks:** 'borders are shared with other countries and free-roaming wildlife, therefore this was rated as high uncertainty' and 'from experience, in January the uncertainty of Foot and Mouth Disease in the region is low.'

**Level of labour:** 'this impact is high because there are few farmers that can afford machinery, most use physical labour' and 'minimal labour tariffs affect labour availability.'

**Presence of an early warning system (EWS):** 'An EWS is a good tool but we don't have adequate technology in Southern Africa, we need governments to invest in EWSs to inform communities and farmers. We need more specific information other than - rainfall will be above normal' and 'an EWS will have a high impact as it allows for informed cropping.'



## Natural Resources

'We had a debate as to what was socio-cultural and what was economic, we found that some drivers could fit into both categories.'

**Level of food security:** 'This was the only driver we ranked as having high uncertainty. This was due to the uncertainty of drought prevalence, agricultural productivity, and trade in the region.'



## Questions & Answers

### Could the given drivers also be ranked quantitatively?

Yes, the qualitative rankings could be investigated further using quantitative data for example, the impact of locusts on crop yields could be assessed using pest modeling. The modeling results could indicate that the impact is not as high as previously thought.



## Learning Exercise

**Now draw up a table specific to your focal issue in question.** Include the drivers that you brainstormed and categorised in the previous steps. Insert columns for ranking them in terms of impact and uncertainty. Discuss the impacts and uncertainties of the drivers with other stakeholders or group members, if possible. Are there areas that you disagree on? Document the discussion and reasoning behind the ranking of each driver.





## Step 05 Select High Impact and Highly Uncertain Drivers



This step requires selecting the drivers, across all categories, that are ranked as both high in impact and high uncertainty. These are the drivers that we want to focus on in developing scenarios.

Drivers		Impact (L,H)	Uncertainty (L,H)
Economic	Changes in levels of youth unemployment	High	High
Governance Political Institutional	Level of state national view and integration	High	High
Natural Resources and Environment	Trans-boundary disease	High	High
	Climate risk	High	High

## MODULE 04 Building Scenarios



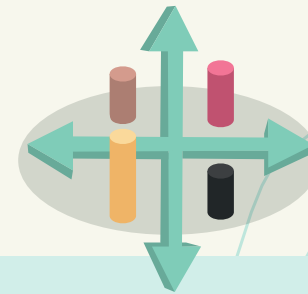
### Learning Exercise

Looking at the table with the drivers that you have just ranked, highlight those that have a high impact and high uncertainty.





## Step 06 Set Up a Scenarios Axis



**Determining the axes of the scenarios is the most crucial step in the scenario-generating process.** This is also the step which requires the most intuition, insight, and creativity (European Foresight Platform, n.d.).

The results of the ranking exercise of the previous step assist in the designation of axes along which scenarios can be constructed. The focus of attention should be on 'high impact/ low uncertainty' and on 'high impact/ high uncertainty' quadrants of the matrix (European Foresight Platform, n.d.). The main goal (and challenge) is to end-up with a few scenarios that can inform the decision-maker.

When you are determining how many scenarios to develop, consider how many are needed to contain the 'area of uncertainty'. Normally only three or four are needed (European Foresight Platform, n.d.).



### Learning Exercise

Select two drivers that you previously ranked as being of high impact and high uncertainty. Draw two axes on a piece of paper. Label the extremities with the drivers and designate them as high or low, respectively. See the figure on the following page for guidance.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

#### Scenario Example 1

##### Level of Regional Integration and Level of Youth Unemployment

Allocate a driver to each axis and identify the extremes around them. For example, national borders closing versus fully functional regional integration and high levels of youth unemployment to low levels of youth unemployment. See the figure on next page to guide you.





## Scenario 1



## Questions & Answers

### What are the best methodologies for including rural/farming communities in a scenario exercise?

The scenario development process could be carried out at this level as a participatory exercise by using **farm or rural community relevant examples**. Additionally, rather than drawing the quadrants you could just discuss the outcomes of the drivers and document the feedback. This would enable you to debate the possible futures in a familiar, local way. In terms of capturing climate change information, of which ground level data is lacking, it would be important to communicate in a visually accessible way.



## Step 07 Building Scenario Storylines



**Building multiple scenarios allows for the exploration of numerous plausible futures.** This is useful for engaging with broad future uncertainty for testing policies, investments, and research innovations (Vervoort et al., 2013).

During this final step of developing scenarios, it is important to discuss the various implications and impacts of each storyline and start to reconsider the strategy going forward. Set the mission and goals while considering every scenario.

**There are five useful criteria that can assist in fleshing out scenarios (European Foresight Platform, n.d.):**

**Plausibility** - The selected scenarios must be plausible; this means that they must fall within the limits of what might conceivably happen.

**Differentiation** - They should be structurally different, meaning that they should not be so close to one another that they simply become variations of a base case.

**Consistency** - They must be internally consistent. The combination of logics in a scenario must not have any built-in inconsistency that would undermine the credibility of the scenario.

**Decision making utility** - Each scenario, and all scenarios as a set, should contribute specific insights into the future that will enhance the decision focus that was selected.

**Challenge** - The scenarios should challenge the organisation's conventional wisdom about the future.



### Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

#### Scenario Example 1 (Continued)

##### Level of Regional Integration and Level of Youth Unemployment

Continuing with the scenario building exercise, at this stage it is useful to layout the different dimensions within the axes to prevent the omission of a category. The categories and dimensions considered to be relevant to the focal issue are shown on the next page.



### Socio-cultural

education, gender,  
and youth



### Economic

investment  
and trade



### Environmental

ecosystem  
functioning, forest  
cover, and soil health



### Political and Institutional



### Agriculture Productivity

livestock, crops,  
and aquaculture

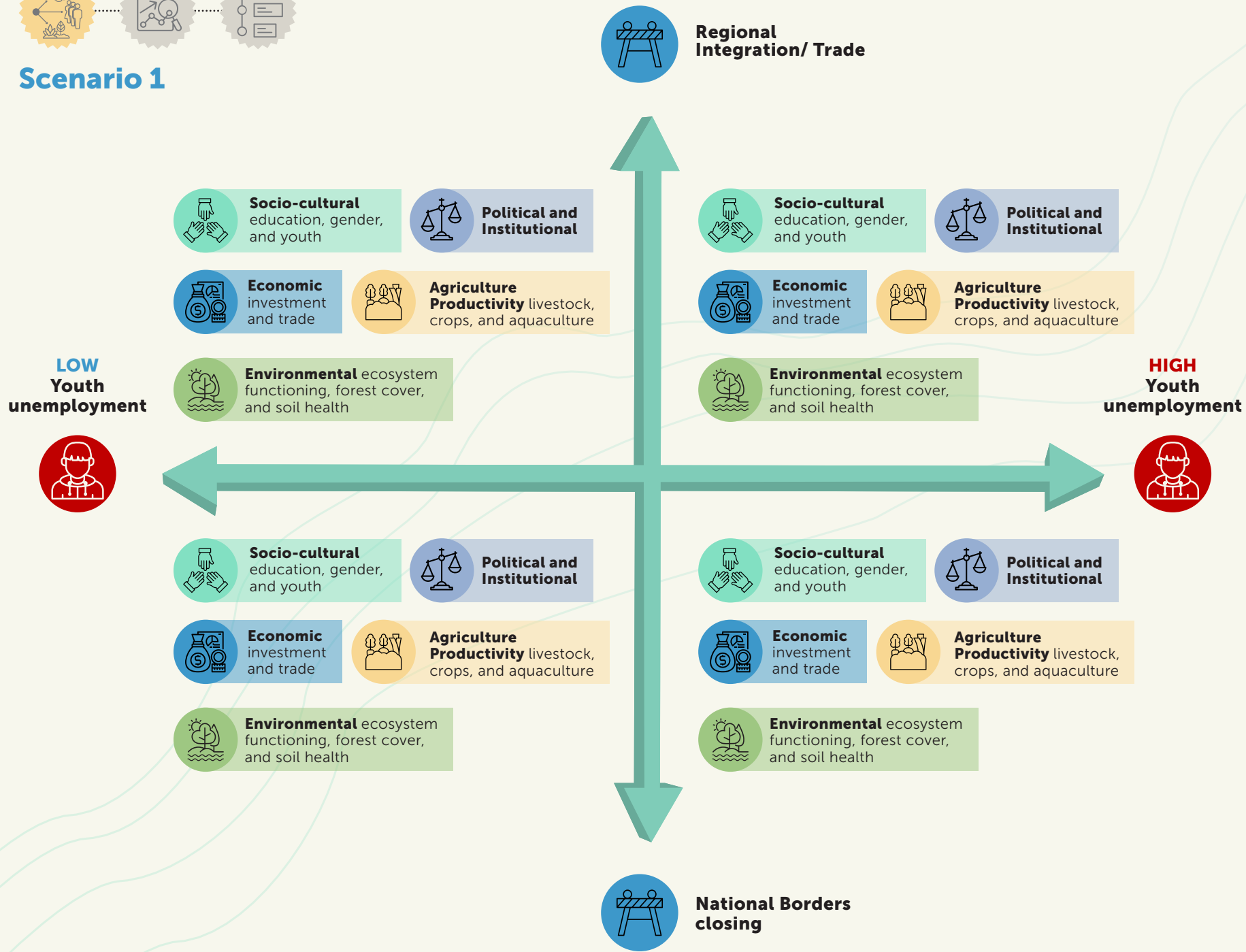


## MODULE 04 Building Scenarios

Once the axes are labelled, the extremes designated and the dimensions added (see the figure below for guidance on adding the dimensions to the axes), we can start to unpack the scenario by looking at each quadrant in turn. Each of the quadrants reflects how two of the drivers meet.



Scenario 1





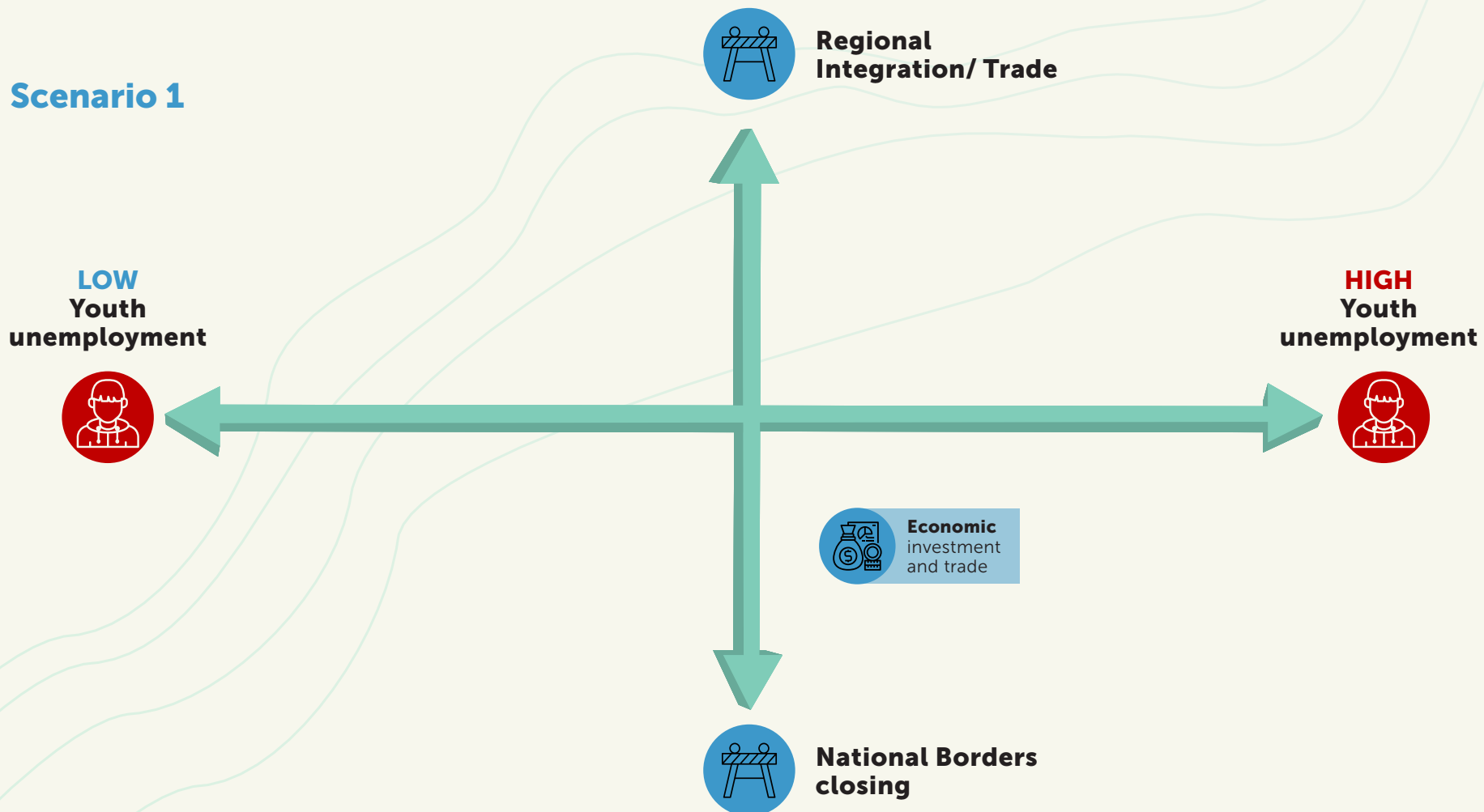


When unpacking a scenario matrix, you need to determine the outcome of the drivers on a given dimension. The described outcomes are your storylines or narratives. For example, considering the figure below you would ask yourself:



**What will the economy of a future state look like in the case of low regional integration (high nationalism) and high youth unemployment?**

## Scenario 1





The outcomes of the drivers of high nationalism and high youth unemployment on the economic dimension could be described as follows:



Let us now consider the other dimensions, the drivers could result in the following storylines:

- **Socio-cultural** - Potential loss of nutritional diversity, increased crime, reduced investment in education and youth, and increased competition across society.
- **Economic** - Dramatic reduction in the importation of food and agricultural inputs and a reduced availability of forex.
- **Environmental** - Society becomes more dependent on the natural environment due to a lack of income leading to increases in deforestation, degradation of natural resources, increased hunting for bushmeat, and potential conflict over transboundary waters.
- **Agricultural productivity** - The need for agricultural productivity increases but based on inputs available within national borders.
- **Political/institutional** - Increased nationalism, limited institutional support of food systems, competition for leadership.

This provides a high-level understanding of how the combined drivers could impact the different dimensions. The picture of what this possible future could entail suddenly becomes clearer.



**HIGH**  
Youth  
unemployment



**Socio-cultural** education, gender, and youth

Potential loss of nutritional diversity, increased crime, reduced investment in education and youth, increased "competition" across society



**Political and Institutional**

Increased nationalism, reduced types of institutions addressing food system, competition for leadership



**Economic** investment and trade

Dramatic reduction of food and agricultural inputs being imported, reduced forex



**Agriculture Productivity**

livestock, crops, and aquaculture

Need for productivity increases but based on inputs within national border



**Environmental** ecosystem functioning, forest cover, and soil health

Unemployment leads to feed families, increases in deforestation, degradation of resources, increased hunting for bushmeat, potential conflict over transboundary waters



**National Borders closing**

Now let us consider the quadrant below, where good regional integration/trade meets low youth unemployment.



**What would the agricultural production system look like? What would be your narrative statement?**

## MODULE 04

### Building Scenarios



The following storylines from participants of the SADC Futures webinar series can be used to guide your thinking:

'Increased productivity.'

'Increased income.'

'Increased exports.'

'In-migration livelihoods.'

'Improved livelihoods.'

'Increased health.'

'Growing and stable. Increasing markets.'

'Increased youth participation in agri-value chain.'

## Scenario 1

**LOW**  
Youth  
unemployment



**Agriculture Productivity** livestock, crops, and aquaculture



**Regional Integration/ Trade**

**HIGH**  
Youth  
unemployment



**National Borders closing**

# MODULE 04 Building Scenarios

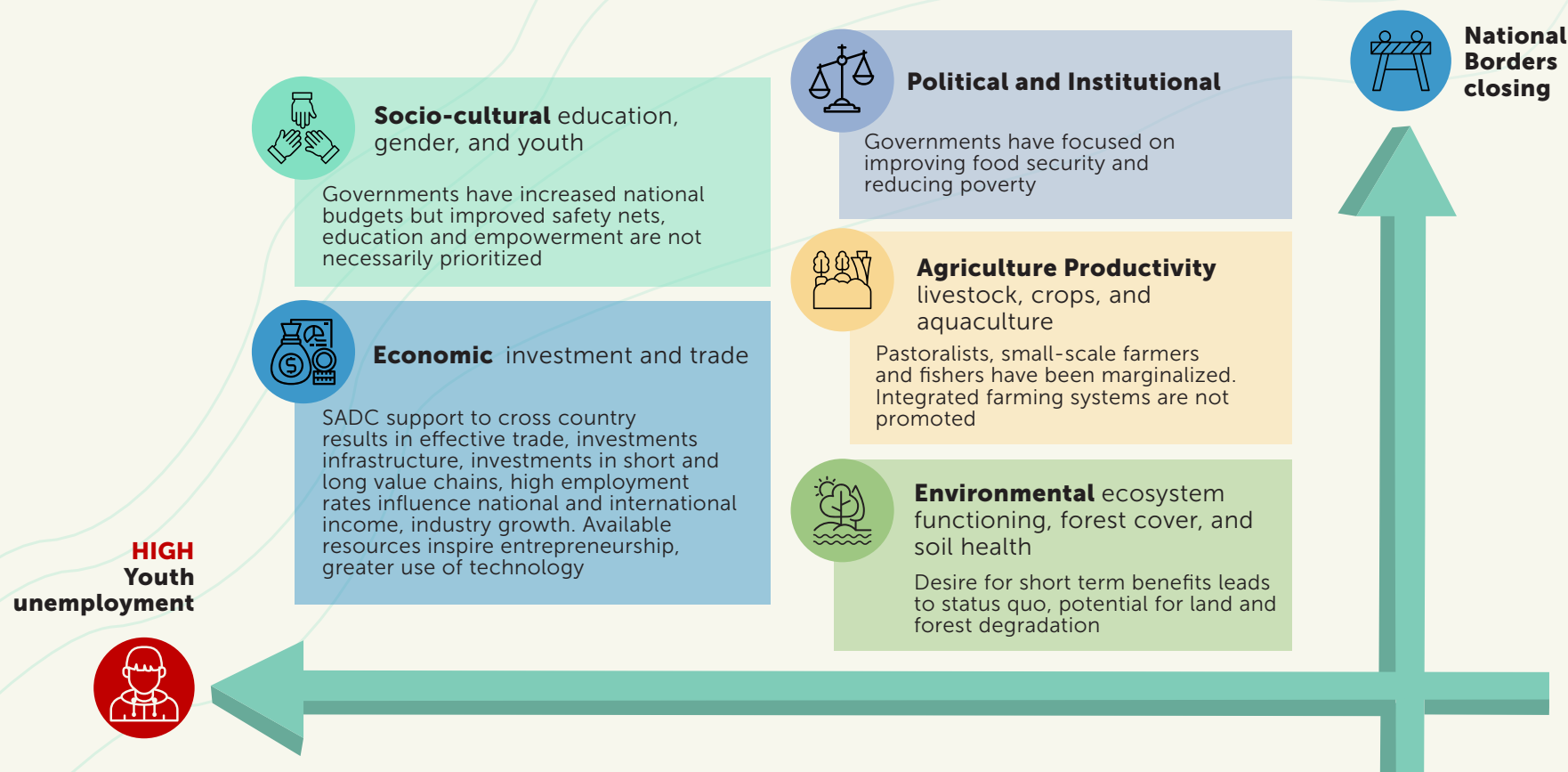




Let us now consider the other dimensions, the storylines could be described as follows:

- **Socio-cultural** - Governments have increased national budgets but may or may not focus resources on improved social safety nets, education, and empowerment. Higher employment rates allow for greater spending power.
- **Economic** - The support of the SADC region results in effective trade, investments in infrastructure, and investments in short and long value chains. High employment rates influence national and international income, and industry growth. Available resources inspire entrepreneurship and a greater use of technology.
- **Environmental** - Desire for short term benefits leads to status quo for land management and potential for land and forest degradation.
- **Agricultural productivity** - Pastoralists, small-scale farmers and fishermen may become marginalised in favour of large-scale production systems. Integrated farming systems are not promoted.
- **Political/institutional** - Member countries are focused on economic development, poverty alleviation and peace and security.

Again, the picture of what the future state would look like suddenly becomes a lot clearer.



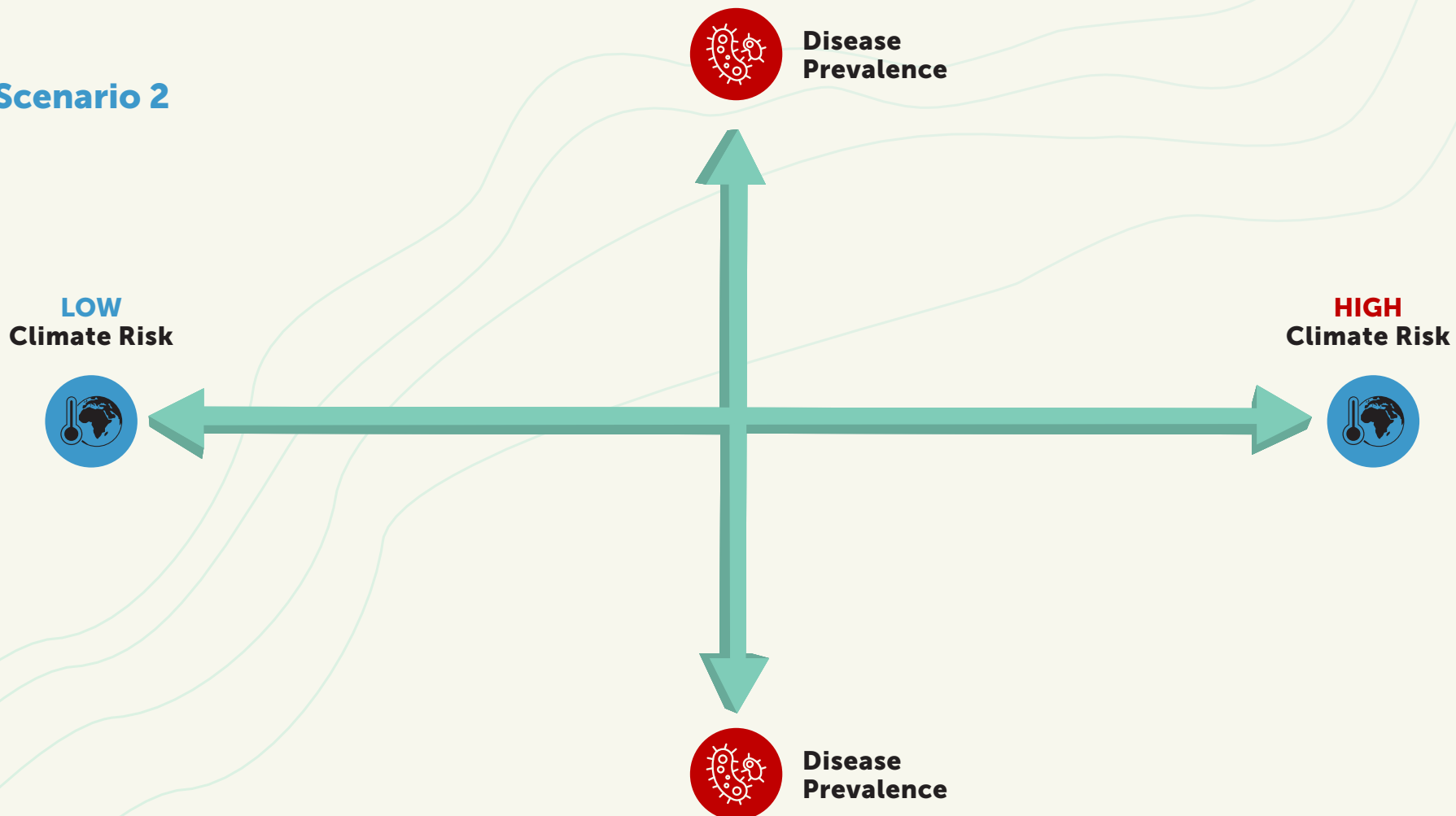


## Scenario Example 2

### Level of Climate Risk and Level of Disease Prevalence

Here we build new axes to address the drivers of climate risk and disease prevalence. The next step is to include the dimensions and start to unpack the scenario storylines. For example, let us consider the quadrant where the drivers of high climate risk and high disease prevalence meet.

## Scenario 2





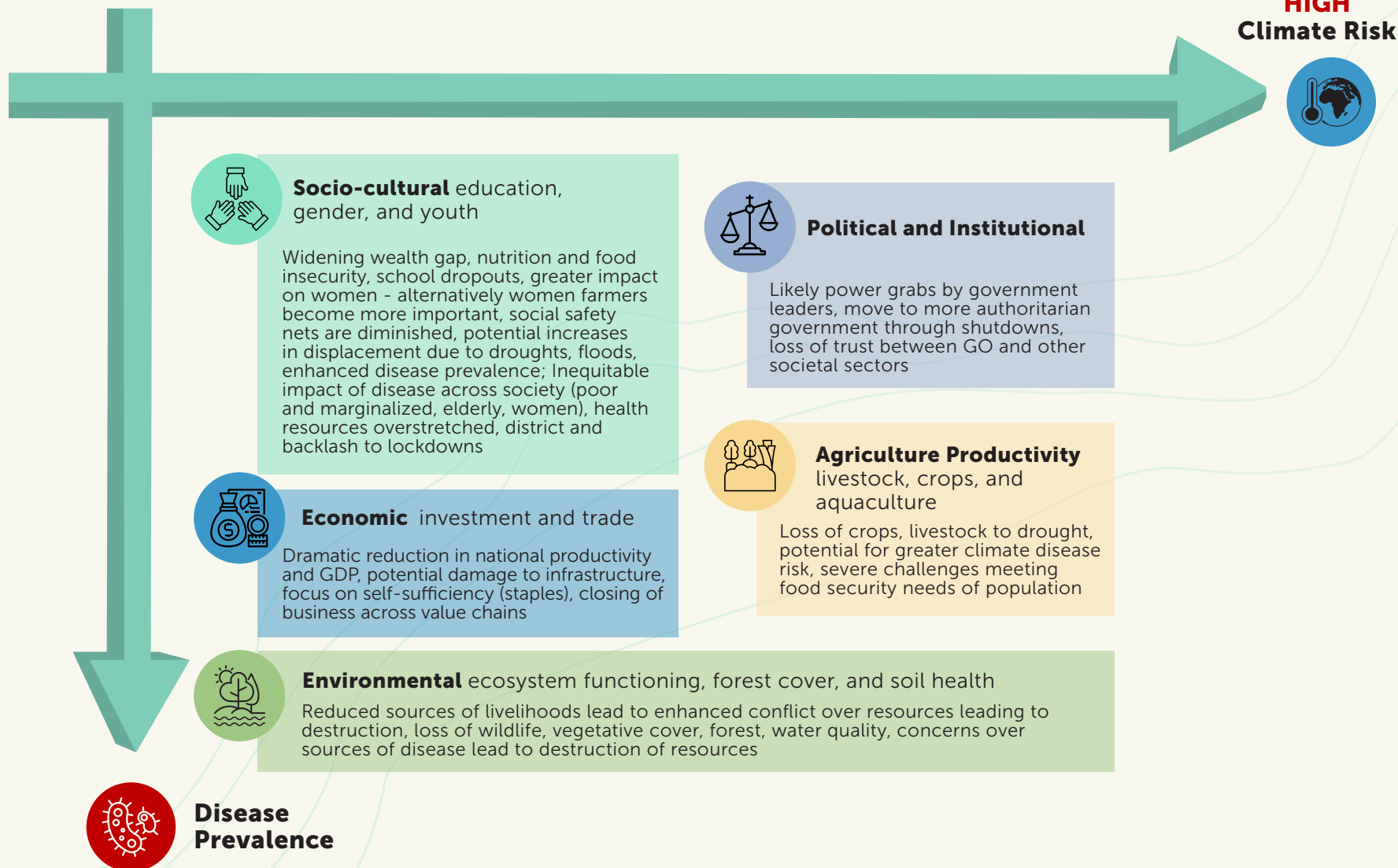
## What will the future state look like in the case of high climate risk and high disease prevalence?

The storylines for each dimension could be described as follows:

- **Socio-cultural** - A widening wealth gap, nutrition and food insecurity, and school dropouts. Increased adverse impacts on women or alternatively women farmers become more important. Social safety nets are diminished. There are potential increases in displacement due to droughts and floods. There is an increase in disease prevalence with an inequitable impact across society (the poor and marginalised, elderly, and women are worst affected). Health resources are overstretched and there is backlash against lockdown enforcement.
- **Economic** - There is a dramatic reduction in national productivity and Gross Domestic Product (GDP), there is potential damage to infrastructure, a focus on self-sufficiency (staples), and closing of businesses across value chains.
- **Environmental** - Reduced livelihood sources lead to conflict over natural resources resulting in their destruction, such as a loss of wildlife and vegetative and forest cover, or reduced water quality. Concerns over sources of disease lead to a further destruction of resources.
- **Agricultural productivity** - Loss of crops and livestock to drought. Potential for greater climate-related disease risk. Severe challenges faced in meeting the food security needs of the population.
- **Political/institutional** - Likely power grabs by government leaders and a move to more authoritarian government through shutdowns. A subsequent loss of trust between government and other societal sectors.



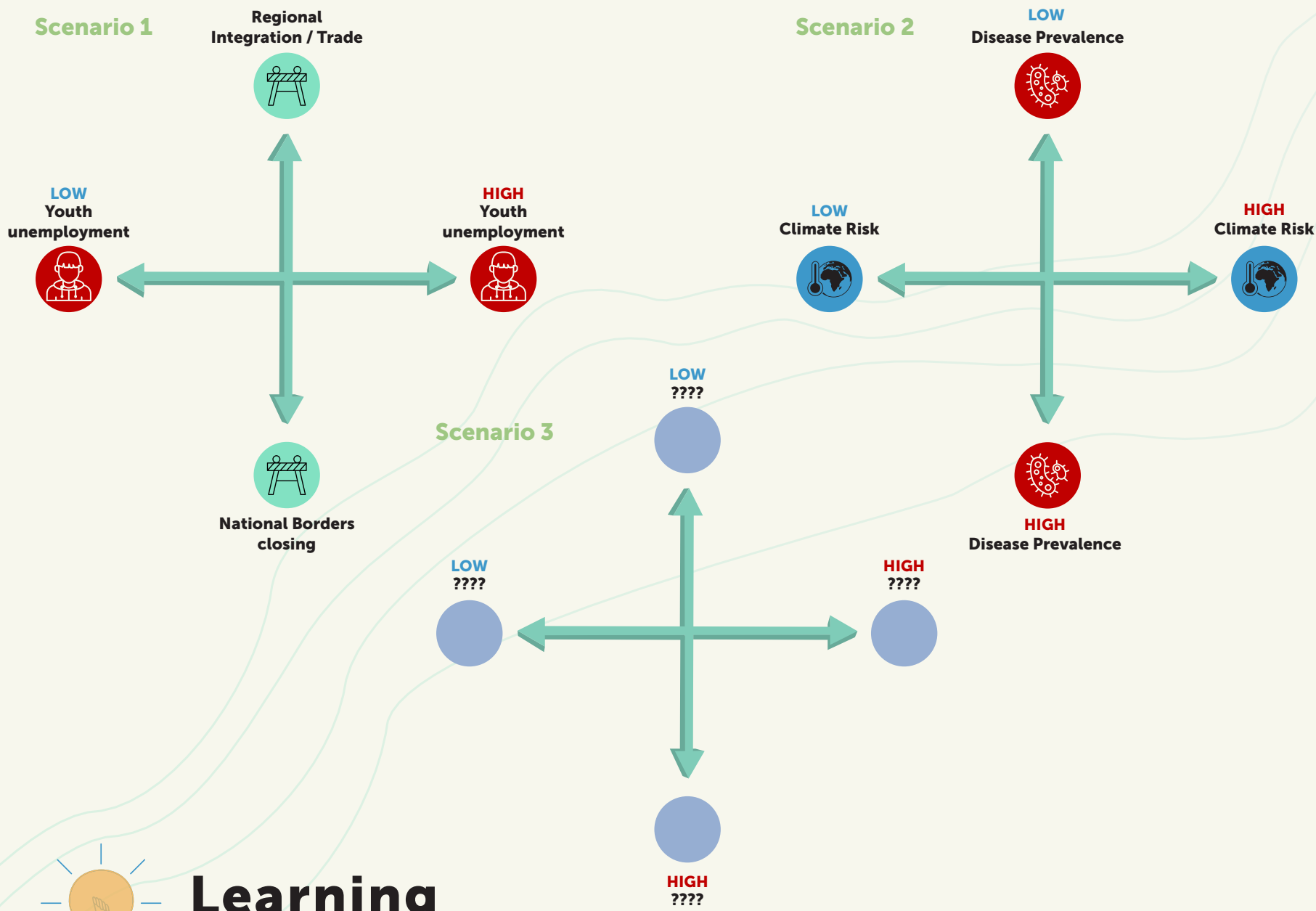
Photo: Dean Chahim



Using the high impact and high uncertainty drivers identified previously, you would continue to develop the scenario storylines. By building rapid and multiple scenarios using combinations of different drivers and how they play out within the dimensions of each category (as with the trends analysis) you can reduce background bias.



Multiple Scenarios



Learning

You should now understand how to categorise and identify high impact and high uncertainty drivers. You have learnt how to set up a scenario matrix and should be able to draft future narratives.



# Scenario Development Case Studies for Climate Resilience at the Global, Sub-Saharan Africa, SADC, and National Levels

This section provides examples of scenario development case studies to illustrate the application of the method in real life policy and strategic planning. For more detailed information on these scenario case studies refer to the SADC Futures knowledge series supplementary report 'What Are Scenarios Telling Us About Developing Climate-Resilient Pathways in the Southern African Region?'



## Case Study 1: Regional Level (Sub-Saharan Africa)

**Green Revolution Scenarios** (Moyer & Firnhaber, 2012)

This case study involved a quantitative analysis by the Institute for Security Studies (ISS)<sup>1</sup> in 2012. They used an international futures model to determine whether increasing agricultural productivity through the Green Revolution would result in better diets for the poor in Africa.



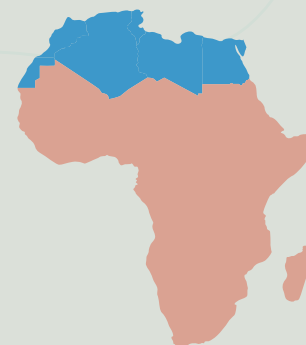
**Key Question Addressed:** Will increasing agricultural productivity in Sub-Saharan Africa result in better diets for poor people in Africa?



**They ran three different scenarios:**

- Base case;
- Positive business as usual; and
- The Green Revolution i.e. increased agricultural productivity.

It was discovered that increasing productivity alone would not be sufficient in improving diets. The poor needed assistance in the form of income and safety nets.

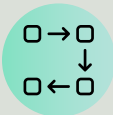


<sup>1</sup> ISS is a leading African organisation that enhances human security to enable sustainable development and economic prosperity in Africa.



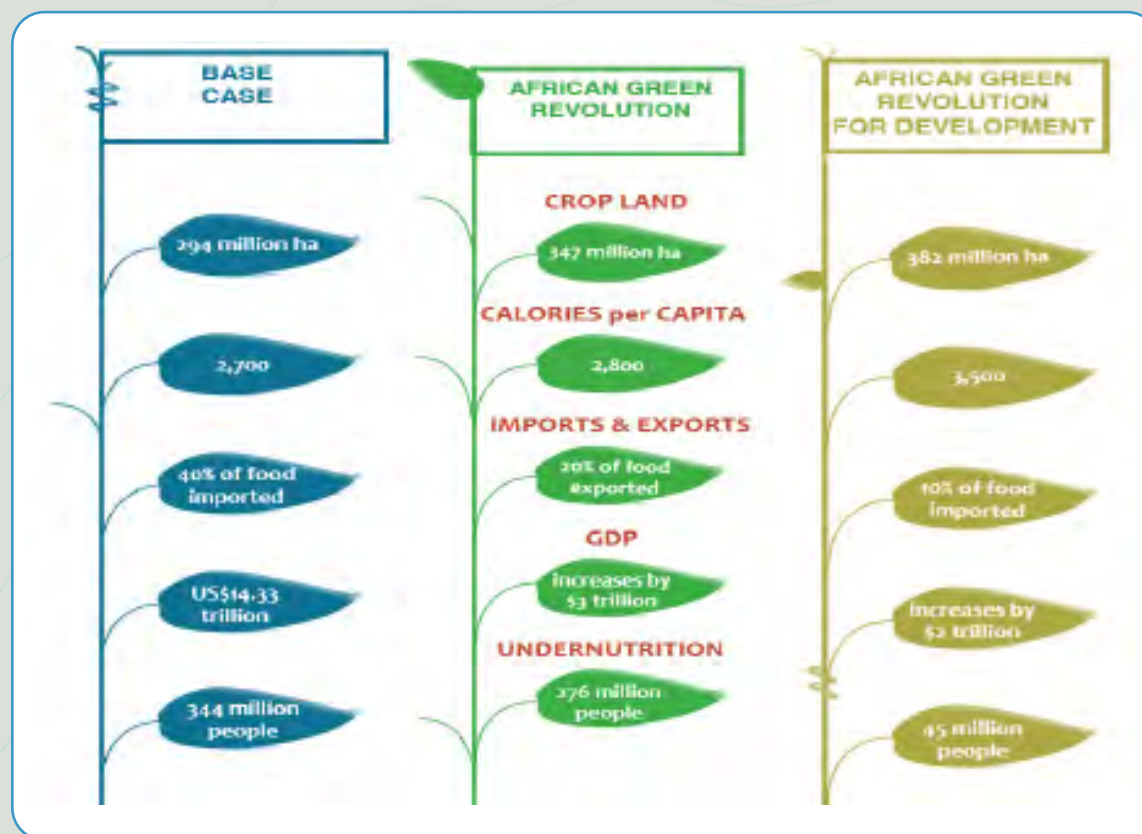
### Key Uncertainties:

- Implementation of policy measures to increase domestic food demand (e.g. safety nets);
- Small-scale farmers included in agricultural productivity increases; and
- Improvements in sanitation and water access needed for ensuring effectiveness of increased calories.



### Methodology:

A quantitative model was used.





## Case Study 2: National Level (South Africa)

### Future of Water in South Africa (WWF-SA<sup>2</sup>) (WWF-SA, 2017)

This case study was a participatory scenario workshop conducted by the WWF in South Africa in 2017. Stakeholder groups with backgrounds in the water industry were invited to take part. The axes chosen were water availability (scarcity and abundance) and socio-economic development (high and low).



### Key Question Addressed: How can water management be improved in South Africa?



#### Key Uncertainties:

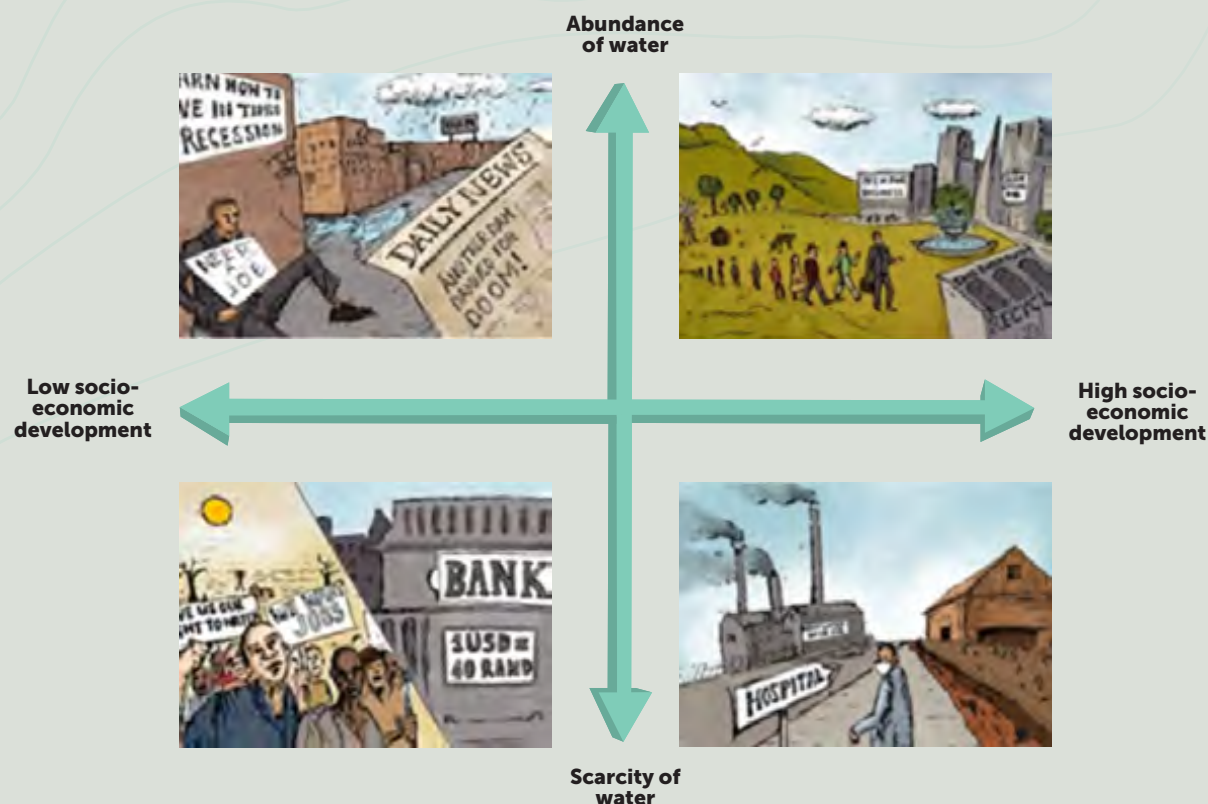
- Abundance or scarcity of water; and
- Level of socio-economic development.

The external driver was around water scarcity and the abundance of water, the internal driver (that could be influenced) was socio-economic development.



#### Methodology:

Axes of uncertainty (analysed a range of mega-trends, assessed them for the level of impact and uncertainty, chose two with both a high impact and high uncertainty).



<sup>2</sup> World Wildlife Fund- South Africa - WWF is an international non-governmental organisation that focuses on wilderness preservation and the reduction of human impact on the environment.

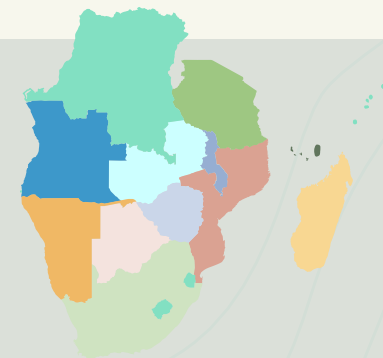




### Case Study 3: Regional Level (SADC)

#### Building Climate Resilience Through Virtual Water and Nexus Thinking in SADC (Quibell & Entholzner, 2016)

The study was undertaken by CRIDF<sup>3</sup> in 2014. The question addressed was: what are the non-political drivers of water management and development in the SADC region?



**Key Question Addressed:** What are the non-political drivers of change in the SADC region? Explore by focusing on water as a manifestation of the development potential and aspirations of the various member states.



#### Drivers:

- Climate change;
- Hydro-political complex, e.g. existing political relations on managing water security; and
- Ability to manage state sovereignty to achieve regional cooperation.



#### Key Uncertainties:

- Existence of localised water shortages and accompanying electricity blackouts and unemployment; and
- Political responses to localised water shortages (division and conflict or cooperation).

The outcome of the study was to determine what the political response would be to managing the water and electricity shortages and increased unemployment. Would the region's member countries be able to cooperate and manage their water, either explicitly water or end products, across the SADC boundaries. This study relied heavily on expert opinion.

<sup>3</sup> Climate Resilient Infrastructure Development Facility (CRIDF) is a programme funded by the UK Department for International Development (DFID). Its aim is to provide long-term solutions to water issues that affect poor communities in Southern Africa.

Photo: Javi Lorbada-Unsplash



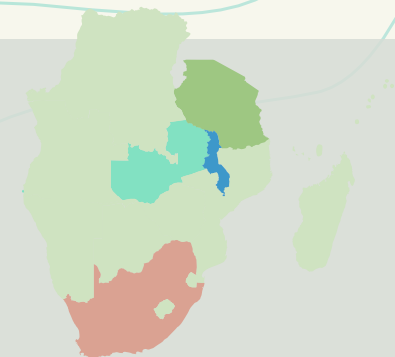
### Case Study 4: National Level (South Africa, Zambia, Tanzania, and Malawi)

This study was carried out by GCRF-AFRICAP<sup>4</sup> in 2018. It focused on four different countries namely, South Africa, Zambia, Tanzania, and Malawi. **The study aimed to improve policy development in support of agricultural decisions.**

When setting the axes, climate risk (high and low), was kept the same for each of the countries. As with the previous case studies, the second axis represented a more internally controllable driver. The second axes were chosen through stakeholder engagement and were defined as follows:

- In **Zambia**, the second axis agreed upon was market connectivity (high and low).
- In **South Africa**, land reform was chosen as the other axis as it presents another major source of uncertainty in the country.
- In **Tanzania**, the second axis was agricultural technology (transformation or stagnation).
- In **Malawi**, the second axis chosen was good or bad policy implementation as coordination is a key issue.

Selected results from the scenarios are shown in the following pages.





A plan for developing and implementing policies to achieve high market connectivity whilst being adaptive to climate risk.



Positive actions were defined across all scenarios for example, to accelerate the process of land reform and to implement a government supported rural development programme.





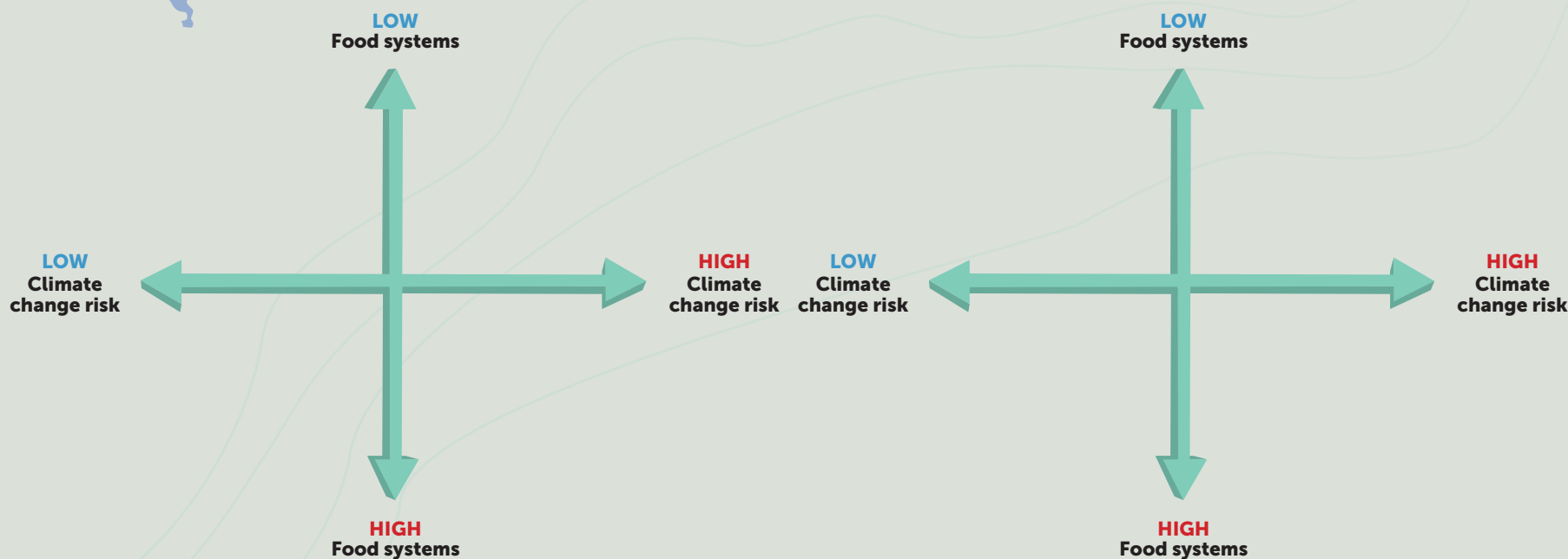
**MALAWI**  
Lilongwe

A shift from business-as-usual, disjointed sectoral policymaking approaches that are reactive to immediate problems, towards the adoption of a holistic and forward-looking 'food system approach.'



**UNITED  
REPUBLIC OF  
TANZANIA**  
Dar es Salaam

Positive actions were defined across all scenarios for example, improving the extent and nature of private sector investment and rallying public support for the agricultural sector and climate change adaptation.



**As the scenarios unfold, features of a desired future start to become apparent.** For example, in the Tanzanian case study, all discussions on the desired future outcome, regardless of the level of climate risk faced, included farmers having adopted new crop varieties with traits that increased resilience to climate change.



**Drivers:**

- Technology
- Climate Risk
- Market Development

**Key Uncertainties:**

How will the severity and frequency of climate change impacts affect agricultural systems?

**FEATURES OF DESIRED FUTURE**

Farmers have adopted new crop varieties with traits that increase resilience to climate change

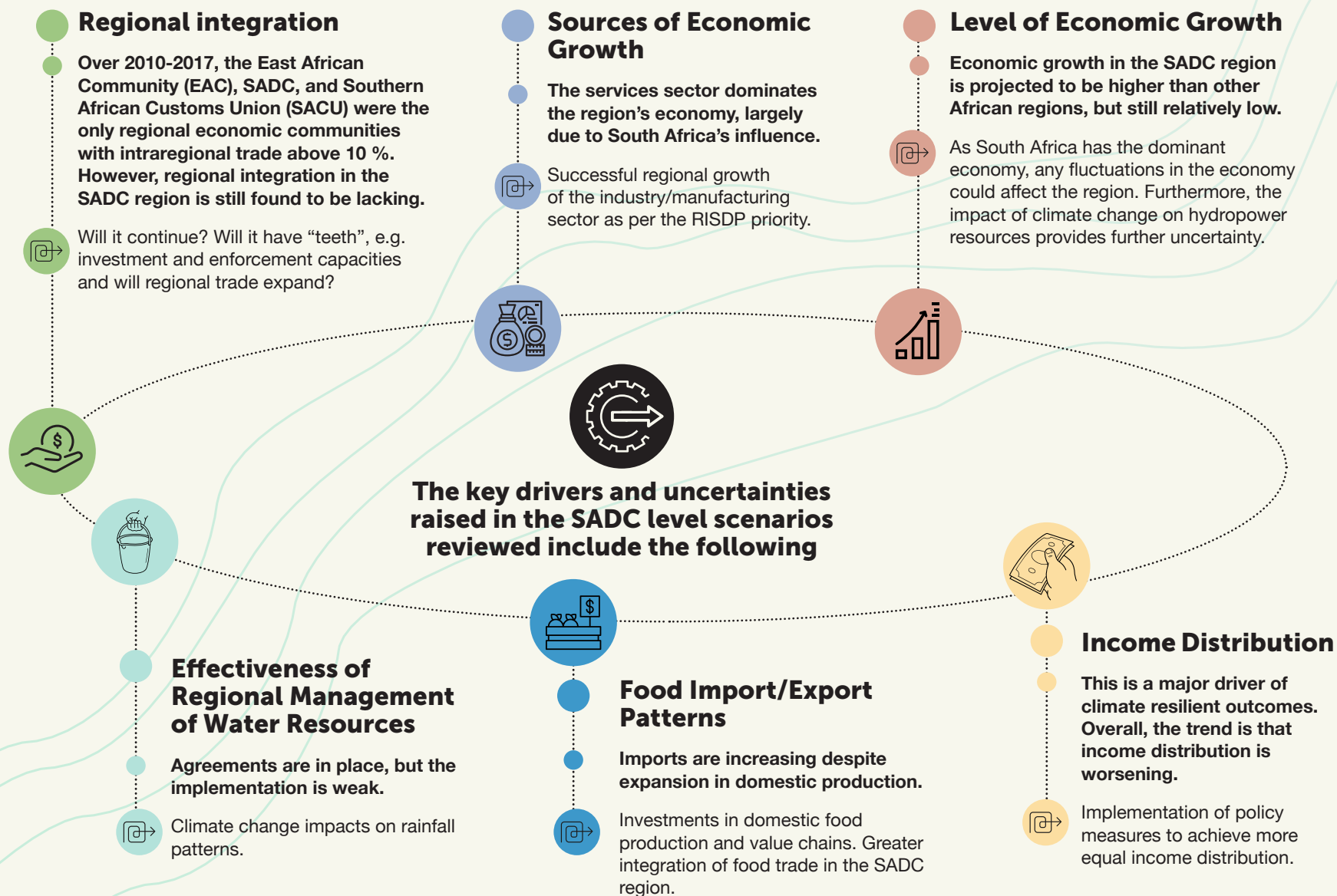
**Questions & Answers****How do we integrate national and regional level scenarios?**

This is difficult because people have different perspectives and priorities in a scenarios development process. As aforementioned, in the scenario development case study in Vietnam, there was considerable disagreement between the regional and national level stakeholders on the importance of the role of China on the economy. This presented a lot of uncertainty and people had vastly different viewpoints on the subject. This was dealt with by developing more detailed matrices including multiple axes representing five high uncertainty drivers. It was a useful exercise that took around four days to complete. The result included the viewpoints of both the national and regional level stakeholders. It should be noted here that this module has described one method of developing scenarios, the method you choose should suit the focal issue in question.



## Key Drivers and Uncertainties Affecting the SADC Region

Key drivers and uncertainties that are likely to affect the achievement of climate resilient agri-food systems in the SADC region include:





## Summary

**Analysing the results of scenarios from the SADC region** to country level it is evident that there is considerable consensus as well as divergent ideas on envisioning an ideal future, such as:

### Common visions

- Higher levels of equality in income distribution;
- Improved conservation and natural resource management;
- Reduction in food imports;
- Increased investment in education and health; and
- Increased investment in infrastructure.

### Divergent visions

- Roles of regional government;
- Relative importance of the small-scale farming sector to economic growth and food supply;
- Degree to which the region is inward or outward looking; and
- Nature of the transition to get to the ideal future.



**Analysing the results of scenarios from SADC to country level we can see there is considerable consensus as well as divergent ideas on visioning an ideal future.**

### Common Visions

Higher levels of equality in income distribution  
Improved conservation and natural resource management  
Reduction in food imports  
Increased investment in education and health  
Increased investment in infrastructure

### Divergent Visions

Roles of regional government  
Relative importance of small-scale farming sector to economic growth and food supply  
Degree to which the region is inward or outward looking  
Nature of the transition to get to the ideal future

## MODULE 04 Building Scenarios



### Questions & Answers

#### How do we link parallel initiatives and policy planning using the scenarios process?

Invite the people on both teams into one room and encourage dialogue around the key drivers and uncertainties they face, and what their preferred futures look like, for both policy processes.



## Learning

You should now understand the application of scenario development in planning for the future. You will have a better understanding of the importance of scenarios in policy development. You have learnt that building scenarios is not a new concept in the SADC region and that there are numerous case studies, at a variety of geographic scales, that can be drawn upon to further understand the method(s) and to provide valuable key learnings.





Photo: Axel Fassio (CIFOR)

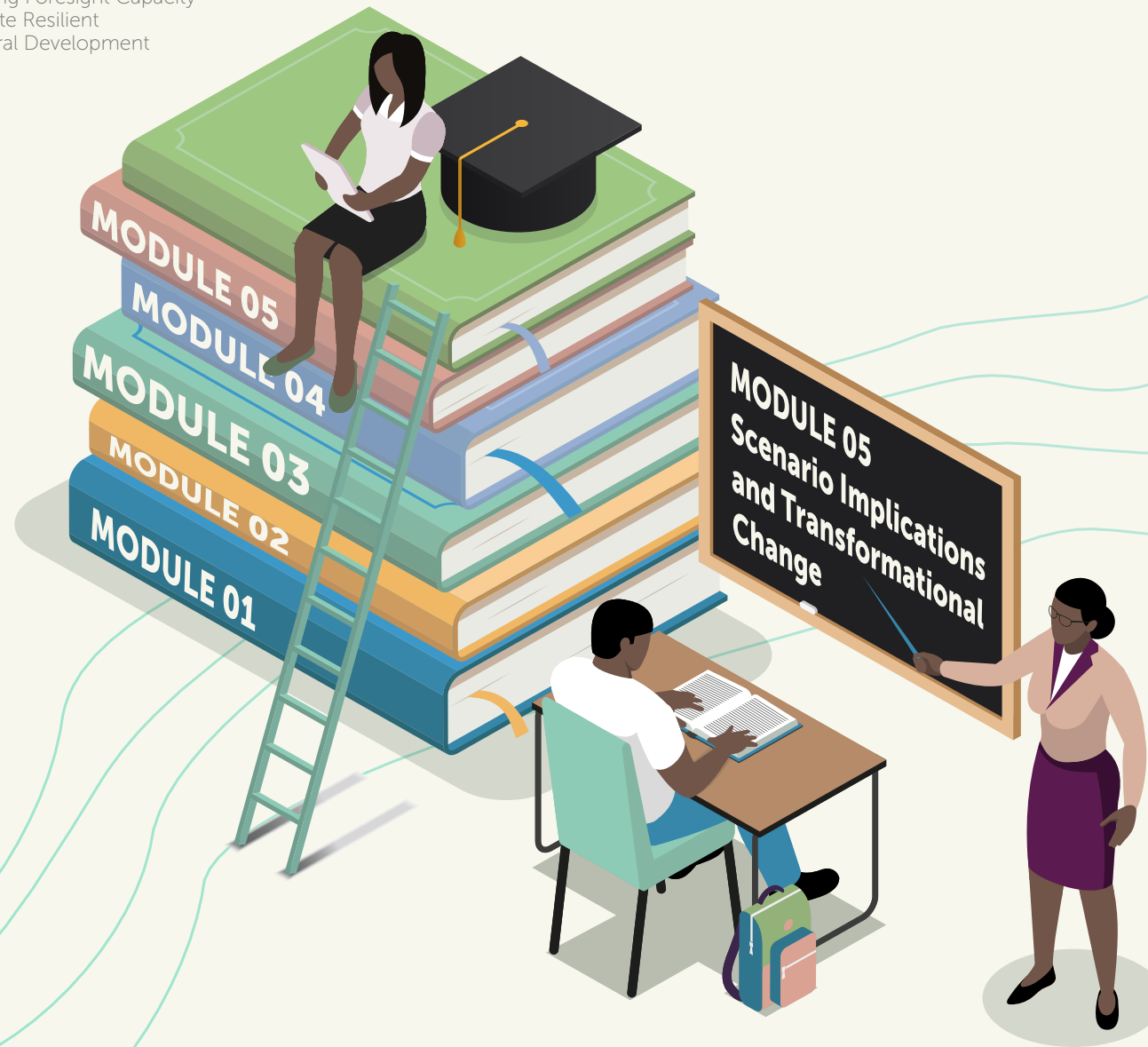
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## SADC Futures

Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



# MODULE 05 Scenario Implications and Transformational Change



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



Implemented by:



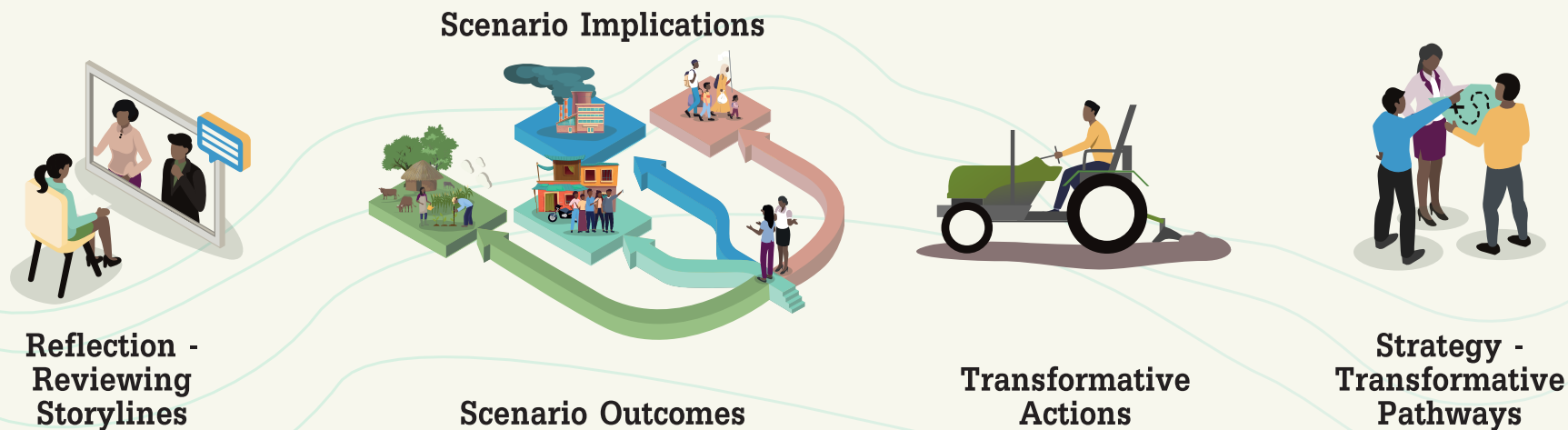


## What Will You Learn?

Module 5 focuses on the reflection and strategy stages of the foresight process. It starts with a revision of developing scenario storylines, a method learnt in Module 4. It then covers the method used to reflect upon scenario storylines, to understand the implications they may have on achieving a vision and what actions or activities could be implemented to avoid the negative storylines and get us to that preferred future. Transformational change is then defined and how it can be achieved through enhancing pathway actions and activities to make them transformative. The last section of the module demonstrates the application of this method to a pathway action plan to achieve transformational change.

### On completing Module 5 you will:

- Understand how to build scenario storylines;
- Be able to review scenario implications and brainstorm initial actions to address potential future states;
- Understand transformation and transformational elements; and
- Be able to apply transformation to existing or future pathways or strategies to ensure they are robust.







## Test Your Learning of the SADC Futures Foresight Framework

Before continuing with Module 5, test your understanding of building scenarios based on information given in Module 4, by answering the questions below:



What are the seven key steps to building scenarios?

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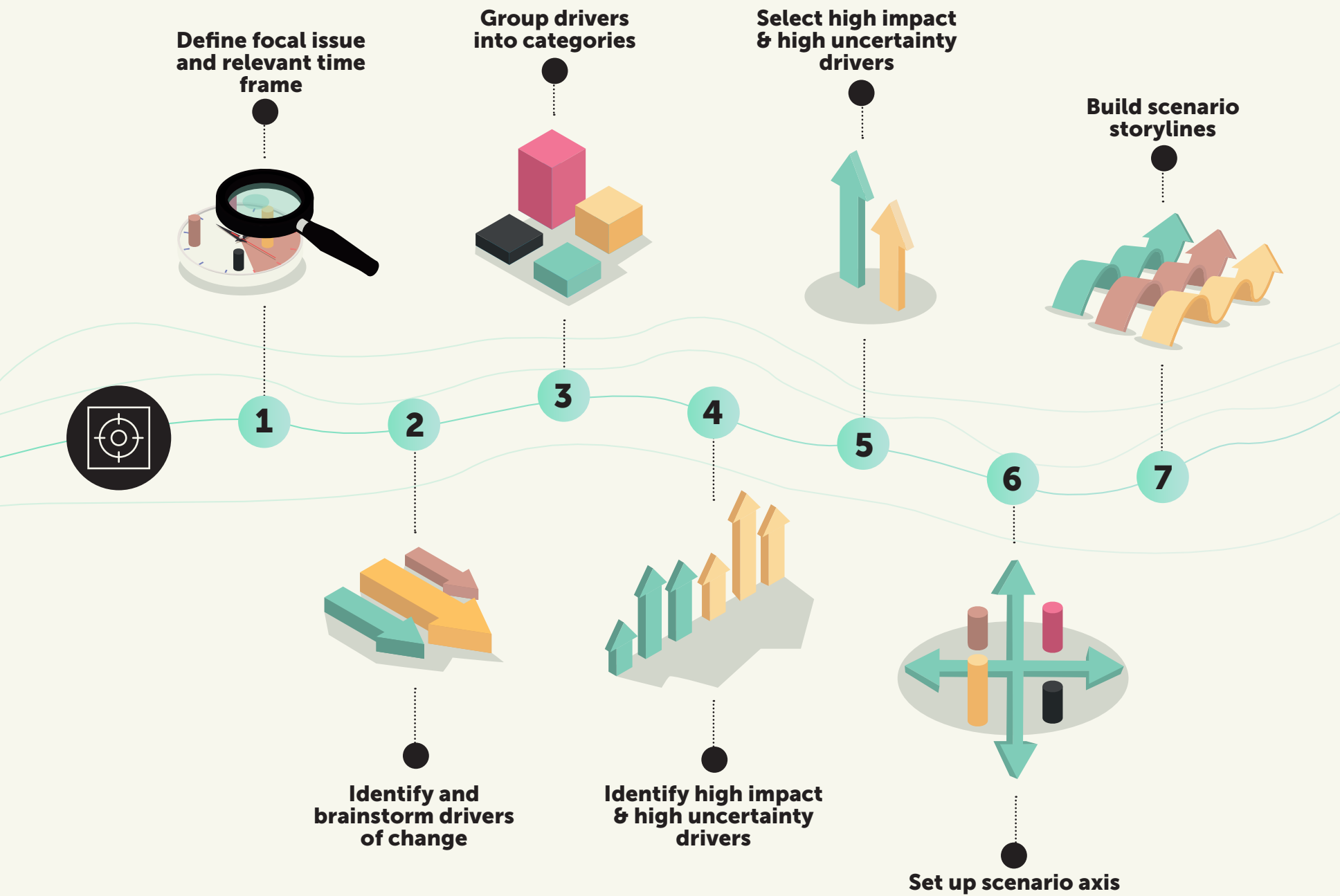
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Key steps for building scenario storylines



In a scenario process, what are the key factors that cause change that we are trying to understand?

MODULE 05  
Scenario Implications and  
Transformational Change





**Drivers** - are factors, issues or trends that cause change thereby affecting or shaping the future.



**Internal driver** - internal force of change for example social drivers within a farm or community and directing decision making of a farmer.



**External driver** - external force of change, for example political or market drivers.



**Driving forces** - a cluster of individual trends on the same general subject moving in certain directions, broad in scope and long term in nature e.g. climate change or globalisation.

**For a scenario exercise you want to select drivers that are... and ....?**

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Drivers		Impact (L,H)	Uncertainty (L,H)
Economic	Changes in level of youth unemployment	High	High
Governance Political Institutional	Level of SAC regional view and integration	High	High
Natural Resources and Environment	Trans-boundary disease	High	High
	Climate risk	High	High

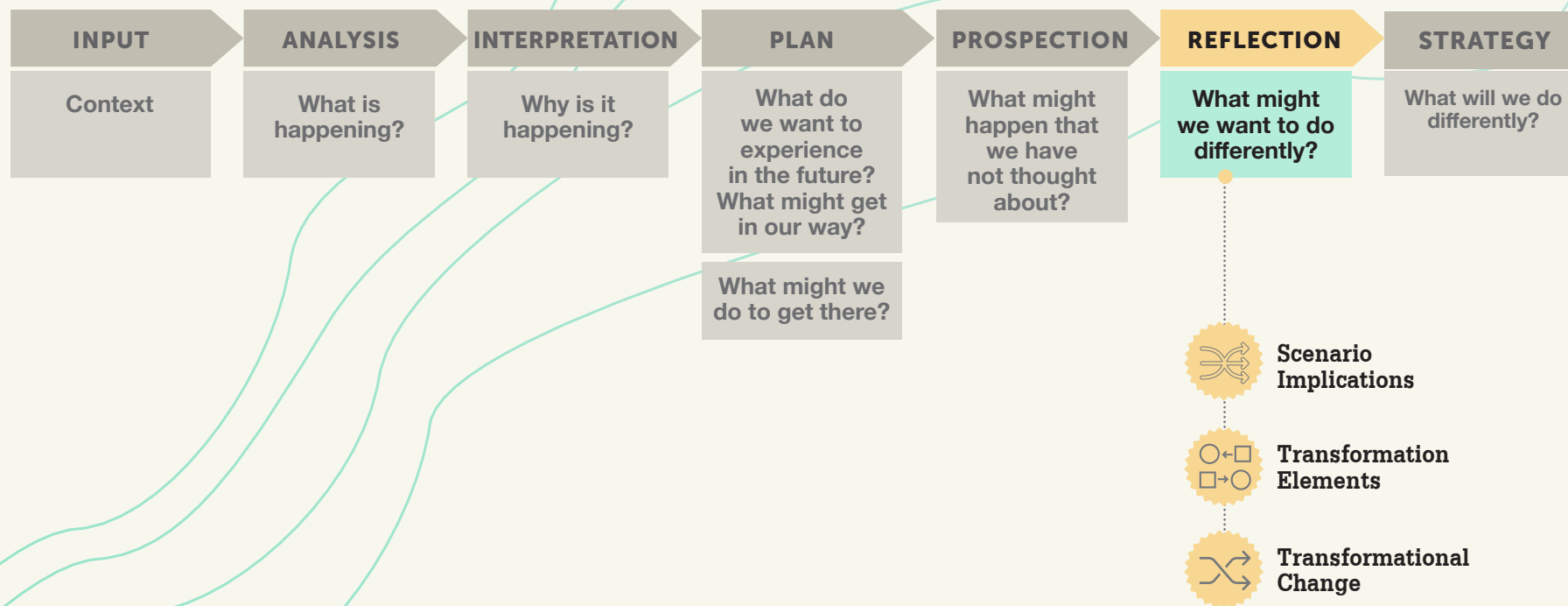


# Reflection Stage

The reflection stage of the foresight process follows on from the prospection stage described in Module 4. In this stage it is important to understand the implications of scenarios and to consider elements that allow for transformational change. A key question the scenario method aims to answer is:



**What might we want to do differently?**



## MODULE 05 Scenario Implications and Transformational Change



**SADC Futures**  
Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



Photo: Mokhamad Edliadi (CIFOR)



## Scenario Implications

**Scenario implications falls under the reflection stage of the foresight framework.** This method is applied after the scenario storylines have been developed.



### What is the method?

- Once scenarios have been developed, this method is used to reflect upon and explore what has emerged in the scenario storylines that might have implications on achieving a vision.
- This method can be used to test existing pathways and strategies to understand what would have to change, given the future narratives that have emerged from the scenarios.



### Why apply it?

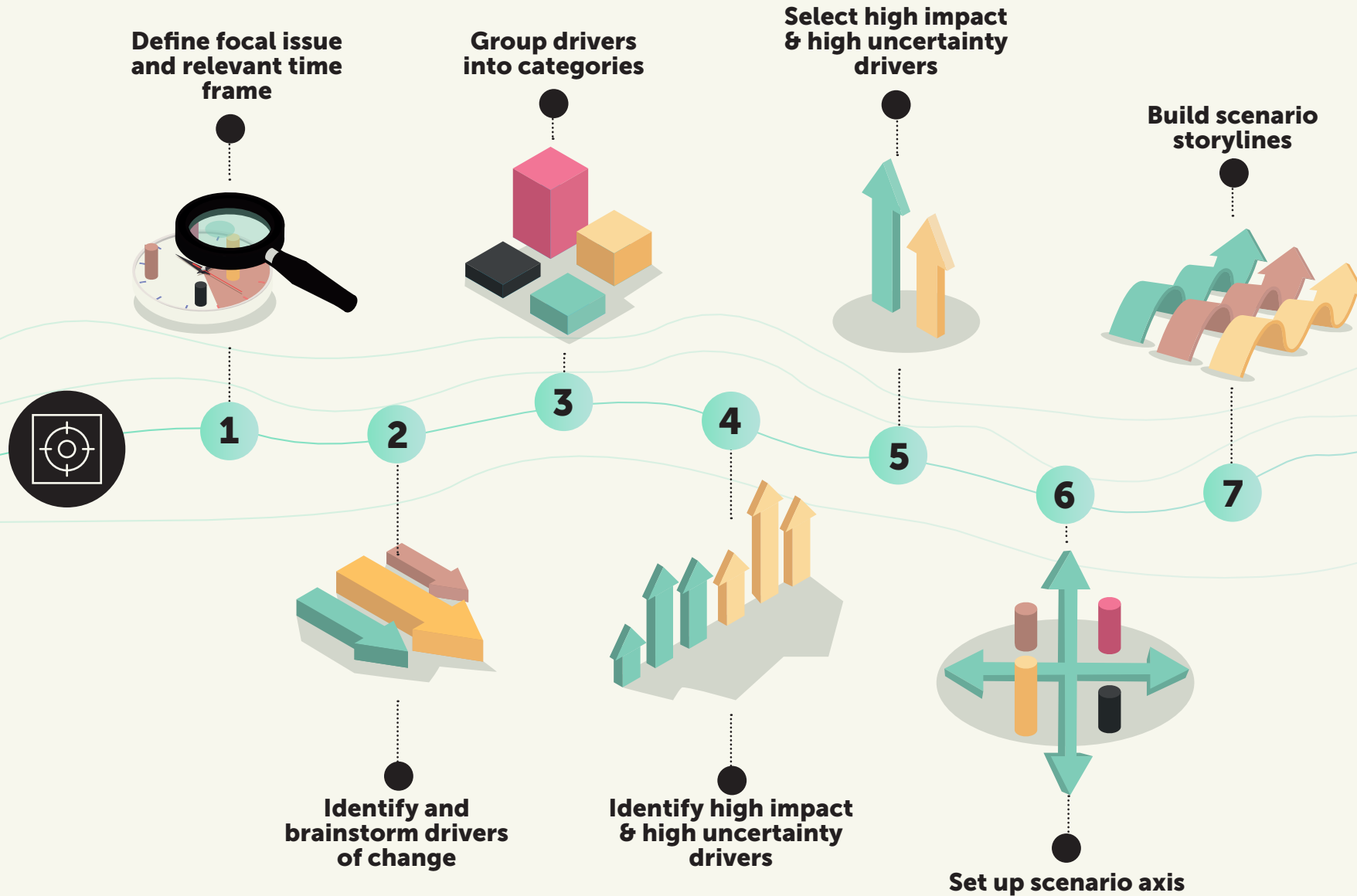
- Given what we have learnt from different scenarios, it is important to reflect on the many storylines to discover what it means for how we can go about.

**A key thing to remember is that scenarios are not about predicting the future,** the storylines are not what will happen but what could happen, among a range of things that could happen under different future scenarios. Their importance is in making sure policy considers a range of possible futures and makes decisions that consider that the future is not certain. We want to make decisions now that enable us to respond to different futures as they come. Scenarios are a means to explore the 'possibility space' in the future, we are looking for actions that are reasonably robust across these different futures.



This section provides a brief recap on the 'developing scenarios' method as it forms the basis for the application of the scenario implications and transformational change methods covered in this module.

## Scenario steps



# MODULE 05 Scenario Implications and Transformational Change



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Here we **revisit the scenario building exercise** undertaken in Module 4, the scenario examples provided are relevant to the context of climate resilient agri-food systems in the SADC region.



### Scenario Building

Once the focal issue you wish to address and the time frame have been defined, relevant drivers are identified and ranked based on **two criteria**: the magnitude of 'impact' on the dimension of the focal issue, and the degree of 'uncertainty'.

Drivers		Impact (L,H)	Uncertainty (L,H)
Socio-cultural	Changes in- or out-migration	High	High
	Population growth + Age ranges	High	Low
Agricultural Productivity	Presence of animal disease outbreaks	High	High



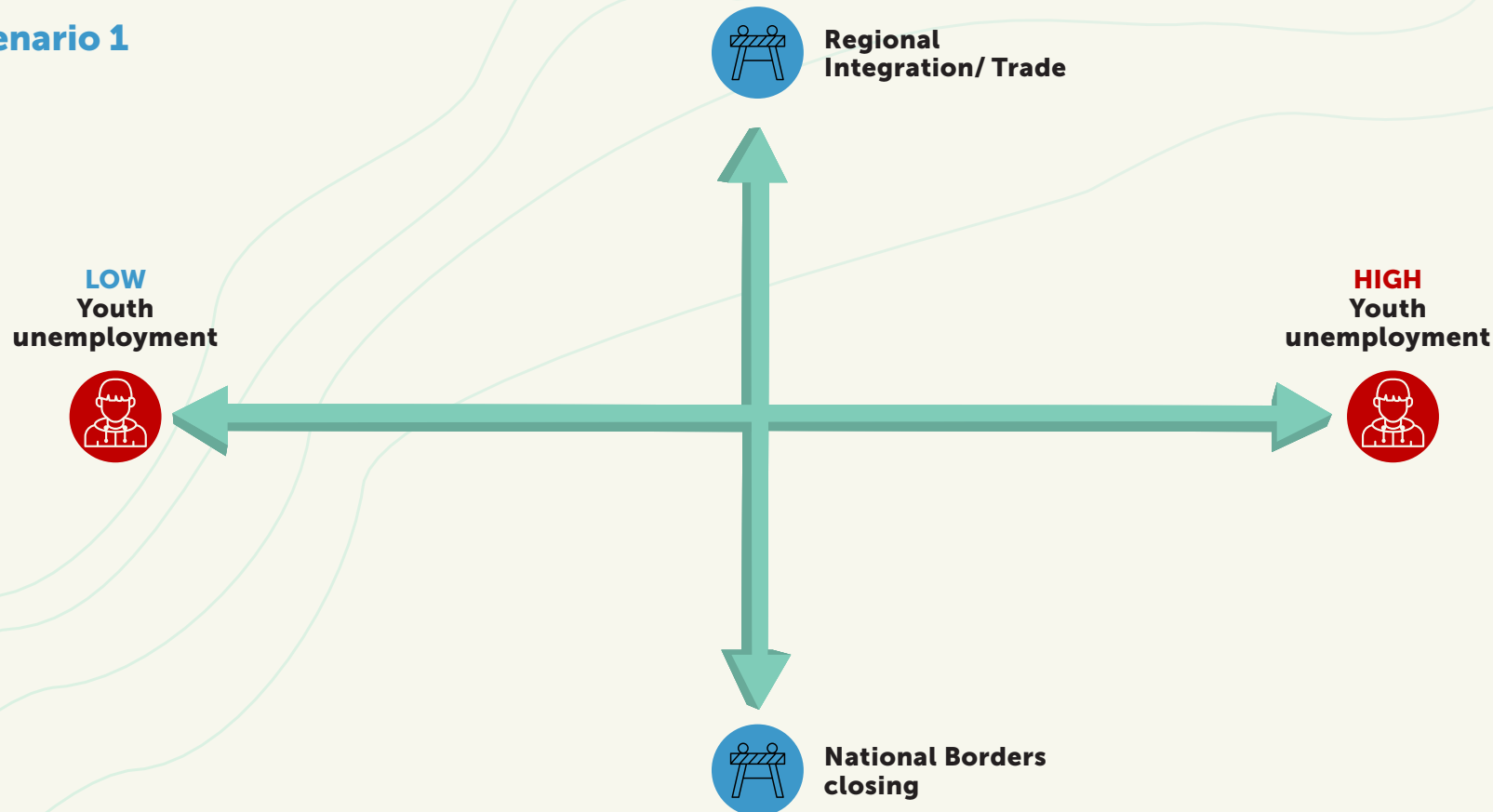
## Questions & Answers

### Do the drivers always have to be linked?

No, the drivers do not have to be linked. Once you have selected your high impact and high uncertainty drivers it can be valuable to allocate them to axes in random combinations as this can present scenarios that would not have been thought of previously. Furthermore, it is important to put as many different driver combinations together as possible, to be able to consider a variety of viable or plausible futures. For example, in considering the COVID-19 pandemic, if multiple scenarios had been run with public health drivers could it have allowed us to see a pandemic as a plausible event?

**High impact and high uncertainty drivers** are then selected as they are the drivers that we know the least about and that could have the biggest impacts. They are allocated as axes with their extremes defined.

### Scenario 1







Next, the dimensions **considered to be relevant to the focal issue** are described. Those chosen as relevant to climate resilient agri-food systems are:



**Socio-cultural**  
education, gender,  
and youth



**Economic**  
investment  
and trade



**Environmental**  
ecosystem  
functioning, forest  
cover, and soil health



**Political and  
Institutional**



**Agriculture  
Productivity** livestock,  
crops, and aquaculture

These dimensions are then placed within the axes to prevent the accidental omission of a category.

## MODULE 05

### Scenario Implications and Transformational Change



Once the high impact and high uncertainty drivers are allocated to axes and the dimensions are laid out within them, we can start to **unpack the scenarios by looking at each quadrant in turn**. Each of the quadrants reflects how two of the drivers meet. For example, consider Scenario 1 below:

### Scenario 1

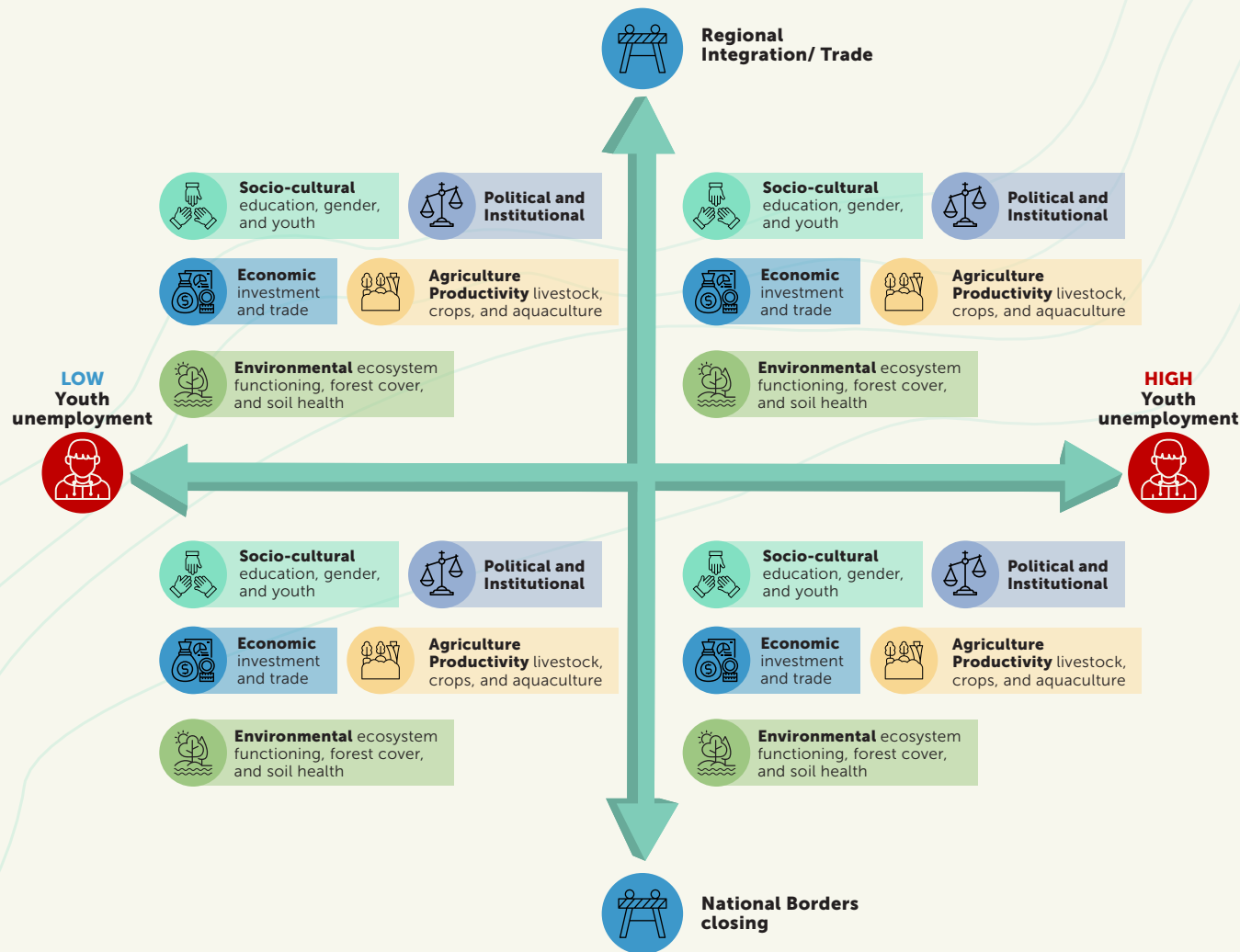
The high impact, high uncertainty drivers chosen for the axes are:

- National border closing to regional integration; and
- Low youth unemployment to high youth unemployment.

The socio-cultural, economic, environmental, political and institutional, and agricultural productivity dimensions are then laid out within the axes.

To build the scenario storylines we then consider each dimension within a quadrant individually. For example, in Module 4 we considered the economy dimension within the high youth unemployment and low regional integration quadrant, answering the following question:

**What might the economy look in the future under this scenario?**



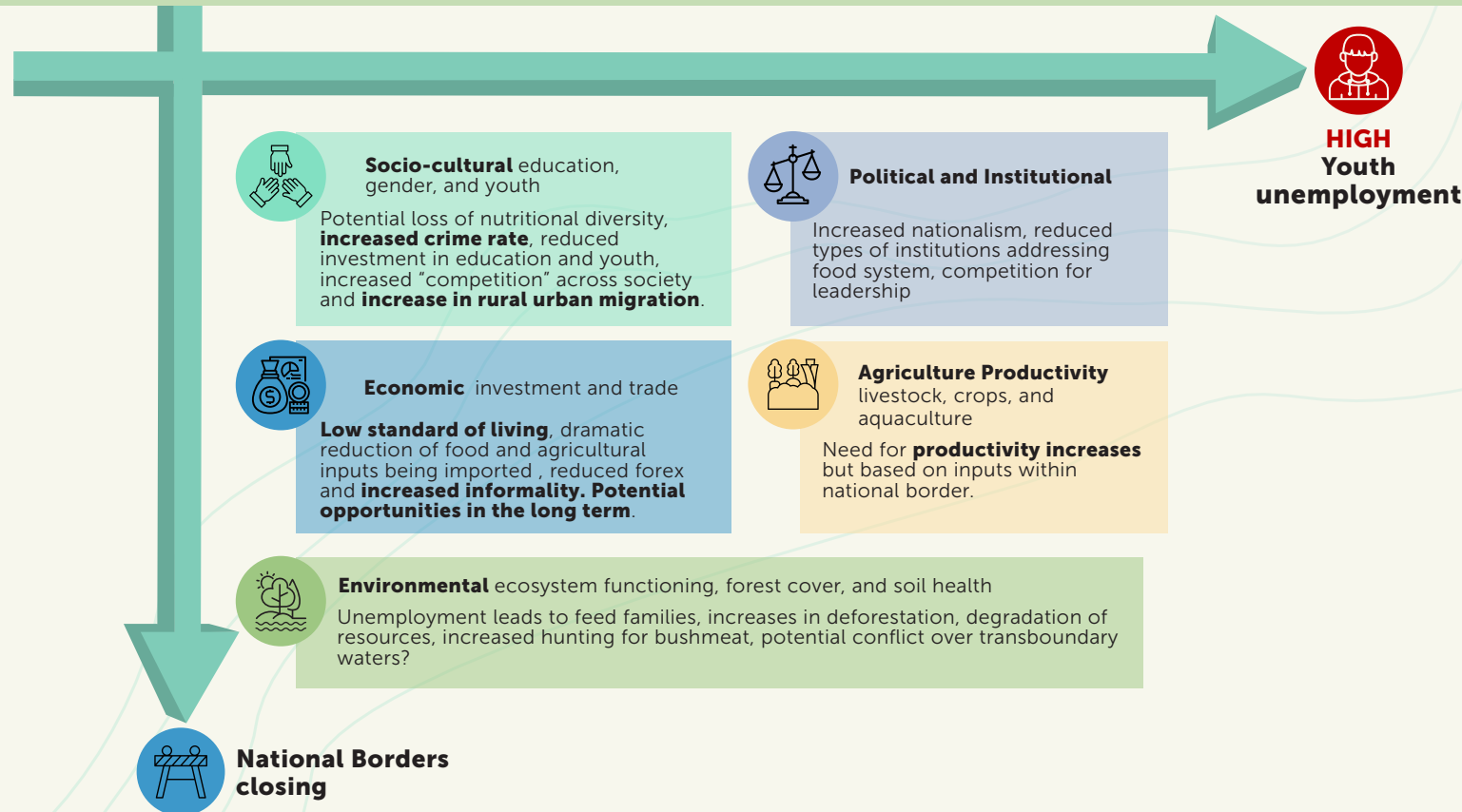
Some examples of storylines (from participants of the SADC Futures webinar series) on the state of the economy, taking into consideration the quadrant indicating high youth unemployment and low regional integration, are provided below:

**'Increased crime rate.'** **'Increase in rural-urban migration.'** **'Low standard of living.'**  
**'Increased informality.'** **'Potential opportunities in the long term.'**



The next quadrant to consider has the following axes:

- Low youth unemployment; and
- High regional integration.



### What might agricultural productivity look in the future under this scenario?

For example, participants of the SADC Futures webinar series gave the following storylines on agricultural productivity, taking into consideration the quadrant indicating low youth unemployment and high regional integration:

'Increased youth participation in agricultural value chains.' 'Productive, mechanised agriculture with low labour intake.' 'Increased access to agricultural markets.' 'Increased well-being.' 'Land locked countries will be better off.' 'Political stability.'



### **Socio-cultural** education, gender, and youth

Governments have increased national budgets but may or may not focus resources on improved social safety nets, education and empowerment. Higher employment rates allow for greater spending power. **Increase in well being.**



### **Economic** investment and trade

SADC support to cross country results in effective trade, investments infrastructure, investments in short and long value chains. **Increased access to agricultural markets.** High employment rates influence national and international income, industry growth. Available resources inspire entrepreneurship, greater use of technology. **Land locked countries will be better off.**

**HIGH Youth unemployment**



### **Political and Institutional**

Member countries are focused on economic development, poverty alleviation and peace and security. **Political stability.**



### **Agriculture Productivity**

livestock, crops, and aquaculture

**Increased youth participation in agriculture value chains. Productive, mechanized agriculture with low labour intake.** Pastoralists, small-scale farmers and fishers may be marginalized in favor of large-scale production systems. Integrated farming systems are not promoted.



### **Environmental** ecosystem functioning, forest cover, and soil health

Desire for short term benefits leads to status quo for land management and potential for land and forest degradation.



### **National Borders closing**

# MODULE 05 Scenario Implications and Transformational Change



## Questions & Answers

**The different combinations for linking drivers and the depths to which we can explore them seems endless, how can we focus and prioritise them?**

Limit the options you need to assess by applying your scope i.e. focal issue and timeframe. The dimensions you choose are critical. Think broadly within your scope but focus on the dimensions that are important to the preferred outcome.





# Scenario Implication Actions

Now that you have refreshed your memory on developing scenario storylines, the next step is to **consider their implications and designate appropriate actions and activities to achieve the preferred future or avoid negative storylines.**



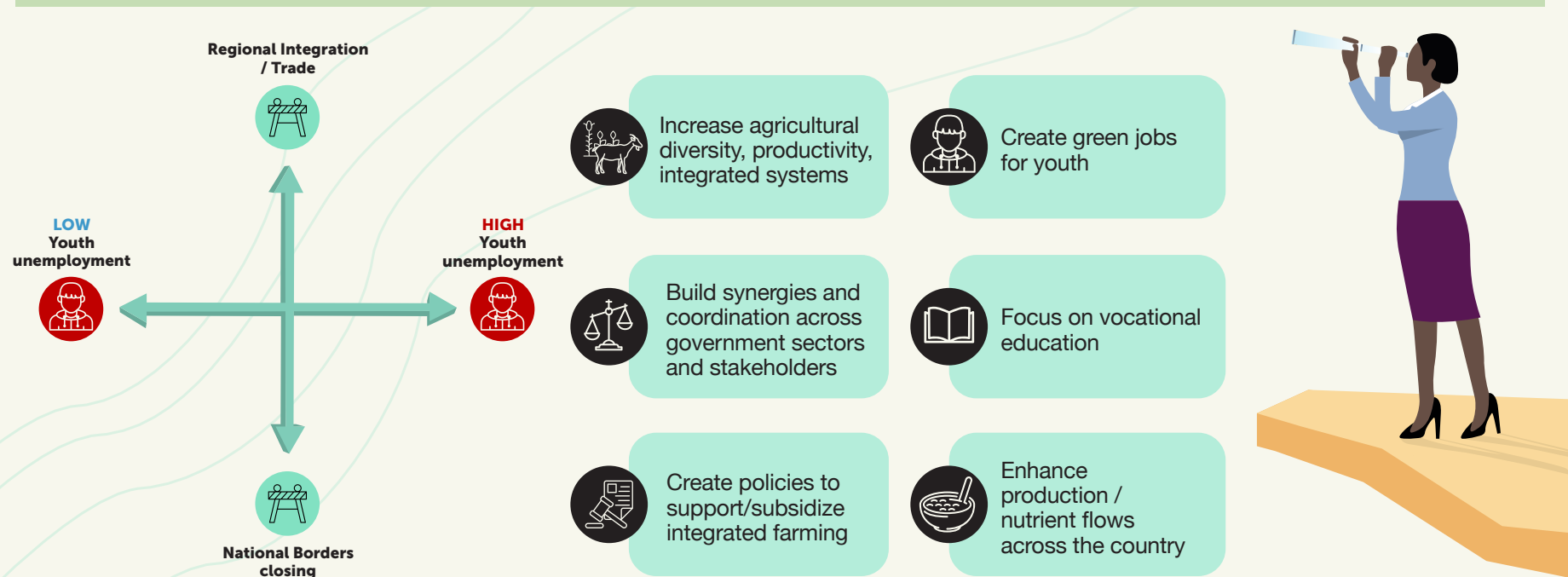
## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

For example, consider Scenario 1:

### Scenario 1

- National border closing to regional integration; and
- Low youth unemployment to high youth unemployment.

Look across all the scenario storylines that have been developed throughout this matrix and determine the actions that need to be taken to increase the likelihood of reaching the preferred future or avoiding the negative storylines. For example, the following actions could be considered:



**MODULE 05**  
**Scenario Implications and**  
**Transformational Change**





## Now determine the scenario implication actions for Scenario 2:

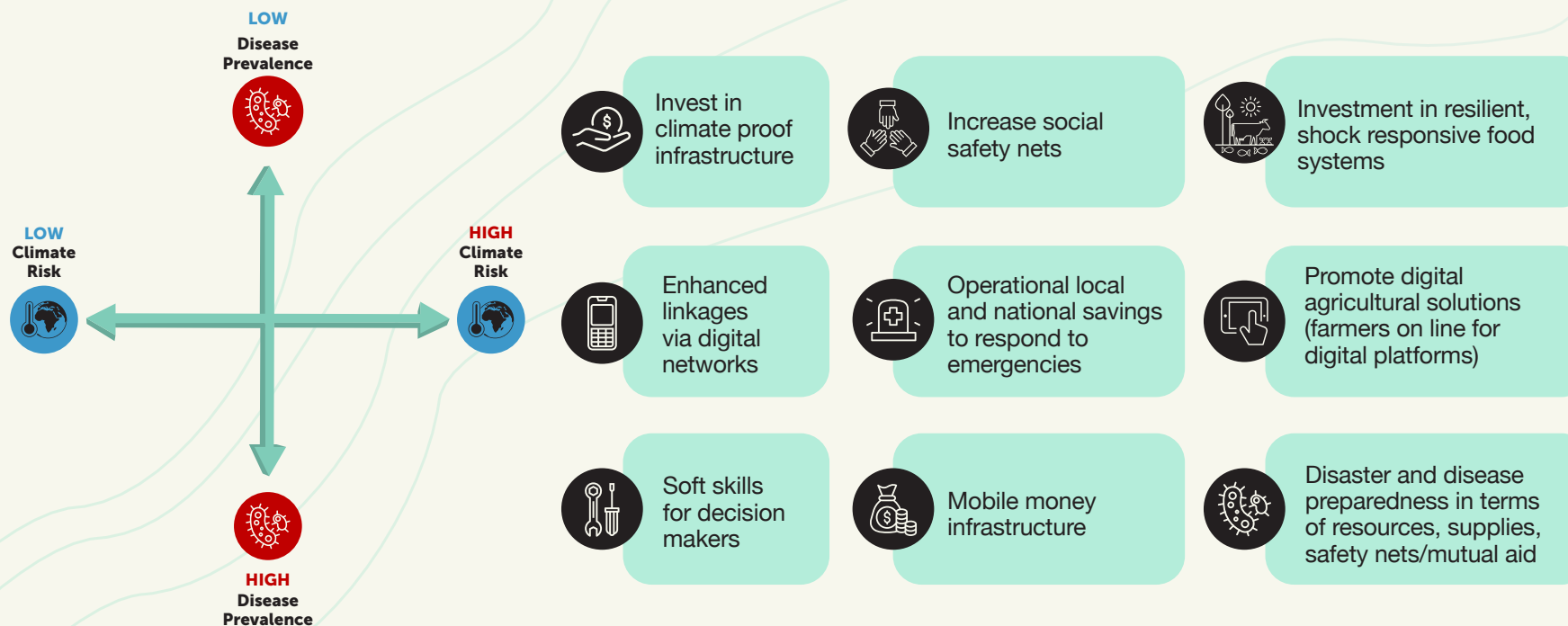
### Scenario 2

- Low climate risk to high climate risk; and
- Low disease prevalence/spread to high disease prevalence/spread.

Look across all the scenario storylines in all the quadrants that have been developed and ask yourself:



**What actions would I need to take to increase the likelihood of reaching the preferred future, or to avoid the negative storylines?**





# Learning Exercise

In this exercise you will develop scenario storylines and propose ideas for actions to achieve the preferred future, or to avoid the negative storylines. This exercise is best conducted in a meeting or workshop setting with a variety of actors with different backgrounds to provide multiple, diverse viewpoints for discussion.



**Task 1** - Consider the tables below which represent quadrants of a scenario matrix, two drivers and five dimensions are provided for each. Develop a scenario storyline for each dimension in the quadrant.



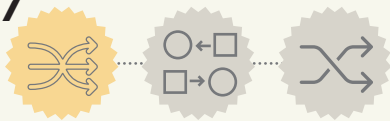
**Task 2** - Enter ideas into the given table for actions you could take based on what your storyline is showing.



**An action or activity**- is something that helps us achieve the positive storylines or avoid the negative storylines.



DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION		
Dimensions	Task 1 - Storyline	Task 2 - Action / Activity
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		



**DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE**

Dimensions	Task 1 - Storyline	Task 2 - Action / Activity
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		

**This exercise was also completed by participants of the SADC Futures webinar series.** See their ideas in the tables below. How do your ideas compare? Did they develop storylines or actions that you did not think of? This demonstrates the importance of engaging multiple stakeholders from a variety of backgrounds.





## DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION

Dimensions	Task 1 - Storyline	Task 2 - Action / Activity
ECONOMIC, INVESTMENT AND TRADE	<ul style="list-style-type: none"> <li>• Higher reliance on trade in Southern Africa;</li> <li>• Poor economic conditions;</li> <li>• Low investment appeal; and</li> <li>• Investment in tourism.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve regional market integration.</li> <li>• Textile industry with the brand 'Made in Lesotho' becomes a global trademark.</li> <li>• Identify products that are well suited - goats / mohair / and export crafts.</li> <li>• Support economic transition towards an industrial/service-based economy.</li> <li>• Come to an arrangement with South Africa on opening railway lines to one of the ports.</li> </ul>
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	<ul style="list-style-type: none"> <li>• Have to shift to alternative livelihoods due to land issues with livestock.</li> </ul>	<ul style="list-style-type: none"> <li>• Revisioning campaign on comparative advantage livelihoods i.e. away from livestock.</li> <li>• Addressing patriarchal norms and values which create power imbalances and heightened vulnerability of women.</li> </ul>
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	<ul style="list-style-type: none"> <li>• Water is a key consideration;</li> <li>• Land degradation; and</li> <li>• Overstocking and overgrazing due to a growing population and dependence on livestock.</li> </ul>	<ul style="list-style-type: none"> <li>• Dam and irrigation considerations.</li> <li>• Soil conservation measures.</li> <li>• Rainfall is harvested for water exports supplying South Africa and other countries.</li> </ul>
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	<ul style="list-style-type: none"> <li>• Reliance on agriculture for employment.</li> <li>• High disease infestation on livestock.</li> </ul>	<ul style="list-style-type: none"> <li>• Breeding programmes using artificial insemination and promoting aquaculture.</li> <li>• Use of disease tolerant crops.</li> <li>• Hydroponics to protect against climate change impacts.</li> <li>• Use technology and practices that are climate smart.</li> </ul>
POLITICAL / INSTITUTIONAL	<ul style="list-style-type: none"> <li>• More stringent regulations on environmental protection due to climate risks.</li> <li>• Support to resilience.</li> </ul>	<ul style="list-style-type: none"> <li>• Restructure the national budget towards climate risk activities.</li> </ul>

# MODULE 05

## Scenario Implications and Transformational Change



## DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE

Dimensions	Task 1 - Storyline	Task 2 - Action / Activity
ECONOMIC, INVESTMENT AND TRADE	<ul style="list-style-type: none"> <li>Youth can be trained/educated (without fear of disease) and then employed (more certainty that they will not be affected negatively by disease).</li> </ul>	<ul style="list-style-type: none"> <li>Enabling training, more accessible to the youth.</li> <li>Enabling access to finance.</li> <li>Training should be available in local languages.</li> <li>Implementing what is on paper to allow youth to access funds.</li> <li>Youth involvement.</li> </ul>
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	<ul style="list-style-type: none"> <li>Youth are motivated and looking actively for opportunities.</li> <li>Youth are creating opportunities for themselves, higher entrepreneurship.</li> </ul>	<ul style="list-style-type: none"> <li>Creation of associations to involve youth.</li> <li>Improving living conditions in rural areas with things like electricity, to allow for internet connections.</li> </ul>
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	<ul style="list-style-type: none"> <li>Unemployed youth could be used to take care of the environment and improve the ecosystem, through tree planting and thereby improving soil health.</li> <li>Increase land care awareness groups, promoting environmental stewardship.</li> </ul>	<ul style="list-style-type: none"> <li>Government actions to attract youth to stay in the rural areas.</li> <li>Programme to help youth take ownership of the environment.</li> </ul>
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	<ul style="list-style-type: none"> <li>Opportunity to diversify production and adopt climate smart practices.</li> <li>Production of more climate resilient crops, rabbit farming, conservation farming, growing of legumes to fix nitrogen.</li> <li>Horticulture production and improvement in agricultural productivity.</li> </ul>	<ul style="list-style-type: none"> <li>Government to help in the creation of cooperatives to attract youth into agriculture.</li> <li>Encouragement or promotion of ICT in agriculture to attract youth.</li> <li>Building of vibrant youth groups.</li> <li>Promotion of agriculture as a mainstream job, not a backup plan or a lesser desired activity.</li> </ul>
POLITICAL / INSTITUTIONAL	<ul style="list-style-type: none"> <li>Vote of the youth will be important.</li> <li>High youth unemployment may lead to exploitation of the youth by politicians.</li> <li>Youth need to be engaged as current and future leaders.</li> </ul>	<ul style="list-style-type: none"> <li>Inclusive policies to encourage participation of youth in politics.</li> <li>Implementation of youth programmes and tracking.</li> </ul>



## Questions & Answers

### How do you verify your storylines?

**Combining qualitative and quantitative inputs can enhance the robustness and consistency of scenarios.** For example, you could use a participatory scenario development approach at first, these often include opinions about human values and behaviour. Then apply a more focused quantitative approach to verify the storylines by looking at data and using computer models.

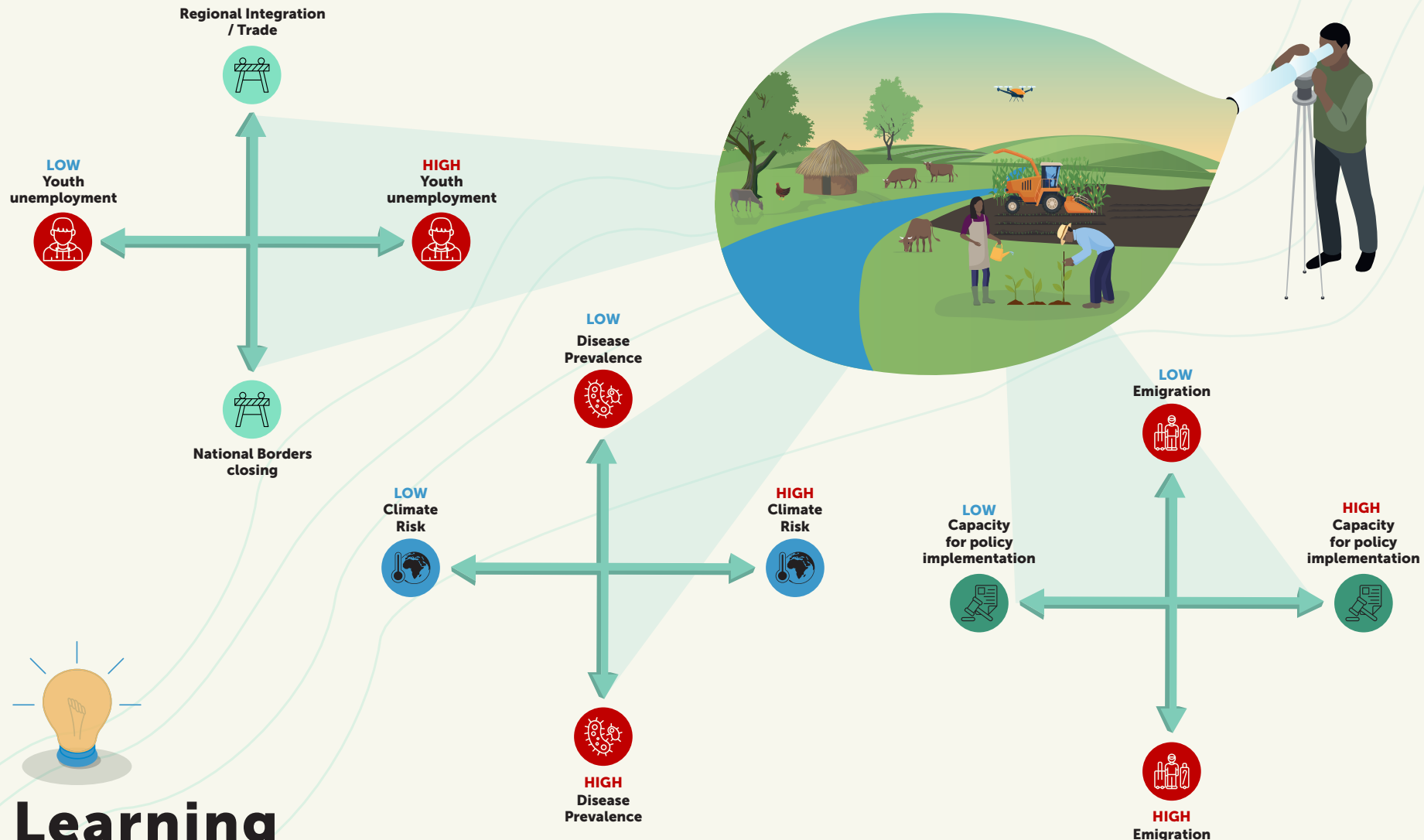
The above question **‘how do you verify your storylines?’** was put forwards in the SADC Futures webinar series, the answers that were given demonstrate the importance of multi-stakeholder collaboration for knowledge sharing and the importance of diverse viewpoints and dialogue.

- ‘The participatory scenario process, involving multiple stakeholders, is useful in avoiding bias.’
- ‘The issue of benchmarking is especially important because in each country there are scientists investigating climate change. The politicians (some of which are scientists) have political agendas. It is the duties of the scientists to correct false information or misperceptions.’
- ‘If scenario projects are run across multiple countries in the region, the outputs can be verified.’
- ‘In the case of climate change, we need to work collectively to see results. If we do not it could be considered maladaptation.’
- ‘In theory it is good to run shared projects and implement actions collectively, however not all the countries in the region are at the same level of development. It is important not to slow down those that are ahead and leave behind others that are lagging. We need to try to grow collectively, to harmonise growth. Furthermore, different countries have different priorities.’
- ‘It is important to recognise the starting point, this determines the length of the journey. Those that take longer will have precedents to learn from. Leaders must work independently and the initiative must be long term. Addressing climate change in the region would be considered more of a programme than a project.’





The above question **'how do you verify your storylines?'** was put forwards in the SADC Futures webinar series, the answers that were given demonstrate the importance of multi-stakeholder collaboration for knowledge sharing and the importance of diverse viewpoints and dialogue.

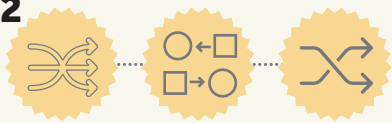


## Learning

You should now understand how to review scenario implications and brainstorm initial actions to address potential future states.

## MODULE 05 Scenario Implications and Transformational Change





# Transformational Elements and Change

**Transformational elements and change still falls within the reflection stage of the foresight framework<sup>1</sup>.**

This is where we think about what our actions need to be to adequately respond to the different possible futures identified during the scenario development process.

**Transformation can be defined as:**

- Physical or qualitative changes in form, structure, function or meaning. Changing from one type of system to another with a different identity. It can refer to the biophysical world or the social world. It can be intentional, autonomous, or forced (O'Connell et al., 2015).
- The process of changing the current system (O'Connell et al., 2015).
- A change in the fundamental attributes of natural and human systems (Denton et al., 2014).
- (In the context of agri-food systems) a significant redistribution, by at least a third, of land, labour and capital, and/ or outputs and outcomes (e.g. types and amounts of production and consumption of goods and services) within a timeframe of a decade (Steiner et al., 2020).



**When you hear the term transformation what do you think of, or how do you define this?**

Participants from the SADC Futures webinar series gave the following responses, how does your understanding of transformation compare?

'Change of status or way of existence.'

'Change from the current way things are done.'

'It's a complete change.'

'Permanent change from the current to desired state.'

'A marked change.'

'Change of the current situation.'

'Is the change after going over a tipping point, it may not be to a better state.'

<sup>1</sup> Guidance on Transformational Change was received from Laura Pereira under the scenario work conducted for the Programme for Climate-Smart-Livestock-Systems (PCSL) at International Livestock Research Institute <https://www.ilri.org/programme-for-climate-smart-livestock-systems>.



**Transformative scenario planning is a promising tool for improved decision making by taking four issues into account (Ranjan, 2019)**

- Dealing with assumptions through developing detailed and carefully contextualised understandings;
- Recognising uncertainties by mapping causal relationships of important variables;
- Widening perspectives through combining a variety of ideas from diverse disciplines; and
- Resolving dilemmas and conflicts by considering a wide range of stakeholders' views.

Multi-stakeholder engagement is critical to transformative scenario planning. The active involvement of civil society, policy-makers, science communities, and businesspeople is needed in creating a cohesive vision, framing problems jointly, generating solutions-oriented knowledge, creating mass awareness, experimenting with solutions, developing networks of mutual learning, and leveraging collective action for implementation (Ranjan, 2019).



### What is the method?

- We apply transformational 'elements' which can be grouped broadly under policies, interventions and partnerships and are a grouping that come together to result in significant 'transformative' change.



### Why apply it?

- Transformative change includes major long-term changes in the way we operate and may shift us between, or into, a new 'system' and process. This can be a significant or radical level of change.

**Some useful ways of thinking about transformation include:**

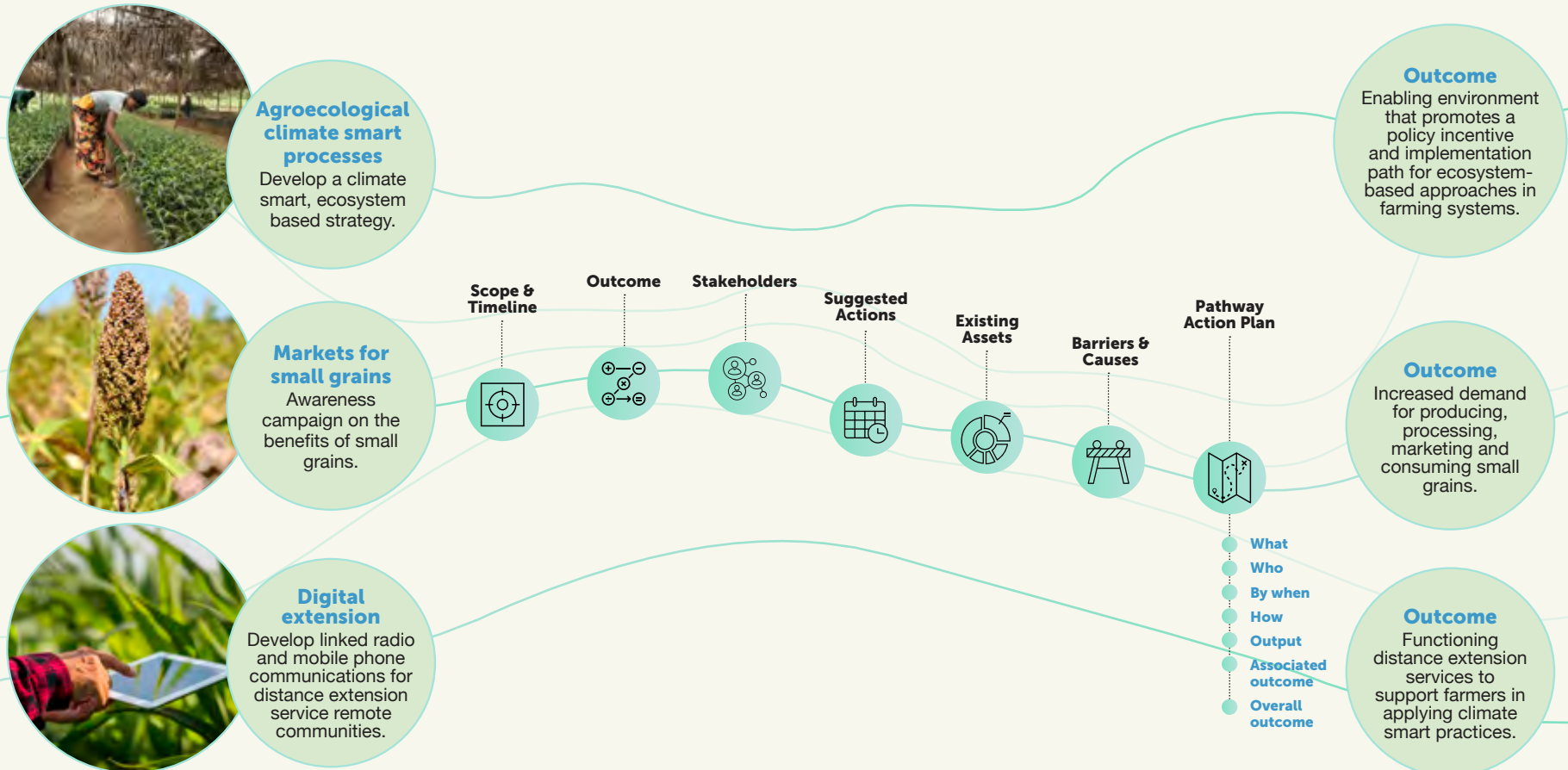
- The future that is coming often requires significant change;
- Transformative change sometimes requires radically new interventions, policies, and partnerships; and
- It moves us beyond incremental change, and results in major long-term changes in the way systems operate.



**Transformations are complex processes that require significant planning and foresight to pursue effectively.** Transformations often require significantly more change than most expect and consist of major, long-term changes in the way systems operate. We often build our plans and strategies based on actions that result in incremental change, when we need actions that are transformative and suitable for the future that is coming. In Module 4, we looked at climate-resilient pathways that follow a process and end in an outcome. The pathways developed, as with many plans and strategies, are unlikely to result in transformative change. A key question here is:



**How can these plans and strategies be improved to achieve transformational change?**



## MODULE 05 Scenario Implications and Transformational Change



# Transformative Actions

To achieve transformational change, consider the use of the following three transformative



**Interventions** - integrated and adaptive interventions;



**Policies** - flexible, robust, and synergistic policies that drive implementation; and



**Partnerships** - novel partnerships, cross sectoral or multi-stakeholder relationships.

Categories of  
transformative  
actions

Integrated  
and adaptive  
interventions



Flexible, robust  
and synergistic  
policies that drive  
implementation



Novel  
partnerships,  
cross sectoral or  
multi-stakeholder  
relationships



MODULE 05  
Scenario Implications and  
Transformational Change





## Interventions

**Examples of integrated and adaptive interventions include:**

- A monitoring, reporting, and verification system;
- New design or infrastructure;
- Scaling existing innovations;
- Awareness, knowledge, skills, empowerment development;
- Knowledge or data platforms;
- New technology;
- A lifestyle or behaviour change;
- Finance/incentives/subsidies; and
- New businesses and business models.

Taking an example of an intervention from above, a transformative action may be - **developing financial technology to enable the private sector to directly pay farmers for restoring land health.**



## Policies

**Examples of flexible, robust, and synergistic policies that drive implementation include:**

- Changes in decision making processes;
- A form of decentralisation or distributed decision making;
- Nested scale policy design;
- Time bound reflections on policies; and
- Cross sectoral policy development and financing frameworks.

Using the example of 'changes in decision making processes' a transformative action could be - **to develop a formalised office in financial planning for cross sectoral coordination, joint planning, and joint budgetary allocations.**



# MODULE 05 Scenario Implications and Transformational Change



## Partnerships

Examples of novel partnerships, cross-sectoral or multi-stakeholder relationships include:

- New set of actors working together in an informal or formal setting;
- New cross sectoral, multi-stakeholder relationships;
- Pooling resources, money, or labour for synergy; and
- Trans-generational and thematic partnerships.

Using the example of 'pooling resources, money, or labour for synergy', a relevant transformative action could be - **to develop a job hub to bring youth and the private sector together.**

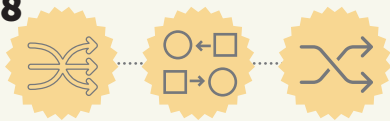


## Learning Exercise

Thinking of your personal work or situation, where do you think transformational change is needed? Use the responses from participants of the SADC Futures webinar series below to guide your thought process.



- 'Creating 'new farmers' by engaging educated youth in agriculture.'
- 'Infrastructure and education relating to the use of information technology. The limiting factor is probably education.'
- 'Traditional policies and the mindset of people need to change.'
- 'I think most African countries have great policy frameworks, but they remain great on paper and not action oriented.'
- 'Smallholder farmer policy and practice in knowledge and information sharing on appropriate climate adaptation options.'
- 'Gender and power relations.'
- 'Strengthen and create an improved seed value chain.'
- 'The Greenbelt initiative could facilitate tree belts as buffers followed by artificial wetlands as sponges for water for agricultural lands year-round.'
- 'Improved land tenure systems in smallholder communities.'
- 'Resource allocation to farmers and the provision of bank loans at low interest.'



# Learning Exercise

Looking at the actions you described in the tables of the previous learning exercise, how would you transform them using the transformative elements you have just learnt about:



Interventions



Policies



Partnerships

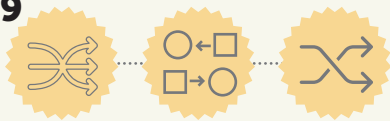


How would you transform your actions, or which new activity or action might be needed?



## DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION

Dimensions	Action / Activity	Transformation
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		



DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE

Dimensions	Action / Activity	Transformation
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		

**This exercise was also completed by participants of the SADC Futures webinar series.** See their ideas for transforming their previously defined actions in the tables below. Again, reflect on how your ideas compare. Would you consider implementing some of the transformative actions they proposed?





## DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION

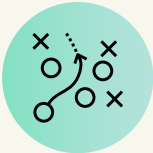
(Participants defined Lesotho as their geopolitical boundary)

Dimensions	Action / Activity	Transformation
ECONOMIC, INVESTMENT AND TRADE	<ul style="list-style-type: none"> <li>• Improve regional market integration</li> <li>• Textile industry with the brand 'Made in Lesotho' becomes a global trademark</li> <li>• Identify products that are well suited - goats / mohair / and export crafts.</li> <li>• Support economic transition towards an industrial/ service-based economy.</li> <li>• Come to an arrangement with South Africa on opening railway lines to one of the ports.</li> </ul>	<ul style="list-style-type: none"> <li>• Limits on imports, giving preference to local manufacturing.</li> <li>• Putting a ban on certain exports.</li> </ul>
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	<ul style="list-style-type: none"> <li>• Revisioning campaign on comparative advantage livelihoods i.e. away from livestock.</li> <li>• Addressing patriarchal norms and values which create power imbalances and heightened vulnerability of women.</li> </ul>	<ul style="list-style-type: none"> <li>• Partnerships – inclusive of both genders, LGBT communities, departments for social welfare support and education.</li> </ul>
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	<ul style="list-style-type: none"> <li>• Dam and irrigation considerations.</li> <li>• Soil conservation measures.</li> <li>• Rainfall is harvested for water exports supplying South Africa and other countries.</li> </ul>	<ul style="list-style-type: none"> <li>• Transboundary water management agreement.</li> <li>• Ensuring not using oil-based plastic for bottling.</li> <li>• Innovative technologies for groundwater.</li> <li>• Introduction of environmental levies - to curb further degradation.</li> <li>• Integrated water association and user committees.</li> <li>• Pastoral representation in political spheres.</li> </ul>
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	<ul style="list-style-type: none"> <li>• Breeding programmes using artificial insemination and promoting aquaculture.</li> <li>• Use of disease tolerant crops.</li> <li>• Hydroponics to protect against climate change impacts.</li> <li>• Use technology and practices that are climate smart.</li> </ul>	<ul style="list-style-type: none"> <li>• Green subsidies as an incentive</li> </ul>
POLITICAL / INSTITUTIONAL	<ul style="list-style-type: none"> <li>• Restructure the national budget towards climate risk activities.</li> </ul>	



## DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE

Dimensions	Action / Activity	Transformation
ECONOMIC, INVESTMENT AND TRADE	<ul style="list-style-type: none"> <li>• Enabling training, more accessible to the youth.</li> <li>• Enabling access to finance.</li> <li>• Training should be available in local languages.</li> <li>• Implementing what is on paper to allow youth to access funds.</li> <li>• Youth involvement.</li> </ul>	<ul style="list-style-type: none"> <li>• Change in accessibility of loans and finance.</li> <li>• Improvement of ICT infrastructure to improve trade and investment.</li> <li>• Promotion of village banking and table banking.</li> </ul>
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	<ul style="list-style-type: none"> <li>• Creation of associations to involve youth.</li> <li>• Improving living conditions in rural areas with things like electricity, to allow for internet connections.</li> </ul>	<ul style="list-style-type: none"> <li>• Transform curricula of the education sector-- move away from agriculture as a punishment to making agriculture something desirable to enter into.</li> <li>• Transformation in gender relations to help women have more control over resources, more equitable sharing of income, more joint decision making.</li> <li>• Raising the status of women and youth to be acknowledged properly.</li> </ul>
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	<ul style="list-style-type: none"> <li>• Government actions to attract youth to stay in the rural areas.</li> <li>• Programme to help youth take ownership of the environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Incentivisation for staying in the rural areas.</li> <li>• Green tax rebates or credits.</li> <li>• Entertainment shows (e.g. game shows and quizzes) for young people to voice support for the environment and incentivise stewardship.</li> </ul>
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	<ul style="list-style-type: none"> <li>• Government to help in the creation of cooperatives to attract youth into agriculture.</li> <li>• Encouragement or promotion of ICT in agriculture to attract youth.</li> <li>• Building of vibrant youth groups.</li> <li>• Promotion of agriculture as a mainstream job, not a backup plan or a lesser desired activity.</li> </ul>	<ul style="list-style-type: none"> <li>• Youth opportunities to access loans for agriculture.</li> <li>• Digital repository for sharing of ideas on livestock production, easing access to information.</li> <li>• Transform viewpoints to see agriculture as a business.</li> <li>• Market accessibility for the youth.</li> <li>• Encouragement of ICT integration in farming.</li> </ul>
POLITICAL / INSTITUTIONAL	<ul style="list-style-type: none"> <li>• Inclusive policies to encourage participation of youth in politics.</li> <li>• Implementation of youth programmes and tracking.</li> </ul>	<ul style="list-style-type: none"> <li>• Seat for youth in Parliament</li> </ul>



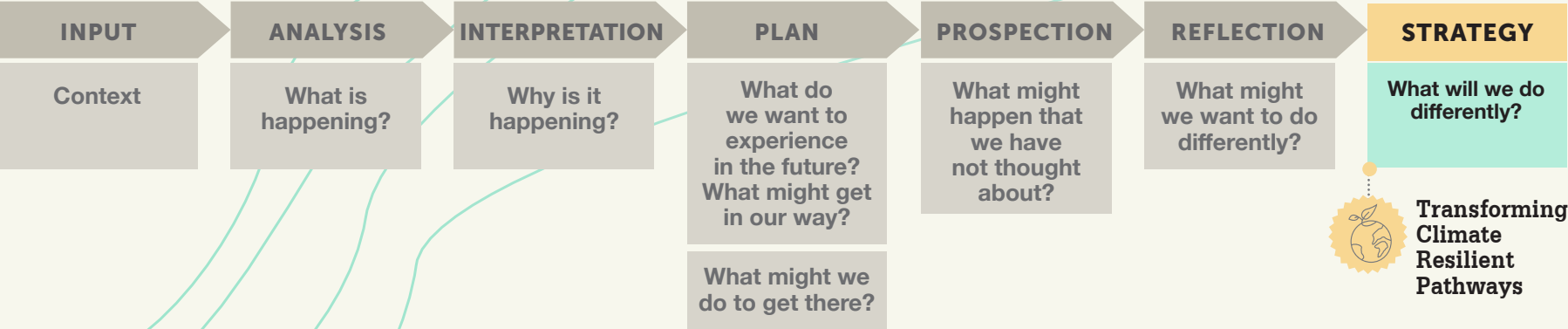
# Strategy Stage

The strategy stage of the foresight process follows on from the reflection stage. A key question here is:



**What will we do differently?**

In this stage of the foresight process it is important to describe the needed strategies, investments, and solutions that will lead to achieving the transformative goals and targets. This requires understanding which strategies represent incremental/business-as-usual solutions, and which strategies are actually transformative.







Often scenario exercises are not practically applied in strategic or policy work and require a dedicated process to ensure the implications are considered. Here we provide **four key steps to transforming pathway action plans**, these can be changed as appropriate to your project. (Refer to the supplementary SADC Futures knowledge series report, 'Climate Resilient Development Pathways' for further information on transforming climate resilient development pathways.



#### STEP 1

Clarify the outcomes  
Prioritize transformative actions



#### STEP 2

Engage new suggested  
partnerships and  
stakeholders that have  
been identified



#### STEP 3

Build climate resilient  
pathways or modify  
existing ones  
  
Agree on roles and  
financing modalities



#### STEP 4

Key focal points in  
place to integrate  
into decision and  
policy processes

Photo: Axel Fassio (CIFOR)

## MODULE 05

### Scenario Implications and Transformational Change





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region



**Given what we have learnt from the different scenarios, what does this now mean in terms of the pathway action plan?**

**What would need to be done differently if any of these scenarios became the future?**

**What might this mean in terms of transformational change?**

The dynamic nature of the 'pathway development' approach, such as its ability to be up-scaled or down-scaled to accommodate different geographies, timescales, sectors and sub-systems, and its ability to incorporate various bodies of knowledge (social, economic, political, climate science, cultural, etc.), is part of the reason why the approach is so well suited to the experimental thinking necessary for transformational change.

In the plan stage we worked on a climate resilient pathway that had an outcome of all farming systems being more diversified and moving in the direction of green employment and climate resilience.

**Overall Outcome:** Small, medium and large-scale farming systems and pastoral systems are diversified and increasing productivity and ecosystem resilience through agro-ecological and climate smart practices and are the basis for climate friendly value chains and green employment opportunities.



Furthermore, in the original pathway we set out some activities such as:

- Awareness campaign on value and benefits of integrated farming systems, sustainable agriculture, and climate resilience;
- Develop capacity materials for agroecological approaches and integrated farming systems; and
- Integrate and expand training into existing farmer groups or farmer field schools.



**What**

Build capacity and incentivize integrated farming systems using agroecological practices

**Who**

Government sectors – Agriculture, water, environment, extensions services, NGOs, UN FAO, farmers’ groups, women’s organizations & youth groups, development partners, investors, media

**By when**

2028

**How**

- Awareness campaign on value and benefits of integrated farming systems, sustainable agriculture and climate resilience
- Develop capacity materials for agroecological approaches and integrated farming systems
- Integrate and expand training into existing farmer groups/farmer field schools

**Output**

20,000 farmers are trained in integrated farming systems

**Associated outcome**

Farmers including women, men and youth are adopting: agroecological practicing, water harvesting measures, sustainable land management activities, higher diverse systems for farming



Is this pathway action plan iterative or transformative?

- **Iterative** responses to climate change address immediate and anticipated threats based on current practices, management approaches, or technical strategies (Denton et al., 2014).
- **Transformative change** is a fundamental change in a system, its nature, and/or its location that can occur in human institutions, technological and biological systems, and elsewhere. It most often happens in responding to significantly disruptive events or concerns about them (IPCC, 2014).

In this case the change is more iterative than transformative.

MORE ITERATIVE THAN TRANSFORMATIVE

What	● Build capacity and incentivize integrated farming systems using agroecological practices
Who	● Government sectors – Agriculture, water, environment, extensions services, NGOs, UN FAO, farmers’ groups, women’s organizations & youth groups, development partners, investors, media
By when	● 2028
How	<ul style="list-style-type: none"><li>● Awareness campaign on value and benefits of integrated farming systems, sustainable agriculture and climate resilience</li><li>● Develop capacity materials for agroecological approaches and integrated farming systems</li><li>● Integrate and expand training into existing farmer groups/farmer field schools</li></ul>
Output	● 20,000 farmers are trained in integrated farming systems
Associated outcome	● Farmers including women, men and youth are adopting: agroecological practicing, water harvesting measures, sustainable land management activities, higher diverse systems for farming



Photo: Axel Fassio (CIFOR)

## MODULE 05

### Scenario Implications and Transformational Change

#### The pathway can be transformed as follows:

##### What



**From:** Build capacity and incentivise integrated farming systems using agroecological practices.

**To:**

- Build linkages among large- and small-scale farmers and use co-learning to develop joint capacity;
- Establish linkages with regenerative, climate smart certification markets to incentivise regenerative practices and whole system thinking; and
- Create youth led transboundary detection protocols and teams.

##### Who

**From:** Government sectors (agriculture, water, environment, extension services), nongovernmental organisations (NGOs), UN FAO, farmers' groups, women's organisations, youth groups, development partners, investors, and media.

**To:**

- **New Partners 1** - Large scale and small-scale farmers and pastoralists partner together with youth and work directly with regenerative farm/pasture to market buyers;
- **New Partners 2** - Global/Regional investors partner with telecommunication companies for direct payments to farmers/pastoralists and with high school graduates to monitor practices; and
- **New Partners 3** - Epidemiologists and extensionists, health providers, and conservancies partner for early detection of disease prevalence.



### The pathway can be transformed as follows:

#### How



##### From:

- Awareness campaign on value and benefits of integrated farming systems, sustainable agriculture, and climate resilience;
- Develop capacity materials for agroecological approaches and integrated farming systems; and Integrate and expand training into existing farmer groups or farmer field schools.

##### To:

- Awareness campaign on the value and benefits of integrated, climate smart practices engaging land managers, extension services, and the private sector;
- Expand farmer field schools and farm-to-market hubs for training youth, farmers, and pastoralists to provide co-learning opportunities on practices, early warning systems, and market readiness.

#### Output

**From:** 20,000 farmers and pastoralists are trained in integrated farming systems.

**To:** Farmers and pastoralists have actively scaled co-learning hubs to imbed testing of most effective mode and use these in combination with extension models.

#### Associated outcome

**From:** Farmers including women, men and youth are adopting agroecological practices, water harvesting measures, sustainable land management activities, and more diverse systems for farming; and

**To:** 500,000 farmers and pastoralists are implementing integrated, agroecological/climate smart practices on 1 M hectares and are connected directly to local, regional, and global markets for regenerative products.

When you have decided on the future and some of the transformative actions you could use, revisit the backcasting method and ask yourself:



**How did we get here (to the new future state you just defined)?**

**Reminder of steps to follow when applying the backcasting method:**

- Step into 2030 and position yourself in the successfully achieved vision such that the future becomes the present.
- Look back to 2020 and ask, ‘what do we remember about how we got to here?’; ‘what actions, partnerships, policy changes, etc. did we carry out’ to get to the 2030 success?
- Remember how you overcame barriers that needed to be addressed.
- As best possible identify when key activities took place.

In closing, it is important to note that transformative pathways require constant re-evaluation and adjustment and must be flexible enough to respond to unforeseen circumstances and consequences that will require new scenario-building and adaptive planning. They are best created with strong integration from national to local governments, as well as input and engagement from multiple sectors (not only the ministries responsible for climate change and agriculture), including civil society organisations that represent the interests of women, the poor, and other potentially marginalised groups (Carter et al., 2018).



## Learning

You should now understand the concept and application of transformational change and its role in addressing future uncertainties.





Photo: Axel Fassio (CIFOR)

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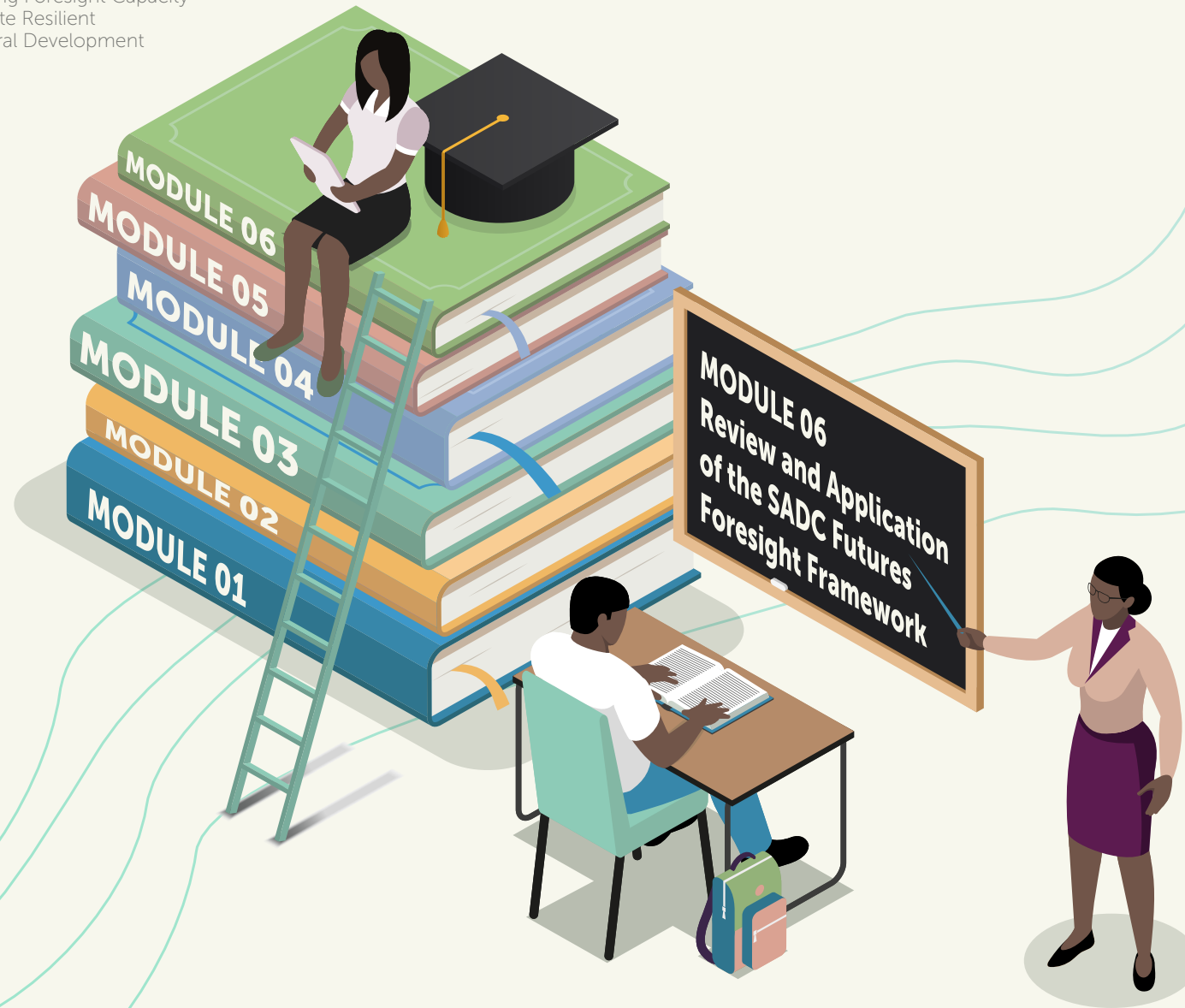
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## SADC Futures

Developing Foresight Capacity  
for Climate Resilient  
Agricultural Development



# MODULE 06 Review and Application of the SADC Futures Foresight Framework



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



Implemented by:





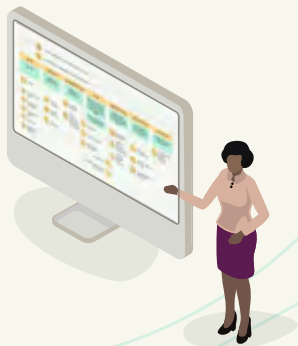


# What Will You Learn?

Module 6 provides a review of the key foresight methods and tools covered in the preceding modules of this SADC Futures Foresight Training Toolkit.

## This module includes:

- A recap of the training framework in the context of climate resilient agri-food systems in the SADC region;
- The application of foresight by presenting a case study on how foresight was used to develop a climate-smart agriculture (CSA) strategy in Central America;
- A question and answer section on foresight methods and tools; and
- Examples of applications of foresight planning given by participants of the SADC Futures webinar series.



Re-cap of the Case Study and Training Framework



Case Study from Central America on CSA Strategy



Foresight Tools and Methods Review



Applying Foresight Tools in our work



Photo: CGIAR



## Recap of the SADC Futures Foresight Framework

The framework used in this training series has been developed around four guiding questions which the foresight process helps us to answer when planning for the future:

- **What seems to be happening?**
- **What is really happening?**
- **What might happen?**
- **What do we need to do?**

The tailored foresight training series focuses on the thematic areas of building climate resilient agricultural systems in the SADC region. The framework and toolkit aim to equip users to **practically apply a range of foresight tools and methods for innovative strategic planning and policy formulation for climate resilience in the agriculture sector.**

The foresight framework has been built around seven key stages with key questions:



**Input** - what is the context? What is happening right now?



**Analysis** - deepening the understanding of the above input questions;



**Interpretation** - why is it happening? This is where foresight differs from strategic planning, here we dig deeper to understand why something is happening;



**Plan** - what do we want to experience in the future and what might get in our way? Here we consider what we might do to get there;



**Prospection** - what might happen that we have not thought about? This is a critical stage of the foresight process and it requires thinking of multiple different potential futures;



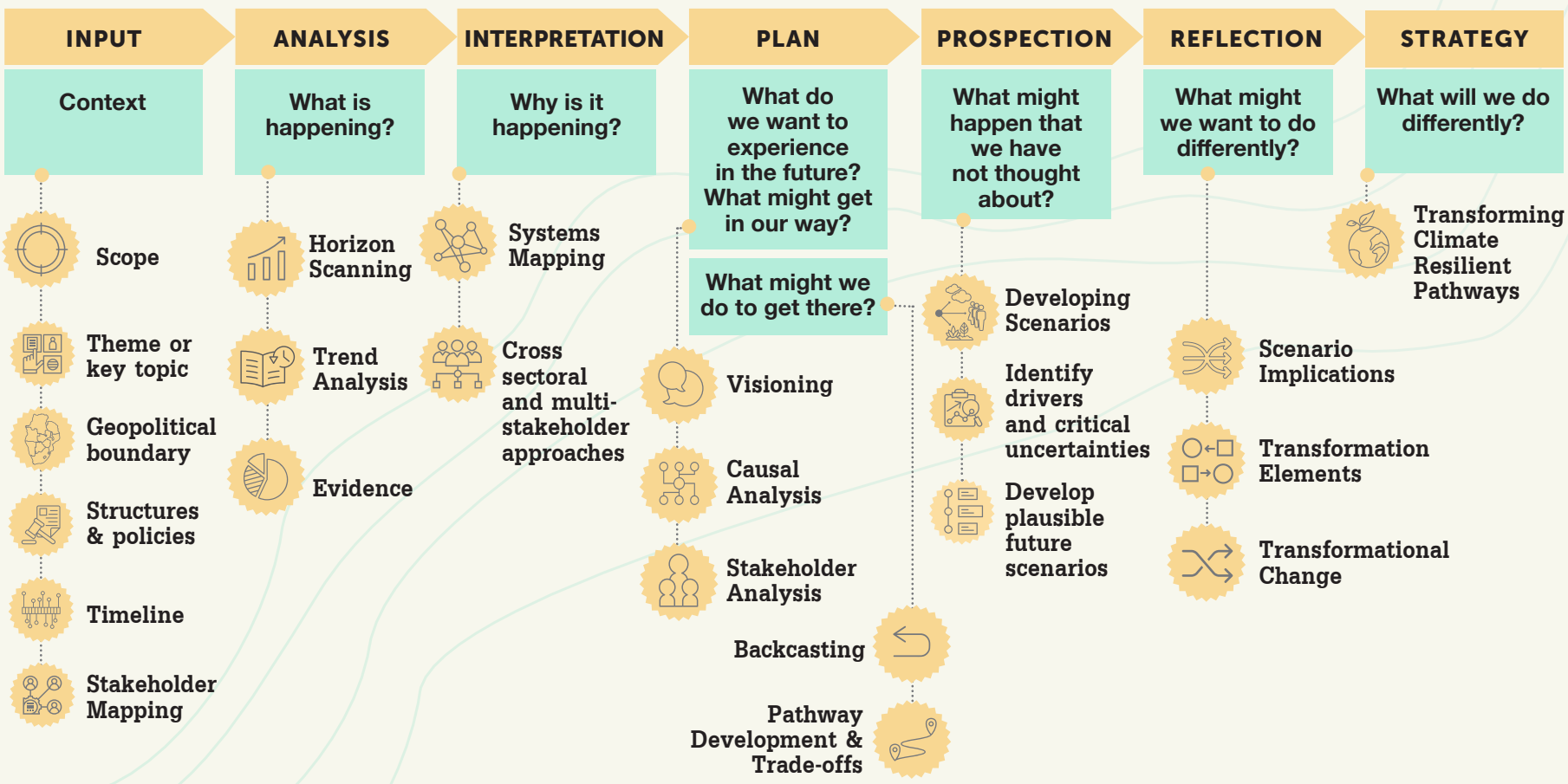
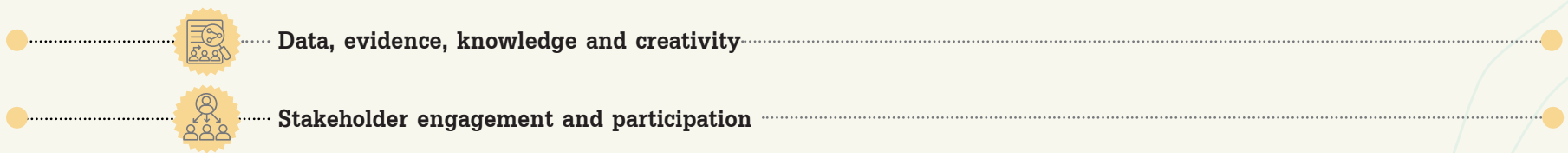
**Reflection** - here we consider what we might want to do differently; and



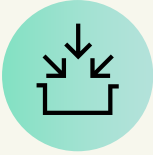
**Strategy** - what will we do differently? This is where we build our new strategy based on our insights of what the future may be like.

### Key points to note:

- Selected foresight tools and methods are presented, and their application demonstrated for each stage of the framework.
- It is important to note that data, evidence, knowledge, and creativity as well as stakeholder engagement and participation are steps that can be applied across the entire foresight process. Foresight is a participatory process that needs continued engagement of stakeholders as well as data and evidence as tools and methods are applied.
- Foresight application is demonstrated in the context of climate-resilient agricultural development in the SADC region. The foresight methods and tools chosen are therefore specific to this theme and may need to be reconsidered for appropriateness, in the context of your study.



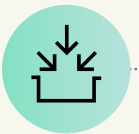




## INPUT- Understanding the Context

The input stage is where we are developing our understanding of the chosen context using the scope method.

- **Set the theme or key topic;**
- **Set the geopolitical boundary;**
- **Understand relevant structures and policies;**
- **Set the timeline; and**
- **Map the stakeholders.**



## Setting the Theme or Key Topic

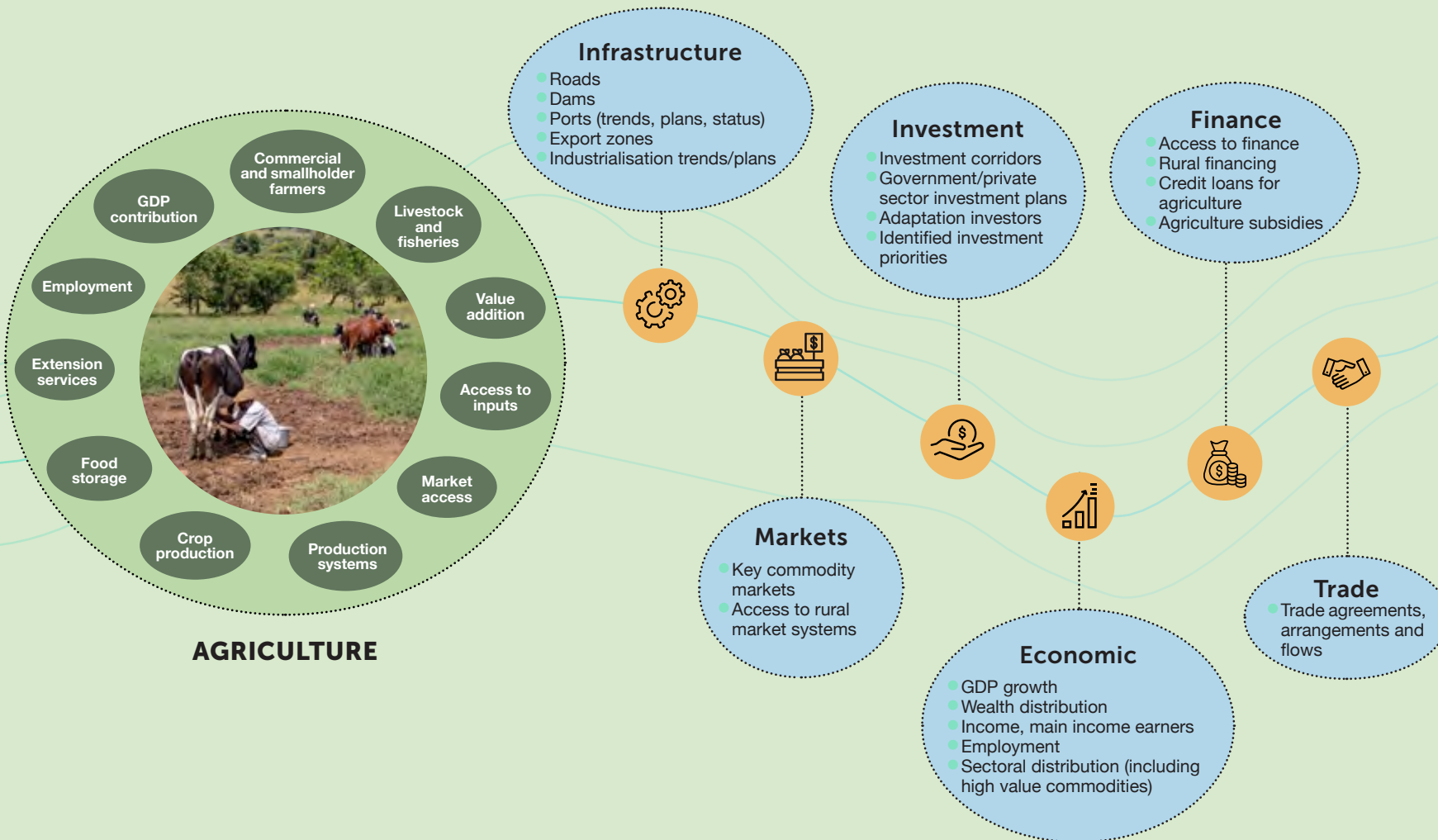
This is where we consider what is happening around us. This means we need to understand as much as we can about the context of our theme.



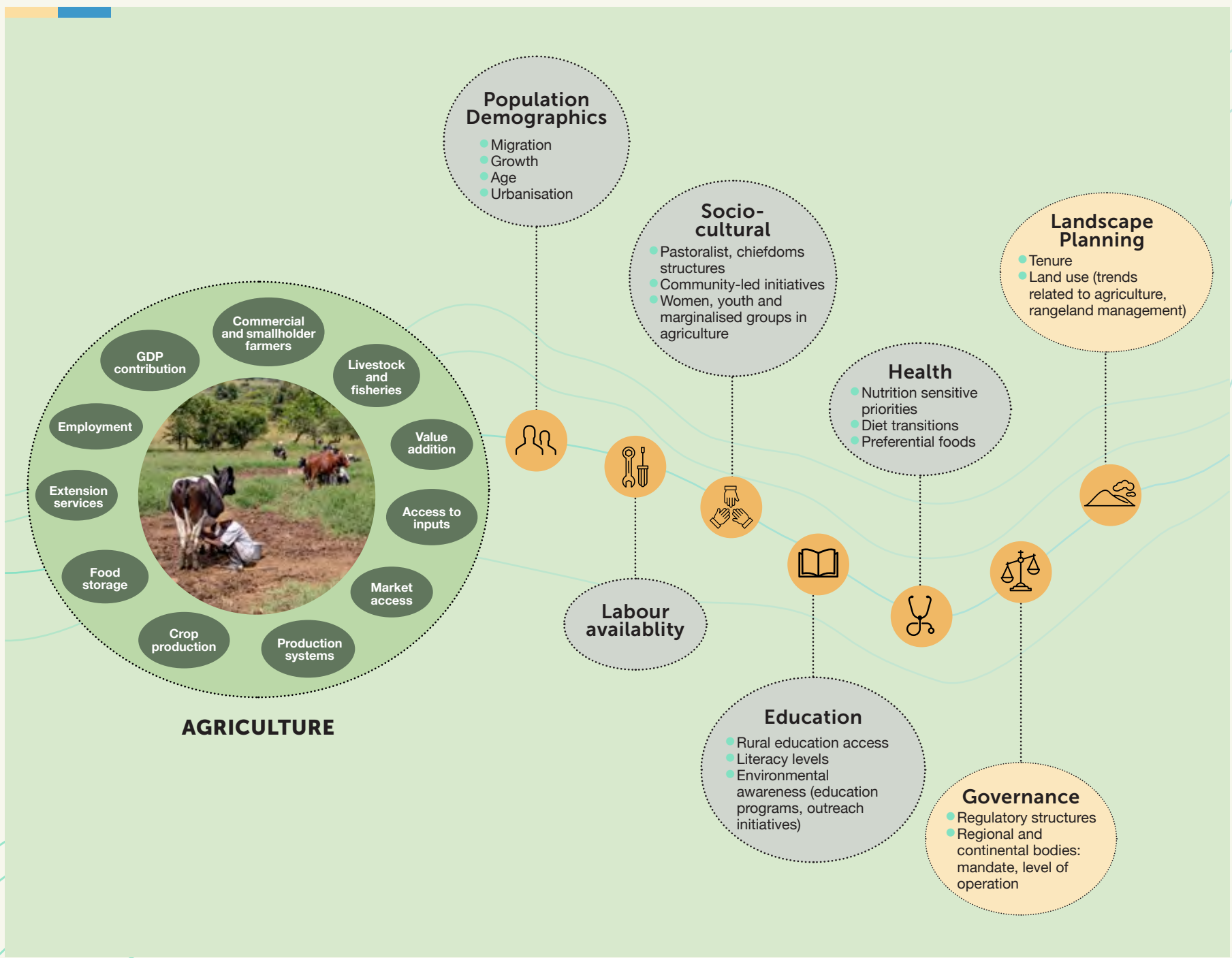
# Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

## Agri-food Systems

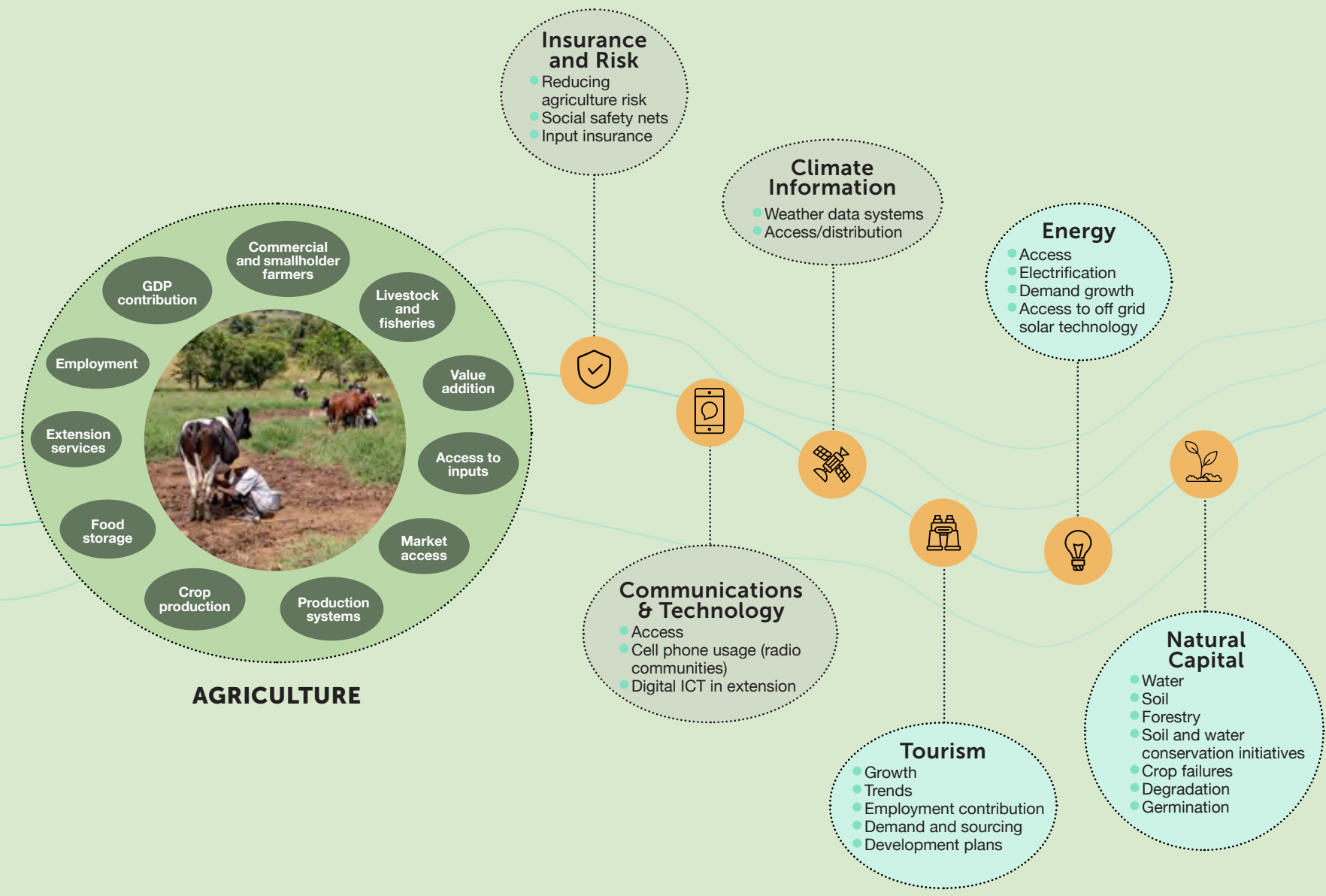
**Agri-food systems within the SADC region are complex.** Within the core agricultural aspect alone there are many different elements such as production systems (crops, livestock, and aquaculture), employment, market access, food storage etc. The agri-food systems are interconnected with other systems and sub-systems that affect outcomes such as production and food security in the region.



MODULE 06  
Review and Application of the SADC  
Futures Foresight Framework



MODULE 06  
Review and Application of the SADC  
Futures Foresight Framework





## Climate Resilience

Climate resilience can be thought of as a set of adaptive capacities such as adaptive infrastructure, people, ecosystems, livelihoods and farm systems, and governance. It is important to identify the adaptive capacities that could be implemented to enhance climate resilience within agri-food systems.

The different dimensions of a climate resilient agricultural system interact and impact the potential outcome of the future.

### INFRASTRUCTURE



Adaptive structures

### GOVERNANCE



Proactive institutions & organisations

### LIVELIHOODS & FARM SYSTEMS



Enhanced livelihoods and farm functioning



Capacity of people to adapt

### PEOPLE



Ecosystem service that built resilience

### ECOSYSTEMS

## MODULE 06 Review and Application of the SADC Futures Foresight Framework



# MODULE 06

## Review and Application of the SADC Futures Foresight Framework

Photo: Charl Folscher-Unsplash



## Setting the Geopolitical Boundary

It is important from the outset to clearly define the scale of the intended foresight exercise. It is also important to understand the dynamics of the scale that you are working at, to do this you need to know what is contained within your selected geographic and corresponding political boundary.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

For the application example we are using, the SADC regional boundary was selected. The socio-economic indicators highlight the inherent vulnerabilities, challenges, and opportunities in the geographical scope area. Furthermore, each country within the SADC region differs vastly from its neighbour, whether it be physically, biologically, socially, technologically, politically, or economically. The data and maps gathered for understanding the geopolitical boundary and the dynamics within it provide 'evidence' for the foresight exercise.



## MODULE 06 Review and Application of the SADC Futures Foresight Framework





Photo: Eva Blue-Unsplash



## Understanding Relevant Structures and Policies

This is where it is important to develop an understanding of the policy environment and governing structures at play, as foresight strategies are typically built on existing structures.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Climate change and agriculture related visions and policies occur at and transcend multiple scales (global, continental, SADC, member state, provincial and local). Although the scope of this exercise focuses on the institutional levels of the SADC region and member countries, their respective policies and programmes feed into overarching continental and global aspirational visions.





## GLOBAL LEVEL GOALS

SUSTAINABLE DEVELOPMENT GOALS



**UNFCCC Paris Agreement on Climate Change**



## CONTINENTAL LEVEL GOALS



**AU Agenda 2063 - Comprehensive African Agricultural Development Programme**



## REGIONAL LEVEL GOALS



**SADC Vision 2050**

**RISDP 2020-2030**

**SADC Climate Change Strategy and Action Plan  
Regional Agricultural Policy**

## NATIONAL LEVEL - POLICY EXAMPLES

**MOZAMBIQUE'S - Agricultural Policy and Implementation Strategy (1995)**

**SOUTH AFRICA'S - National Climate Change Response Policy (2011)**

**ANGOLA'S - National Strategy for Climate Change (2008)**



## MODULE 06

# Review and Application of the SADC Futures Foresight Framework

Photo: Josh Withers-Unsplash



## Setting the Timeline

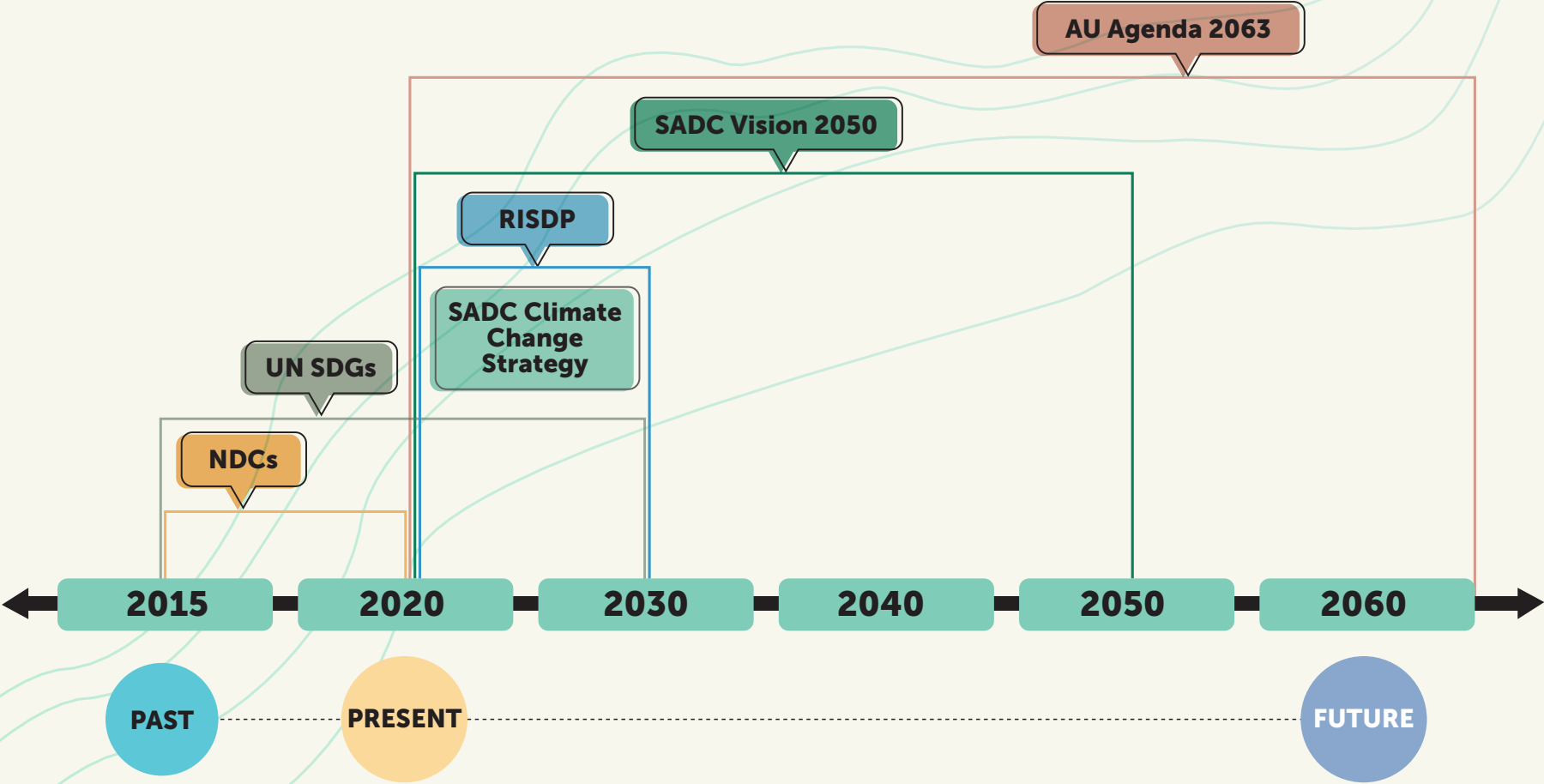
Still within the scope method, the next step is to choose a time frame relevant to the theme. Foresight planning is often based on the time frames of existing strategic plans or policies.





# Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The existing plan and associated time frame determined to be most relevant to the SADC climate resilient agri-food theme is 2030, to align with the SADC Climate Change Strategy and Action Plan and the SADC Regional Indicative Strategic Development Plan (RISDP).





## Mapping the Stakeholders

The final step of the scope method is ‘**stakeholder mapping**’. This is the process of gathering information about the stakeholders that are important to include in the foresight process. Stakeholder mapping is an exercise that enables us to understand who the main actors are in the theme and how they relate to and influence one another.



**Not only do you need to identify stakeholders to include in your foresight process, it is also important to understand their relationships with each other i.e. what they are giving and what they are getting?**



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The **key groups of stakeholders** identified that are relevant to the theme include commercial companies, financial institutions, regional economic communities, government, multilateral organisations, community based organisations, civil society, natural resource or land managers, scientific communities and academia, and media and journalists. **The stakeholder group list needs to be continuously reevaluated, by asking questions such as:**



**Who needs to be at the table? Who has been excluded? Who needs to be emphasised based on influence?**

Other stakeholder groups that are likely to be crucial to future decision making and must be included in policy making are women and youth.



The figure below illustrates the relationships between stakeholder groups using coloured arrows. An example of one of these relationships could be: the scientist and academic community provide evidence-based information to the media and journalists group.

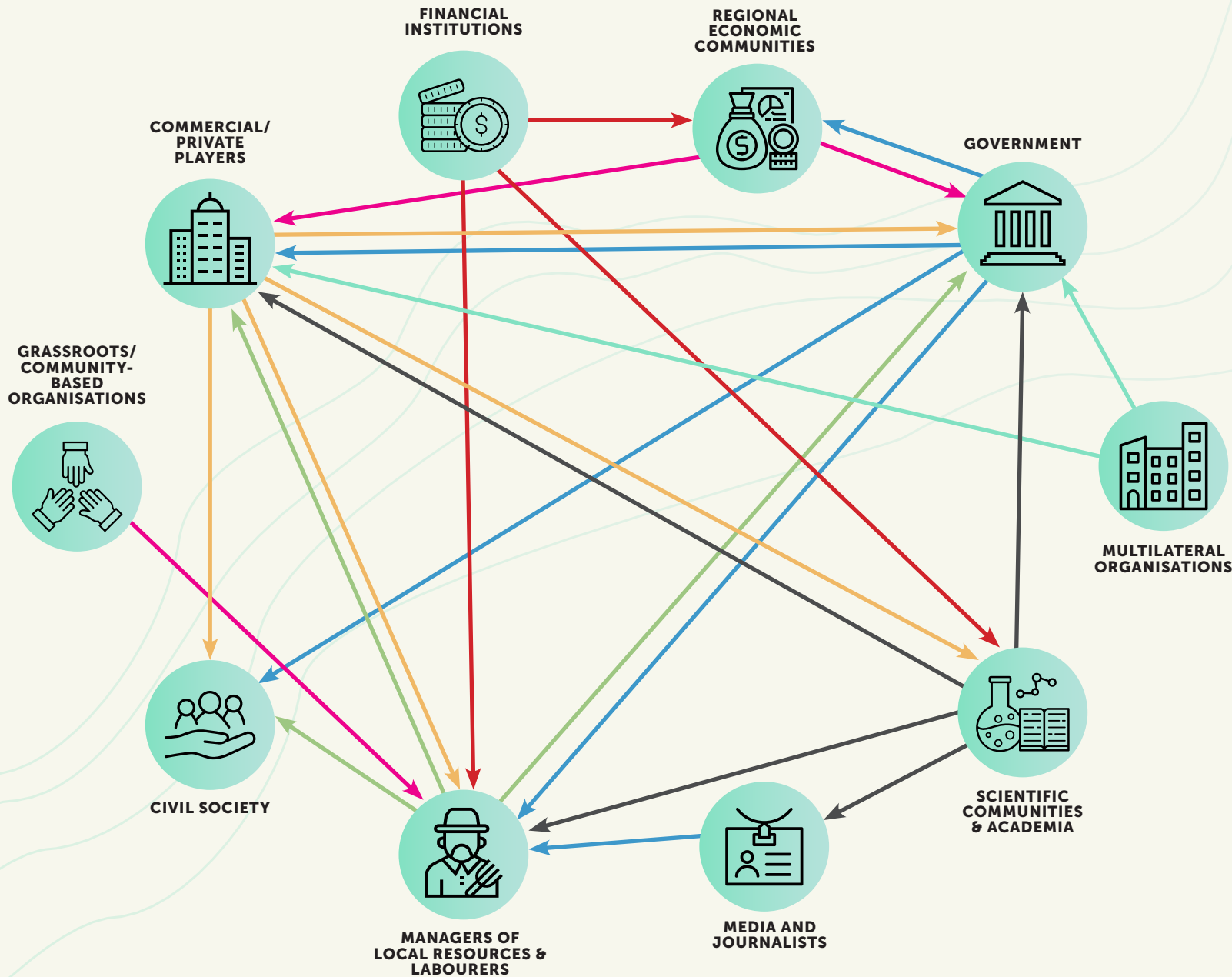




Photo: Redcharlie-Unsplash



## ANALYSIS - What is happening?

The analysis stage deepens our understanding of what is happening in terms of influential historical events and key trends.

Methods within the analysis stage include:



**Trends analysis;**



**Horizon scanning; and**



**Bringing in the evidence.**



## Trends Analysis

This is where we are trying to review key trends in relation to the scope we set for the foresight exercise. There are two key steps for undertaking trends analysis. These include:



**Historical analysis; and**



**Reviewing existing data.**



### Historical Analysis

Historical analysis involves looking at what has happened over a relevant, prescribed timeline to try to understand why current and future patterns are emerging. This is done by reviewing relevant events, stakeholders involved, and processes and patterns that occur within the chosen historical timeframe.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The historical time frame selected as appropriate to the theme of climate resilient agri-food systems in the SADC region is 50 years (1970-2020). The focus of the historical review was on external systems or drivers of change likely to impact the productivity of regional agri-food systems. The chosen topics for the timelines include climate change (droughts and flooding), agricultural pests and diseases, human health, trade, political past, and conflict. A historical review involves research. Ideally the **research is conducted with the involvement of a wide range of actors to gather information on events as experienced by them.**



# Drought

The historic timeline shows that **drought has been a common occurrence in Southern Africa and the SADC region** in particular, over the past 50 years. In comparison with the cyclones and flooding timeline, drought appears to impact larger areas, often affecting whole regions or multiple countries at a time.

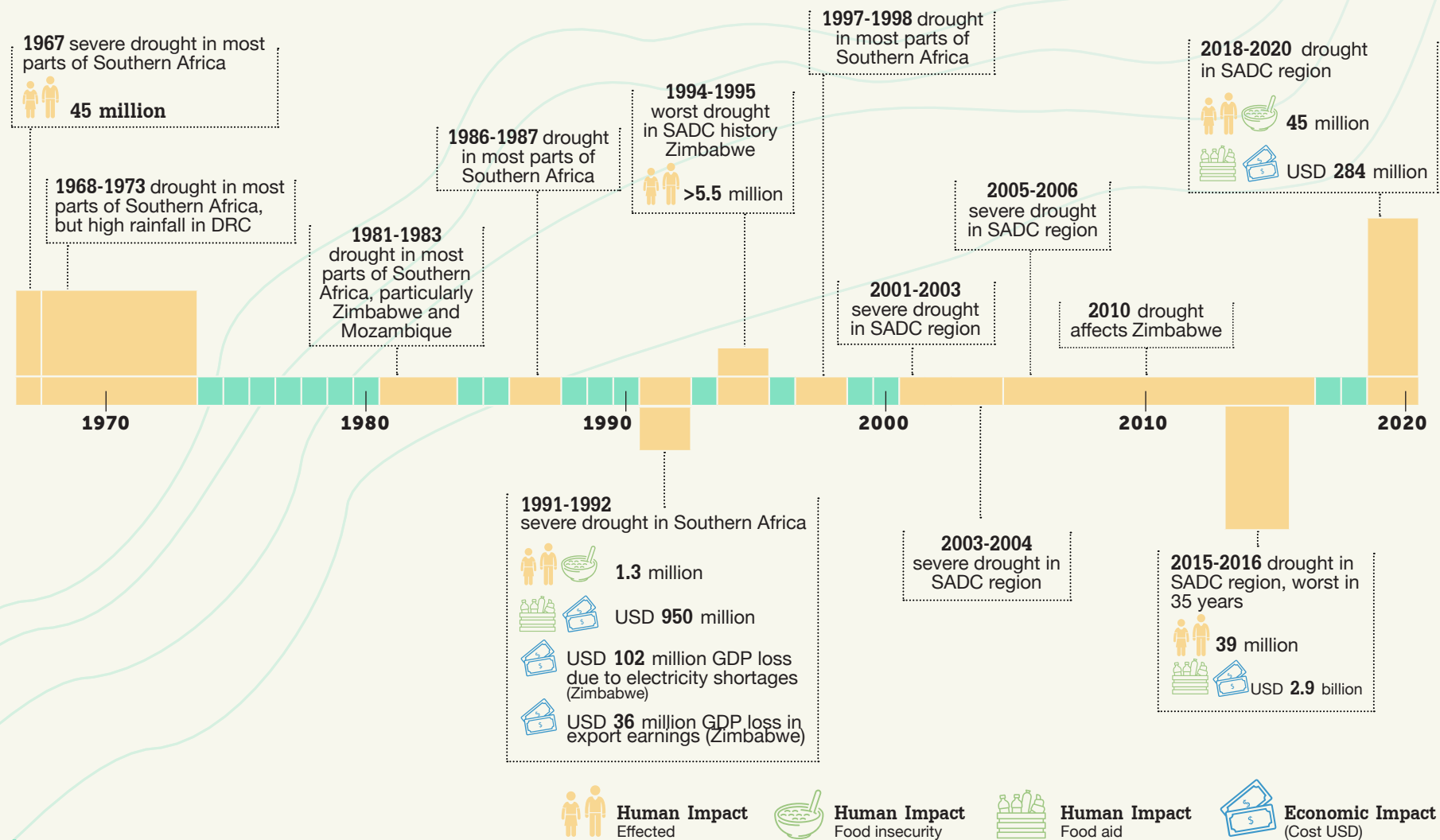






Photo: Bart Heird-Unsplash



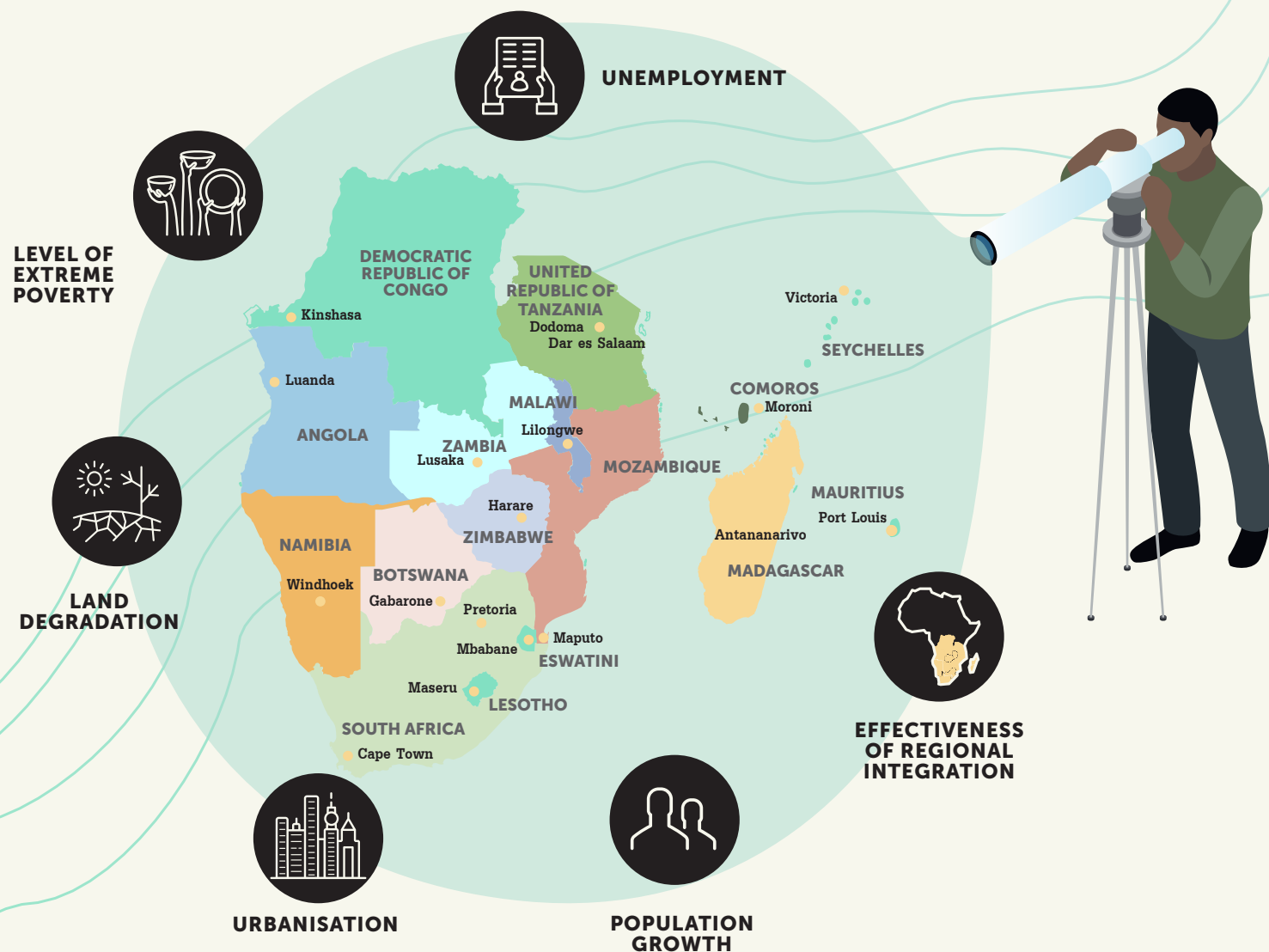
## Horizon Scanning

**Horizon scanning is essentially a process of pulling together information from a variety of reliable sources** (e.g. literature reviews, online surveys, quantitative models, or expert opinions) to identify potential signals of change and future impacts resulting from identified trends. It explores how trends and developments might combine and what impacts they might have.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Megatrends are associated with driving appreciable change, whether through attitudinal, behavioural, economic, or environmental mechanisms. Megatrends relevant to consider in the context of building plans and investments to support climate resilient livelihoods in the Southern African region include:

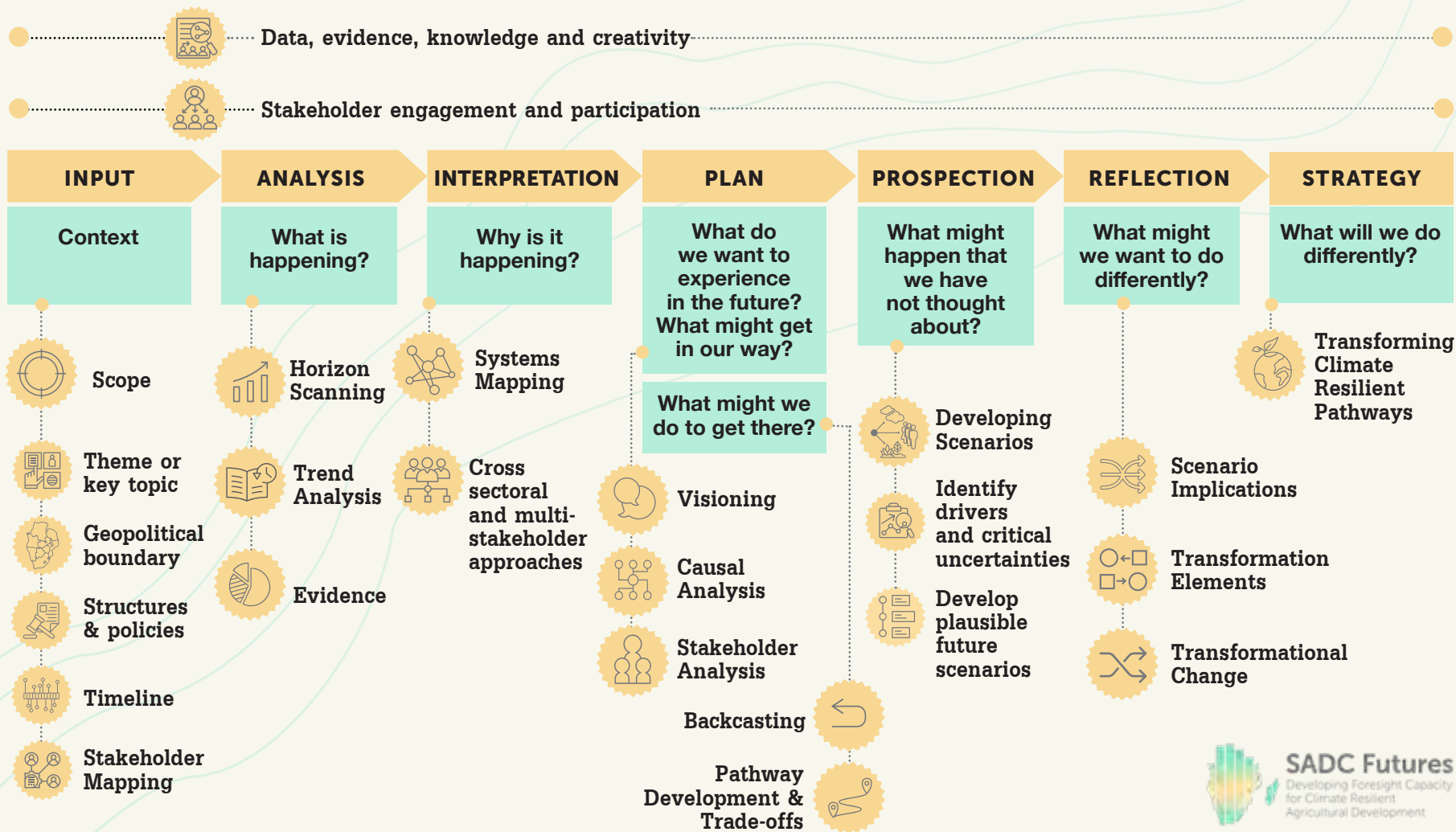


## MODULE 06 Review and Application of the SADC Futures Foresight Framework



## Bringing in Evidence

**Evidence can be defined as the integration of raw data constituting numbers, words, images, and insights emerging from diverse knowledge sources (SHARED, n.d.).** This step involves integrating information gathered on a common theme from a variety of reliable sources (e.g. literature reviews, online surveys, the use of quantitative models or expert opinion). Data gathering, evidence, knowledge and creativity are applied throughout the foresight process.



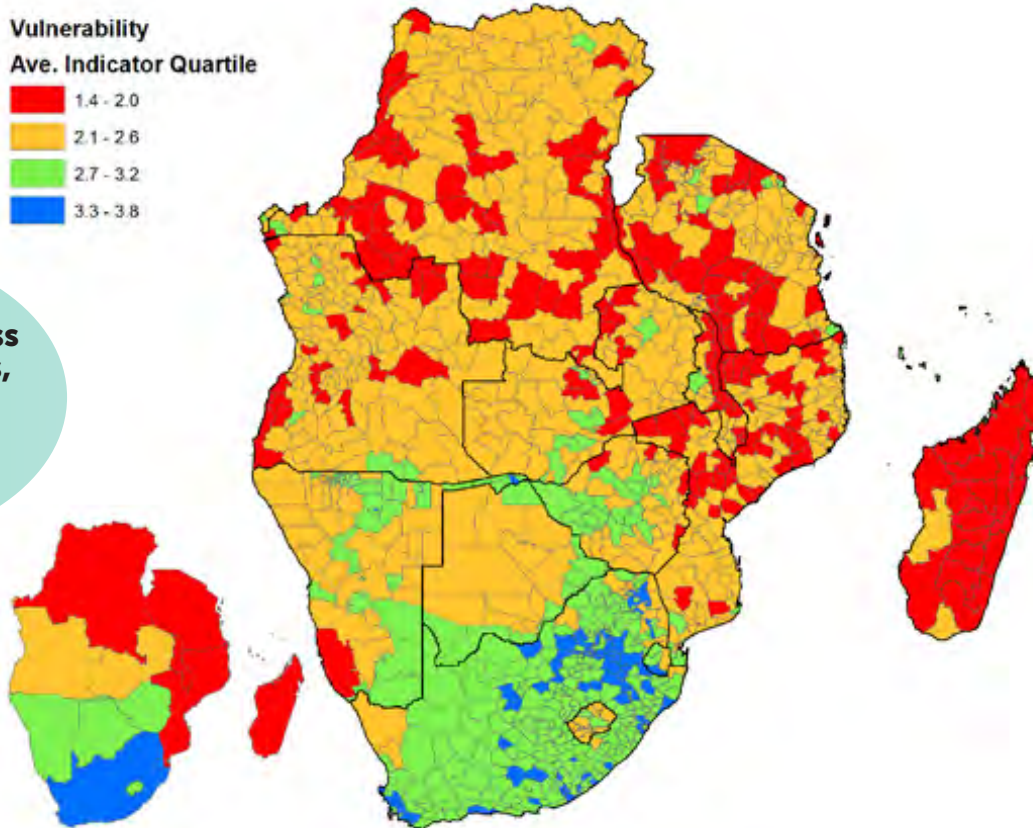
## MODULE 06 Review and Application of the SADC Futures Foresight Framework





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the context of climate resilient agricultural development in the SADC region, evidence on future climate risk is valuable for understanding what SADC may look like in relation to climate change and the impacts it will create. By gathering evidence, a regional map could be produced showing areas of vulnerability and how they will intersect with hazards to create climate risk hotspots in the region. This evidence is important to consider when planning and looking at policies to determine if they take into account these future predicated risks and hotspots.



When we look across all of the indicators, the **red** shows the areas of greatest vulnerability

The blue shows the least vulnerable areas





Photo: CIAT



## INTERPRETATION - Why is it happening?

This is where foresight differs from strategic planning, here we include a 'pause' to understand why something is happening.

Key methods used in the interpretation stage are:



**Systems mapping; and**



**Cross-sectoral and multi-stakeholder approaches.**



## Systems Mapping

**Systems mapping provides a visual way of exploring the system, its elements, connections, and complexity.** Mapping systems can be used as a basis for understanding actors and their relationships, issues, and the influence of trends.

### Key Steps for Systems Mapping:

- Consider which system is relevant to the scope;
- Visualise the system and understand the stakeholders;
- Identify the drivers that are influencing the system; and
- Build multi-stakeholder and cross-sectoral relationships.



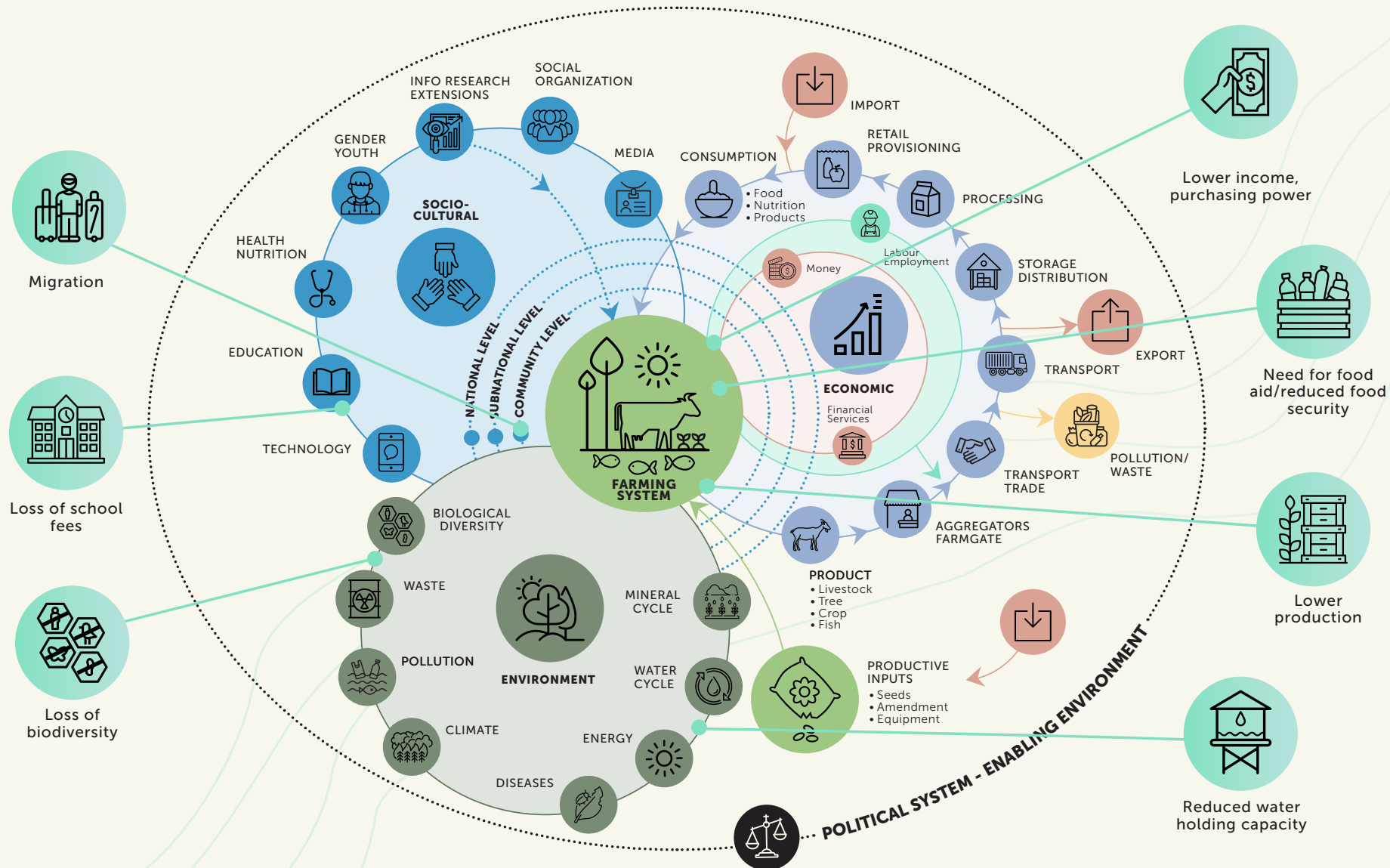
## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

**The system in question could include the following related elements and stakeholders:** the farm, the residents, elements of production such as livestock, crops, trees, and aquaculture.

Farming systems do not occur in isolation, there are other dimensions that either influence or are influenced by the farming system e.g. environmental and economic.

As part of the agri-food systems there are socio-economic drivers such as employment, science and technology, markets, urbanisation, demographics, and food prices or biophysical drivers such as water scarcity, energy sources, land degradation, transboundary disease, and climate change.

**It is important to consider the drivers carefully and understand their implications.** For example, the driver 'land degradation' could result in negative outcomes such as lower income, reduced food security, lower production, reduced water holding capacity, migration, loss of school fees, and loss of biodiversity.



**Multi-Stakeholder Collaboration** - consists of a mix of representatives or stakeholders from public, civil, and private domains of society.

**Cross Sectoral Coordination** - the engagement, management, planning and implementation of activities conducted across different thematic sectors to deliver development outcomes (e.g. food security, nutrition, sustainable landscapes, and agriculture).

## MODULE 06

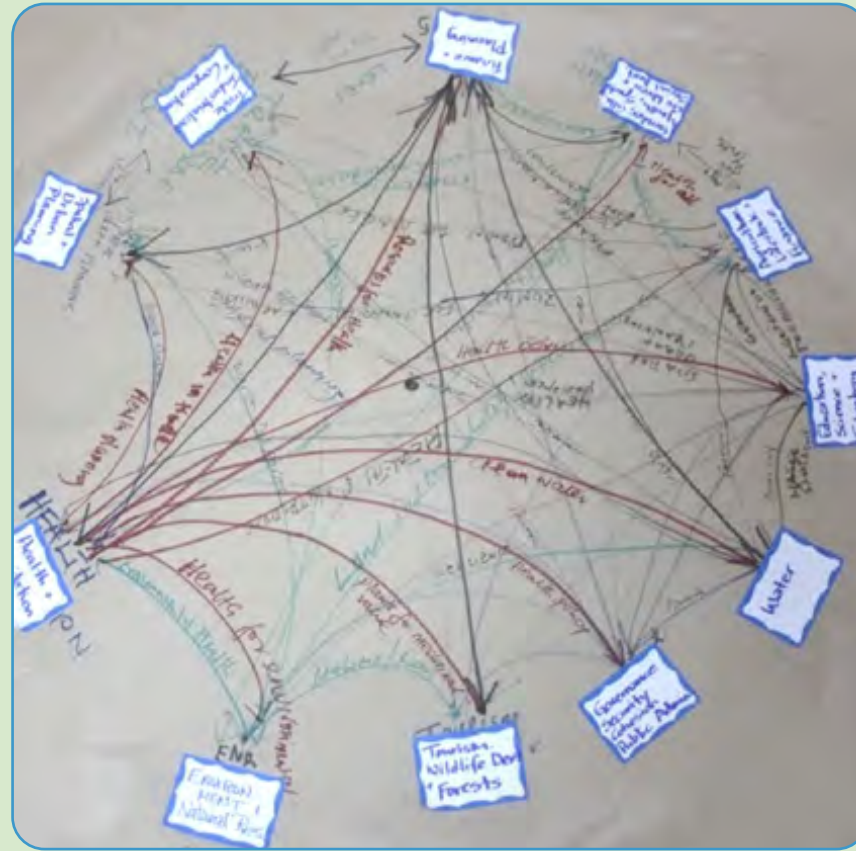
### Review and Application of the SADC Futures Foresight Framework





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

For the purposes of the climate resilient agri-food systems theme, multi-stakeholder collaboration consists of a mix of representatives or stakeholders from public, civil, and private domains of society. Cross-sectoral refers to the different themes and for the purposes of the context of this foresight exercise, predominantly those associated with government sectors.



## MODULE 06 Review and Application of the SADC Futures Foresight Framework





## PLAN – What do we want to experience in the future?

The plan stage covers the following methods:



**Visioning;**



**Causal analysis;**



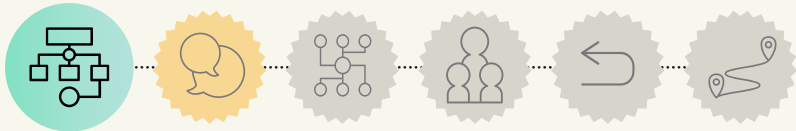
**Stakeholder analysis;**



**Backcasting; and**



**Pathway development and trade-offs.**



## Visioning

**Visioning a desirable future is the first step in creating a powerful strategy and provides the basis for developing interventions, services, policies, and partnerships that will be required to achieve that future. It is necessary to consider for whom and in what situation or purpose the vision is being developed.**

### Key Steps for Visioning:

- Define the theme;
- Set a clear timeline for the vision;
- Define the dimensions of the vision;
- Define the descriptors of the desired outcome in each dimension; and
- Identify supporting and sustaining elements for the desired outcomes.



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

**The theme in this context could be defined as ‘the SADC Secretariat wants to promote greater climate resilience in agri-food systems in the member countries and integrate climate resilience across sectoral plans’.**

The preferred end date for the timeline was set at 2030 as it is relevant to the RISDP and the SADC Climate Change Strategy.

The dimensions chosen as relevant to the theme are economic, socio-cultural, agricultural productivity, environmental and institutional.

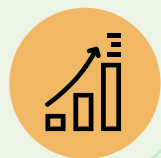
The desired outcomes within each dimension were then defined for example:

**Economic dimension** – Green produce value chains that contribute to employment.

Lastly, the elements that would need to be in place to support and sustain the desired outcomes of the vision were described for example:

**Supporting** – Mechanisms for the private sector to invest in value chains and entrepreneurship; and

**Sustaining** – Thriving local, resilient livelihoods.



### Economic

Green produce value chains that contribute to employment



### Socio-cultural

All Community members have increased capacity to absorb shocks



### Agricultural Productivity

Diversified Farming systems will provide rural food and nutrition security



### Environment

Agriculture and environment are managed as interlinked and for enhanced resilience



### Institutional

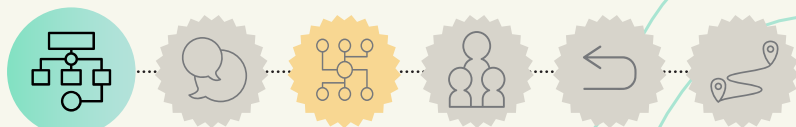
Multi-stakeholder platforms and evidence play a critical role in planning and decision making

### SUPPORTING ELEMENTS

- Mechanisms for private sector to invest in value chains and entrepreneurship.
- Green jobs and entrepreneurship of youth.
- Mechanisms to enhance farmers organizations' capacities agroecological and nutrition smart practices.
- Mechanisms to incentivize and coordinate multi-stakeholder and multi-sectoral efforts.

### SUSTAINING ELEMENTS

- Thriving local, resilient livelihoods.
- Society respects and values the equity, education and prosperity of all of its members.
- Resilient ecosystem, functioning water cycles, high biodiversity, healthy land.
- Responsive, effective and trusted government.



## Causal Analysis

**Causal analysis is used to highlight barriers that prevent the achievement of a vision or desired future state.** It is used to understand what issues underpin identified barriers to achieving a desired outcome. When problem solving, the root cause analysis can be used to check if the team is looking at the problem or just a symptom of the problem.

### Key Steps for Causal Analysis:

- Brainstorm the different barriers;
- Prioritise the barriers to identify those that are most pressing and select one to three main barriers;
- Identify initial causes in a chain of levels to identify the root cause;
- Consider the implications of the barrier if it is not addressed;
- Looking across the root causes and implications, categorise those that are social, economic, institutional, political, cultural, environmental, etc.; and
- Consider the root causes and categorise the types of stakeholders that would have to be involved to solve the underlying causes of the barrier.





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Some important barriers to consider in the context of the theme are food insecurity, water scarcity/droughts (seasonal unpredictability), and transboundary diseases and pandemics.

**Examples of the underlying causes identified for the barrier water scarcity/droughts (seasonal unpredictability) include:**



**Social** - Overuse of available water sources;



**Environmental** - Poor land management;



**Political** - Lack of, or ineffective, water management policies; and



**Institutional** - Unsustainable agricultural practices.

Implications for inaction against water scarcity could include, for example:



Increased time seeking water by women and girls;



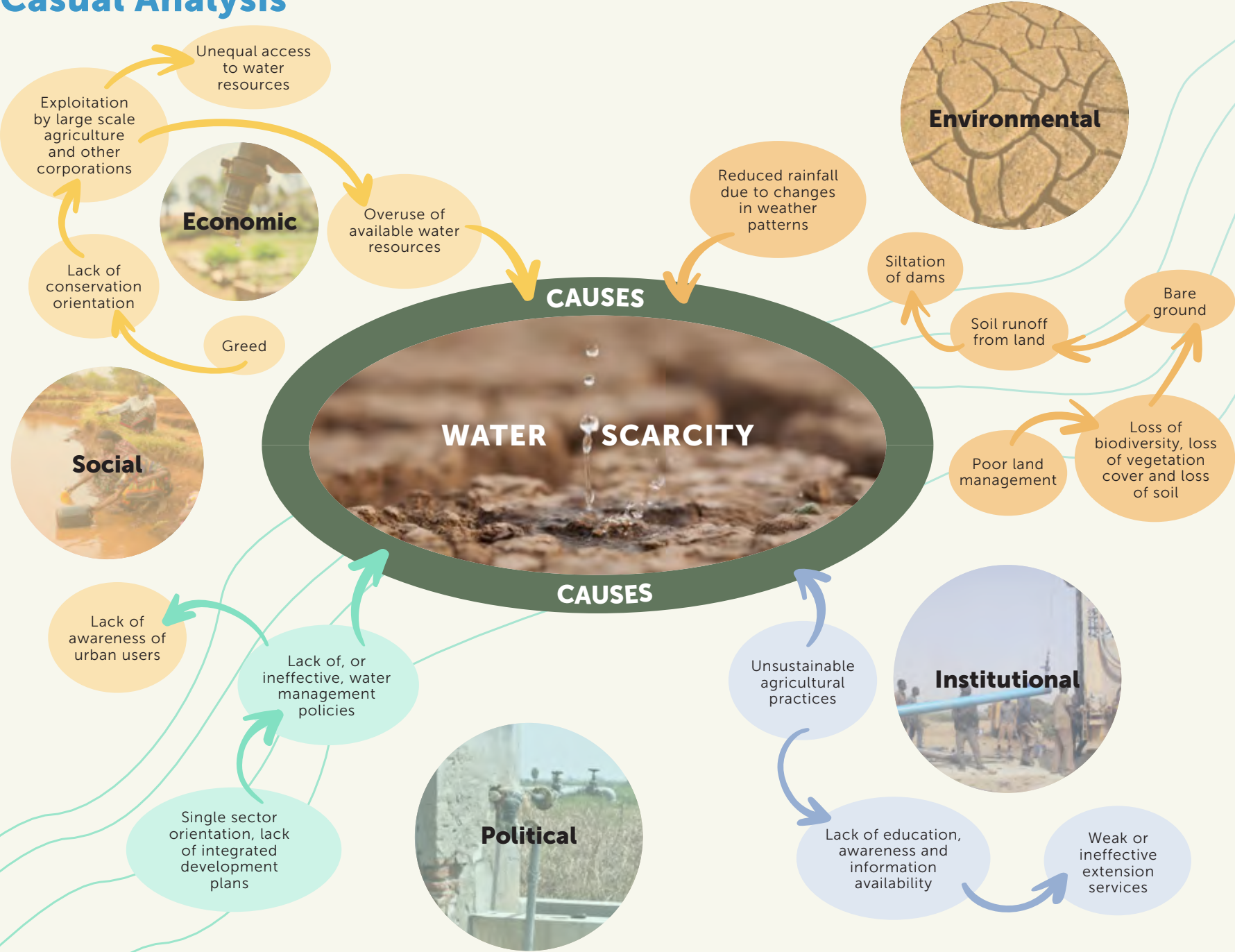
Increased marginalisation of women and girls; and

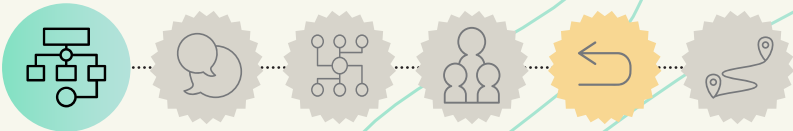


Loss of tourism.

The stakeholders chosen to address the underlying issue of water scarcity come from multiple sectors and are grouped according to categories (e.g. government, civil society, private sector, and others). **This ensures multidimensional viewpoints and non-biased, holistic approaches for addressing the issue at hand.**

Casual Analysis





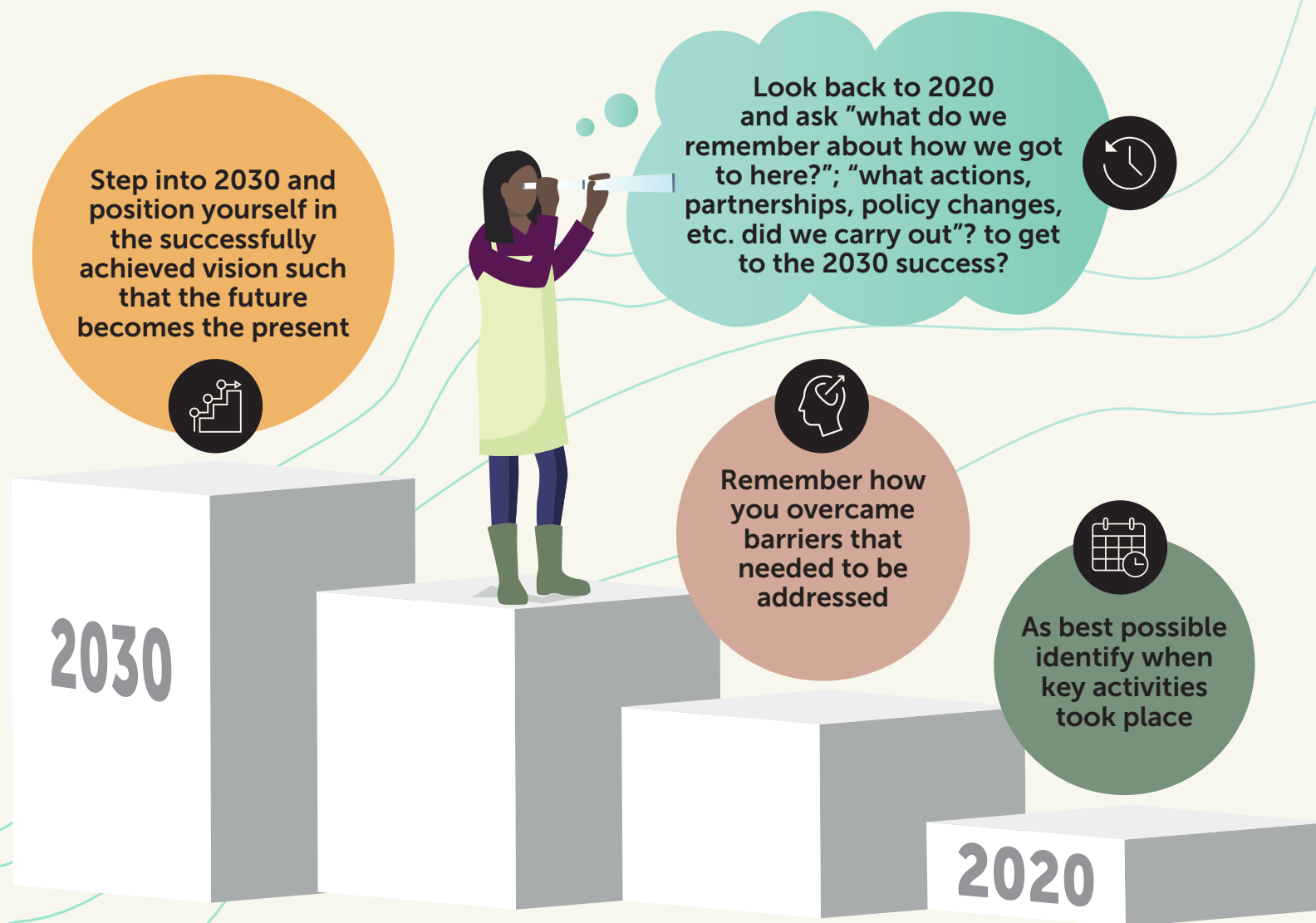
## Backcasting

Backcasting is an approach that starts with defining a vision or desirable future and then works backwards to identify key efforts, partnerships, policy changes that will connect that future to the present.

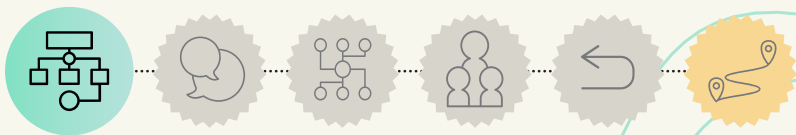
### Key Steps to Backcasting:

- Step into 2030 and position yourself in the successfully achieved vision such that the future becomes the present;
- Look back to 2020 and ask: what do we remember about how we got to here; what actions, partnerships, policy changes, etc. did we carry out to be successful in 2030?
- Remember how you overcame barriers that needed to be addressed; and
- As best possible, identify when key activities took place.

## Backcasting - Key Steps







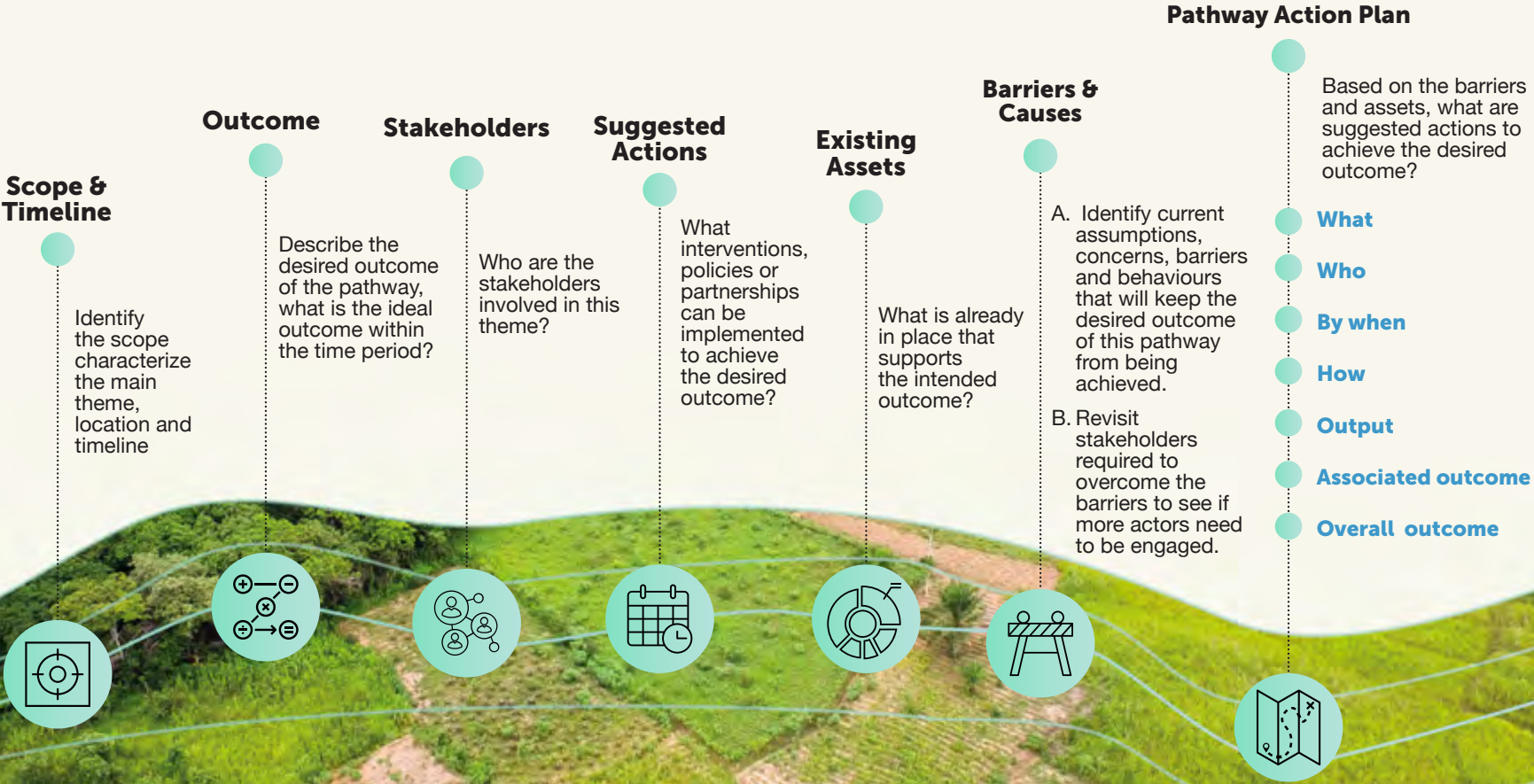
## Pathway Development

The pathway development approach requires creating storylines that frame the analysis and discussion around possible future development trajectories. Pathways outline the actions, actors, and time frames necessary to achieve the agreed outcome.

**The following non-explicit steps can be used to develop a pathway:**

- Provide the scope and timeline;
- Identify the preferred outcome;
- Select the stakeholders that need to be involved;
- Identify which actions and activities need to be considered;
- Identify any existing assets that can be built off (in terms of planning this could include partnerships);
- Understand the barriers and causes; and
- Develop the pathway action plan, providing details on activities such as who, how, what the intended outcome is, by when and what the overall outcome is.

# Climate-Resilient Pathways







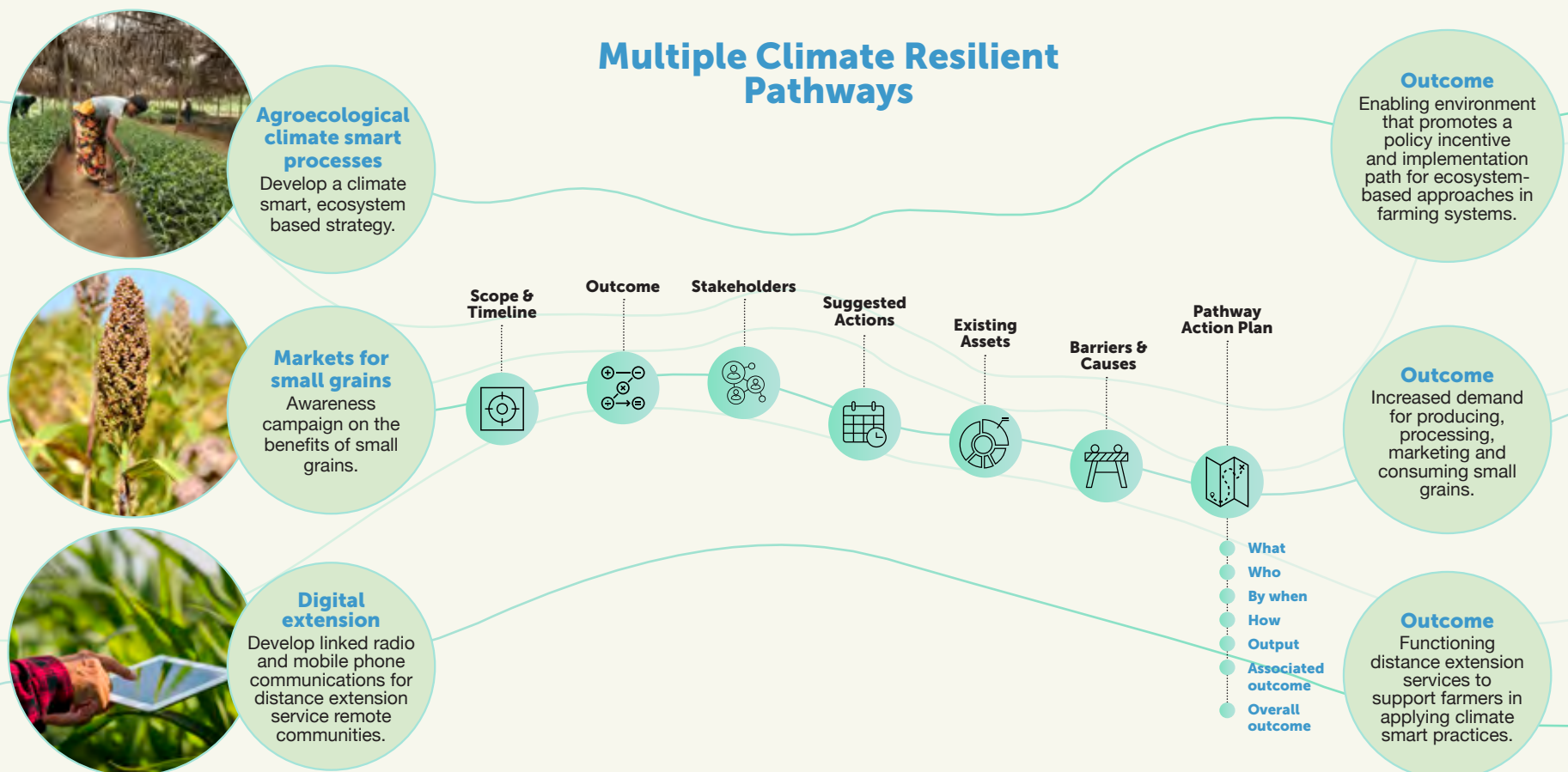
## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the context of the theme, three pathways were developed to move the agri-food systems in the direction of climate resilience. For example:

- Agro-ecological climate smart processes;
- Markets for small grains; and
- Digital extension.

These pathways were developed to achieve individual outcomes that in combination contribute to the overall vision of climate-resilient development.

### Multiple Climate Resilient Pathways



## MODULE 06 Review and Application of the SADC Futures Foresight Framework



Photo: Georgina Smith (CIAT)



## Trade-offs

The next step requires looking for trade-offs, this method is valuable for identifying conflicting elements across multiple pathways toward the future state.





## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The scale, scope, and complexity of agri-food systems and their linkages to natural and human systems mean that future development will result in inevitable trade-offs among and between dimensions. For example, when looking at the previously defined climate resilient pathways in unison it becomes clear that there will be trade-offs that could restrict the success of the pathways. For example:

- Vested interest in small grains could result in fertiliser subsidies that may disincentivise integrated farming systems or seed saving;
- Farmers would potentially trade off maize subsidies for drought resilient crops; and
- Promoting subsidies and fertilisation versus agro-ecological approaches.

### Climate Resilient Pathways - Tradeoffs



**Vested interest in small grains could result in fertilizer subsidies that may disincentivize integrated farming systems or seed saving**



**Would farmers potentially trade off maize subsidies for drought resilient crops**



**Promoting subsidies and fertilization versus agro-ecological approaches**

#### Outcome

Enabling environment that promotes a policy incentive and implementation path for ecosystem-based approaches in farming systems.

#### Outcome

Increased demand for producing, processing, marketing and consuming small grains.

#### Outcome

Functioning distance extension services to support farmers in applying climate smart practices.

#### Agroecological climate smart processes

Develop a climate smart, ecosystem based strategy.

#### Markets for small grains

Awareness campaign on the benefits of small grains.

#### Digital extension

Develop linked radio and mobile phone communications for distance extension service remote communities.

Photo: Georgina Smith (CIAT)



## PROSPECTION – What might happen?

In the prospection stage it is important to consider what might happen that we have not thought about.

**Methods introduced here include:**



**Developing scenarios;**



**Identifying drivers and critical uncertainties; and**



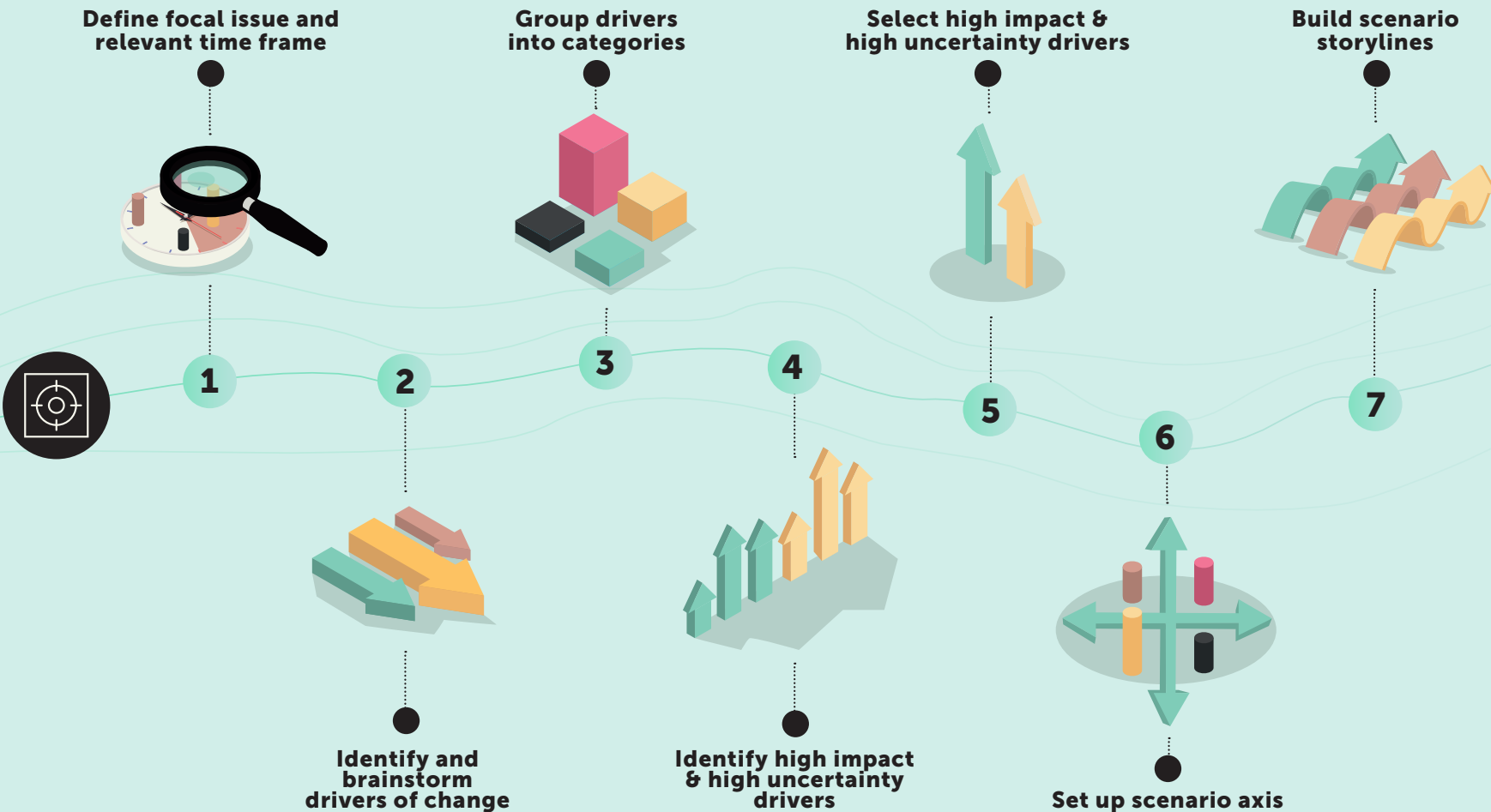
**Developing plausible future scenarios.**



## Developing Scenarios

Foresight uses scenario development as an approach to understand high impact and highly uncertain drivers and to describe possible future states. Although they address uncertainty, scenarios are not predictions, forecasts or projections, they are not 'true' or correct/wrong, only plausible.

### Key Steps for Developing Scenarios







## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

The focal issue to be addressed is 'the integration of climate resilience throughout the SADC region's agri-food systems'. The time frame appropriate to the focal issue is 10 years i.e. 2020 - 2030.

Some of the drivers of change identified during a brainstorming session included:



Changes in food price;



Presence of a land tenure system;



Level of conflict;



Level of access to renewable/non-renewable energy;



Climate risk;



Water scarcity; and



Level of labour;



Land degradation.



These were then grouped into categories (socio-cultural, economic, environmental, and institutional) – this forces you to think outside of the box, or outside of your area of specialty, and ensures that you do not omit an unfamiliar area.

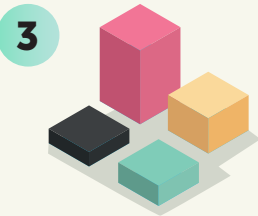
The drivers were then ranked according to high impact and high uncertainty, some of which included:

 Youth unemployment;

 Climate risk; and

 Regional integration;

 Transboundary disease prevalence.



Drivers

Level of food security	Socio-Cultural	Changes in- or out-migration
Urbanisation demographic change	Level of human insecurity	Nutritional status
Level of conflict	Population growth + Age ranges	Level of human health + disease
		Patterns of corruption
Level of Labour	Agricultural Productivity	Presence of productive inputs (machines)
Level of crop pests	Level of extension/knowledge sharing	Presence of animal disease outbreaks
Presence of early warning system	Level of Mechanization	
	Levels of regional infrastructure	Investment in research and technology
	Changes in agri-cultural employment	Changes in level of youth unemployment
	Presence of land tenure system	Economic
	Level of nationalisation	Levels of international trade
		Changes in food price
		Changes in investment in infra-structure + social goods
		Changes in national authority + decentralisation
		Level of SACU regional view and integration
		Environmental management legislation + land environment

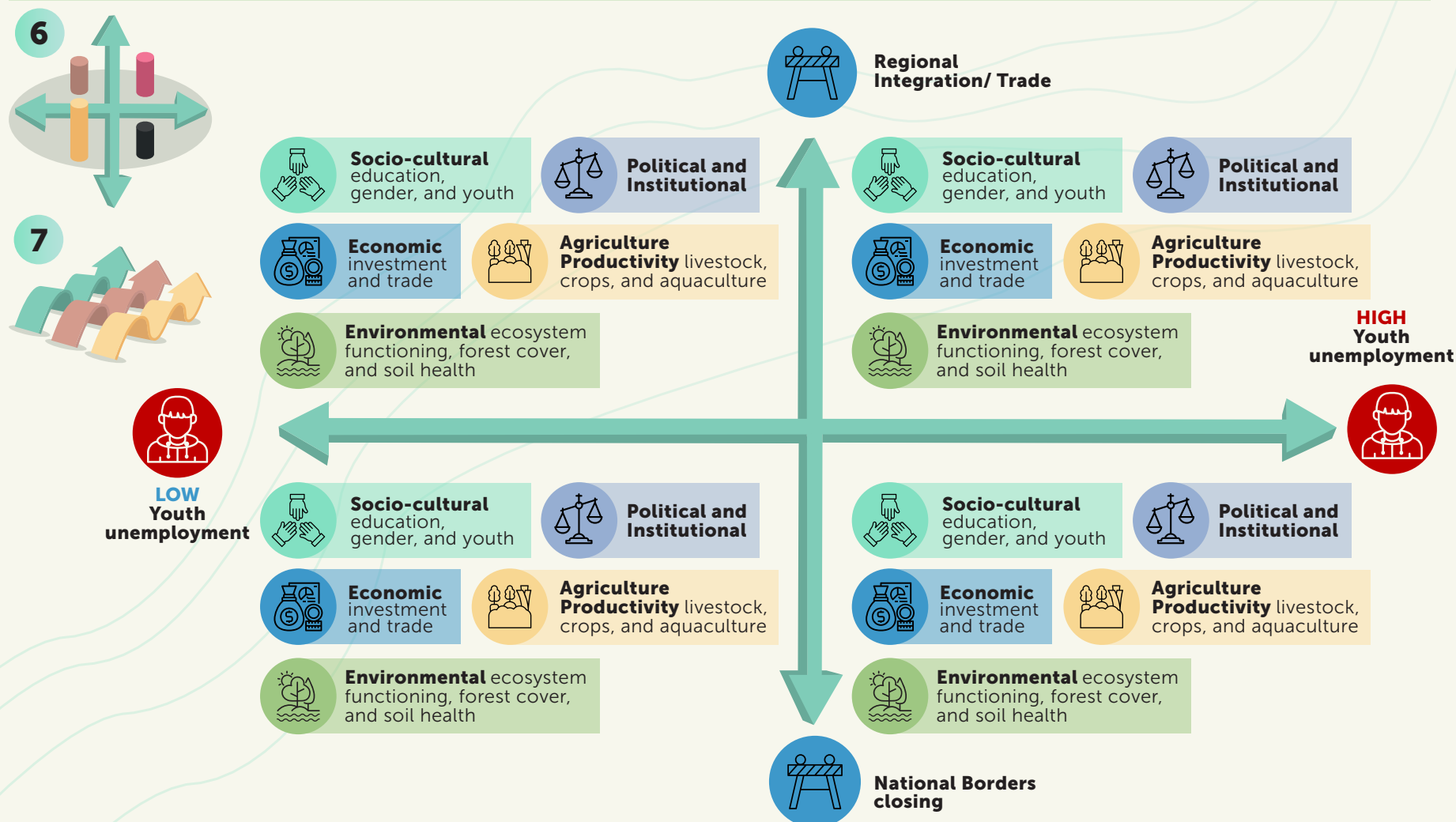
Drivers	Impact (L,H)	Uncertainty (L,H)
Economic	High	High
Governance Political Institutional	High	High
Natural Resources and Environment	High	High
	High	High

High impact and high uncertainty drivers are designated as axes in a scenario matrix and the different dimensions are laid out to prevent the omission of a category. Each quadrant is considered individually and reflects how the two drivers meet. Storylines are then developed for each dimension within each quadrant of the scenario matrix, for example:

### Drivers: Highly integrated region and low youth employment

**Environmental** - Desire for short term benefits leads to status quo for land management and potential for land and forest degradation.

**Political/institutional** - Member countries are focused on economic development, poverty alleviation and peace and security. Political stability.





### **Socio-cultural** education, gender, and youth

Governments have increased national budgets but may or may not focus resources on improved social safety nets, education and empowerment. Higher employment rates allow for greater spending power. **Increase in well being.**



### **Economic** investment and trade

SADC support to cross country results in effective trade, investments infrastructure, investments in short and long value chains. **Increased access to agricultural markets.** High employment rates influence national and international income, industry growth. Available resources inspire entrepreneurship, greater use of technology. **Land locked countries will be better off.**



### **Political and Institutional**

Member countries are focused on economic development, poverty alleviation and peace and security. **Political stability.**



### **Agriculture Productivity**

livestock, crops, and aquaculture

**Increased youth participation in agriculture value chains. Productive, mechanized agriculture with low labour intake.** Pastoralists, small-scale farmers and fishers may be marginalized in favor of large-scale production systems. Integrated farming systems are not promoted.



### **Environmental** ecosystem functioning, forest cover, and soil health

Desire for short term benefits leads to status quo for land management and potential for land and forest degradation.

**National Borders closing**

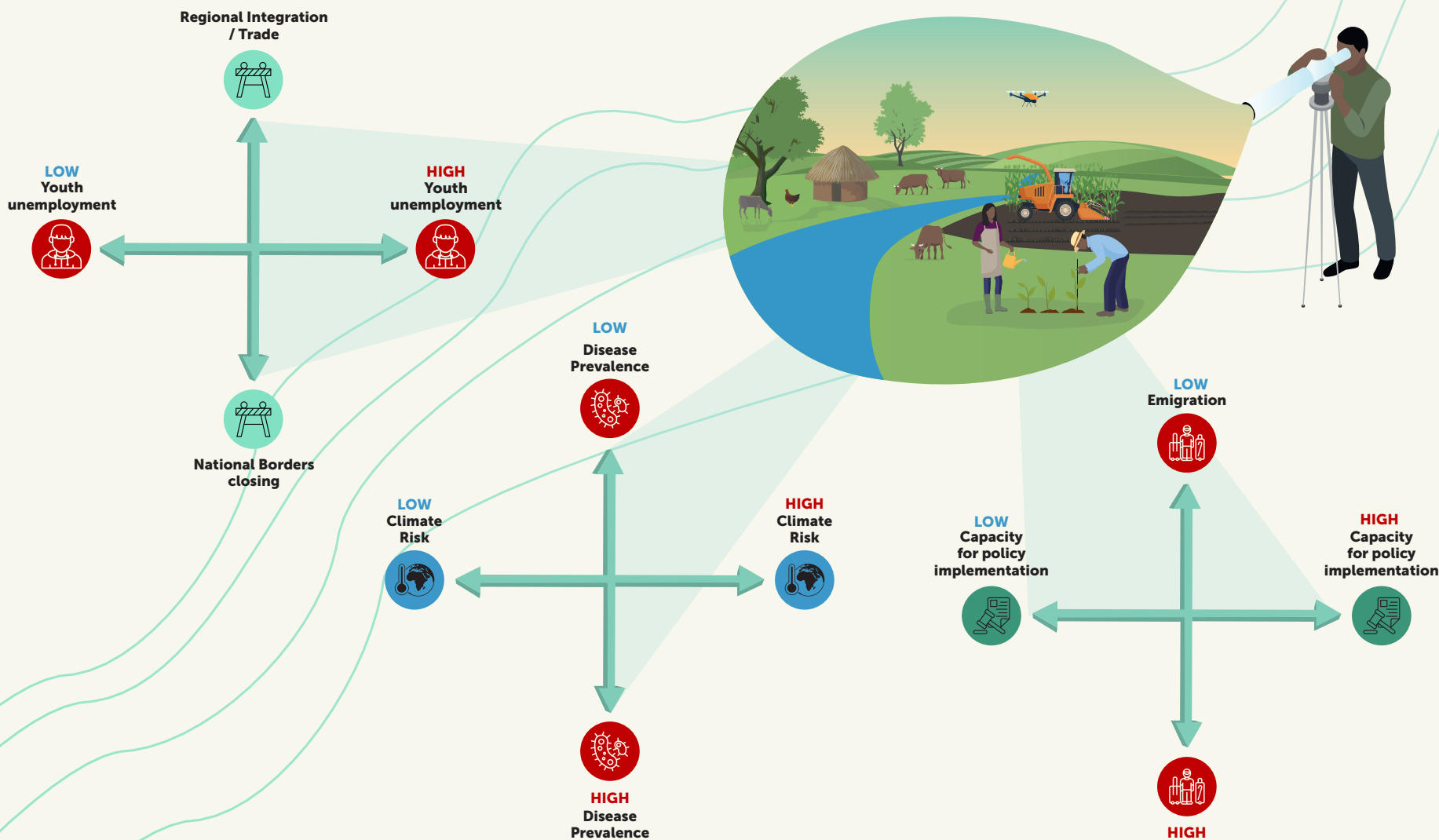


**HIGH Youth unemployment**



# MODULE 06 Review and Application of the SADC Futures Foresight Framework

By building rapid and multiple scenarios using combinations of different drivers and how they play out within the dimensions of each category (as with the trends analysis) you can reduce background bias. The more drivers we look at together the more robust our understanding of plausible futures is. For example, in considering the COVID-19 pandemic, if multiple scenarios had been run with public health drivers could it have allowed us to see a pandemic as a plausible event?



MODULE 06  
Review and Application of the SADC  
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## REFLECTION AND STRATEGY– What might, and will we do differently?

In these stages it is important to understand the implications of scenarios and to consider elements that allow for transformational change. It can then be determined as to what to do differently going forward.

**Key methods in this stage include:**



**Scenario implications;**



**Transformation elements;**



**Transformational change; and**



**Transforming climate resilient pathways.**



Photo: Olivier Asselin (FAO)



## Scenario Implications

Once the scenarios have been developed, this method is used to reflect upon and explore what has emerged in the scenario storylines that might have implications on achieving a vision.

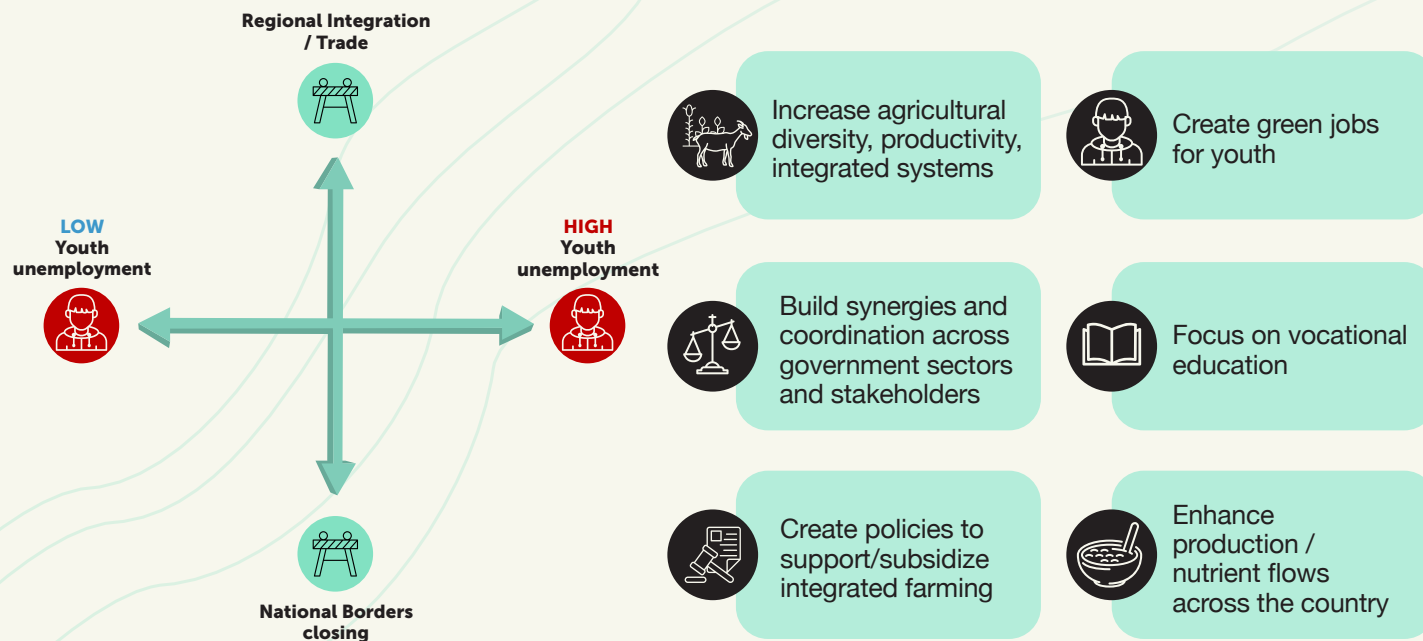
**Here we consider the implications of the storylines and designate appropriate actions and activities to achieve the preferred future or avoid negative storylines.**



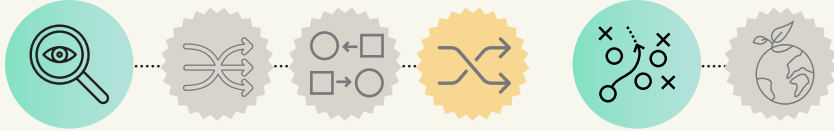
## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Looking across the scenario storylines that have been developed, examples of actions that need to be taken to increase the likelihood of reaching the preferred future or avoiding the negative storylines could be:

- Increase agricultural diversity, productivity, and integrated systems;
- Build synergies and coordination across government sectors and stakeholders;
- Create policies to support or subsidise integrated farming;
- Create green jobs for youth;
- Focus on vocational education; and
- Enhance production/nutrient flows across the country.







## Transformational Change

This is where we think about what our actions need to be to adequately respond to the different possible futures identified during the scenario development process to achieve transformational change. Transformational change includes major long-term changes in the way we operate and may shift us between, or into, a new 'system' and process. This can be a significant or radical level of change.

**This training provides three categories of transformative actions to assist in moving away from iterative change, namely:**

- Interventions;
- Policies; and
- Partnerships.

### Categories of transformative actions

#### Integrated and adaptive interventions



#### Flexible, robust and synergistic policies that drive implementation



#### Novel partnerships, cross sectoral or multi-stakeholder relationships





## Key Steps for Transforming Pathway Action Plans:



### STEP 1

Clarify the outcomes  
Prioritize transformative  
actions



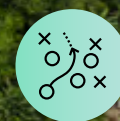
### STEP 2

Engage new suggested  
partnerships and  
stakeholders that have  
been identified



### STEP 3

Build climate resilient  
pathways or modify  
existing ones  
  
Agree on roles and  
financing modalities



### STEP 4

Key focal points in  
place to integrate  
into decision and  
policy processes

Photo: Axel Fassio (CIFOR)



## Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

In the plan stage, the defined climate resilient pathway had an outcome of all farming systems being more **diversified and moving in the direction of green employment and climate resilience**. The original pathway action plan was subsequently upgraded through new interventions, policies, and partnerships to allow for transformational change.

For example:

### Who?

**From:** Government sectors (agriculture, water, environment, extension services), nongovernmental organisations (NGOs), UN FAO, farmers' groups, women's organisations, youth groups, development partners, investors, and media.

**To:**

**New Partners 1** - Large scale and small-scale farmers and pastoralists partner together with youth and work directly with regenerative farm/pasture to market buyers;

**New Partners 2** - Global/Regional investors partner with telecommunication companies for direct payments to farmers/pastoralists and with high school graduates to monitor practices; and

**New Partners 3** - Epidemiologists and extensionists, health providers, and conservancies partner for early detection of disease prevalence

## Transformational Pathway Action Plan

### What

**Build capacity and incentivize integrated farming systems using agroecological practices**

**New What:** Build linkages among large and small scale farmers and use co-learning to develop joint capacity; Establish linkages with regenerative, climate smart certification markets to incentivize regenerative practices and whole system thinking; Create youth led transboundary detection protocols and teams.

### Who

**Government sectors – Agriculture, water, environment, extensions services, NGOs, UN FAO, farmers' groups, women's organizations & youth groups, development partners, investors, media**

**New Partners 1.** Large scale and small scale farmers and pastoralist partner together with youth and work directly with regenerative farm/pasture to market buyers.

**New Partners 2.** Global/Regional investors partner with Telecom for direct payment to farmers/pastoralists and with high school graduates to monitor practices.

**New Partners 3.** Epidemiologists and Extensionists, health providers, and conservancies partner for early detection of disease prevalence.

### By when

2028



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## CASE STUDY

**Scenario guided formulation of the regional Climate-Smart Agriculture (CSA) policy for the System of Integration of Central America (SICA) region by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) program** (Le Coq et al., 2019)

This case study is a CSA policy that was formulated for Central America (inclusive of Belize and the Dominican Republic).

The CCAFS Future Scenarios Project has been ongoing since 2013 in different regions at a global scale:

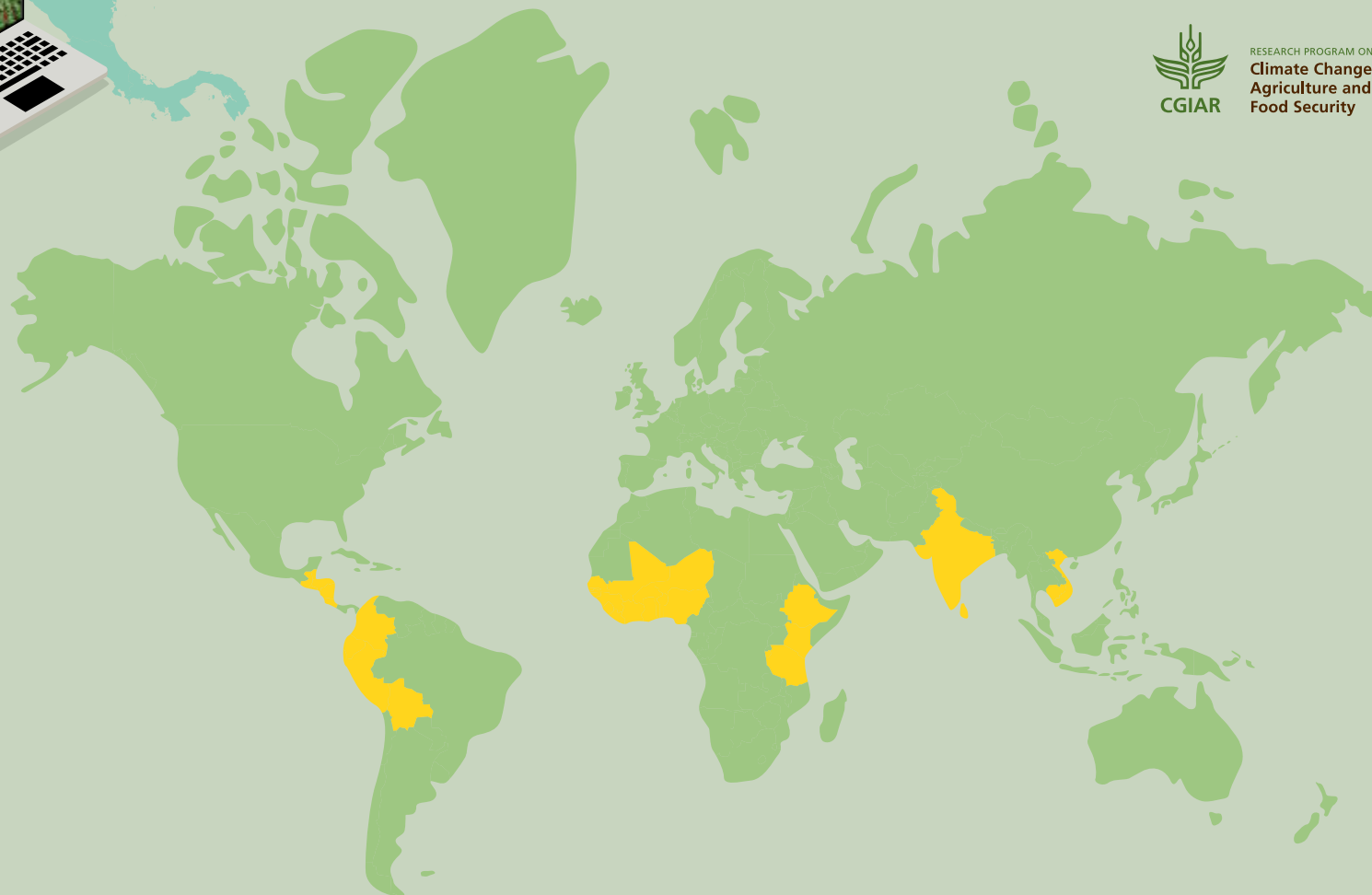
- Central America;
- Andes Region;
- Eastern Africa;
- Western Africa;
- South Asia;
- Southeast Asia; and
- Pacific.

The project is stakeholder-driven, policy focused, and includes 240 partner organisations worldwide e.g. World Resources Institute (WRI), Food and Agriculture Organisation (FAO), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), regional economic bodies, national governments, nongovernmental organisations (NGOs), private sector, academia, and media.





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**The main objective of the CCAFS Future Scenarios Project is to work together with different countries to generate socioeconomic and climate scenarios to support decisionmakers in the formulation of robust plans, policies, investments and institutional arrangements for agriculture and livestock to confront climate change under varying circumstances.**

The assessment required the development of scenarios based on drivers of change for agriculture, food security, environment, and livelihoods.

## MODULE 06

### Review and Application of the SADC Futures Foresight Framework





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This project was done in collaboration with International Food Policy Research Institute (IFPRI) and the International Institute for Applied Systems Analysis (IIASA) to model scenarios with partial equilibrium models (IMPACT and GLOBIOM). The project was demand driven by the stakeholders.

It is crucial that future scenarios recommendations used for policy development are really embedded within the process to ensure that the recommendations are considered and implemented.

The CSA policy was developed for the SICA region because it is one of the most vulnerable regions to climate change. Smallholder farmers constitute the majority of agricultural production in the region and are highly vulnerable to climate change.



#### **The formulation process of the strategy took place over the following timeline:**

- The process was started in December 2016 with a regional workshop on strategic axes and lines of actions. This involved stakeholders that were identified as being important to the process. Central America already had systems in place that could be leveraged off, these included the Regional Technical Group (representatives of Ministries of Agriculture), CAC technical committee on climate change and the Inter-Agency Group (included national and international NGOs and research institutions).
- The stakeholders were then invited to a regional workshop in 2017, to layout the main structure of the policy.
- This was then followed by a period of virtual collaboration to refine areas of the policy.
- A regional scenarios workshop was then organised with stakeholders to test the policy. This was then put forward for an open online consultation.
- A few months later, still within the year 2017, the CSA policy was approved.



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**Key steps taken in the formulation process of the Central American CSA Strategy included:**

- **STEP 1 - Review of the draft policy.** A draft version of the CSA policy was validated with key public and private stakeholders.
- **STEP 2 - Adjust the narrative of the regional scenarios to include policy relevant variables.** Stakeholders then adjusted the narratives of four existing socioeconomic and climate scenarios on the future of agriculture, environment, and food security to variables relevant to the policy (to ensure that the scenarios would present issues relevant to the policy). The original scenarios were created in a participatory fashion in 2013.
- **STEP 3 - Test the policies' strategic guidelines and actions in the context of the different scenarios.** All policy elements (objectives, actions, etc.) were then tested for effectiveness in all four scenarios and recommendations of improvement were given to increase the robustness of the policy.
- **STEP 4 - Compare recommendations.** Which recommendations are relevant to several scenarios? What are the strengths and weaknesses of the policy? Any critical assumptions that have not been considered and need to change?
- **STEP 5 - Writing up of recommendations.** Recommendations were presented before a board of ministers. Recommendations were then revised and included by the core policy team.



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## MODULE 06

### Review and Application of the SADC Futures Foresight Framework



#### Key Factors of Success:

- Institutions and science-policy interface;
- **Pre-existence of CAC technical committee** on climate change;
- **Interagency group (donors and researchers)** to support the formulation;
- **Track record** of CCAFS in technically supporting the Ministries of Agriculture, including support in policy formulation through the exploration of future scenarios; and
- **Good communication** between the executive secretary of the technical committee and the SICAs ministries.



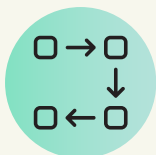
#### Methodology:

- Combination of **face-to-face and virtual consultation**. Stakeholder integration that fostered transparency and openness; and
- **Prospective methods** to assure the systems approach and reduce future uncertainties.



#### Policy and Politics:

- Clear **policy will** and mandate;
- **Leadership** from the Costa Rican Minister of Agriculture; and
- **Policy windows**.



# Foresight Methods and Tools



## Questions & Answers

This set of questions and responses came from the SADC Futures webinar series which was attended by participants from across the SADC region.

### **In a scenario with insufficient political will but clear will from other stakeholders - how best can we navigate this?**

The reason we explore these scenarios is to ensure that things move in the right direction. In this case, if there is insufficient political will, the stakeholders or civil society would likely ensure that action is taken. Civil society can really make a difference. Although it is key to consider the context of the situation.

### **If you want to review an existing policy do you look at the policy first before developing the scenarios, or develop the scenarios then review the policy?**

Both options are possible. However, if you work with a draft version of the policy first the impact of the scenarios work might be more concrete.

### **What are some of the biggest challenges in using the foresight process to shape policies?**

It is important to dedicate some time to explain that you are exploring possible futures, and not only the futures you want. It is important to embed the scenarios exercise in the broader policy process and include key decisionmakers to make sure recommendations are really taken forward.

### **Politics versus climate change in Africa, which is the greatest issue when thinking of the future?**

More youth are needed in politics in Africa. There is a need for young, energised people who want to change their futures and the futures of their children.





## Questions & Answers

### How can we manage unreliable data/information/archives in the SADC region?

Reliable data is an issue not just in Africa but globally. Ground level weather station numbers have declined considerably. New methods using remote sensing in combination with ground level weather data is common. Some websites pull together household datasets from around sub-Saharan Africa. Other options include crowdsourcing and alternative big data techniques.

### How do you manage stakeholder engagement where there is no project setting and attendance varies according to personal will? The stakeholders keep changing and there is no continuity.

In West Africa, CCAFS set up a science policy stakeholder platform and embedded it in a national structure. It was funded, but the allocation was minimal. Those involved had to produce Annual Work Plans, this kept the momentum going. It is important to use a national organisation to embed the work within and to take to it on.

However, if this is not possible, encourage attendance by getting people to make a commitment. Make the sessions invigorating so that people want to attend. Use a formal social networking tool or surveys to see why people are disinterested, interpret the data, and re-evaluate your sessions.

### I am working with smallholder farmers in producing vegetables for the export market. How do I go about the stakeholder engagement process?

Firstly, you need to consider all levels of institutions and policies for the export market- this would include the international level right down to the local level. Start off by brainstorming stakeholders, even if they may not all seem relevant at the start. The stakeholders can be narrowed down as you progress through the foresight process.

Ask yourself who the key stakeholders are e.g. the private sector (potentially large- and small-scale commercial farmers), financial sector and donors. Next you need to understand the relationships between them, the levels of influence and power dynamics. To communicate with farm workers, work with established coalitions and unions. Do not forget to consider who is not represented such as vulnerable women, children, and those with disabilities. Remember that a stakeholder map is dynamic, it will change as your project unfolds.



# Application of Foresight

The table below provides some of the responses from participants of the SADC Futures webinar series on how they plan on applying the foresight methods and tools to their current areas of work or projects.

Institution	Theme	Scale	Tools and Methods	Application
Agriculture Research Council	Crop protection, grain production	District	Data, evidence, knowledge, and creativity as well as stakeholder engagement and participation	Develop a strategy for crop protection and grain security for South Africa
Zimbabwe Parks and Wildlife Management Authority	Reducing natural wildlife mortalities	Region	Prospection	Use environmental models to identify drivers of change and predict future scenarios
Zambia Meteorological Department	Creating conditions for conservation and sustainable agriculture through integration of climate and weather information	Community	Analysis stage - Trends analysis of climate patterns. Interpretation stage- using systems mapping and cross sectoral and multi-stakeholder approaches to promote ownership and adoption	Bottom up approach, i.e. integrating user communities and promoting synergies for sustainability
Zambian Centre for Lifelong Learning	Enhancing the adoption of technology for reducing postharvest maize losses among smallholder farmers in sub-Saharan Africa: a case study of Zambia	Region	Nearly all the tools	Some of the tools will be used during data interpretation and the development of the research model for increasing the uptake of post-harvest loss reduction technologies

Institution	Theme	Scale	Tools and Methods	Application
Agricultural Research Council/ University of Cape Town	Evidence-based adaptive and integrated water resources management	Region	Systems mapping and causal analysis	<p>To identify the variables that interact to enhance or affect water policy planning and performance</p> <p>To determine the variables that should be considered in water policy planning and performance monitoring and evaluation</p>
University of Fort Hare	Sustainable agriculture-Community Food Security Gardening Project for the unemployed youth	Community	All the tools	Will employ both top-down and bottom up approach to interact with all stakeholders concerned, for the Food Security Gardening Co-operative projects at community level
International Livestock Research Institute	Applying foresight to create opportunities for better livestock value chains and natural resource management	Region	Stakeholder engagement for full participation in analysis, planning, prioritising, reflection and feedback	Will use it in upcoming projects
C4 EcoSolutions	Applying foresight for increasing water resilience	Region	Causal analysis, identifying drivers and uncertainties, scenario implications	Use foresight to improve integrated watershed management
Cape Peninsula University of Technology	Applying foresight to explore ways to manage systemic risk to enhance social equity and build drought resilience at multiple scales	Multiple scales (community to catchment)	All the tools	<p>The scope and theme of the research is already in place, the establishment of the boundaries of the project (physical, then geopolitical) is underway</p> <p>The timeline is set, but there is a need to understand the structures and policies governing the fruit and vegetable value chain</p> <p>Then stakeholder mapping will be carried out</p>

Institution	Theme	Scale	Tools and Methods	Application
Women Who Farm Africa / CAADP Youth Network (CYN)	<p>Accelerate the landscape for agricultural technology adoption among Africa's Women Farmers to scale up their production while mitigating the effects of climate change</p> <p>Explore how the youths in the agriculture space can become more productive in all stages of the agricultural value chain so that they may improve their livelihoods</p>	Continental but will be done in phases starting with the Southern Africa Region for both initiatives	Reflection, Planning (if not all)	<p>Women Who Farm Africa - explore the future in which Agritech is highly adopted and what is getting in the way from reaching this desired future</p> <p>Reflect on how as an organisation we can deliver our flagship Leadership Development Programme so that women farmers can increase Agritech adoption at an affordable cost</p> <p>CYN - plan around achieving high productivity for youth in the Agricultural Sector</p> <p>Reflect on the media campaigns to encourage the employment of youth within the various stages of the Agricultural Value Chain</p>
Institute of Agricultural Research of Mozambique (IIAM)	Identification of training and technology transfer needs in farmers for adaptation and mitigation to climate change	District	<p>Analysis stage - trend analysis, horizon scanning and evidence</p> <p>Plan stage - causal analysis and stakeholder analysis</p>	Organising meetings with different stakeholders at the provincial, district and community levels
Indaba Agricultural Policy Research Institute	Mainstreaming climate change adaptation practices into broader agricultural policy and finance	Region	Prospection, Reflection and Strategy stages	General policy influence at the institutional level

## MODULE 06

### Review and Application of the SADC Futures Foresight Framework



Institution	Theme	Scale	Tools and Methods	Application
Independent researcher	Shaping the future of agriculture and food systems in Zimbabwe	National	Scenario Analysis	The scenarios output will aid in policy planning purposes for all relevant stakeholders (e.g. government, academia, private sector, farmers)
Cranfield University	Effect of climate and drought risk on irrigation, water use and crop production	National	Stakeholder mapping and defining the timeline, trend analysis, a combination of causal analysis, backcasting and pathway development and trade-offs, developing plausible future scenarios and considering transformational changes required to achieve the desired plausible outcomes	Form partnerships with stakeholders including farmers, policy makers in both local and national government, irrigation system development companies and NGOs that are interested in sustainable crop production to meet the growing demand despite the risks posed by climate change that result in drought risk and other extreme weather events
Christian University of Rwanda	Create tools for agriculture/livestock conservation, breed dairy cows that emit less methane gas, to lower the effects on climate change	Community	Trend analysis, horizon scanning, systems mapping and transforming climate resilient pathways	The tools will be used through the structures and policies set in the Rwandan Livestock Industry as well as during research activities



## MODULE 06

# Review and Application of the SADC Futures Foresight Framework

Photo: Axel Fassio (CIFOR)

## References

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