



Meeting report

1st Transition Space meeting Tana

7-8 February 2024

Agenda

DAY 1 - WED 7th February 2024

08:30 – 09:00	Start Meeting (Coffee)
09:00 - 12:30	<ul style="list-style-type: none"> ❖ Welcome ❖ General presentation – EPIC Africa ❖ Presentations: <ul style="list-style-type: none"> ○ Introduction to transition theory ○ Role of Transition Spaces in EPIC Africa ○ Short explanation on general concepts of sustainability (SDGs in particular) ❖ Getting to know each other / team building ❖ Agreeing on the Terms of Reference for the meeting
12:30 – 13:30	Lunch
13:30 – 17:30	<ul style="list-style-type: none"> ❖ Group co-creation: Establishing understanding and visions for a sustainable WEF system in 2063
17:30 – 18:00	<ul style="list-style-type: none"> ❖ Wrap-up

DAY 2 - THU 8th February 2024

08.30 – 09:00	Start Meeting (Coffee)
09:00 – 12:30	<ul style="list-style-type: none"> ❖ Harvesting main insights from Day 1 on a sustainable Water-Energy-Food system ❖ Future speeddate ❖ Brainstorming on guiding principles for the WEF projects of the future
12:30 – 13:30	Lunch
13:30 – 17:00	<ul style="list-style-type: none"> ❖ Developing concepts of disruptive WEF innovations ❖ Introducing the OSeMOSYS model
17:00	Closing the Transition Space meeting



What is a Transition Space?

Supporting transitions within the perspective of sustainable development requires an active involvement of different quadruple helix actors (civil society, private sector, government & administration, and knowledge institutes). All these actors have different ideas and visions regarding certain societal issues. However, to initiate and stimulate societal transitions a common understanding of one or more systemic issues and shared long-term actions is indispensable. A Transition Space (TS) is a way to reframe problem perceptions in the context of long-term visions of the different actors and to create a strong interaction between the members based on an agreement on relevant values. It is a systemic instrument to co-develop a common vision, an agenda, and a supporting network to tackle complex societal issues in a selective and strategic way. The TS members make up an innovation network, within which various perceptions of the persistent problem and possible directions for solutions can be deliberately confronted with each other and subsequently integrated.

Participants





EPIC Africa Consortium

Edo Abraham	TU Delft	WP5, WP8
Anna Gralka	TU Delft	WP8
Viktoria Martin	KTH	WP4
Shravan Kumar	KTH	WP4
Carlos Guerrero Lucendo	VITO	WP2
Erik Laes	VITO	WP2
Yves De Weerd	VITO	WP2
Léa Tetry	VITO	WP2
Frank O. Annor	TAHMO	WP7
Stella Malinda Nzuki	TAHMO	WP7
David N. Mburu	TAHMO	WP7
<i>Rafatou Fofana</i>	VBA	WP1
<i>Salifou Dene</i>	VBA	WP1
<i>Eric Ofosu-Antwi</i>	UENR	WP6
<i>Simon Mulwa</i>	KALRO	WP3
Stephen Malonza	KALRO	WP3
Morris Gatheru	KALRO	WP3
Primrose Nabwire	KALRO	WP3
Trezer Odera	KALRO	WP3
George Chivatsi	KALRO	WP3
Esan Odera	KALRO	WP3

External participants:

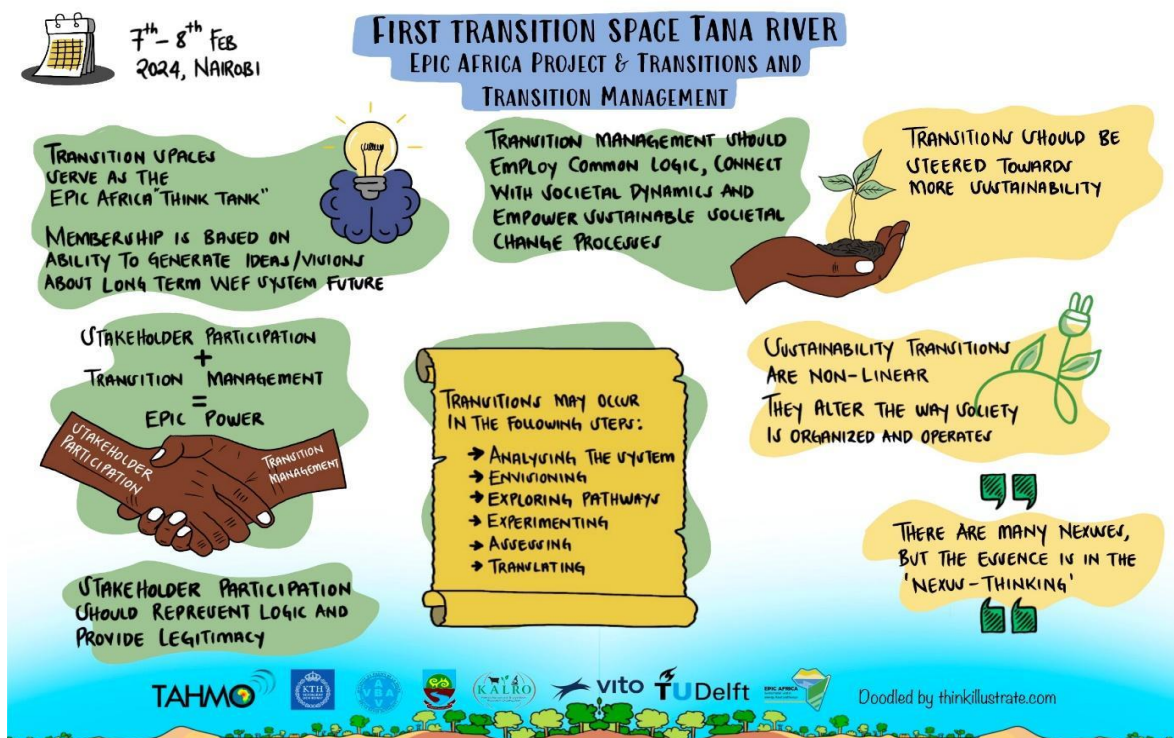
Anthony Lagat	KenGen	AB
Philip Padi Tetteh	VRA / UENR	
Loureen Awuor	KENAFF	
Jacqueline Wang'ombe	Digital Green	
Peter Odhiambo	Strathmore University	
David Nyamal	MODED[AG1]	
Juma Ignatius	Power Shift Africa	
Beatrice Langat	Kenya Water Institute	
Lilian Mutangili	Kenya Water Institute	
Eli Mutitu	ThinkIllustrate	Illustration



DAY 1



In an introductory lecture on ‘Transition Management and Systems Thinking’, the importance of applying different lenses to build a broad and comprehensive understanding of complex problems was stressed. An important part of this first therefore comprised a collective exploration of different lenses when looking at the WEF Nexus challenge. The lens of values and the lens of time were two important lenses the group worked around on the first day. The figure gives a visual representation of the main takeaways of the introductory lecture.





Brainstorm on values that the WEF system has to deliver.

Results

First, an open and collaborative discussion was organized where the TS participants were encouraged to share their perspectives, experiences, and priorities regarding the desired outcomes and impacts of the water-energy-food (WEF) system on Kenyan society. The broad range of values identified by the participants – who considered economic, social, environmental, as well as cultural dimensions of sustainability – was captured in real time by a graphic note taker (cf. Figure below).

‘Long list’ of values that WEF system should bring to society:

- “Sustainability”: umbrella term, to be specified further
- “Development”: increase the capabilities of people
- “Well-being”: holistic concept, different from pure welfare (monetary income)
- “Accessibility”: of infrastructures for everyone
- “WEF security”
- “Affordability”
- “Productivity”: no waste of valuable resources
- “Inclusivity”: people working on different sectors should interact
- “Connectivity”
- “Providing life”: not only for humans
- “Nutrition”
- “Peace”
- “Dignity”
- “Livelihood”
- “Reliable”
- “Recreation”
- “Resilience”: looking into the future – the ability to bounce back from external shocks
- “Innovation”: creating new systems, new ideas, new technologies
- “Monetary value”
- “Economic growth”
- “Economic development”: different from economic growth – growth should benefit all people, specifically the least well-off in society
- “Cultural identity”
- “Social development”
- “Services”
- “Safety”
- “Ethics”
- “Health”
- “Education”
- “Transportation”
- “Conservation”: of food, the environment
- “Sanitation”
- “Food & nutrition security”
- “Power”: associated to the ownership of resources/infrastructures
- “Justice”
- “Trade”
- “Shelter”
- “Equality”
- “Water security”



- “Energy security”
- “Sustainable urban development”
- “Employment”
- “Job security”
- “Self-reliance”
- “Freedom”
- “Coherence”: contributing to a harmonious society
- “Stronger rural areas”: referring mostly to infrastructures, transport, reducing urban immigration



7th - 8th FEB
2024, NAIROBI

FIRST TRANSITION SPACE TANA RIVER WEF VALUES



The importance of this exercise is twofold. First it transcends classical sectoral thinking and puts thinking about the WEF Nexus in immediate relation with (a direction of) societal change. Secondly, it shows the impressive number of expectations that (often implicitly) are projected onto the WEF Nexus governance.

ILLUSTRATIVE QUOTES FROM THE SESSION:

“ECONOMIC GROWTH MEANS GDP INCREASE BUT DOESN’T MEAN THAT IT IS CASCADING TO THE COMMUNITIES AND THE CITIZENS.”

“IT IS VERY IMPORTANT TO CONSIDER THE CONCEPTS OF VALUE CONFLICT AND VALUE TRADE-OFFS”

“WE ARE CRAZY. KIDS HAVE THE ABILITY TO SIMPLIFY THINGS AND THEY WILL SAY THAT WE ARE OVERTHINKING THE PROBLEM.”

“WE ARE TOO AMBITIOUS, AND WE ASK TOO MUCH FROM ONE SYSTEM”



Future work

The outcome of the TS brainstorm on values will be further used to inform Deliverable 2.4 on “Transition objectives, criteria and indicators”. A clustering methodology will be applied, composed of the following steps:

- **Review of the long list**, making sure that each value is clearly articulated, and duplicates are removed;
- **Identification of common themes or patterns;**
- **Creation of initial clusters;**
- **Iterative grouping and refinement** of the initial clusters, based on feedback of the TS participants;
- **Finalization of clusters and values;**
- **Incorporating clusters in Deliverable 2.4**

“From – to” exercise

TS participants were asked to look back at the major changes that occurred in WEF nexus management in Kenya, and what the expected trends would be for the coming years:

- A. What for you is the major change over the last 10-20 years related to WEF in Kenya?
- B. What are the things that will change more dramatically over the next 10-20 years in Kenya related to WEF(expected change, not desired)?

Contrasting the current state ("from") with the expected future state ("to") allows participants to identify challenges or opportunities that need to be addressed during the transition (positive trends that can be reinforced, negative trends that need to be countered). This helps prioritize actions and interventions that will bridge the gap between the current and desired end state (cf. Future visions). Results of the exercise are reported in the following table and figure:

What changed the most in the WEF nexus in the last 15 years?	What will change the most in the WEF nexus in the next 15 years?
<p>Water</p> <ul style="list-style-type: none"> ● Less access to water ● More salination of water ● Lower water quality (mining activities, contamination) ● More water quantity (precipitations) ● Capacity gap (finance) in implementing Integrated Water Resources Management (IWRM) <p>Ecosystems</p> <ul style="list-style-type: none"> ● Bush fires (due to climate change) ● Disappearance of wetlands due to urbanization and land conversion (Kenya) ● Increased conflict between humans and wildlife 	<p>Water</p> <ul style="list-style-type: none"> ● More floodings (Volta) ● Less wetlands (Volta) ● More competition for water usages (energy, agriculture, residential, industry) and change of scale (local to global) ● Decline in aquifers and availability of groundwater (Kenya) ● Increased price of water <p>Ecosystem</p> <ul style="list-style-type: none"> ● Increased conflicts between humans and wildlife



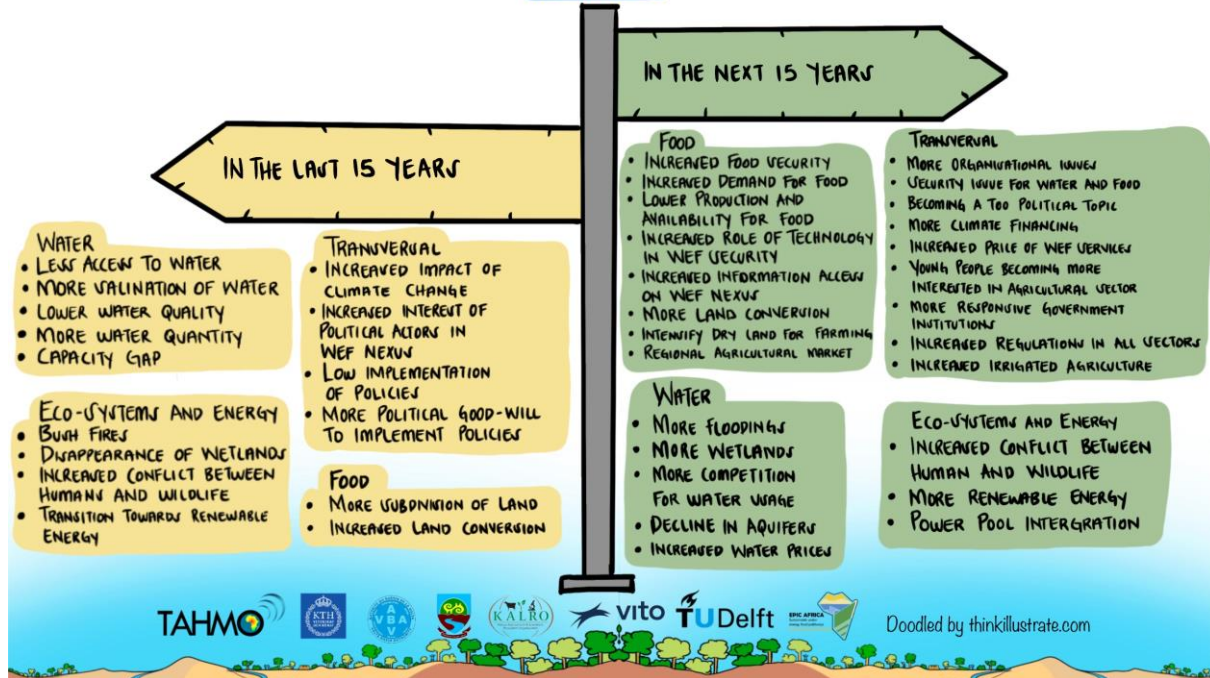
<p>Energy</p> <ul style="list-style-type: none"> • Transition towards renewable energy (geothermal, solar) <p>Food</p> <ul style="list-style-type: none"> • More sub-division of land • Increased land conversion to marginal lands is now used for agricultural activities <p>Transversal</p> <ul style="list-style-type: none"> • Increased impact of climate change à Changing rain patterns • Increased interest of political actors in WEF nexus • Low implementation of policies due to lack of accountability • More political good-will implement policies 	<p>Energy</p> <ul style="list-style-type: none"> • More renewable energy (hydrogen, solar, wind) • Power pool integration (EAPP) <p>Food</p> <ul style="list-style-type: none"> • Increased food security • Lower production (decreasing productivity) and low availability of food • More complex food systems – more technologies • Increase demand for food and diet change due to the increase of income • Increase role of technology in WEF security • Increase information access on WEF nexus • More land conversion (arable land) • Intensify dry land for farming • Regional agricultural market <p>Transversal</p> <ul style="list-style-type: none"> • More organization issues • Security issue for water & food (deforestation and land degradation) • Becoming a too political topic • More climate financing: How to mobilize it? • Increased of price for WEF services • Young people are more interested by the agricultural sector (commercial) • More responsive governmental institutions • Increased regulations in all sectors • Increased irrigated agriculture (water & food)
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FIRST TRANSITION SPACE TANA RIVER

WHAT HAS CHANGED THE MOST IN THE
WEF NEXUS:



Future visions on the Energy-Water-Food system of 2063

TS participants were subdivided in three groups. Each of these groups was assigned to one system (water, food or energy) and asked to visualize (with the aid of creative materials that were available at the table) a sustainable future for their system. Next, participants were asked to think about the links to the other systems (“What do you need from the other systems in order to enable this sustainable future?”).

Envisioning is an important step in the work of a TS. Envisioning helps participants articulate a shared vision of the desired future state of the system undergoing transition. By collectively imagining what success looks like, participants can set a clear direction for the transition process and align their efforts towards common goals and objectives. A well-defined vision can serve as a guide for decision-making on the scenarios and pathways that will be modeled with the aid of the OSeMOSYS model of the Tana River basin. The work done in the first TS meeting sets up the potential building blocks for such visions, which have to be further articulated into coherent future storylines before the 2nd meeting of the TS (within one year).

The picture below represents the work of the ‘Energy’ subgroup.



Results of the Energy group

- (Energy) Integration within the region.
- Promote local R&D innovation and local finance. Just transition. Getting more from local.
- Self-reliance in the technology chain. China is currently the technology driver.
- Develop own capacity to manufacture locally.
- A more efficient power sector with less players.
- Accessibility. We need 99% access to energy. Clean, reliable.
- Transmission lines are reliable.
- Cleaner and sustainable technologies.
- Diversified energy sources. Less reliance on hydro due to less rainfall because of climate change.
- Harmonization of regulations within the regions.
- Payment for environmental services upstream.
- Energy system more flexible with the integration of storage solutions (batteries, hydrogen, pumped hydro)
- Multi-purpose dams.
- Circular use of water.
- Wastewater. Treatment is very costly. Generation of energy from wastewater.
- Transport sector. With also biofuels, electrification, and hydrogen.
- Decarbonization of industry with the aid of hydrogen.
- Hydrogen export

Linkages to other sectors to achieve the desired future

- Water is used for energy generation (hydro + geothermal)
- Management of ecosystems to maintain water.
- Irrigation. Dams can benefit the communities around for irrigation and drinking purposes. Multi-purpose Dam.
- Ecosystem services are important for upstream services of hydropower dams.
- When doing farming, water quality is affected. If you stop me from farming, then I should be compensated.



- Saltation in the dam. Good farming practices are needed to conserve the water quality for the hydro reservoirs.
- Smart Irrigation systems need energy, including mechanization of farms using clean energy. Energy is very important for value-adding like drying. Reduced post-harvest losses through drying.
- Water pumping for farming.
- Water needed for hydrogen production. Hydrogen used as energy storage.
- Competition between fuel crops and food crops. Biofuels will compete with food crops for land, water, and energy for irrigation.
- Solar competes with food for available land. Competition between land and energy.
- Biogas from food and livestock waste.
- Desalination requires energy.

Results of the Food group

- Along the value chain of the food system (sowing the seeds, nurturing crops, harvesting crops, post-harvest treatment, transportation, etc.) most food waste occurs between harvest and consumption of food due to inadequate conservation methods.
- The availability of clean and reliable renewable energy can help:
 - Enough energy for cold storage to avoid waste
 - Remaining waste can be used to produce biogas
 - Biogas can be used to power mechanical treatment technologies (tractors, harvesting machines, etc.)
- Another idea is to move the value chain closer to the farmer: one town/one factory (adding value for farmers at the lower end of the value chain)
- Who takes responsibility for setting up the local factories? Government or private companies? Competition between both is ongoing.
- Traditional knowledge/cultural practices stand in the way of making local food production more drought resilient. Water saving is a priority => recycling of water should be practiced wherever possible
- Change to more drought resilient crops is an option but difficult for cultural reasons: a diet based on indigenous crops is seen as a 'poor-man's diet' => need for decolonizing the food system.
- Big problem is financing all the required changes in the food system. Agriculture cooperatives could be a solution here.

Linkages to other sectors to achieve the desired future

- Agricultural waste (biomass) is used to produce biogas (for powering agricultural machinery)
- Access to information can help (predicting periods of drought as well as excessive rainfall) but farmer need a smartphone and therefore also access to clean energy
- Better irrigation can help, this requires pumping which also needs clean energy
- Electricity should come from decentralized energy system (island mode)

Results of the Water group

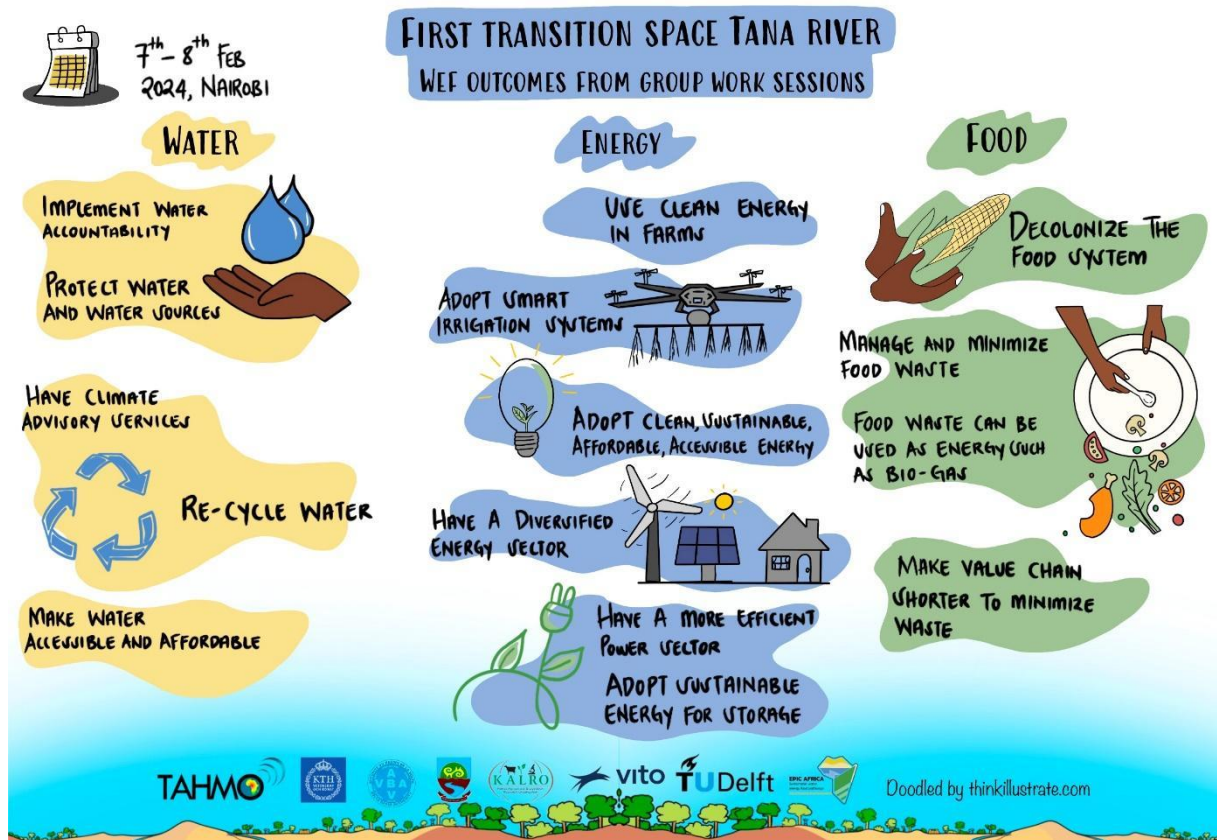
- Water is a valuable resource. Introduce water accountability.
- Water is recycled to the maximum extent possible
- Establishment of a fine-grained climate information system. Farmers are warned of upcoming climate events (draughts, heavy rainfall)
- Desalination of seawater (or salty ground water)
- Conservation of water ecosystems (wetlands)



- Widespread availability of clean water through water treatment technologies
- Efficient irrigation techniques

Linkages to other sectors to achieve the desired future

- Energy needed to pump water (for irrigation, drinking water)
- Energy needed for wastewater treatment
- Multi-purpose dams (electricity generation, irrigation)





DAY 2

Principles for a sustainable WEF nexus management

After a 'Future Speed date' exercise (where the participants were asked to think about one thing that is already possible now and that really amazes them), a brainstorm was organized on the principles that should become guiding when developing WEF plans, policies, or projects of the future. The difference between a principle and a value lies primarily in their nature and application. While principles provide overarching rules or guidelines for actions or practices, values represent deeply held beliefs and priorities that inform attitudes and decision-making. Principles are more prescriptive in nature, guiding actions based on fundamental rules, while values are more descriptive, reflecting personal or collective preferences and aspirations.

Results are recorded below. Just as for the values, these principles will be clustered (ideally into 7 leading principles) and submitted for feedback to the TS participants.

FIRST TRANSITION SPACE TANA RIVER

- Lead by example
- Enhance Resilience
- Enhance Security of Resources and Society
- Create Synergies
- Enhance flexibility
- Enhance Social justice
- Enhance Self reliance
- Introduce Circular practices
- Increase Affordability
- Support livelihoods
- Resource Conservation
- Maintenance
- Be Renewable
- Enhancing Implementation
- Be Inclusive and Participatory
- Hold Individuals and Institutions Accountable
- Be Transparent
- Ensure that What is done is enforceable
- Enhance Surveillance
- Fit for purpose
- Carry out Nexus Assessment
- Based on Nexus considerations
- Enhance Coordination
- Enhance Stakeholder management
- Show Leadership
- Review, learn and Adopt
- People centered
- Future Oriented
- Be Restorative
- Be Committed to Sustainable development



Description of 4 disruptive WEF cases

To make the principles more tangible, the TS participants were divided into 4 sub-groups that each discussed an innovative practice invented by the TS facilitators. Participants were asked to describe how each of these cases would work in practice (who would be involved, what would the practice achieve, how would decisions be made, etc.).

1. **WEF competition solving space**
2. **WEF energy farmers.**
3. **WE-Factory in every town.**
4. **WEF activist movement.**

WEF-competition solving space

The WEF collaboration space involves launching a WEF secretariat under the office of the prime minister. This WEF secretariat has an audit function: it has to check every policy plan submitted by other ministries has implemented the correct WEF assessment procedure. Each of the ministries submitting a plan that has a significant impact on either water, energy or agriculture has to do such an assessment before submitting plans to the Ministry of Finance. The WEF assessment has to follow the principles of transparency and inclusiveness (upstream consultation of stakeholders before the plan is submitted). The WEF secretariat audits these assessments and gives a certificate of approval when the correct procedure has been followed. In particular, such WEF assessments should

- look for synergies to the maximum extent possible
- contain an evidence-based and scientifically sound WEF impact assessment
- plan mitigation in case a serious impact on one or more of the WEF sectors is unavoidable.

WEF Energy farmers

Participants in this sub-group created a storyline:

“In 1979, VITO Power entered Kenya with ambitious plans to invest in the Tana River Basin, promising to boost the fish supply of the river and restore ecosystems. However, after four years of negotiations, they failed to reach consensus with the local community. Instead, they struck a deal with the local government to relocate 10,000 households downstream, driven by the need for funds. Unfortunately, when VITO Power realized the dam's size wouldn't suffice, they diverted water upstream, adversely affecting communities there. Operations commenced in 1994 amid a severe drought, leading to cost-cutting measures that compromised the dam's integrity, resulting in cracks and subsequent flooding downstream, devastating crops and livelihoods. The impacted communities, both upstream and downstream, voiced their grievances, highlighting the detrimental effects of the dam's mismanagement.

Recognizing the urgent need for change, VITO Power underwent a shift in management, embracing a new mindset centered on community engagement and shared values. Collaborating with downstream communities, VITO Power initiated tree-planting projects, aiming to mitigate the environmental impact and foster resilience. This proactive approach garnered praise from local politicians, who acknowledged the positive strides made by VITO Power in addressing community concerns and undertaking environmental stewardship efforts. Through these collaborative endeavors and a renewed commitment to sustainable practices, VITO Power and the affected communities are forging a path towards reconciliation, resilience, and mutual prosperity in the Tana River Basin.”

WE-Factory in every town



In envisioning a functioning WE-Factory in every town, the aim is to cultivate environments where individuals and families can flourish without the need to migrate to major urban hubs like Nairobi. This holistic approach to community development encompasses various aspects, including energy independence through the establishment of energy islands. These energy islands harness the potential of renewable energy sources like solar and wind power. By situating power facilities closer to energy sources such as wind farms or solar arrays, communities can minimize transmission losses and optimize the utilization of renewable resources.

In addition to energy considerations, the WE-Factories prioritize the preservation and management of water resources. Ensuring an adequate supply of water is essential not only for sustaining local ecosystems but also for meeting the diverse needs of agriculture, industry, and households. By implementing integrated water resource management, investing in infrastructure for rainwater harvesting and storage, and promoting responsible water usage practices, communities can enhance their resilience to droughts and water scarcity while safeguarding the environment for future generations.

WEF activist movement

“We the WEF movement have a petition to bring back power to the people in Africa in what matters most to them, Water energy and food.

1. Bring power to the people. People who have the resources also have the decision on what to do with them
2. We want to be a movement of solutions.
3. Provide alternative visions on business models. Decolonization.
4. Ensure that we are inclusive, and everyone can share their voice.
5. Focus on local farmers, who are the ones affected by WEF policies
6. Youth must be able to share their voices.
7. Work with other entities like NGOs to have more impact.

What have we seen from these actions?

- Job creation
- Increase access to WEF analysis
- Communities more aware and willing to protect resources
- Amplifying communities’ voices at international level. We could tell that organic agriculture is a real alternative.

Conclusion

In conclusion, the 1st Transition Space meeting of the Tana River basin has provided a vital platform for participants to engage in collaborative dialogue and action towards the sustainable management of water-energy-food systems. Through insightful discussions, shared experiences, and diverse perspectives, we have identified key values, principles, and building blocks for advancing sustainability in these critical sectors. The results of this first meeting will be further developed into tangible assets that serve to support the overall ambition of the EPIC Africa project:

- Values will be clustered and further developed into criteria and indicators (Deliverable 2.4, to be submitted in October 2024).
- Principles will be clustered and further articulated into guiding principles for the design of the Tana River basin model, as well as the scenarios and pathways developed with the aid of the model.
- Disruptive WEF cases (possibly complemented by others) will serve as inspiration to build scenario pathways.



Annex 1 – Transition Management presentation

Welcome to transition space!

Nairobi, February 2024

Erik Laes & Yves De Weerd (VITO Nexus), with support from Carlos Guerrero and Léa Taty (VITO)

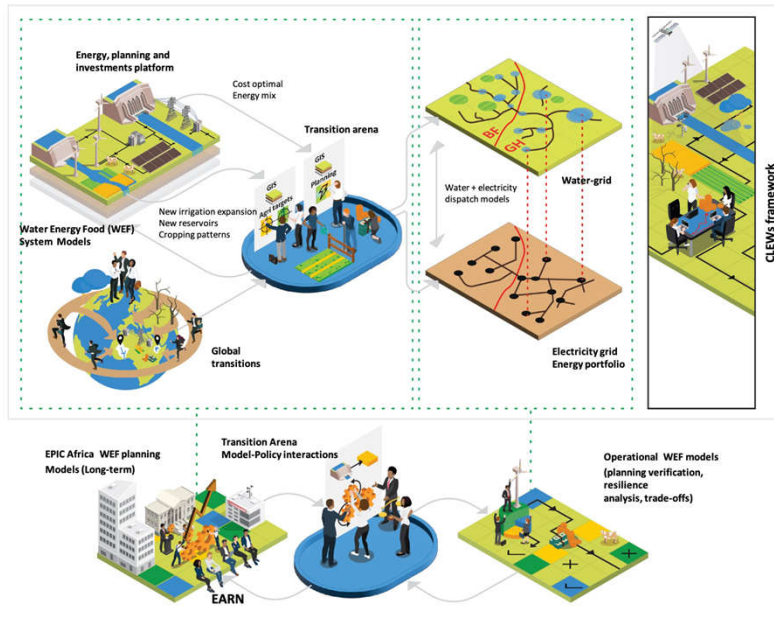


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Energy Planning and Modelling through Integrated Assessment of Climate-Land-Energy-Water Nexus in Sub-Saharan Africa: *the Cases of the Volta and Tana River Basins*



EPIC Africa approach



Operationalizing integrated approaches in infrastructure planning using **open-source** tools with **community of users**

- Create African experts and expertise in this area: **EPIC Africa Research Network** for co-creating tools and data
- **Transition management: spaces** to deliberate on visions, priorities, locally-led capacity mobilization on nexus and science-policy interactions
- Integrated models of **water-energy-food** to study interactions between water-energy-land resources and their **operational and spatial aspects**

Transition Spaces
within EPIC

Transition Spaces

Function

- They serve as the **EPIC Africa "think tank"**
- Membership based on ability to **generate ideas/visions about long-term future of WEF system** in the two river basins
- Interaction between transition spaces and stakeholder group based on output of **TS meeting 3: pathways & trade-offs**
- Interaction between **transition spaces and modelling:**
 1. Define WEF system dynamics and their representation in the WEF models
 2. Create visions / transition pathways that will serve to define the parameters within the scenario modelling



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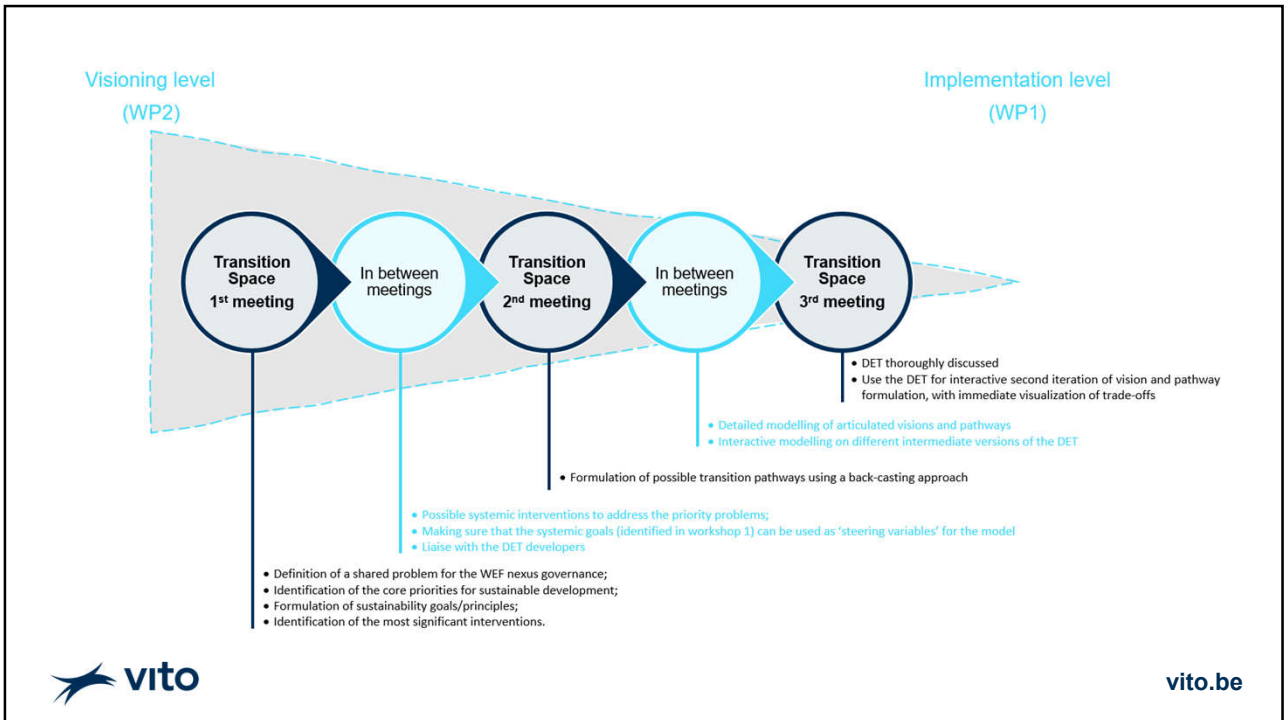
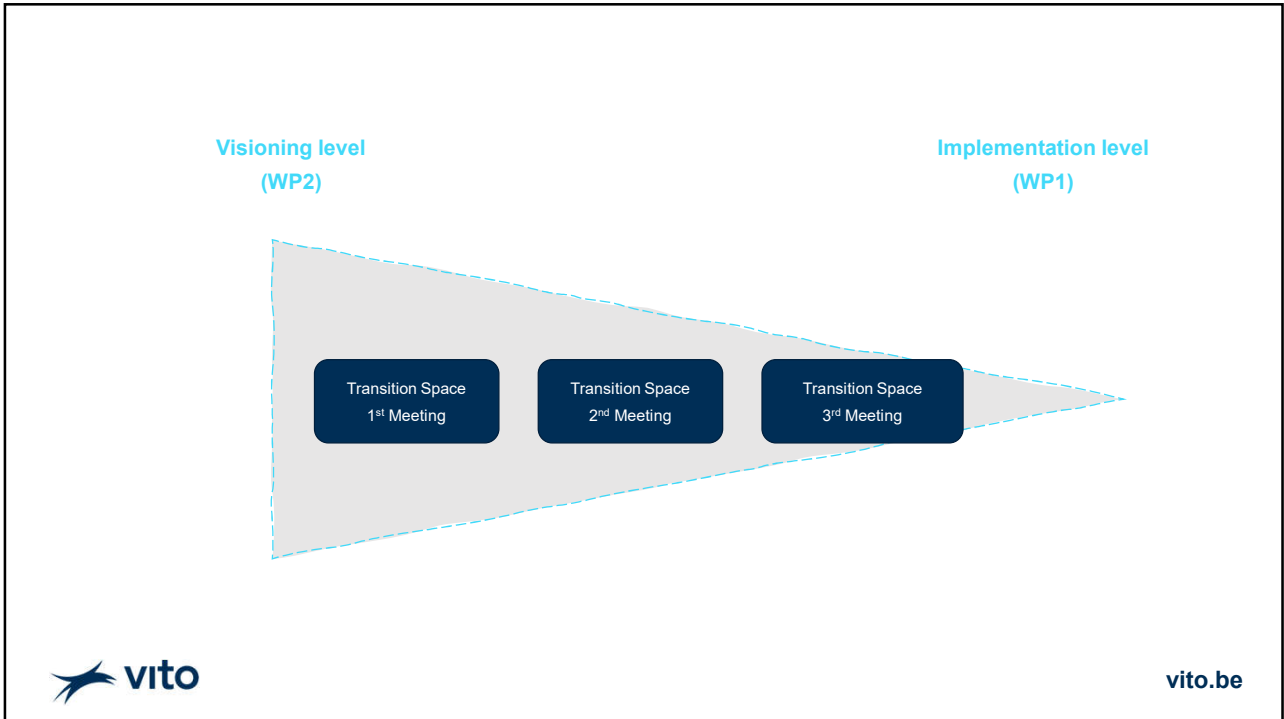
Stakeholder participation + transition management = Epic power!

Characteristics

- | | |
|---|--|
| <ul style="list-style-type: none">▪ Stakeholder participation<ul style="list-style-type: none">• Representation logic• Has to provide legitimacy..• .. For political action
▪ So:<ul style="list-style-type: none">• Government and politics are leading• Science to policy logic | <ul style="list-style-type: none">▪ Transition management<ul style="list-style-type: none">• Common good logic<ul style="list-style-type: none">- Transcending interest representation• Connects with societal dynamics...• .. To empower sustainable societal change processes
▪ So:<ul style="list-style-type: none">• Citizens and civil society are leading, government participates in co-creation, policy development in support• Science to society logic |
|---|--|



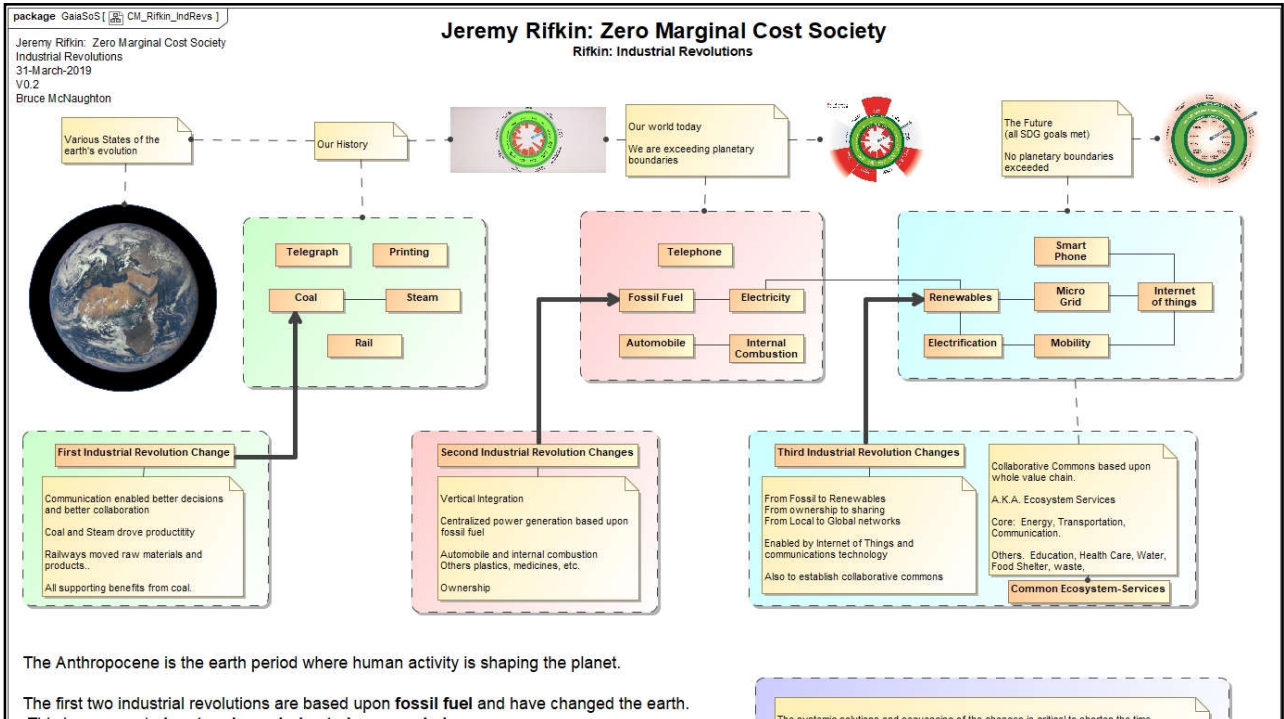
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SUSTAINABLE DEVELOPMENT GOALS



Transitions & transition management?



Transitions versus sustainability transitions

Sustainability transitions are non-linear, long-term and fundamental change processes towards sustainability that alter the way society is organised (e.g. physical infrastructures, institutions), values services and amenities (e.g. values and norms) and operates (e.g. production routines) (Rotmans et al., 2001, Frantzeskaki and Loorbach, 2010, Markard et al., 2012)



But can you manage transitions and why would you want to?

**Transition theory:
way of looking**

**Transition management:
frame for action**

- Inter- and transdisciplinary in nature
- Long term perspective
- Systems perspective
- Co-creation



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Draw
'Making toast'

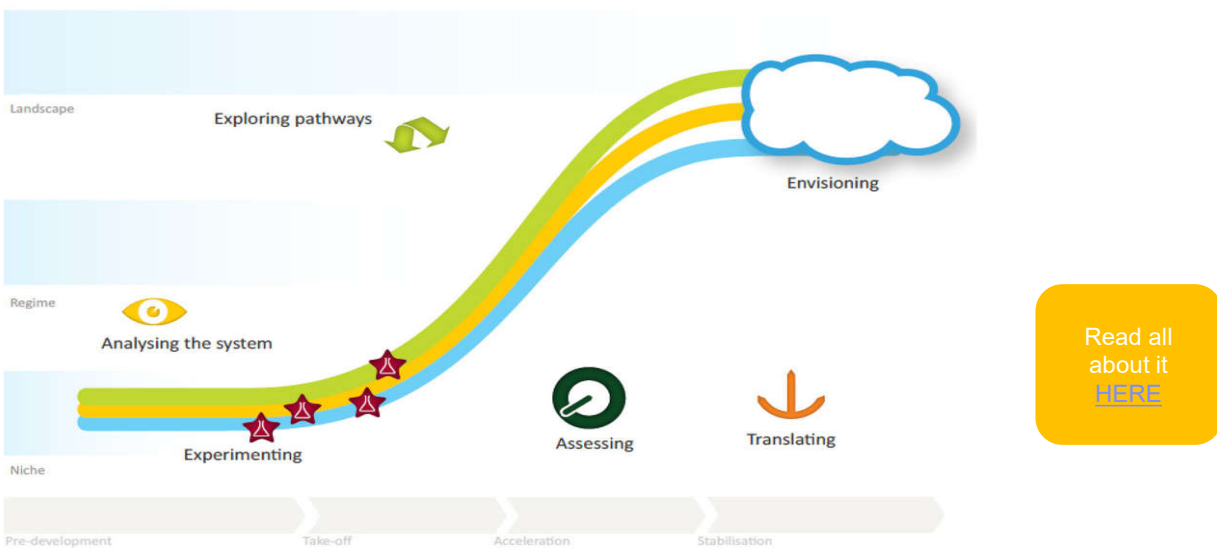


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HOW MIGHT TRANSITIONS HAPPEN

A framework of 3 lenses for looking at systemic changes for sustainability.



LENS 1: MULTILEVEL

A framework of 3 lenses for looking at systemic changes for sustainability.

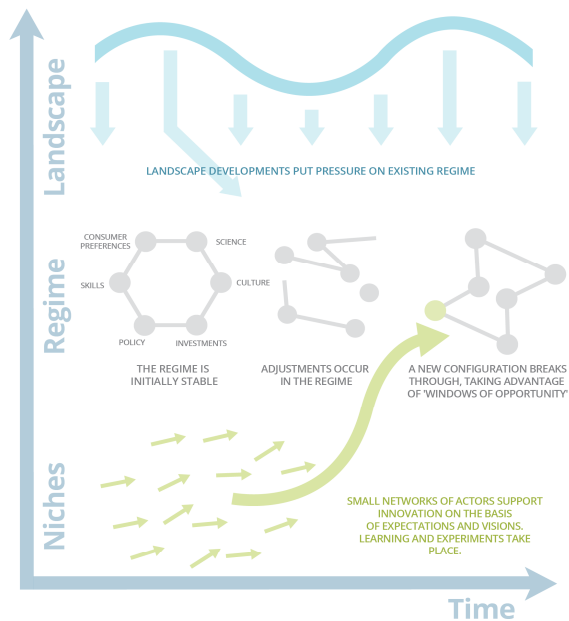
LANDSCAPE (MEGATRENDS, SOCIETAL TENDENCIES, 'MACRO'-CHARACTERISTICS)

REGIME ('Well, that's just how we do it here')

NICHE (What's brewing? Where are people and/or organizations doing things really different?)



A multilevel perspective to societal change



LENS 2: MULTI-PHASE

A framework of 3 lenses for looking at systemic changes for sustainability.



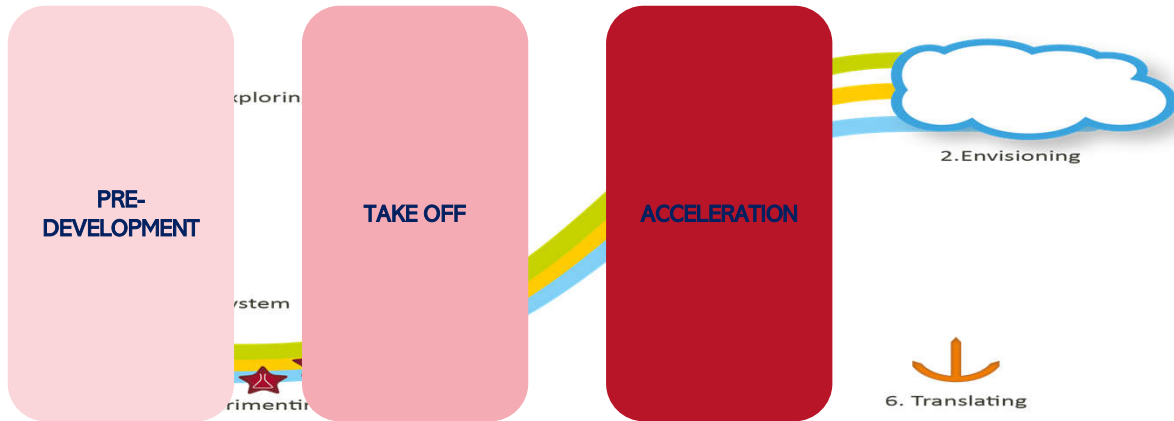
LENS 2: MULTI-PHASE

A framework of 3 lenses for looking at systemic changes for sustainability.



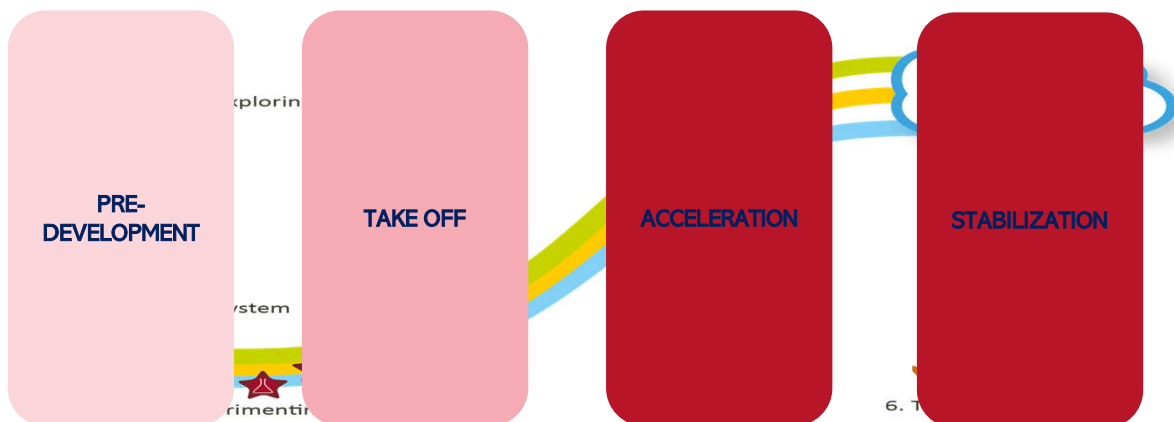
LENS 2: MULTI-PHASE

A framework of 3 lenses for looking at systemic changes for sustainability.



LENS 2: MULTI-PHASE

A framework of 3 lenses for looking at systemic changes for sustainability.



LENS 3: MULTI-ACTOR



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Managing? Governing!



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How could you manage or govern a transition

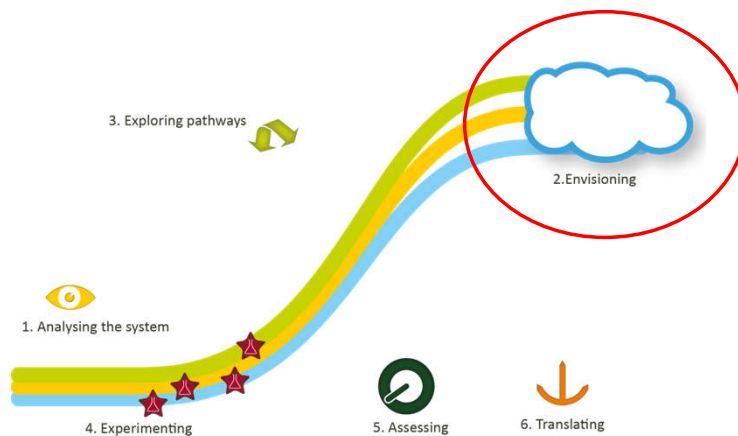
Iceberg model, causal loop diagrams, ...

See further



How could you manage or govern a transition

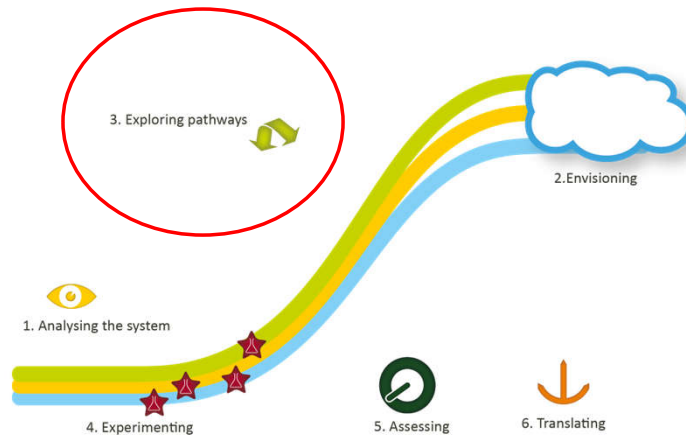
Envisioning : a change trajectory towards a more sustainable society or system is mainly initiated by an appealing and inspiring vision of a desirable future. A vision entails clear images/narrative of desirable systems based on shared principles of sustainable development. Inspiring visions replace 'having to' by 'wanting to', 're-active' by 'pro- active' and 'creative'. Visions are developed in carefully composed 'arenas' of engaged, creative and visionary frontrunners. Not he vision 'an sich'



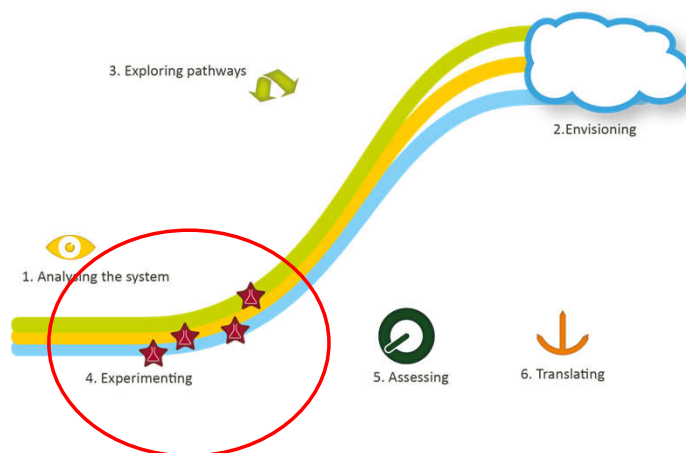
How could you manage or govern a transition

Exploring pathways: starting from an inspiring and clear vision, different strategies to realise a desired societal system configuration can be outlined. This 'back casting' exercise results in a number of strategic pathways that contribute to reaching the desired system configuration.

Models/scenarios can assess and underpin the effectiveness and feasibility of alternative pathways and the alignment of envisaged or on-going actions.

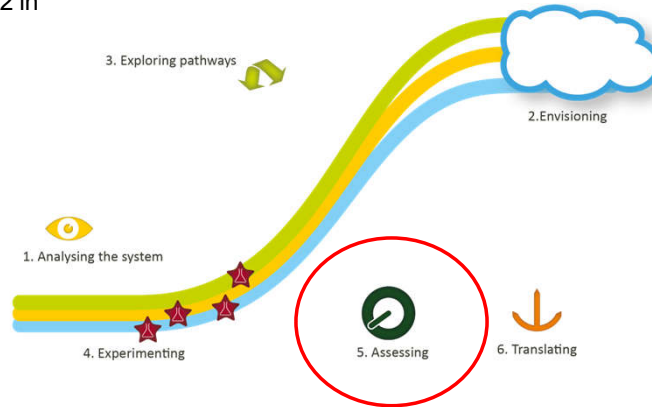


How could you manage or govern a transition

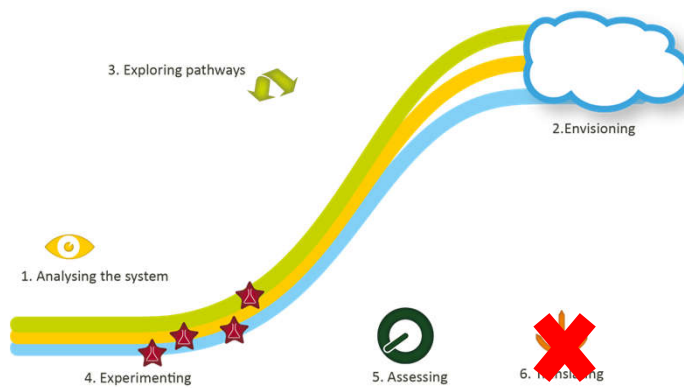


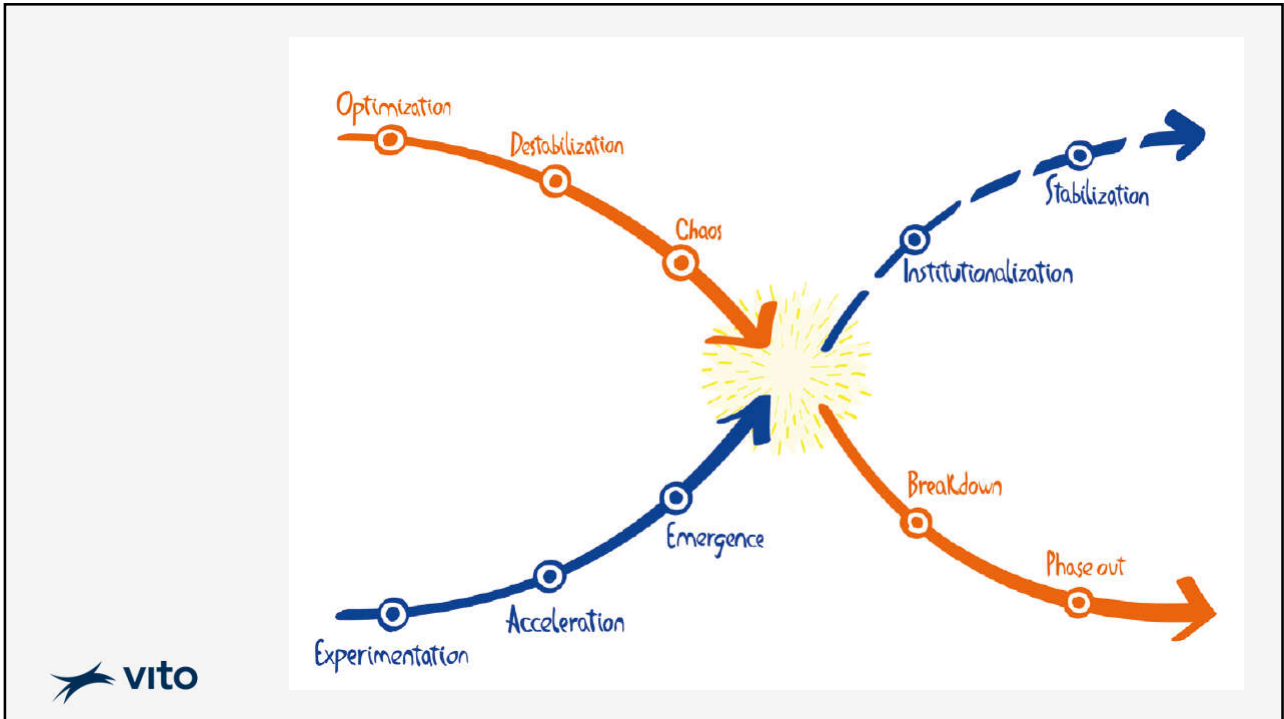
How could you manage or govern a transition

Assessing: to be developed under WP2 in this specific context




How could you manage or govern a transition






vito



TRANSITIONS AND SYSTEMS

THINK ABOUT IT



'There are many nexuses, but the essence is in the 'Nexus-thinking'

Tafadzwa Mabhaudhi



vito.be

Simple as 1 – 2 – 3 ...



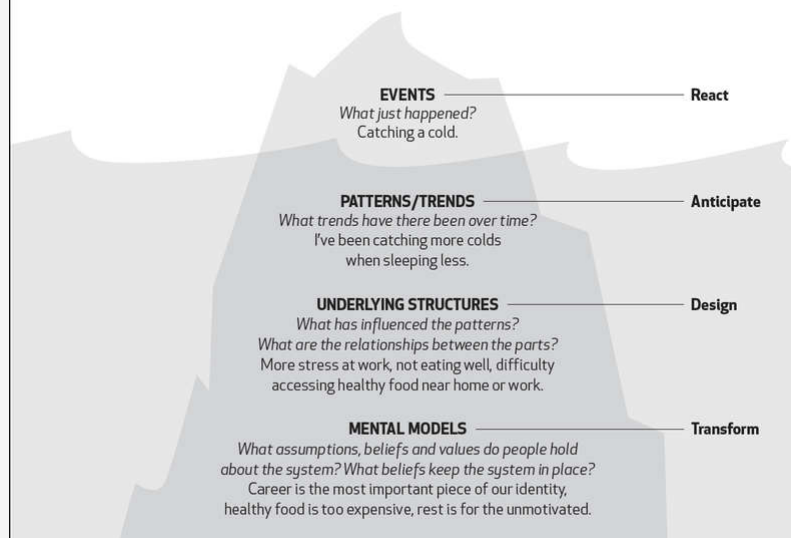
Man announces he will quit drinking by 2050

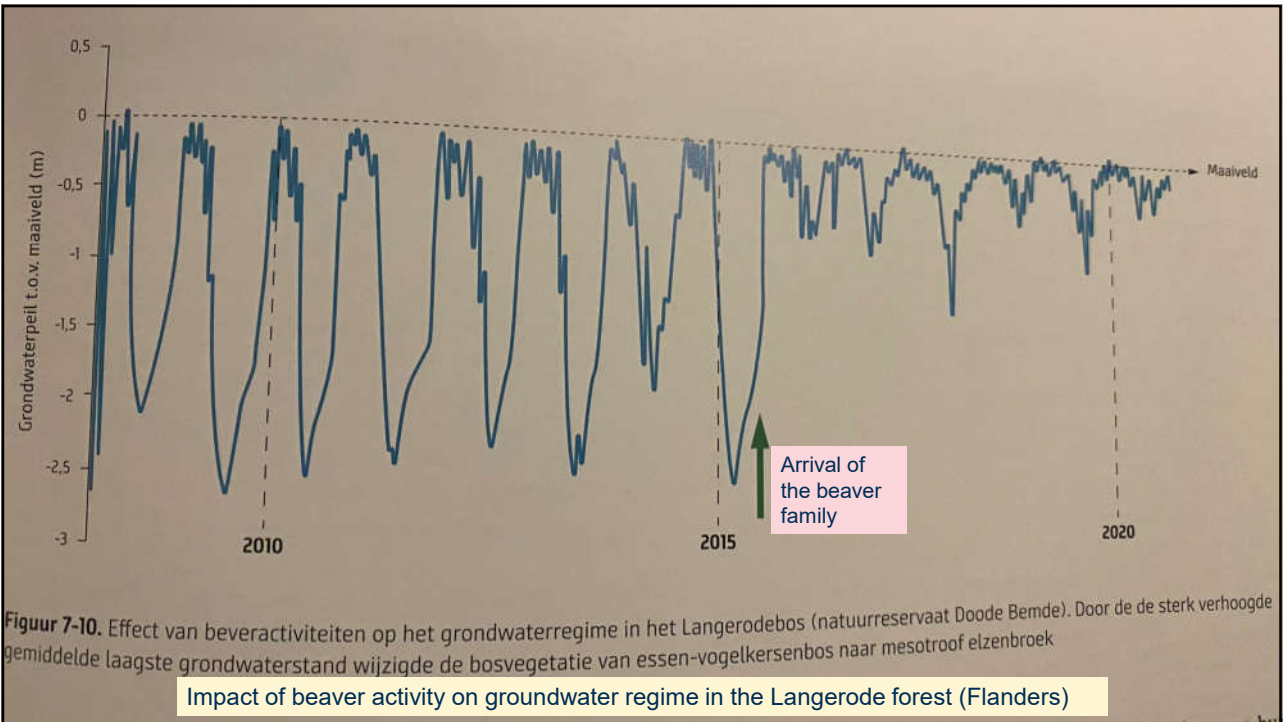
A Sydney man has set an ambitious target to phase out his alcohol consumption within the next 28 years, as part of an impressive plan to improve his health.

The program will see Greg, 73, continue to drink as normal before reducing consumption in 2049 when he turns 101. Taylor said it was important not to rush the process: "It's not realistic to transition to zero alcohol overnight. This requires a phased approach", he said, adding that whisky drinkers were the real problem. Greg is lobbying for additional investments in beer to maintain beer supply-chain security.

Greg will be able to bring forward drinking credits earned from the days he hasn't drunk over the past forty years, enabling him to reach net-zero but keep drinking. To assist with the transition, he has bought a second beer fridge which he describes as the 'capture and storage' method. He is also investing in direct alcohol extraction from blood technology.

THE ICEBERG A Tool for Guiding Systemic Thinking



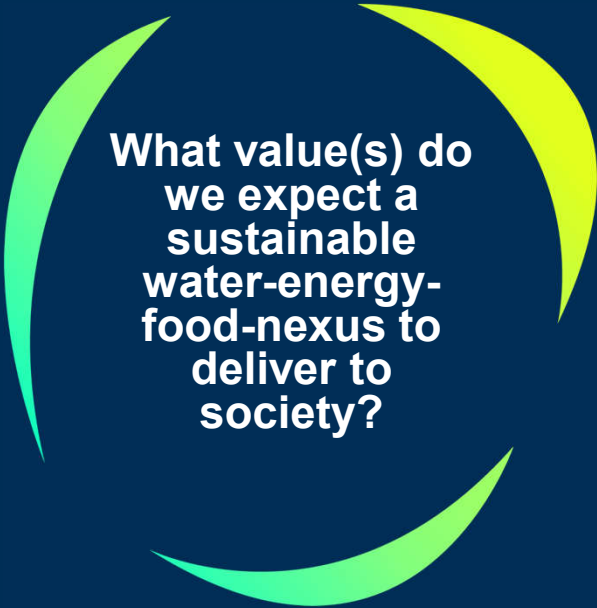


Figuur 7-10. Effect van beveractiviteiten op het grondwaterregime in het Langerodebos (natuureservaat Doode Bemde). Door de de sterk verhoogde gemiddelde laagste grondwaterstand wijzigde de bosvegetatie van essen-vogelkersenbos naar mesotroof elzenbroek

Impact of beaver activity on groundwater regime in the Langerode forest (Flanders)



The Values lens



**What value(s) do
we expect a
sustainable
water-energy-
food-nexus to
deliver to
society?**







Annex 2 – Modelling presentation

EPIC AFRICA's Work Package 4 – interacting with the Transition Space in Modelling for Insights (not answers)

WEF Investment Planning and Optimisation Model

Viktoria Martin, Shravan Kumar, KTH

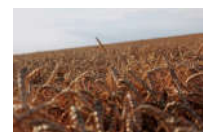


EPIC Africa – Transition Space, Kenya, February, 2024

Trade-offs and synergies in the "WEF-NEXUS"

Security of supply is desirable!

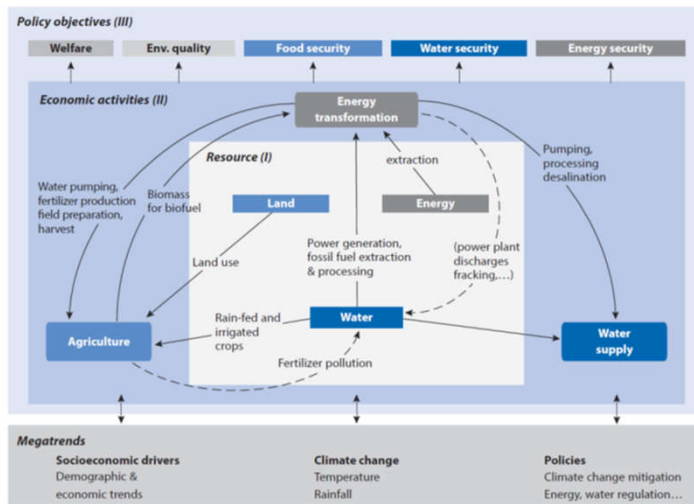
- **Water Security:** *"The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability."* (UN Water: <https://www.unwater.org/publications/water-security-infographic/>)
- **Energy Security:** *"uninterrupted physical availability at a price which is affordable, while respecting environmental concerns"* (IEA: <https://www.iea.org/areas-of-work/ensuring-energy-security>)
- **Food Security:** *"when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life"* (UN FAO: http://www.fao.org/fileadmin/templates/faotaly/documents/pdf/pdf_Food_Security_Concept_Note.pdf)



How can "security" be accomplished, in overall? Trade-offs? Synergies?

WEF-interlinkages

Figure 1.1. Main linkages within the land, water and energy nexus



OECD, The Land-Water-Energy Nexus, 2017
<https://doi.org/10.1787/9789264279360-en>

Why should we model?

- Governments and the public have **qualitative** ideas on the future development of the country and its energy system, for example:
 - Policy goals (e.g. economic development, financial constraints, environmental constraints, energy security, rural development ...)
 - Preferred technology options (e.g. using domestic resources, increasing RES shares...)
 - Future availability and prices of energy forms...
 - Public perception: may prefer some technologies over others
- With mathematical models, it is possible to assess implications of different energy policy / development options on the resources management and sustainable development.



Why should we model?

- Sectors compete for resources ...
- ... resources under stress are especially vulnerable
- To accomplish security for all, we have to understand interlinkages and challenges!
- Models cannot predict the future!
 - But can help understand the future better and stay prepared to take informed decisions
- Models cannot make decisions!
 - But aids in evaluating options and provide clear inputs for decision makers
- “Modelling for *INSIGHTS*, not numbers...” (nor answers)



[Huntington et al, 1982](#)

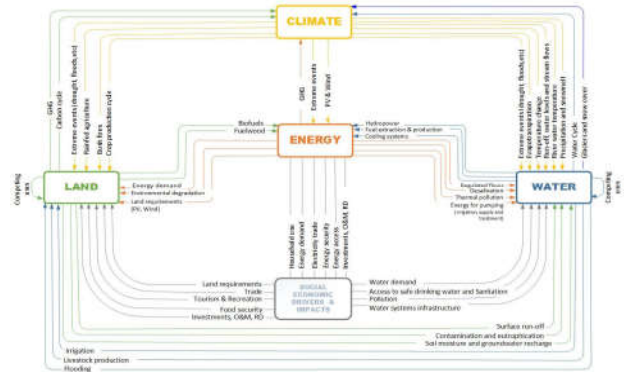
In addition, Climate Change is affecting the WEF NEXUS

Climate Change

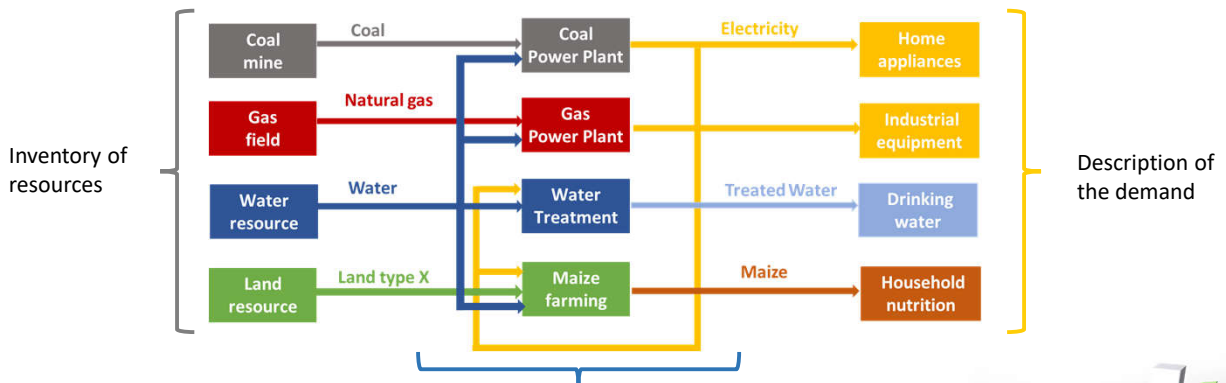


The CLEWs framework

- For quantifying the nexus
- developing an integrated accounting model (resources use factors, adding CLEWs elements to sectoral models);
- with the development of sectoral systems models and integration and iteration between these;
- using a single modelling tool (here, [OSeMOSYS](#))



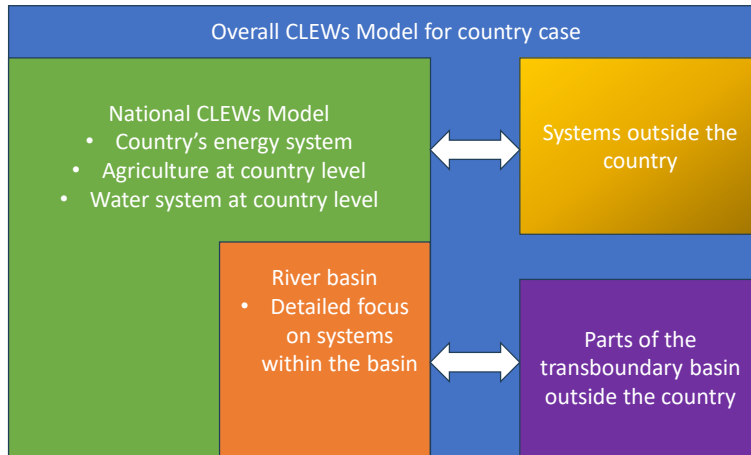
CLEWs model -- a schematic



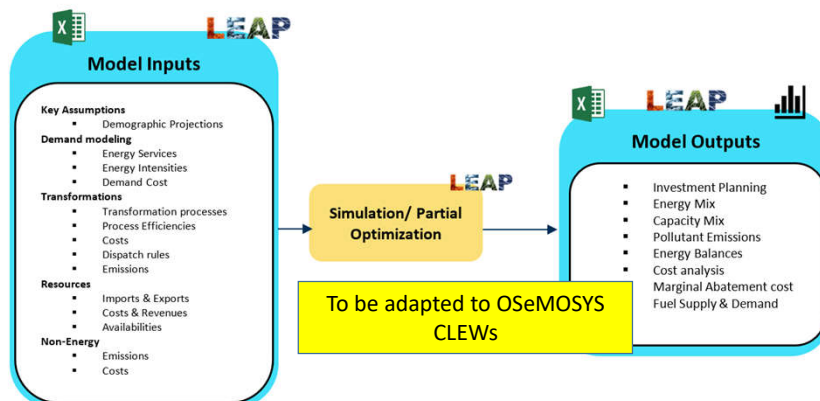
Sector related conversion and distribution activities

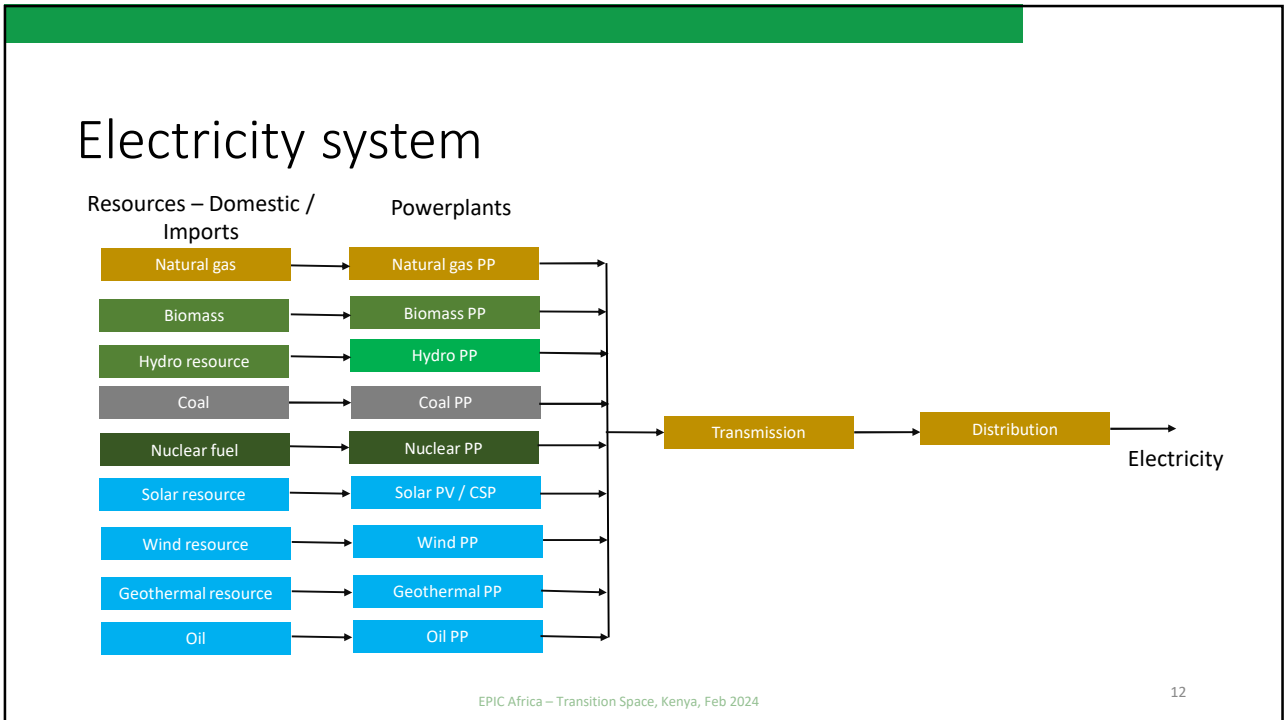
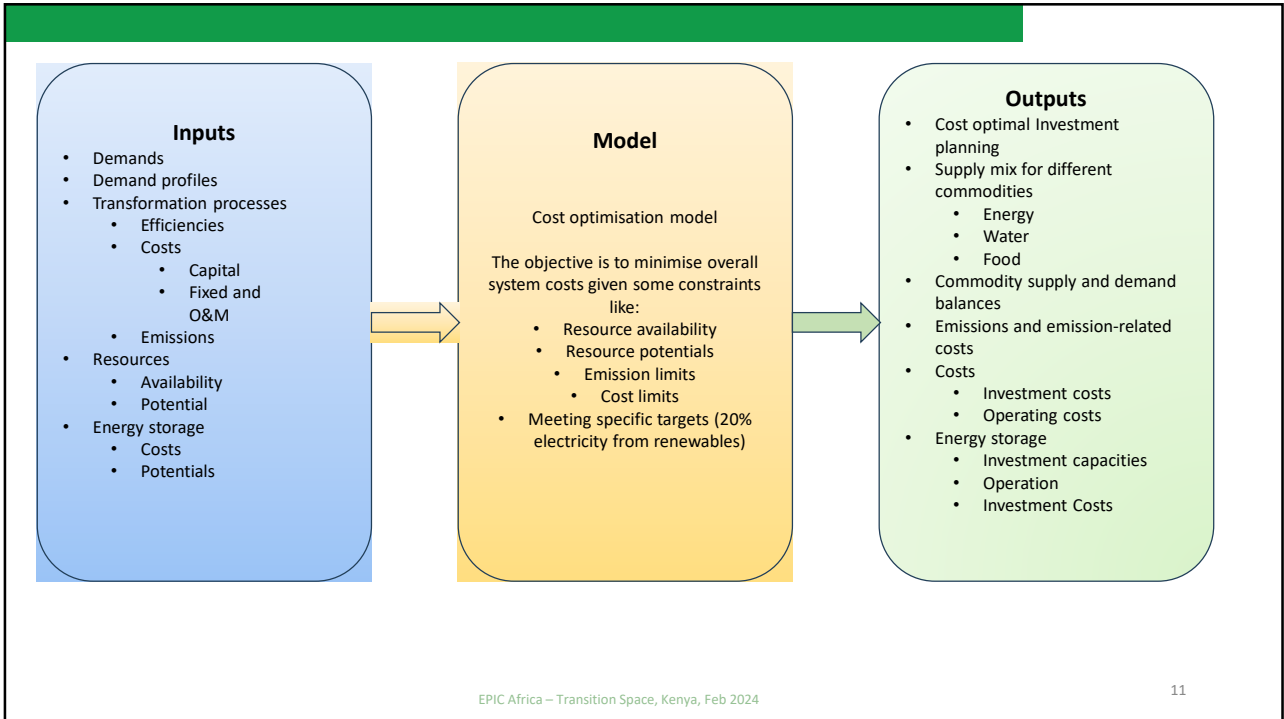


Model overall structure

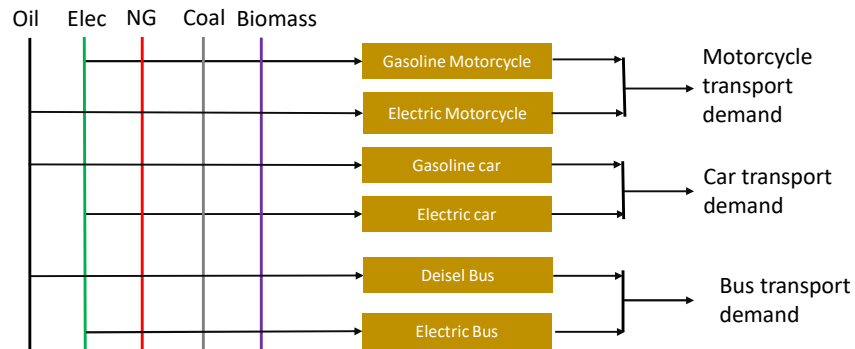


Main inputs and outputs of the model

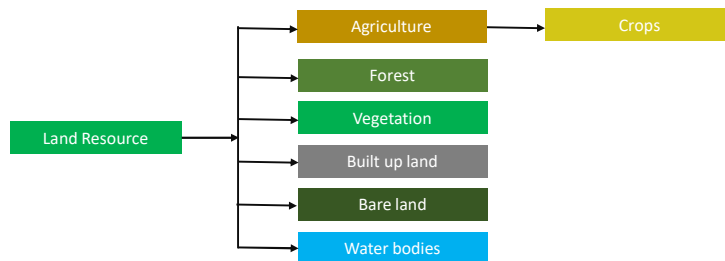




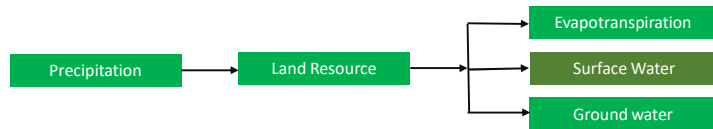
Transport system



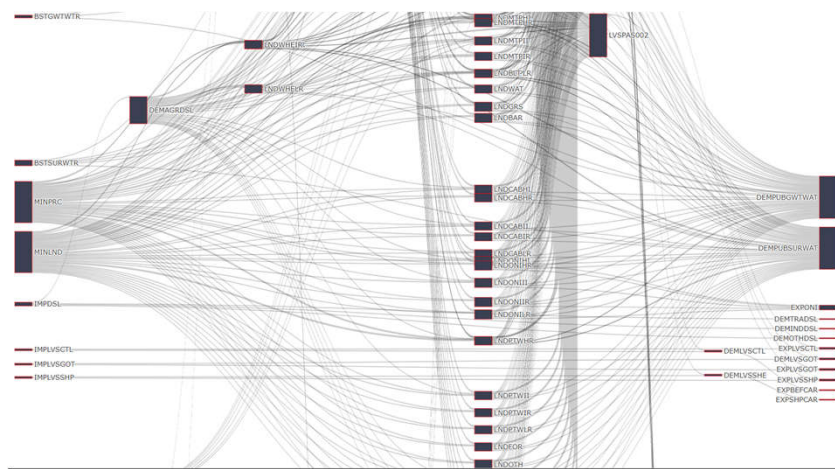
“Simplified” Reference for Land System



“Simplified” Reference for Water System



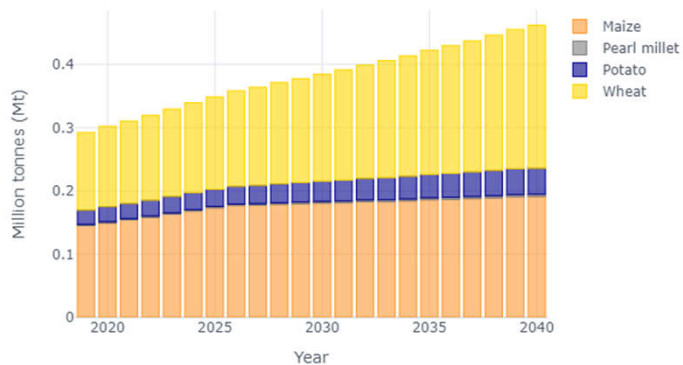
CLEWs model – the case of Namibia



Insights from the Namibia model

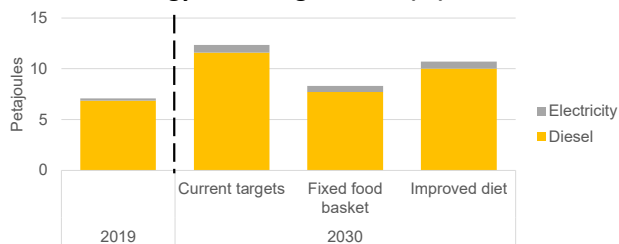
With the assumptions made for costs of domestic production and prices of grain imports, **imports are more convenient** than domestic production for wheat and potatoes, while **domestic production of maize** takes increasing share of demand increase.

However, if the costs of domestic production decrease and import prices increase, this could change.

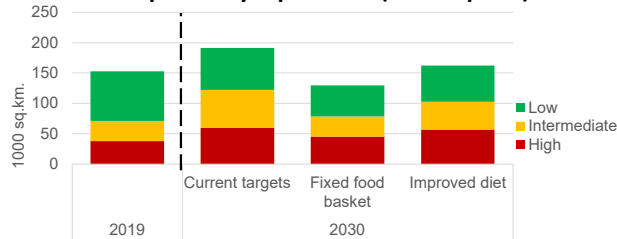


Modern agriculture (Namibia Case): Scenarios for productivity and modernization, Namibia

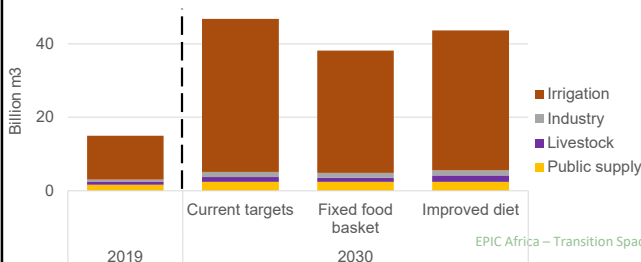
Energy use for agriculture (PJ)



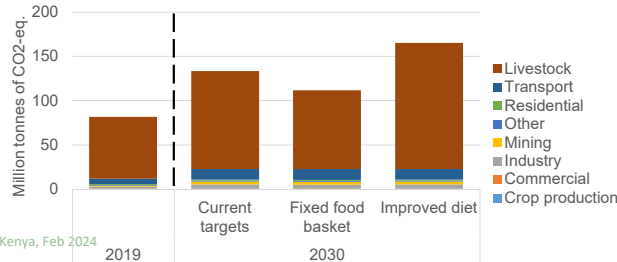
Crop area by input level (1000 sq.km.)



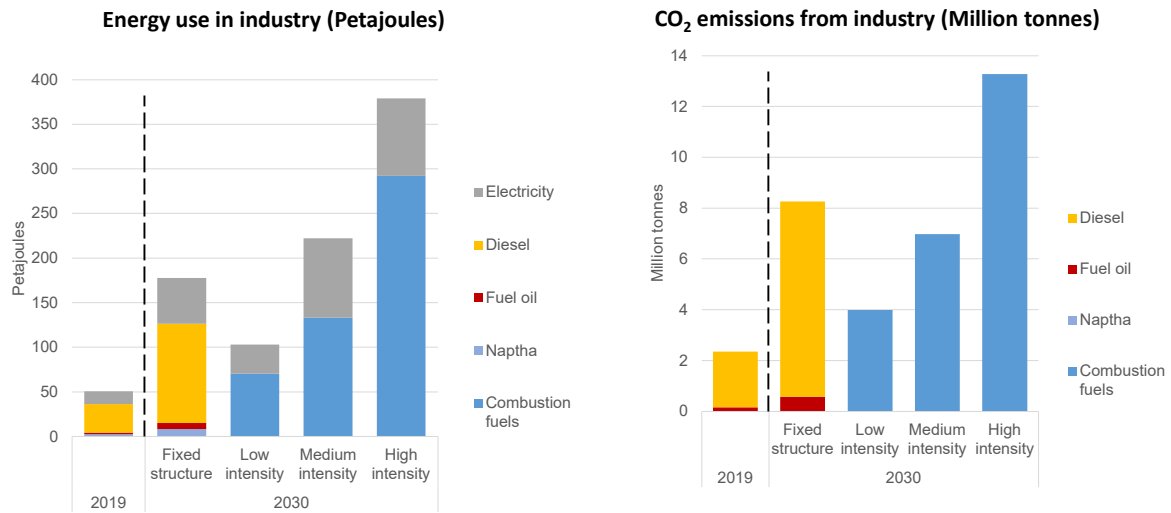
Water use by sector (bcm)



GHG emissions by sector (Mt of CO₂-eq.)



Manufacturing sector, Namibia: Scenarios for industrial development



EPIC Africa – Transition Space, Kenya, Feb 2024

WP4 WEF Investment Planning and Optimisation Model in the Transition Space Dialogue, Feb 2024?

- We are here to listen, and capture insights on most important dynamic relations between resources systems and their interaction with users.
- We will document our perception and report back to TS for comments and feedback.





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