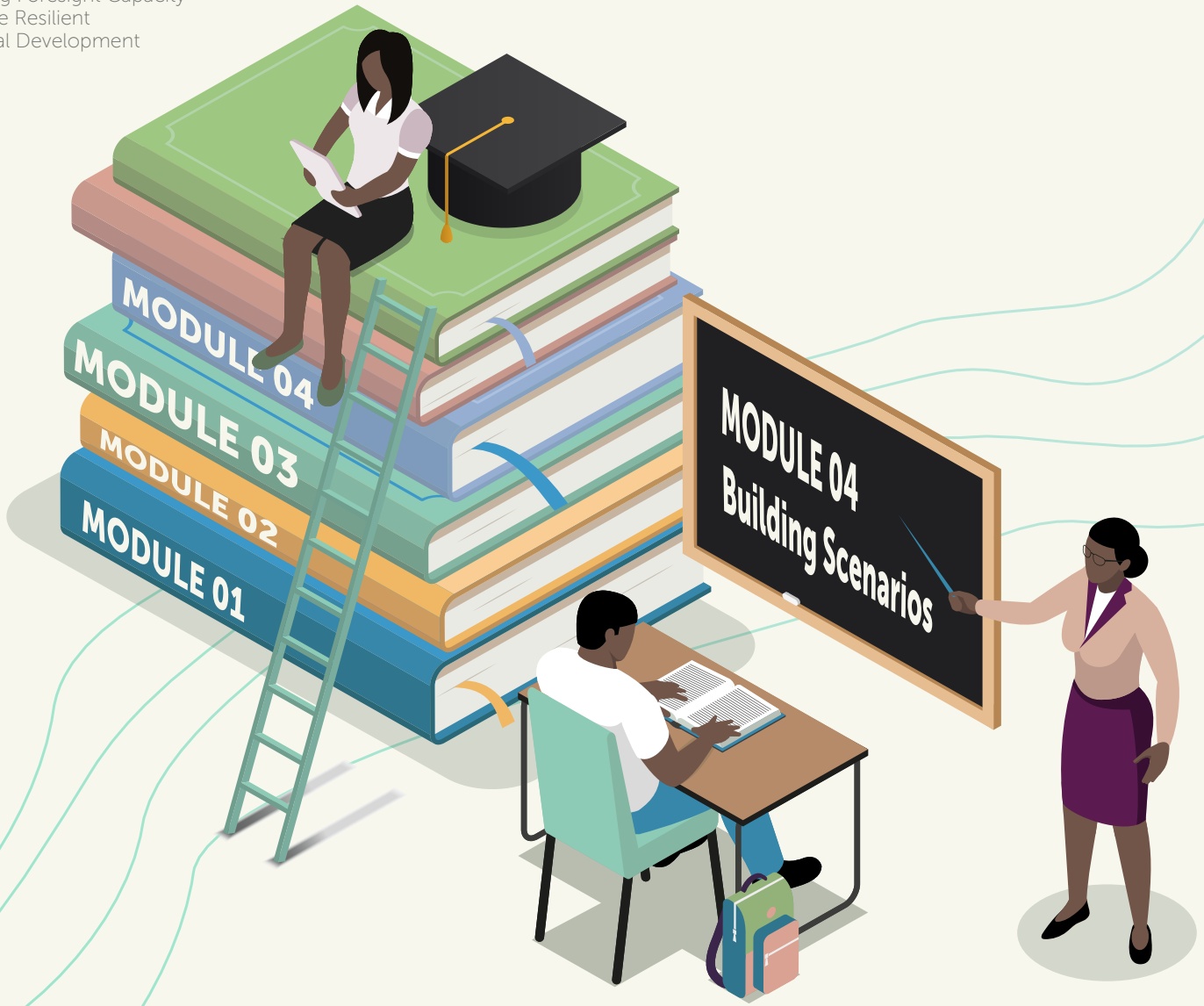
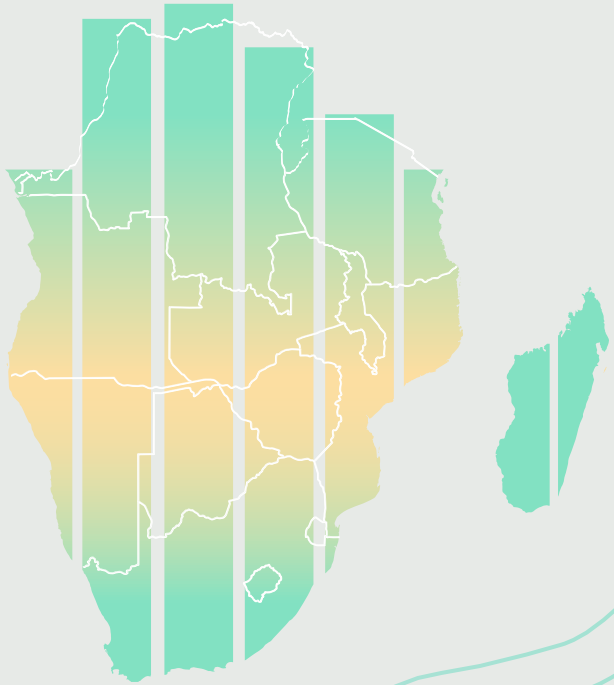
SADC Futures

Developing Foresight Capacity for Climate Resilient Agricultural Development



MODULE 04
Building Scenarios

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security · CCAFS · ILRI · german cooperation · Implemented by: giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH · CCARDESA



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SADC FUTURES FORESIGHT TRAINING TOOLKIT

The SADC Futures project (https://bit.ly/SADCFuturesForesight) has developed a range of foresight training materials. The SADC Futures Foresight Training Toolkit forms part of this knowledge series and presents content that was given during the SADC Futures webinar series, a six-part virtual webinar series and facilitated training.

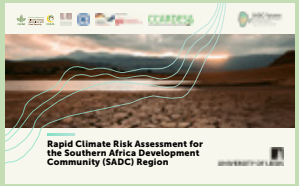
INPUT

Structures, Policies and Stakeholder Landscape Relevant to Climate Change and Agriculture in the SADC Region

ANALYSIS

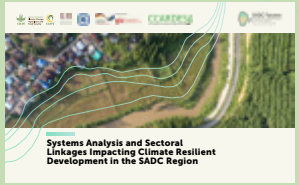
Historical Analysis of Climate Change and Agriculture Related Events in SADC

Mega-trends in the Southern African Region



Rapid Climate Risk Assessment for the Southern Africa Development Community (SADC) Region

INTERPRETATION



Systems Analysis and Sectoral Linkages Impacting Climate Resilient Development in the SADC Region

PLAN

Climate Resilient Development Pathways

PROSPECTION

What Are Scenarios Telling Us About Developing Climate-Resilient Pathways in the Southern African Region?

REFLECTION

STRATEGY

Applying Foresight For Enhanced Climate Resilience and Agriculture Policy Development in the SADC Region

SADC Futures Foresight Training Toolkit

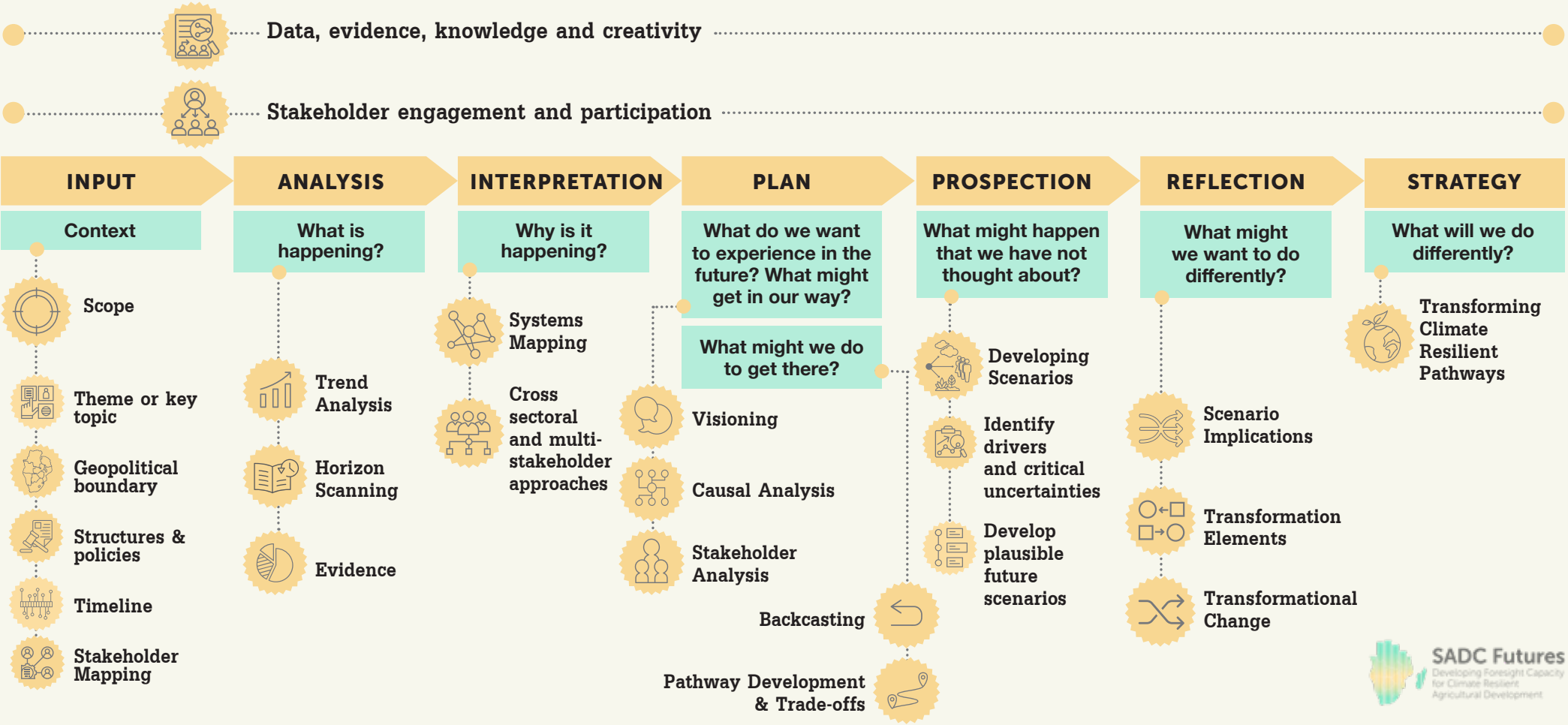
The purpose of the toolkit is to provide accessible training to multiple stakeholders on key foresight methods and how and when to apply them.

SADC Futures Foresight Framework

A tailored foresight training 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. This theme was chosen as **climate change poses the greatest threat to the SADC region's agricultural system and therefore technical capacity is needed to address these future impacts and adapt plans, policies, and programs**.

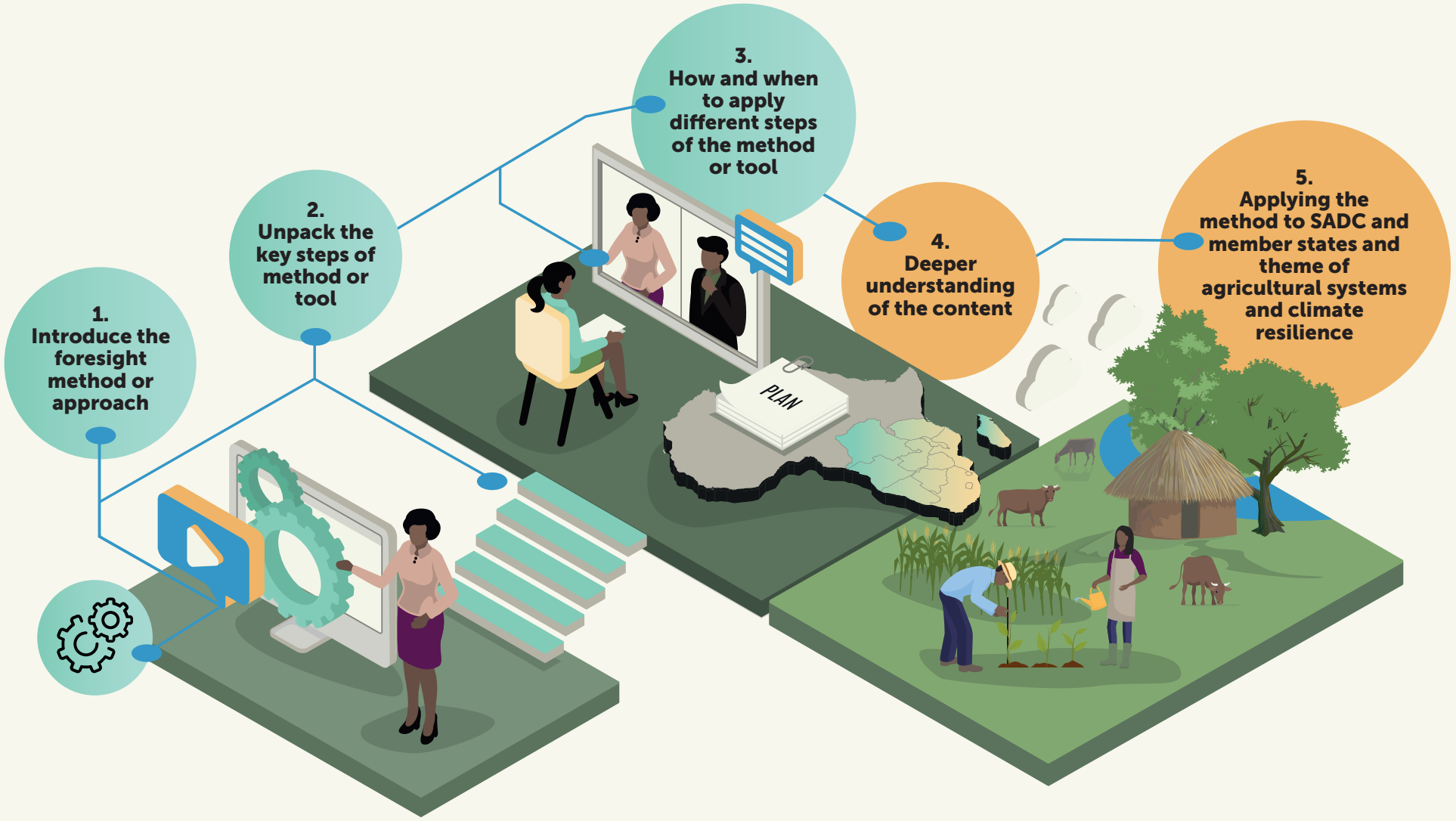
The foresight framework **guides users in the practical application of the chosen foresight tools and methods for innovative strategic planning and policy formulation for climate resilience**. It is important to note that there is no standardised way of doing foresight, the methods and tools presented in the framework were chosen specifically for the theme of climate-resilient agricultural development in the SADC region.

The foresight framework has been built around seven stages that address key questions.



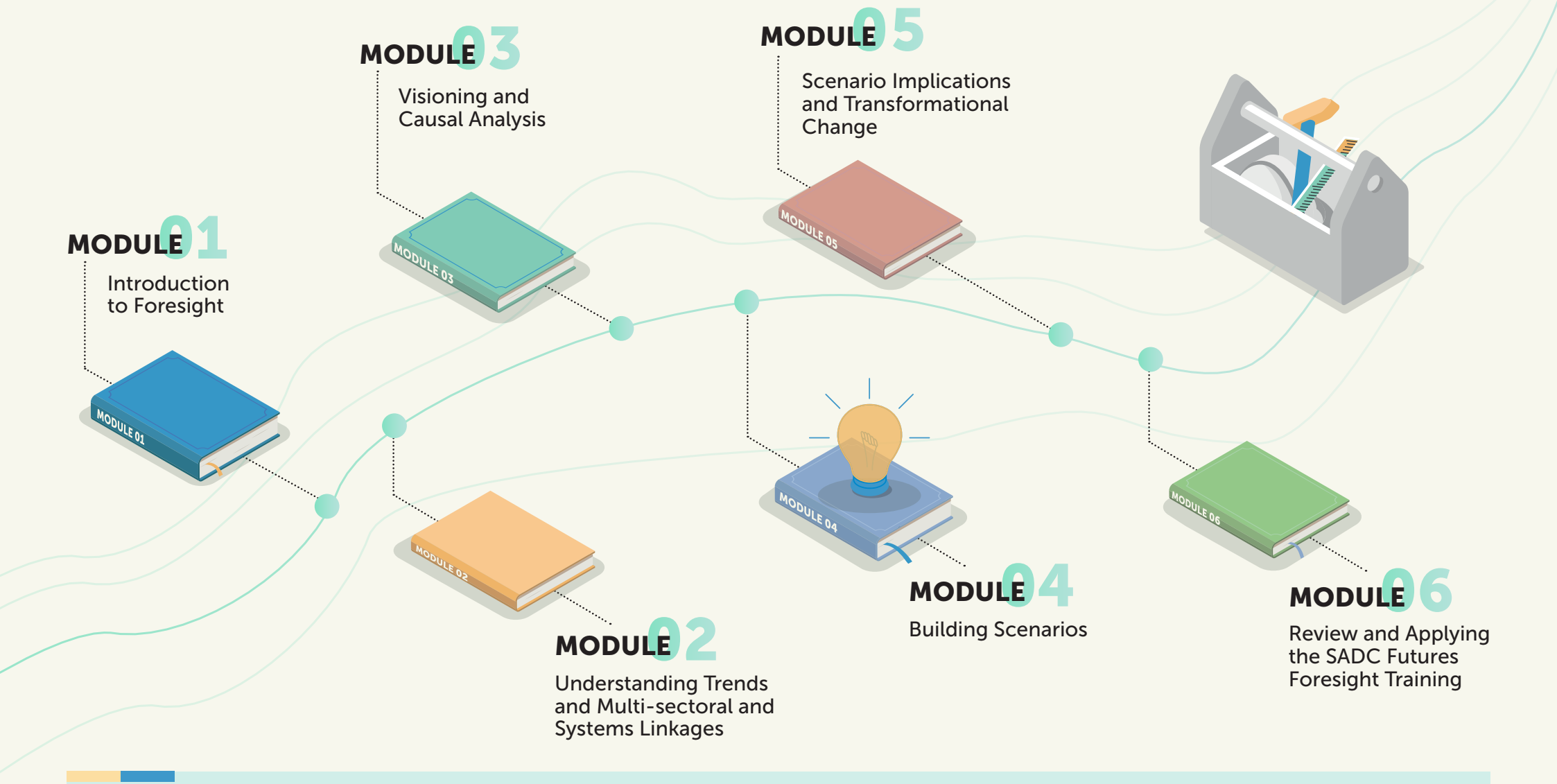
Training approach

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 agriculture development in the SADC region.



Structure of the toolkit

The toolkit comprises six modules. **This document presents Module 4: Building Scenarios.**



Within the modules, reference is made to the SADC Futures knowledge series supplementary reports (as previously shown mapped to the foresight framework). These reports provide further detail on the use of the foresight methods and tools for building climate-resilient agricultural development 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.

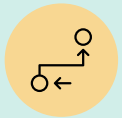
Questions and Answers from participants of the SADC Futures webinar series

'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[i]

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.

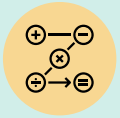
Term	Description
Critical Uncertainties 	Are drivers that are both highly impactful and highly uncertain.
Cross-cutting Issues 	Issues or challenges that affect more than a single interest area, institution, or stakeholder, and that need to be addressed from all points of view.
Drivers 	Are factors, 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
Feasible 	Possible and practical.
Forecast 	An estimate or best guess of what might happen in the future i.e. not a definitive prediction.
Foresight 	Structured tools, methods and thinking styles to enable the capacity to consider multiple futures and plan for them.
Foresight Organising Group 	A small core group that builds the foresight plan
Foresight Participating Group 	A broad mix of identified key stakeholders that need to be involved
Futuring 	The act, art, or science of identifying and evaluating possible future events.

Term	Description
Grey Rhino 	These are the large, obvious dangers that will sooner or later emerge but whose exact timing is unknown.
Impact 	Refers to the potential scale of impact of a driver on a scenario theme.
Internal Driver 	Internal force of change for example, social drivers within a farm or community directing the decision making of a farmer.
Mega-trend 	A trend that is apparent at a large or global scale e.g. growing youth population across the African continent.
Mind Mapping 	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.
Modelling and Simulation 	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 	An approach to understanding highly impactful and highly uncertain drivers and to describe possible future states. Although they address uncertainty, scenarios are not predictions or forecasts - they are not 'true' or correct/ wrong - only plausible.
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
Trend Impact Analysis 	Collecting information and attempting to spot a pattern, or trend, and assess its influence from the information.
Uncertainty 	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.
Underlying Cause 	Unpacking why an obstacle is in place.
Unknown Unknowns 	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.
Viable 	Able to be done or could occur.
Vision 	A compelling image of a (usually preferred) future.

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

Climate Resilience

Adaptive Capacity 	The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.
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.
Climate Resilience 	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
Elements 	The different, discrete elements within a system (e.g. farms, organisations, inputs, and soil).
Interconnections 	The relationships that connect the elements (e.g. rules, ideas, funding, or service relationships, among others).
Land Degradation 	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.
Multi-Stakeholder Collaboration 	Consists of a mix of representatives or stakeholders from public, civil, and private domains of society.
Post-Harvest Loss 	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.
Pre-production 	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
Productive Inputs 	These are used to increase yields and range from improved seeds, genetics, fertilisers and crop protection chemicals to machinery, irrigation technology and knowledge.
System 	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.
Systems Thinking 	A mindset, tool, and process that is reserved for complex problems.
Systems View 	Understands life as networks of relationships.
Transboundary Animal Disease 	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.

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

Cardona, O.D., van Aalst, M.K., Birkmann, J., Fordham, M., McGregor, G., Perez, R., Pulwarty, R.S., Schipper, E.L.F. and B.T. Sinh, (2012). Determinants of risk: exposure and vulnerability. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., Barros, V., Stocker, T.F., Qin, D., Dokken, D.J., Ebi, K.L., Mastrandrea, M.D., Mach, K.J., Plattner, G.-K., Allen, S.K., Tignor, M. and Midgley, P.M. (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 65-108.

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Photo: Felix Clay, Duckrabbit 2012

CONTENTS

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.

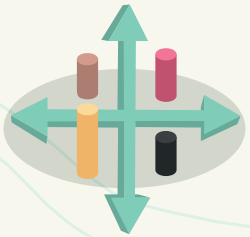
On completing Module 4 you will:

- **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.**

Visioning

Building Scenarios

Understanding Drivers and Uncertainty



Building Scenario Axes

Development Scenario Narratives

Test Your Learning of the SADC Futures Foresight Framework

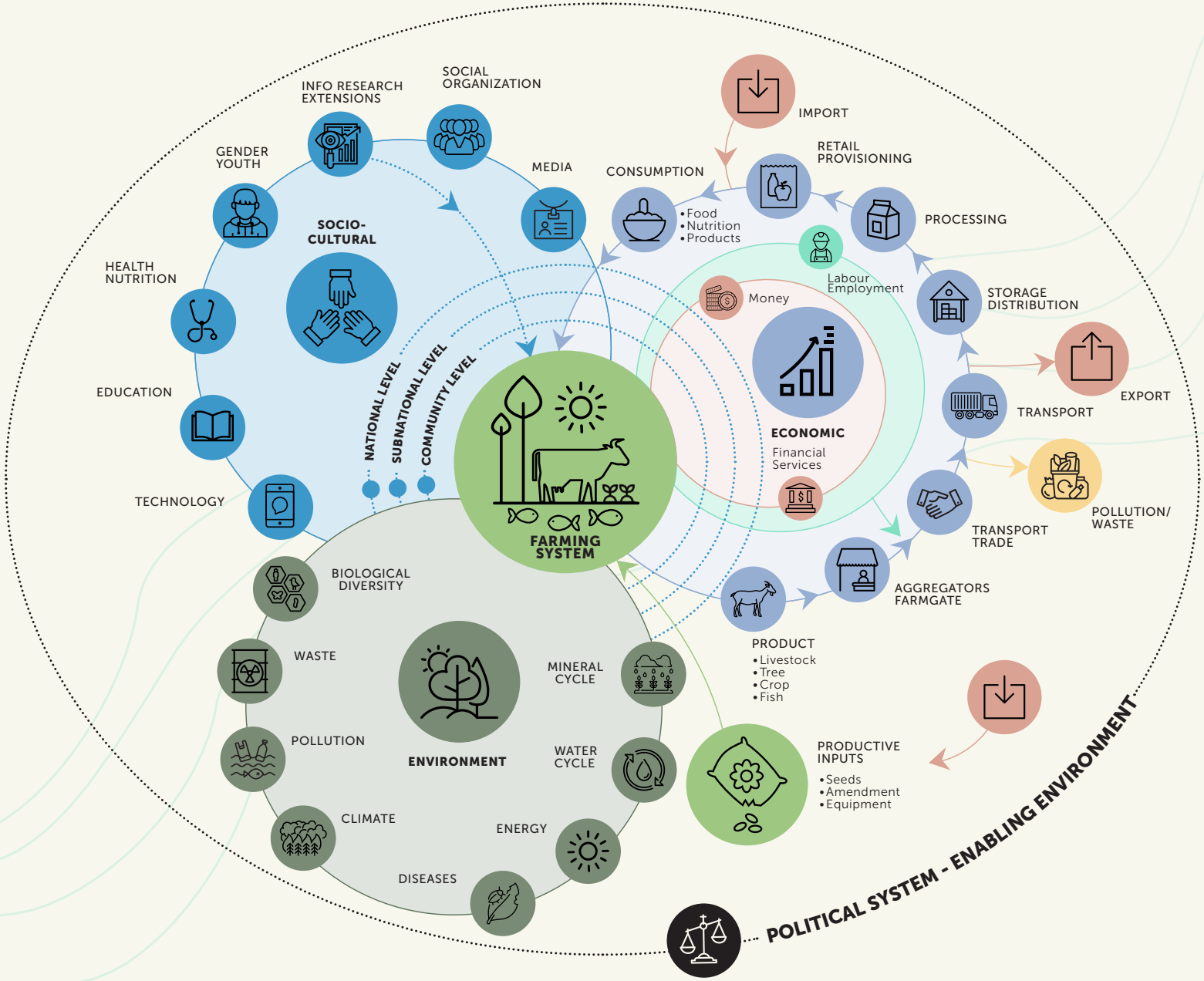
Before continuing with Module 4, test your understanding of foresight and information from the last module by answering the questions below:

What are the seven different stages of the SADC Futures Foresight Framework?

INPUT	ANALYSIS	INTERPRETATION	PLAN	PROSPECTION	REFLECTION	STRATEGY
Context	What is happening?	Why is it happening?	What do we want to experience in the future? What might get in our way? What might we do to get there?	What might happen that we have not thought about?	What might we want to do differently?	What will we do differently?

Who needs to be involved in making a systems map?

Those represented in the system and those influencing the system



Describe one of the steps in the backcasting process

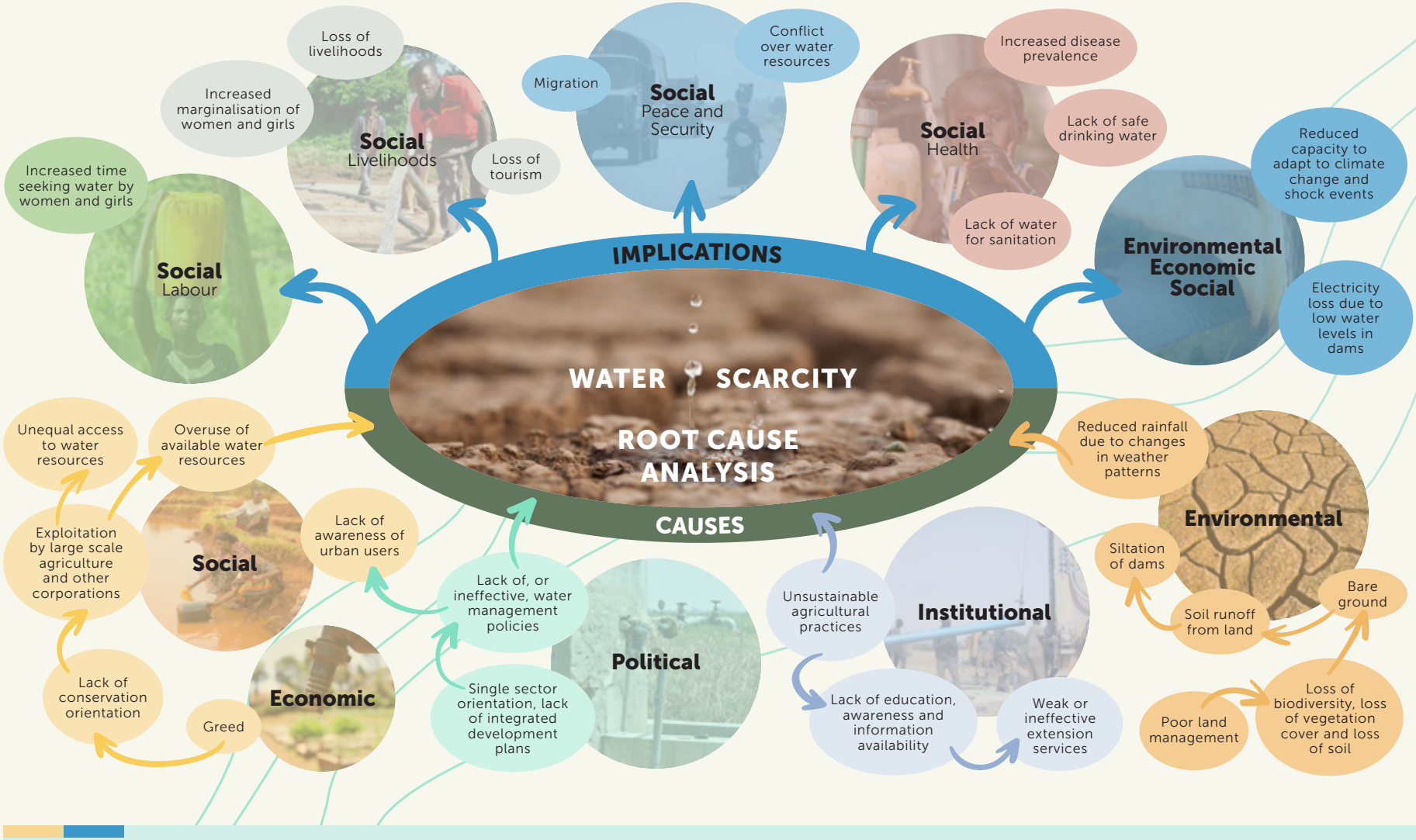
Step into 2030 and position yourself in the successfully achieved vision such that the future becomes the present.

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.

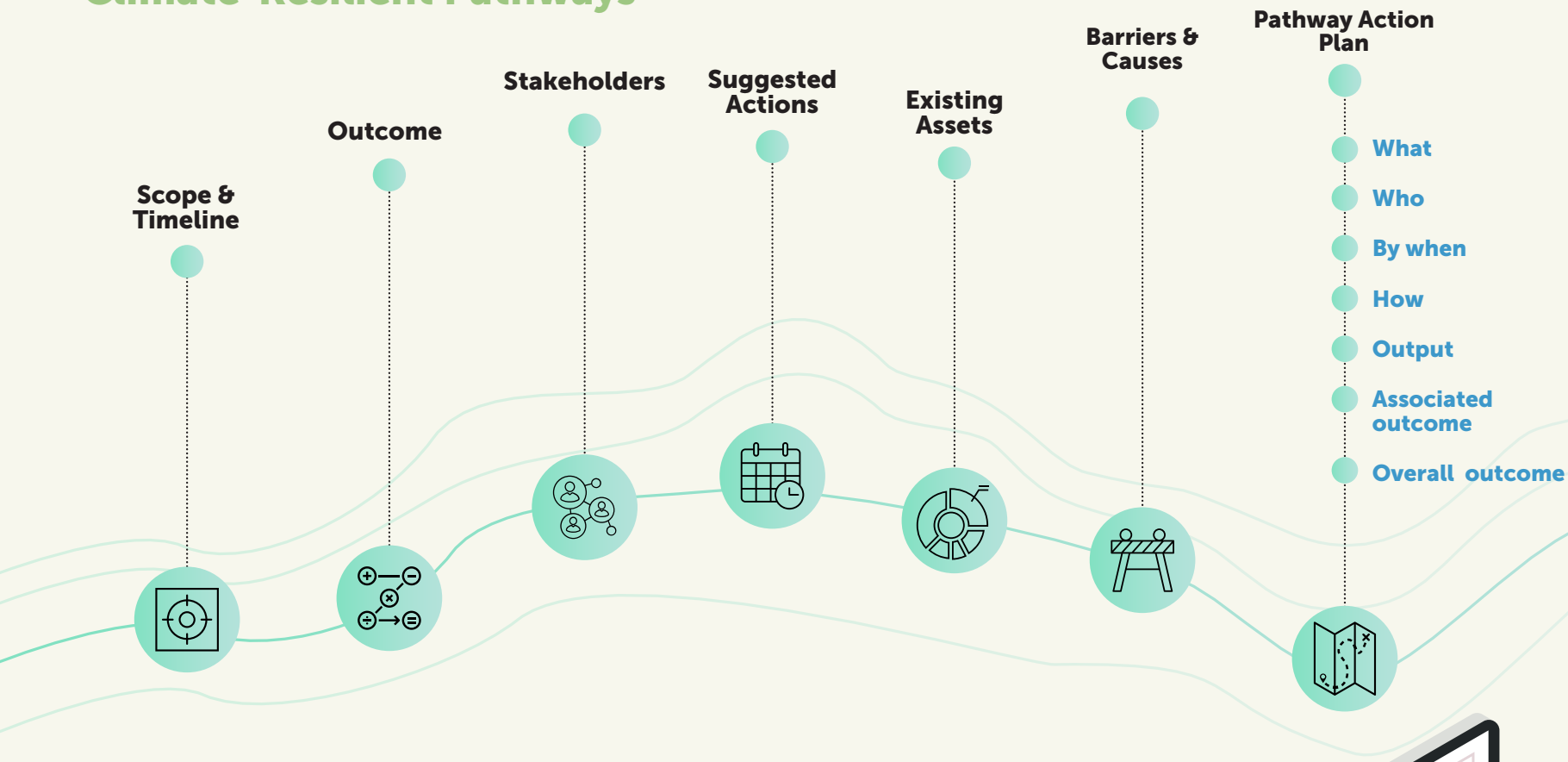
As best possible identify when key activities took place.

What tool could you use to understand the difference between symptoms and problems?



What is the difference between pathway, strategy, and trajectory?

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 prospection stage of the foresight process follows on from the plan stage. A key question in the foresight process we aim to answer through prospection is:

What might happen that we have not thought about?

INPUT	ANALYSIS	INTERPRETATION	PLAN	PROSPECTION	REFLECTION	STRATEGY
Context	What is happening?	Why is it happening?	What do we want to experience in the future? What might get in our way? What might we do to get there?	**What might happen that we have not thought about?**	What might we want to do differently?	What will we do differently?

- Developing Scenarios
- Identify drivers and critical uncertainties
- Develop plausible future 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.):

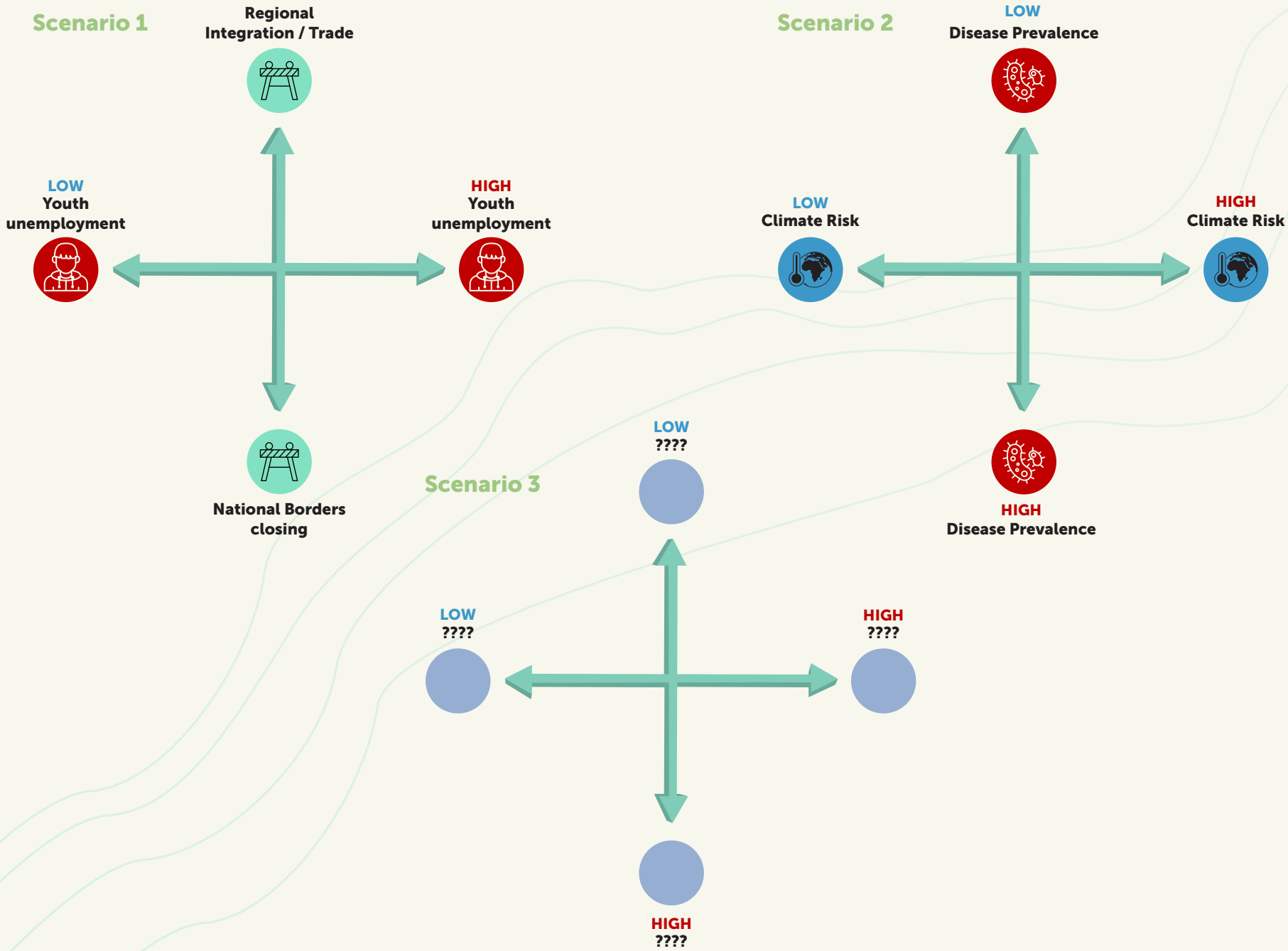
- Scenarios must fall within the limits of what might conceivably happen;
- The combination of logics in a scenario must not have any built-in inconsistency that could undermine its credibility; and
- Scenarios should contribute specific insights into the future that will lead to decision-making on the 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



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.

Artist: A. Tapsoba. Source: Palazzo et al., 2016

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.

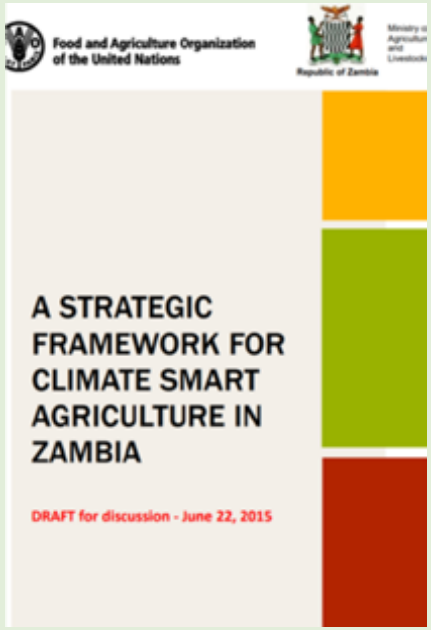
Mwadyamweka (alludes to selfishness) - a country with high and steady economic growth but institutions that are weak and unresponsive.

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.

Photo: Ricky Martin (CIFOR)



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)

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:

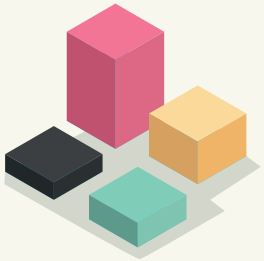
- **Define the focal issue and relevant time frame;**
- **Identify and brainstorm drivers of change;**
- **Group drivers into categories;**
- **Identify high impact and high uncertainty drivers;**
- **Select high impact and high uncertainty drivers;**
- **Set up a scenario axis; and**
- **Build scenario storylines.**

Key steps for building scenario storylines

1. **Define focal issue and relevant time frame**

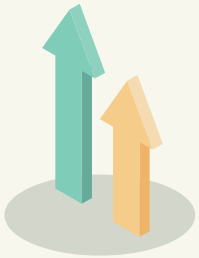
2. **Identify and brainstorm drivers of change**

3. **Group drivers into categories**

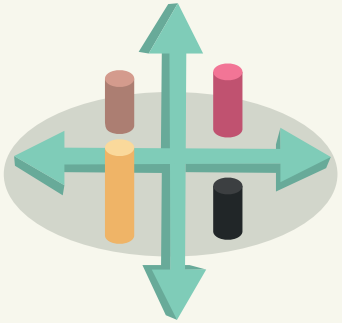


4. **Identify high impact & high uncertainty drivers**

5. **Select high impact & high uncertainty drivers**



6. **Set up scenario axis**



7. **Build 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.

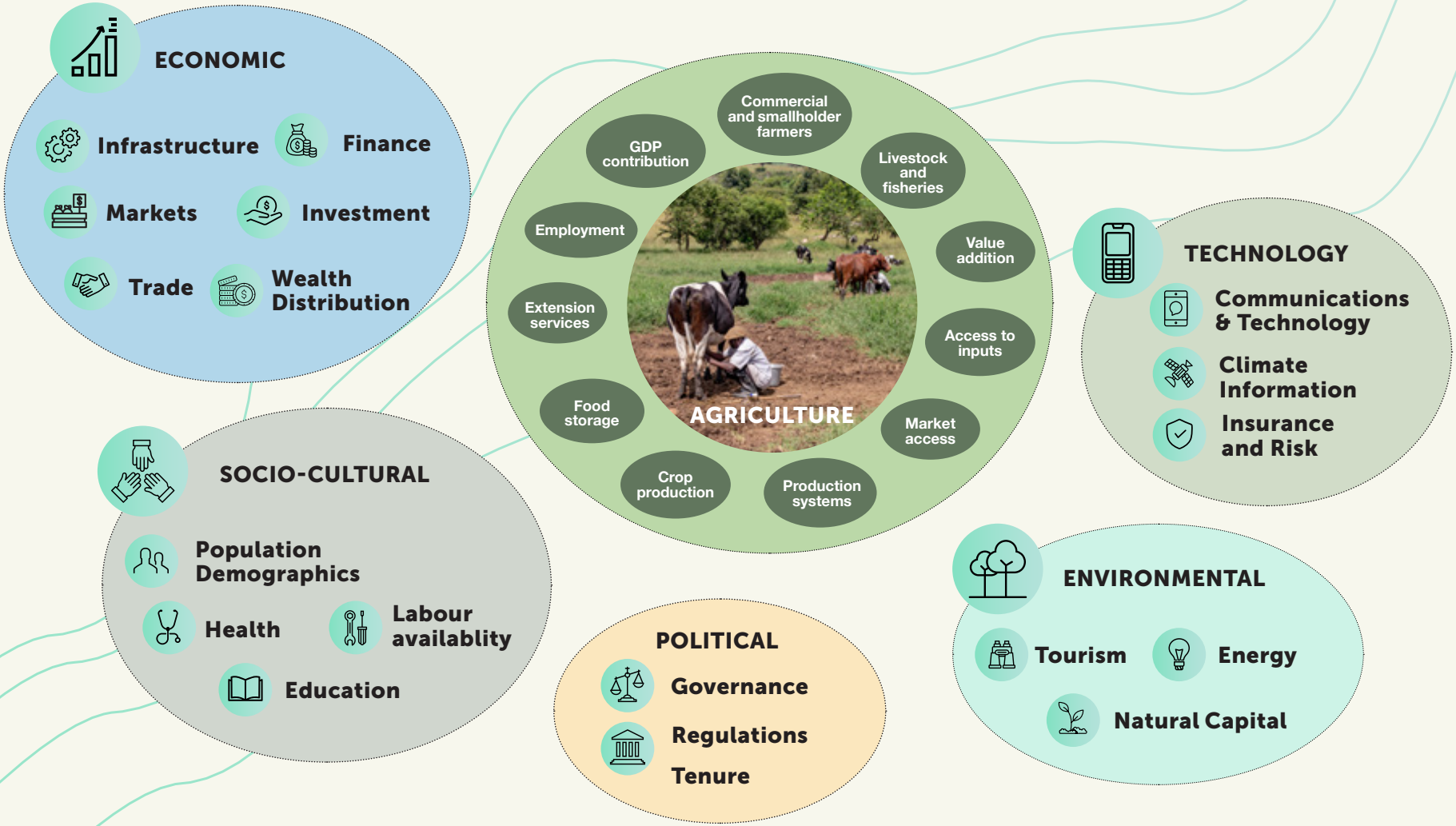
- **'Deforestation and forest degradation, 25-year timeline.'**
- **'Land restoration globally within 10 years.'**
- **'Land degradation in rural communities, 20-year timeline.'**
- **'Reduced crop losses in a region, 10-year timeline.'**
- **'Crop suitability in West Africa by 2030.'**
- **'Explore 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

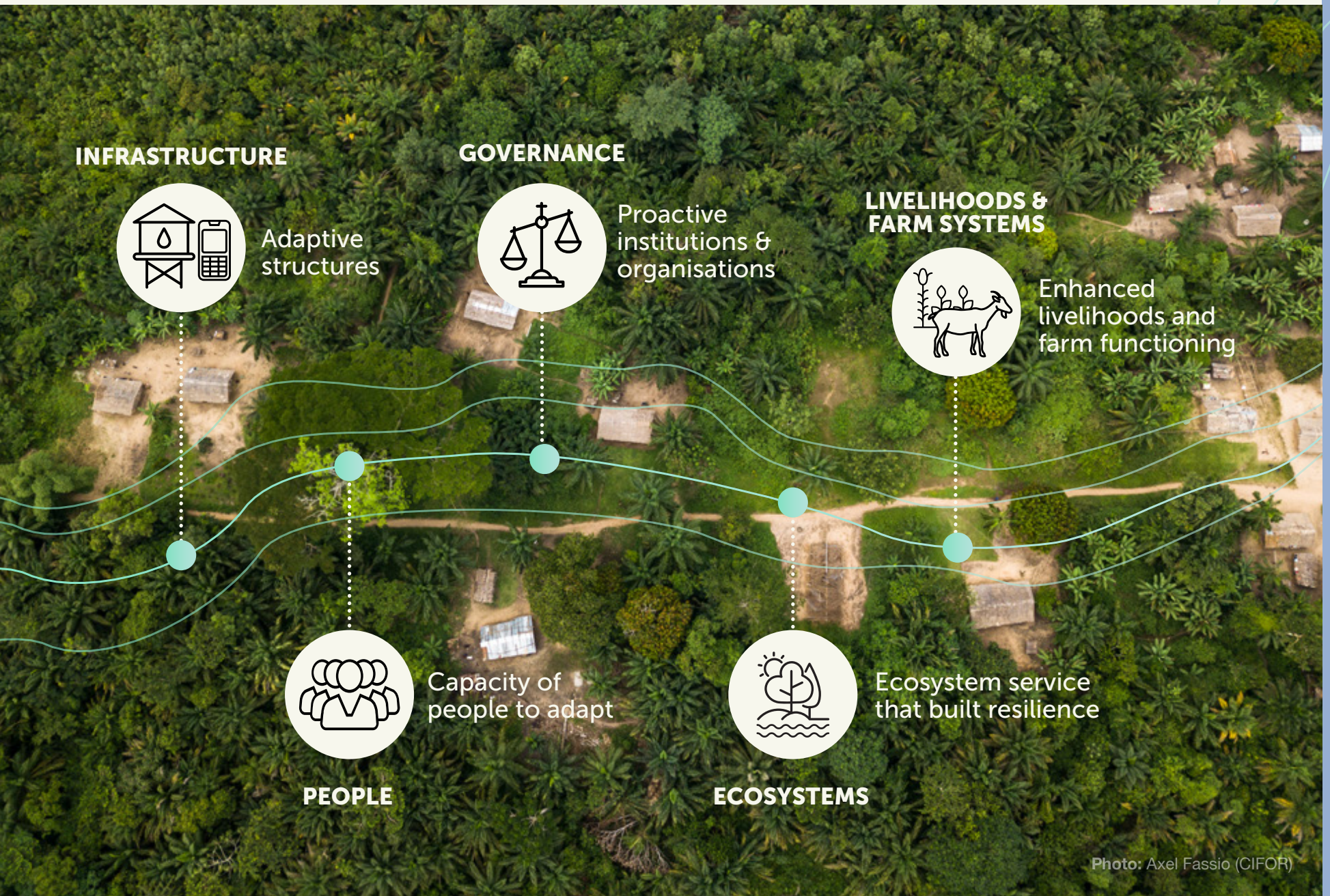
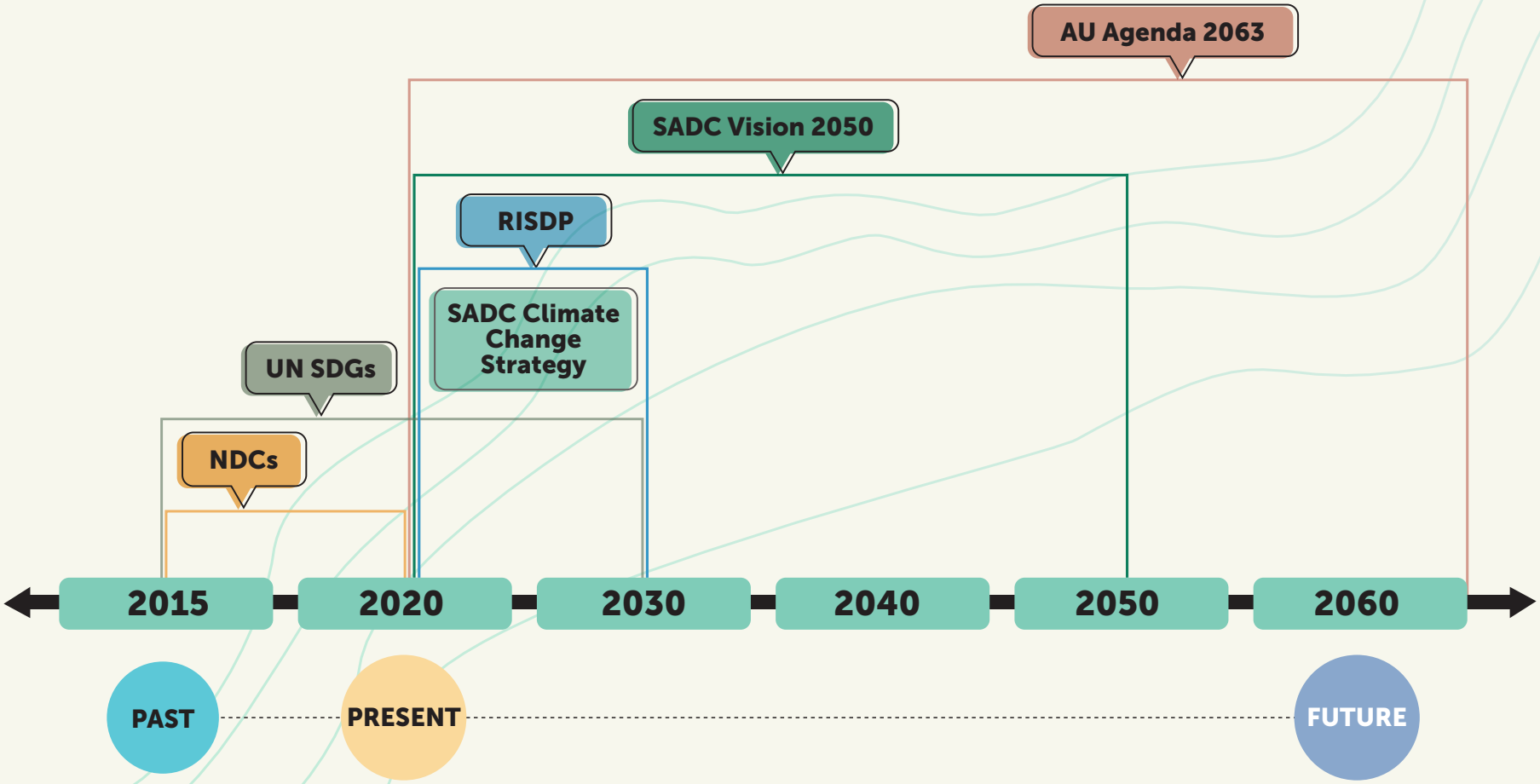


Photo: Axel Fassio (CIFOR)


AU Agenda 2063
SADC Vision 2050
RISDP
SADC Climate Change Strategy
UN SDGs
NDCs
2015
2020
2030
2040
2050
2060
PAST
PRESENT
FUTURE

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

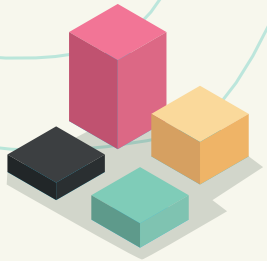
Thinking of the focal issue that you wish to develop scenarios for, **what are the main drivers of change that comes to mind**? What is affecting the situation you want to understand more about? Brainstorm drivers and document them on Post-its or on a whiteboard (so that you can easily move them around 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**
- **Economic**
- **Natural Resources and Environment**
- **Governance/ Political/ Institutional**
- **Agriculture Productivity**

Socio-cultural

Agriculture Productivity

Natural Resources and Environment

Economic

Governance/ Political/ Institutional

Step 04 Identify High Impact and High Uncertainty Drivers

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?

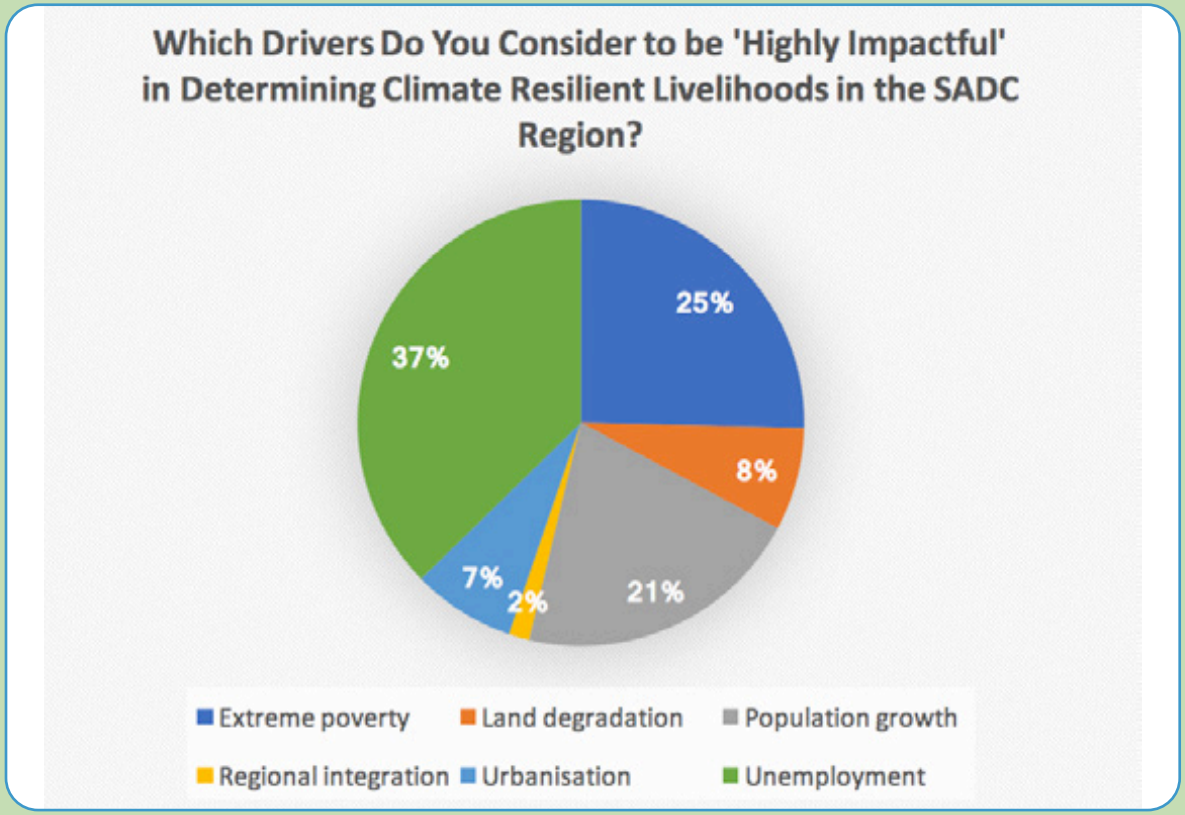
Which of these drivers are we least certain on how they will develop in the future?

- 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?

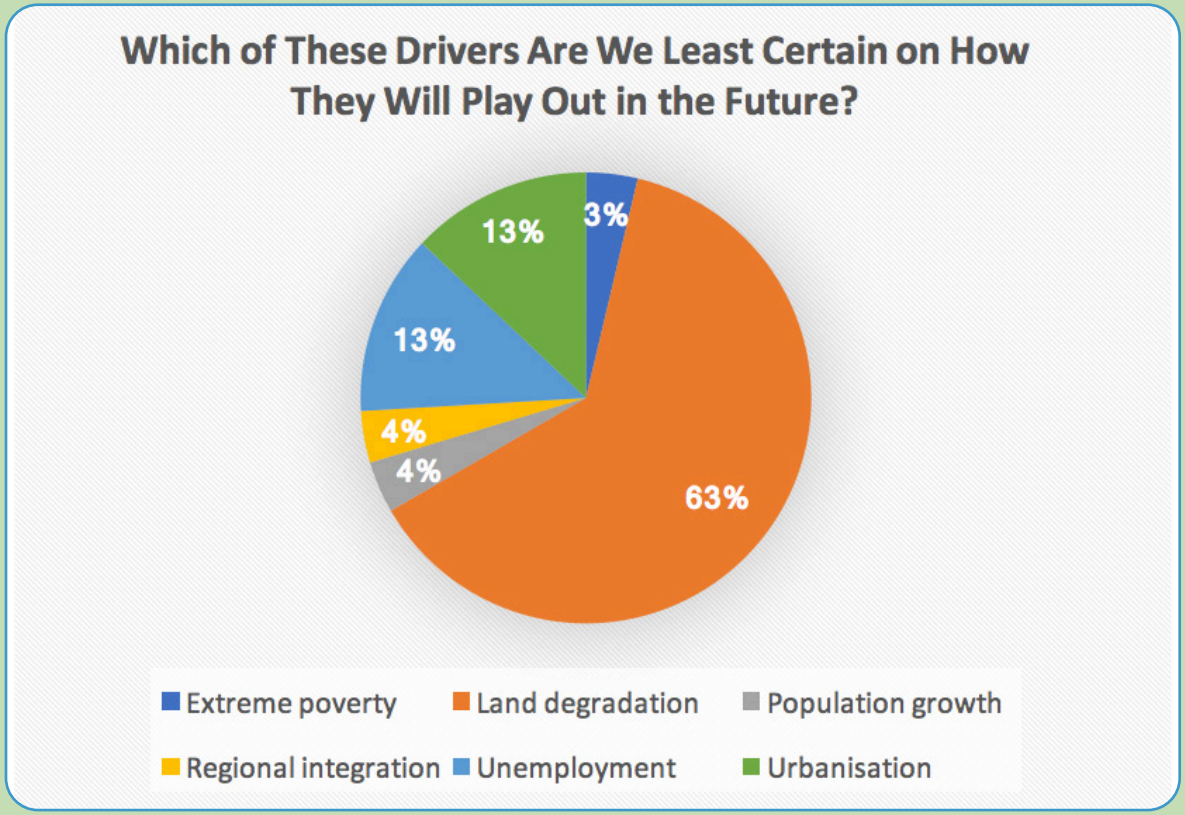
Discuss your findings with your colleagues.



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?



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).

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.

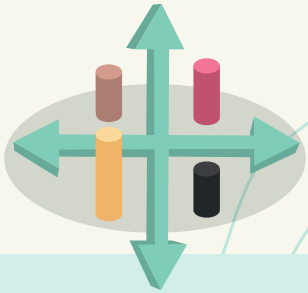
Step 05 Select High Impact and Highly Uncertain Drivers

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.

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.

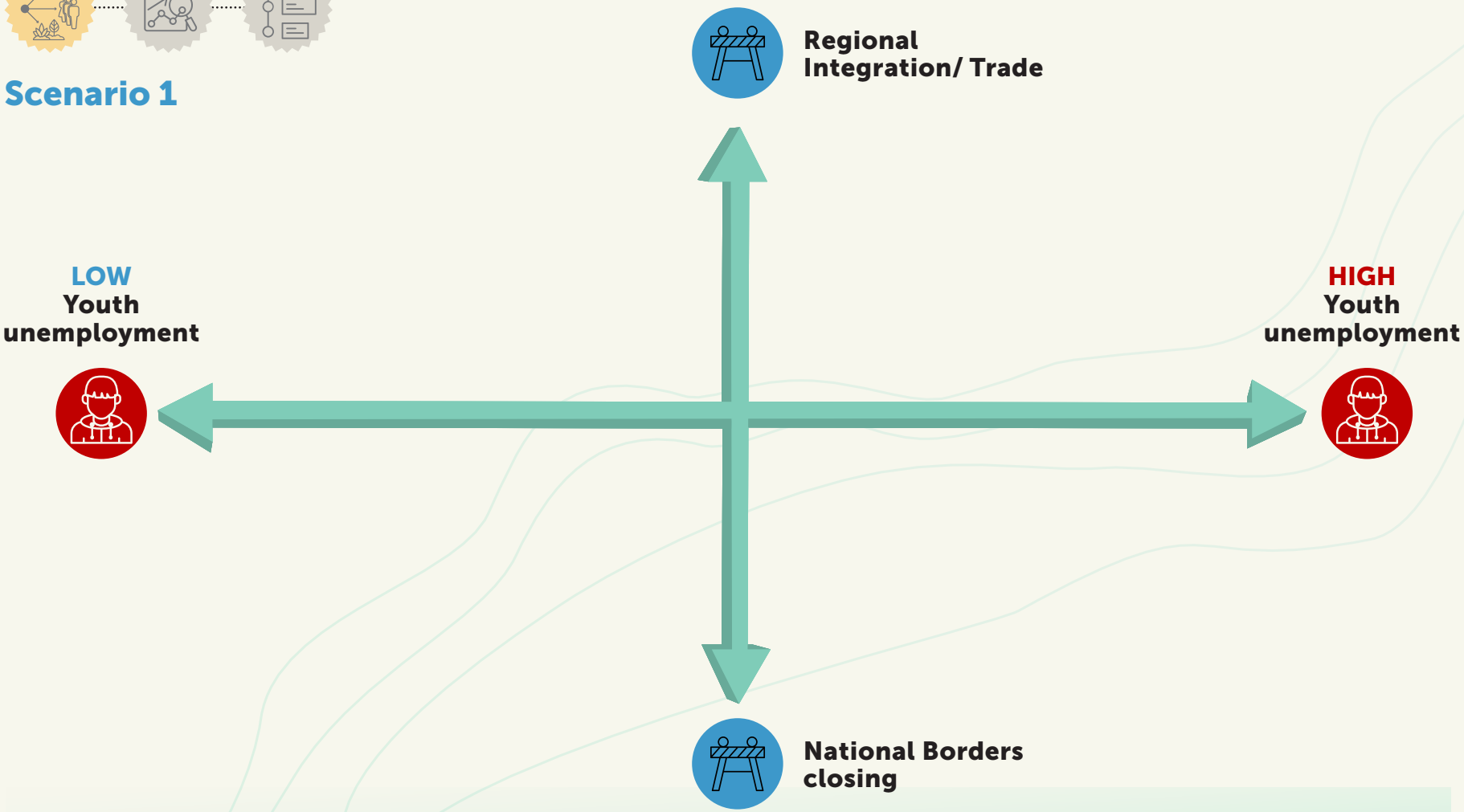
Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

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 omittance 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

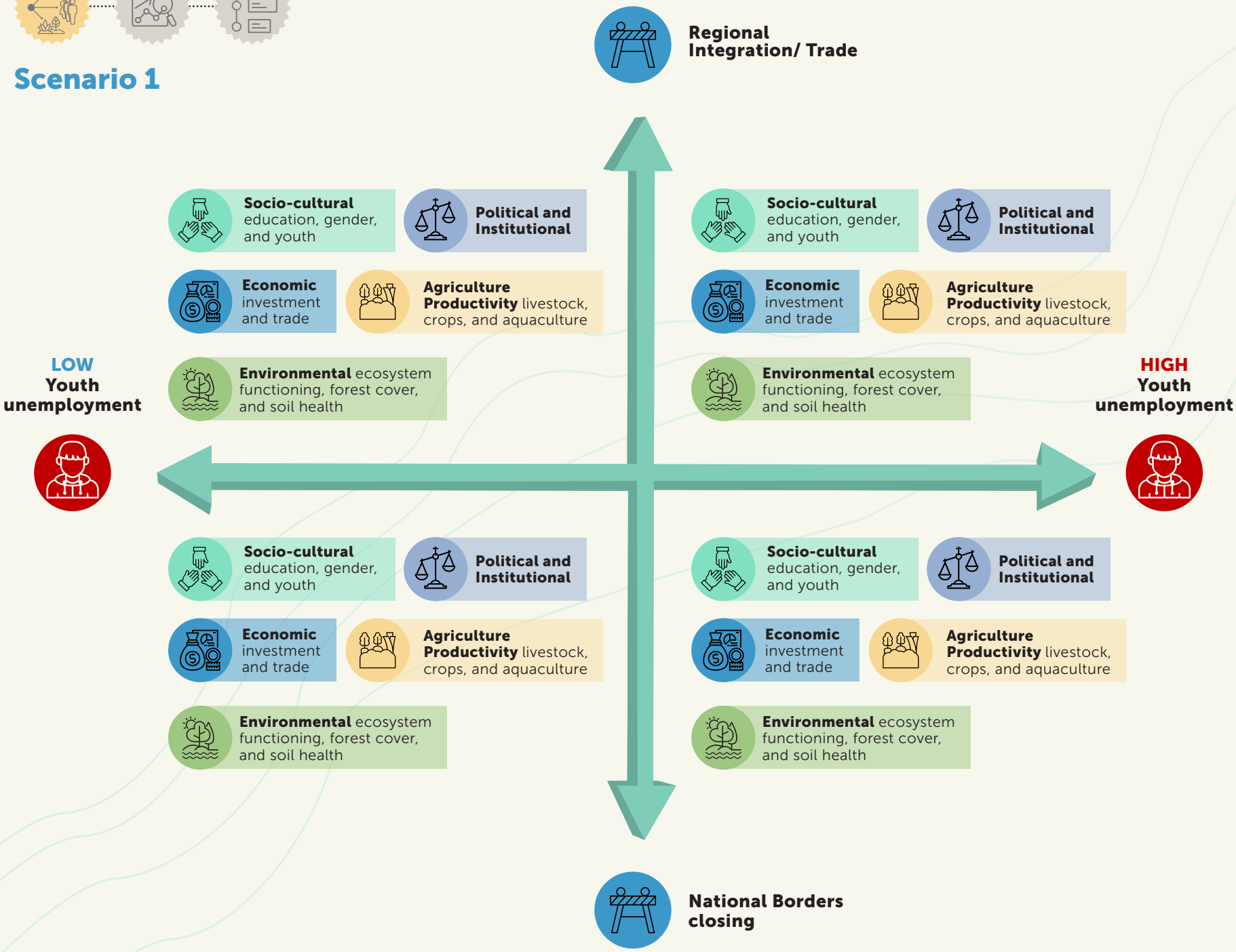
Environmental
ecosystem functioning, forest cover, and soil health

Political and Institutional

Agriculture Productivity
livestock, crops, and aquaculture

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.

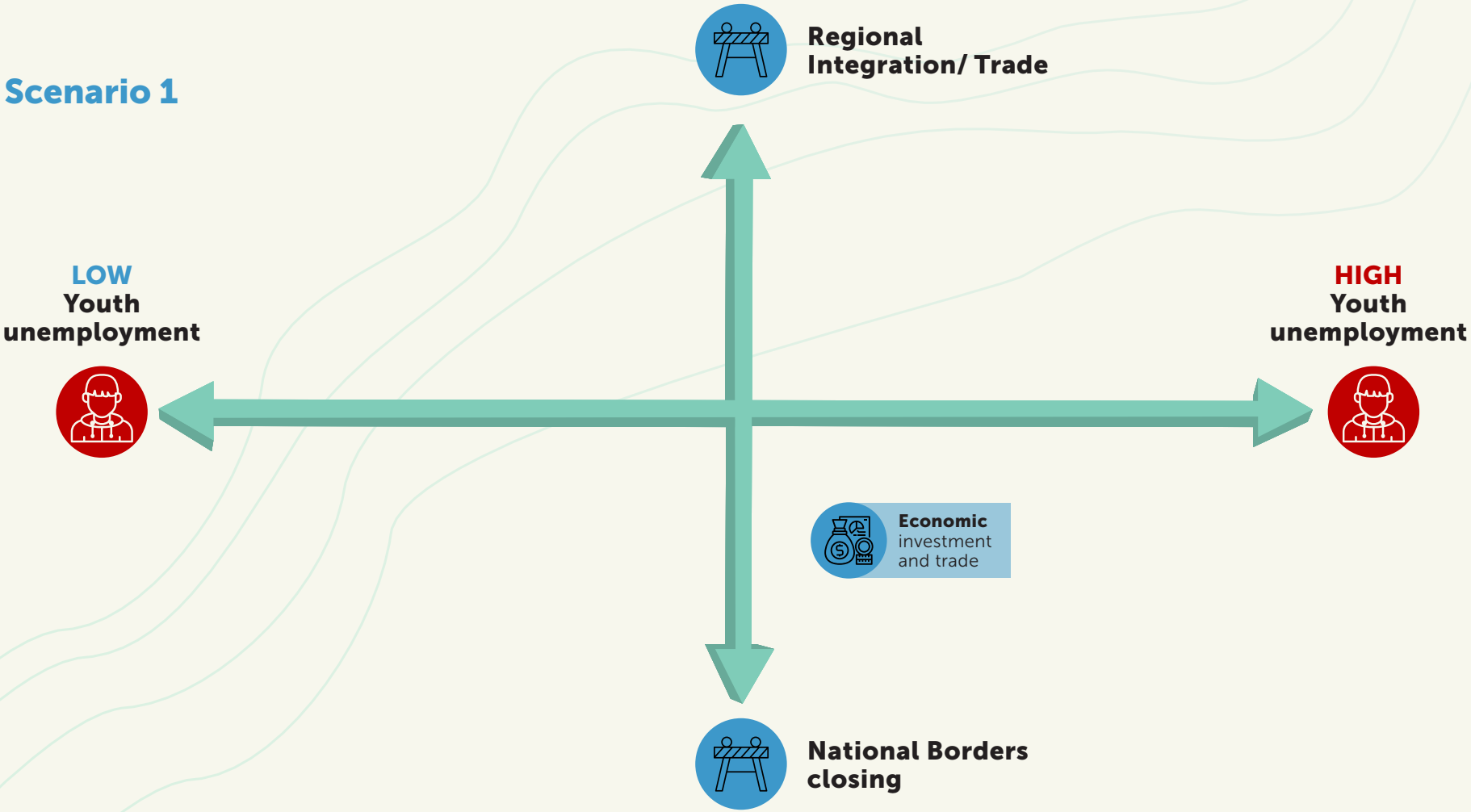
Scenario 1


Regional Integration/ Trade
LOW Youth unemployment
HIGH Youth unemployment
National Borders closing
Socio-cultural education, gender, and youth
Political and Institutional
Economic investment and trade
Agriculture Productivity livestock, crops, and aquaculture
Environmental ecosystem functioning, forest cover, and soil health

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?

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.'

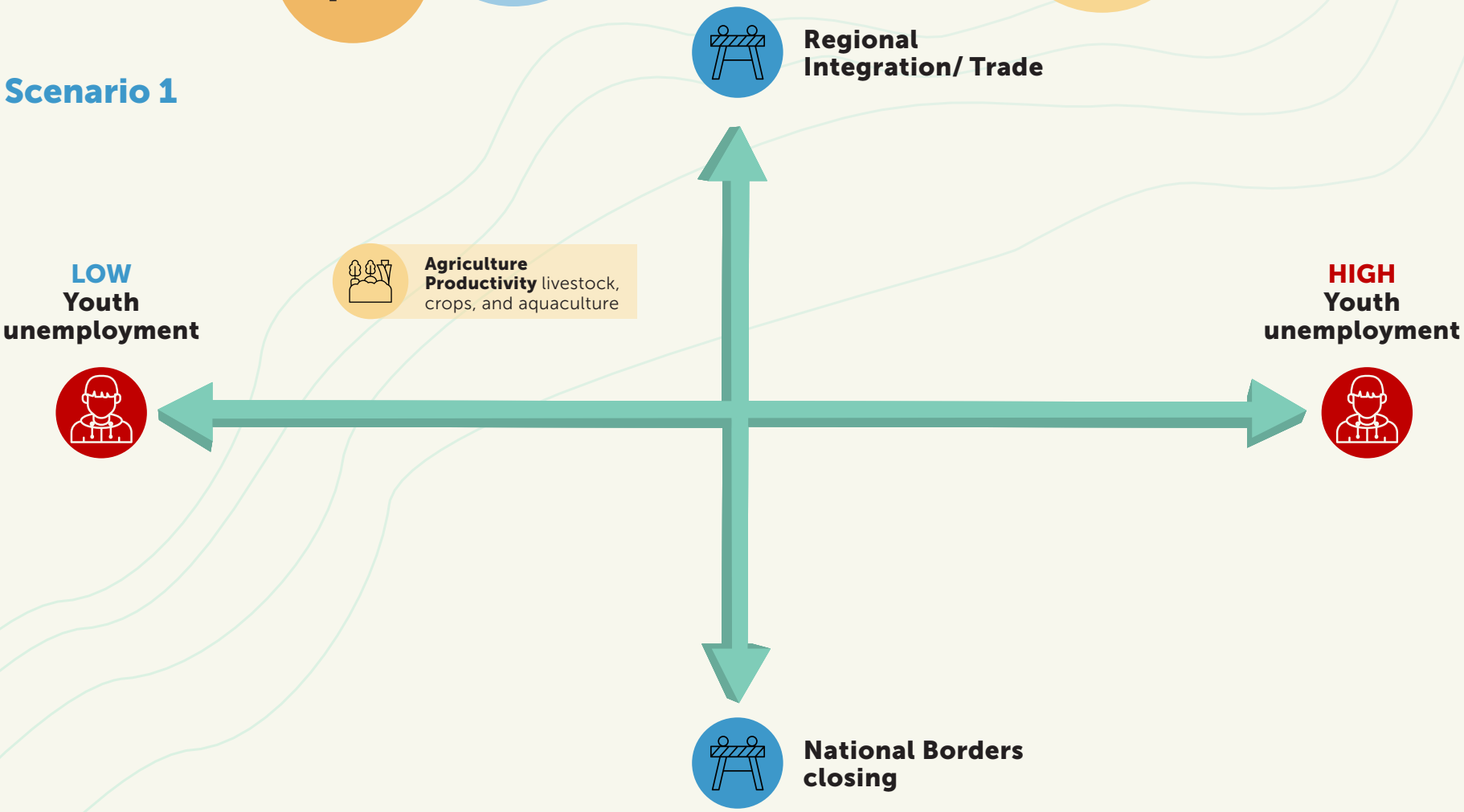
'Improved livelihoods.'

'Increased health.'

'Growing and stable. Increasing markets.'

'Increased youth participation in agri -value chain.'

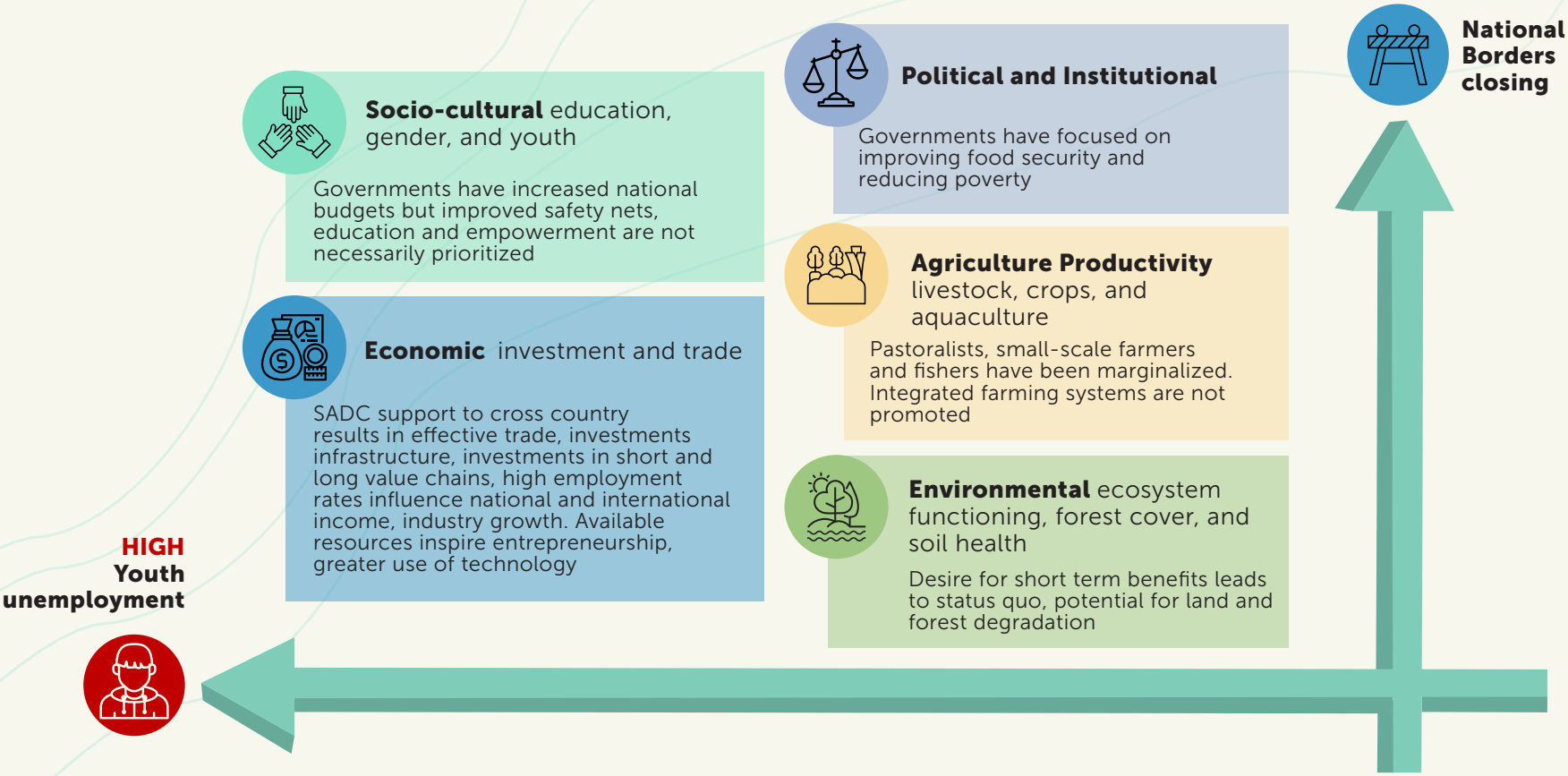
Scenario 1



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.

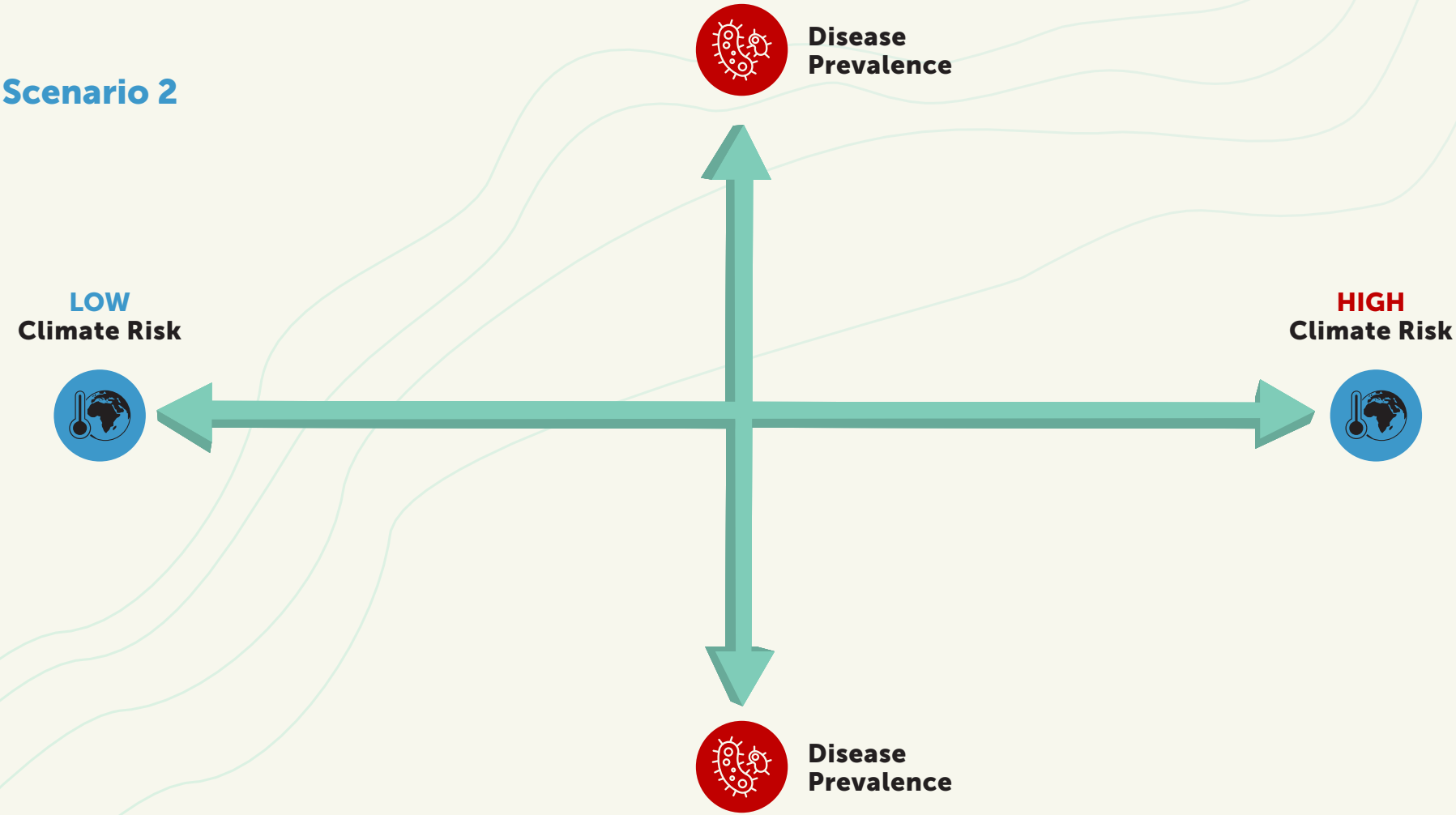


Scenario Example 2

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.

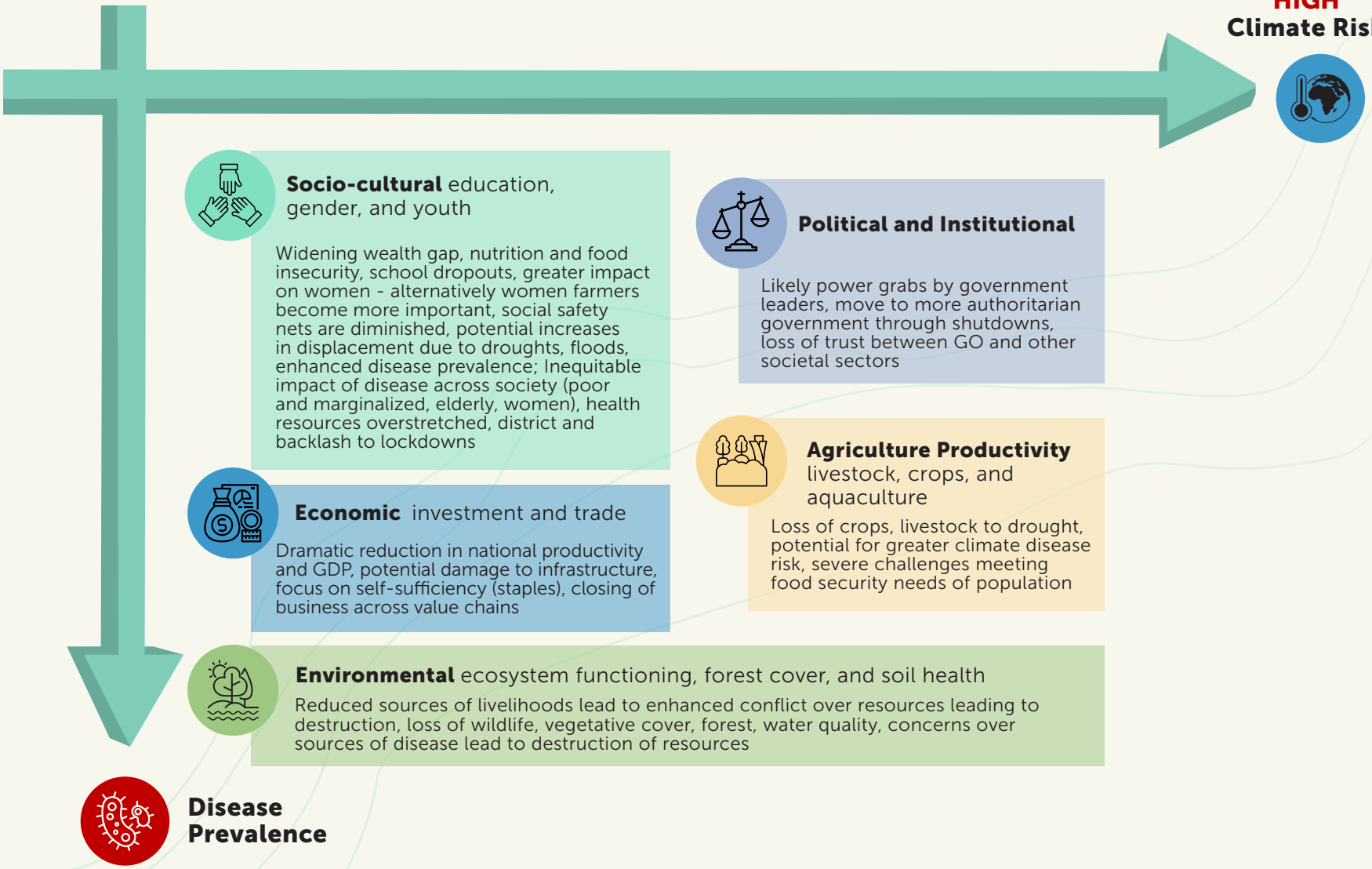
- **Economic** - There is a dramatic reduction in national productivity and Gross Domestic Product (GDP), there is potential damage to infrastructure, a focus on self-sufficiency (staples), and closing of businesses across value chains.

- **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.

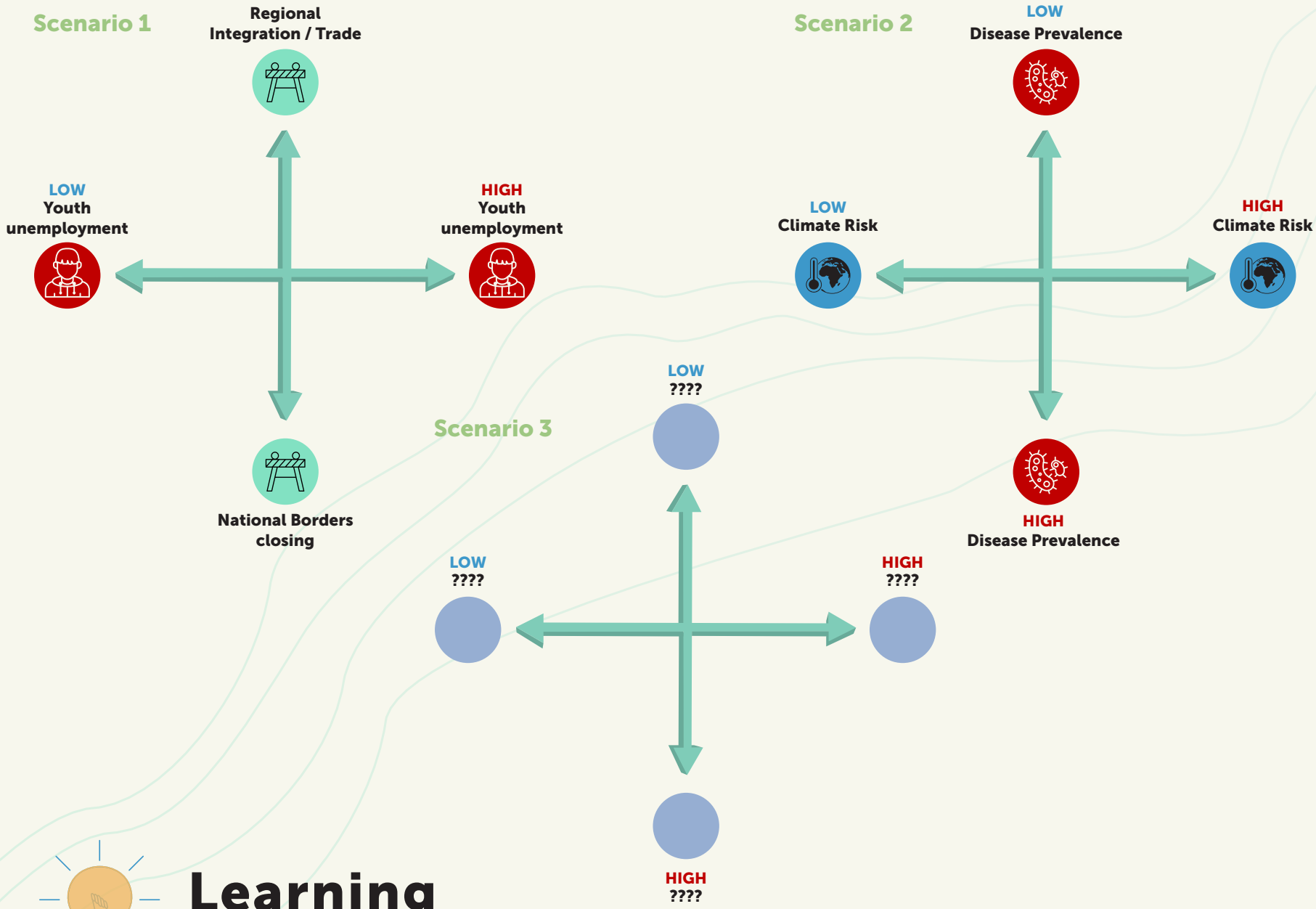
- **Political/institutional** - Likely power grabs by government leaders and a move to more authoritarian government through shutdowns. A subsequent loss of trust between government and other societal sectors.

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

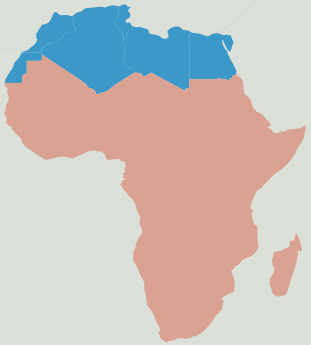
You should now understand how to categorise and identify high impact and high uncertainty drivers. You have learnt how to set up a scenario matrix and should be able to draft future narratives.

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)[1] 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.

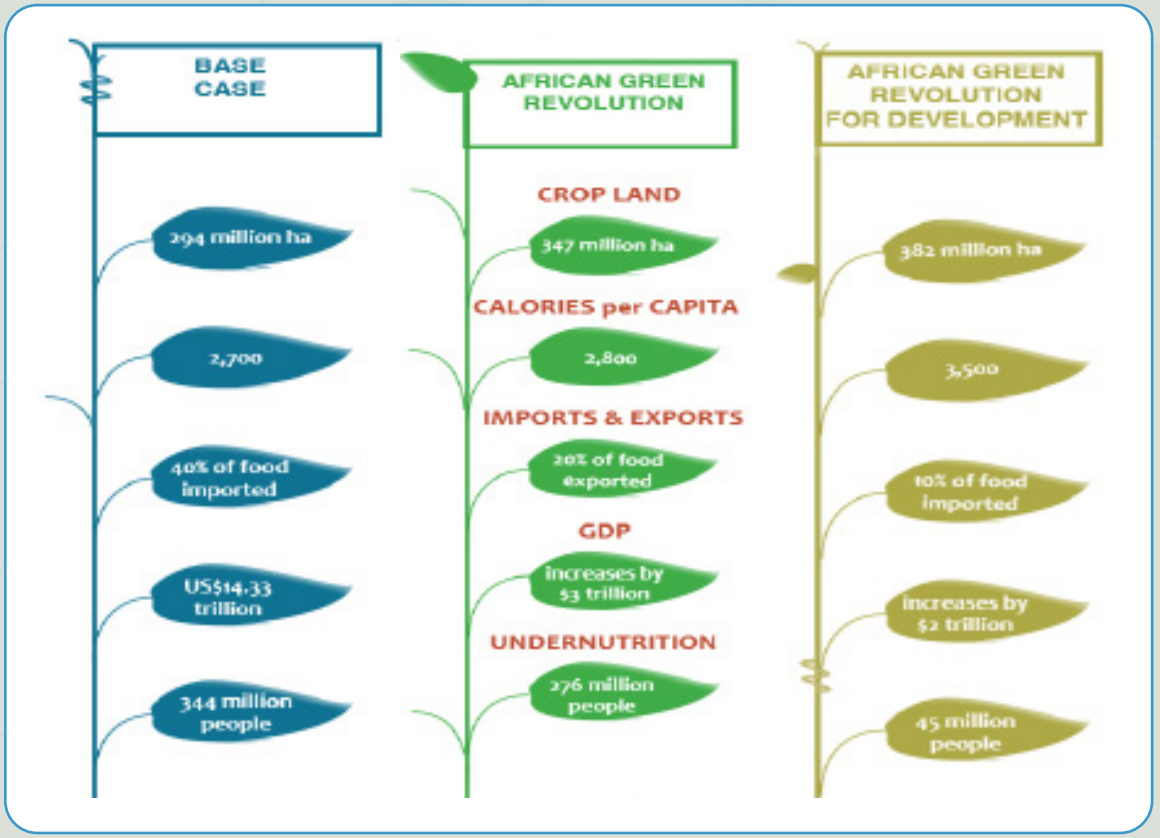
[1] ISS is a leading African organisation that enhances human security to enable sustainable development and economic prosperity in Africa.

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[2]) (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?

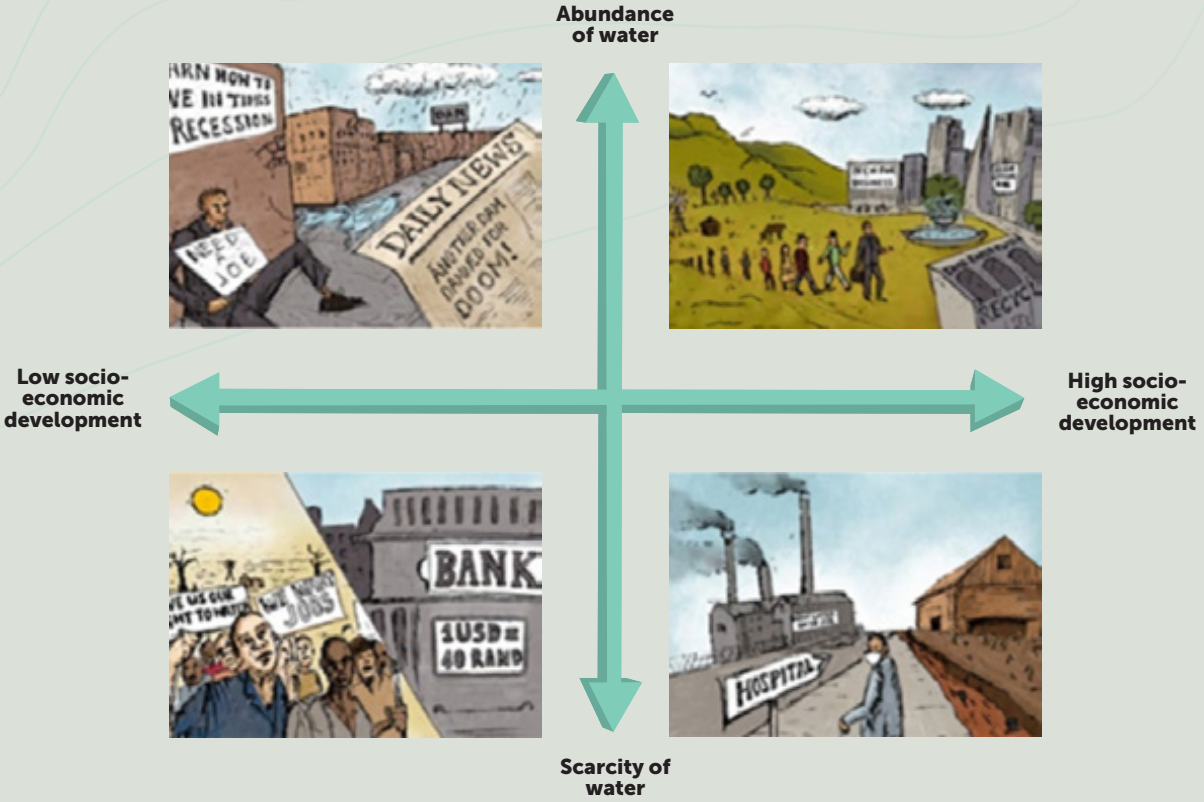
Key Uncertainties:

- Abundance or scarcity of water; and
- Level of socio-economic development.

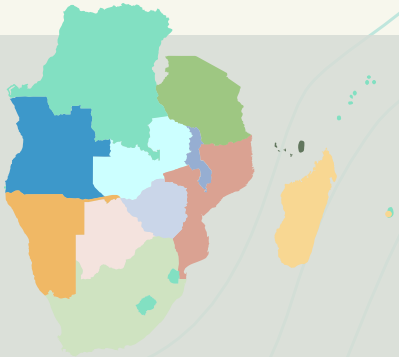
The external driver was around water scarcity and the abundance of water, the internal driver (that could be influenced) was socio-economic development.

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).



[2] 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[3] 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:

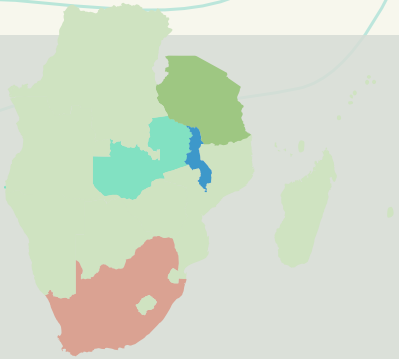
- Existence of localised water shortages and accompanying electricity blackouts and unemployment; and
- Political responses to localised water shortages (division and conflict or cooperation).

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.

[3] 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[4] 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.**

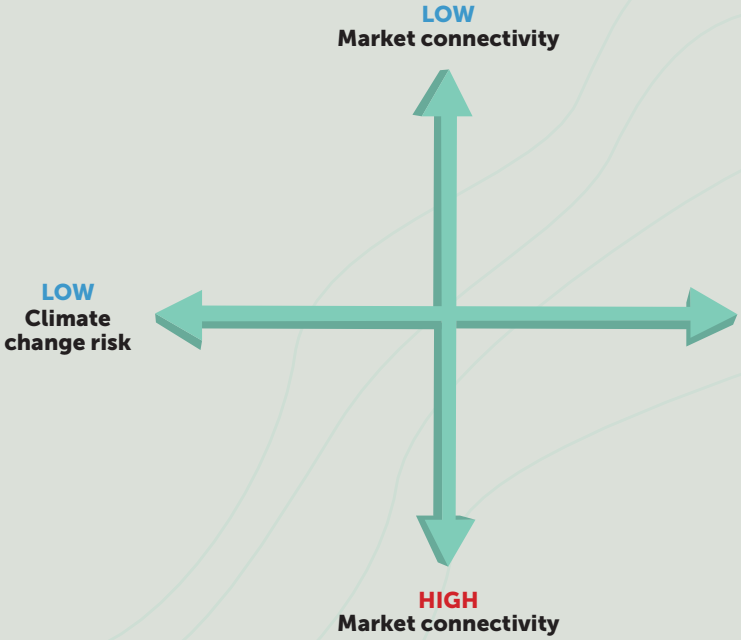
When setting the axes, climate risk (high and low), was kept the same for each of the countries. As with the previous case studies, the second axis represented a more internally controllable driver. The second axes were chosen through stakeholder engagement and were defined as follows:

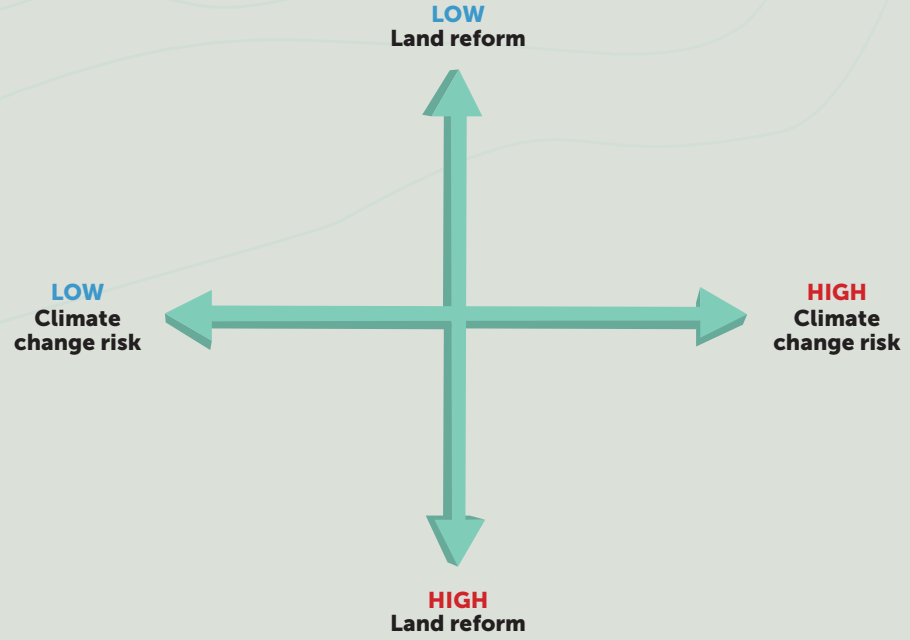
- In **Zambia**, the second axis agreed upon was market connectivity (high and low).
- In **South Africa**, land reform was chosen as the other axis as it presents another major source of uncertainty in the country.
- In **Tanzania**, the second axis was agricultural technology (transformation or stagnation).
- 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.





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.'

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:

Regional integration

Over 2010-2017, the East African Community (EAC), SADC, and Southern African Customs Union (SACU) were the only regional economic communities with intraregional trade above 10 %. However, regional integration in the SADC region is still found to be lacking.

Will it continue? Will it have "teeth", e.g. investment and enforcement capacities and will regional trade expand?

Sources of Economic Growth

The services sector dominates the region's economy, largely due to South Africa's influence.

Successful regional growth of the industry/manufacturing sector as per the RISDP priority.

Level of Economic Growth

Economic growth in the SADC region is projected to be higher than other African regions, but still relatively low.

As South Africa has the dominant economy, any fluctuations in the economy could affect the region. Furthermore, the impact of climate change on hydropower resources provides further uncertainty.

The key drivers and uncertainties raised in the SADC level scenarios reviewed include the following

Effectiveness of Regional Management of Water Resources

Agreements are in place, but the implementation is weak.

Climate change impacts on rainfall patterns.

Food Import/Export Patterns

Imports are increasing despite expansion in domestic production.

Investments in domestic food production and value chains. Greater integration of food trade in the SADC region.

Income Distribution

This is a major driver of climate resilient outcomes. Overall, the trend is that income distribution is worsening.

Implementation of policy measures to achieve more equal income distribution.

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 visioning 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.

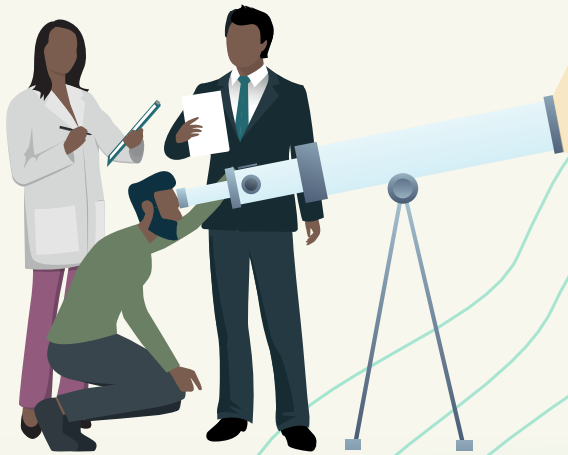
Analysing the results of scenarios from SADC to country level we can see there is considerable consensus as well as divergent ideas on visioning an ideal future.

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



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

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

german cooperation DEUTSCHE ZUSAMMENARBEIT

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CCARDESA Centre for Coordination of Agricultural Research and Development for Southern Africa

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