

KESHO MPYA (New Tomorrow):

ENVISIONING A SUSTAINABLE FUTURE
FOR THE SOUTHERN AGRICULTURAL
GROWTH CORRIDOR OF TANZANIA
(SAGCOT)



**DEVELOPMENT
CORRIDORS
PARTNERSHIP**

in
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Background

Agricultural investment is intensifying at a rapid rate in East Africa. Tanzania's multi-billion-dollar program of 'green development', the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), is a public-private partnership initiated at the World Economic Forum Africa Summit in Dar es Salaam in 2010 as a 20-year strategic initiative to 2030.

SAGCOT's goal is to boost agricultural productivity, improve food security, reduce poverty, and ensure environmental sustainability through the commercialization of smallholder agriculture. The partnership does this by catalysing responsible private sector-led agriculture development, leveraging innovative financing mechanisms, engagement and communication, policy development, harmonisation across priority value chains and promoting environmentally sustainable investments of smallholders.

In brief, SAGCOT aims to, among other development benefits,

- bring 350,000 ha of land into profitable production,
- generate USD1.2 billion in annual farming revenue,
- support commercialization of 100,000 smallholders,
- lift 2 million citizens out of poverty, and
- establish southern Tanzania as a regional food exporter¹.



Map 1. SAGCOT clusters

But how can partners, including government, communities, businesses, land managers and others achieve these ambitious goals? And what can local cluster stakeholders do to better achieve desired outcomes and mitigate potential risks for biodiversity, social capital and equality?

Through the Development Corridors Partnership, researchers in the University of York, UK, WWF Tanzania, and Sokoine University of Agriculture - Tanzania worked in partnership with SAGCOT and diverse stakeholders across scales and sectors from Kilombero cluster to envisage how the land may transform in the future under targeted investments, and other likely environmental and socio-economic changes, using participatory scenario planning.

Box 1. What is participatory scenario planning and why do we use it?

When we think about the future, it's easy to imagine it as a single, 'most probable' outcome, based on individual knowledge and experiences from the past. But diverse stakeholders have different experiences of the present, and one person's 'most probable' outcome may diverge from another's. In reality, there are multiple potential futures, some more plausible than others. Scenario planning is a standardized method that brings stakeholders across scales and sectors together, to collaboratively consider diverse world views, pool knowledge of potential future stressors, and critically create narratives for the multiple outcomes, or futures, to support long term decision-making and sustainable land use planning.

¹ AWF (2017). ABCG Tanzania land use planning workshop, April 2017. Workshop report. African Wildlife Foundation. USAID; Njilima, F. (2018). Scenario-based planning for a sustainable future in Southwestern Tanzania. Report for USAID. African Wildlife Foundation. Retrieved from Africa Biodiversity Collaborative Group: http://www.abcg.org/action/document/show?document_id=934

WHO? The first key step is getting the right voices in the room (Table 1).

Table 1. Stakeholders involved in the scenario workshops

District government from Morogoro and Iringa regions	Kilombero, Ulanga, Ifakara Town Council Town, Malinyi, Kilolo, (officials from Department of Land, Agriculture, Natural Resources, Marketing and Cooperatives)
National government	Land Use, Rufiji River Basin Office; Kilombero Forest Nature Reserve Mbingo; Kilombero Nature Forest Reserve; Land Tenure Support Programme; Tanzania Forest Service Kilombero
Research Institutes	Tanzania Research Institute; Udzungwa Ecological Monitoring Centre M'angula Morogoro
Universities	Sokoine U of Agriculture; U of York; Uppsala U, Nelson Mandela African Institution of Science and Technology
Development agencies	USAID Waridi Ifakara; Caritas Dioces; Aga Khan Foundation
Private sector	Kihansi Hydropower Mlimdba Kilombero; Kilombero Valley Teak Company; Kilombero Sugar Company Limited Kidatu; Kokoa Kamili; SAGCOT; National Service (JKT) Chita Rice Plantation
Civil society organisations	Southern Tanzania Elephant Program; Africa Mangela, Kilombero Ramsar Site Ifakara; African Wildlife Foundation

We facilitated a three-day participatory scenario planning workshop involving 53 participants, complemented by 58 key informant interviews, field visits in Kilombero, Morogoro and Dar es Salaam, as well as validation and feedback workshops.

WHAT? The aim was to:

1. Develop plausible diverse scenarios that help to envision risks and opportunities of SAGCOT and related investments in the medium term (2030) and longer term (2063) within the Kilombero catchment.
2. Raise awareness about potential future land use scenarios within SAGCOT and capacity to understand better how to achieve the desired futures or avoid undesirable futures.

WHEN? These activities took place between 2018-2020.

WHERE? Kilombero was selected as a priority cluster of SAGCOT with expected high agricultural investment in an area of biological diversity and exceptional ecological value encompassing one of the largest wetlands in Africa.

HOW? The workshops use the scenarios tool KESHO which means "tomorrow" or "later" in KiSwahili and has been developed and applied in East Africa since 2014, by the York Institute for Tropical Ecosystems, with adaptations based on previous studies such as Capitani et al (2016, 2019), McBride et al (2017), and Thorn et al (2020).



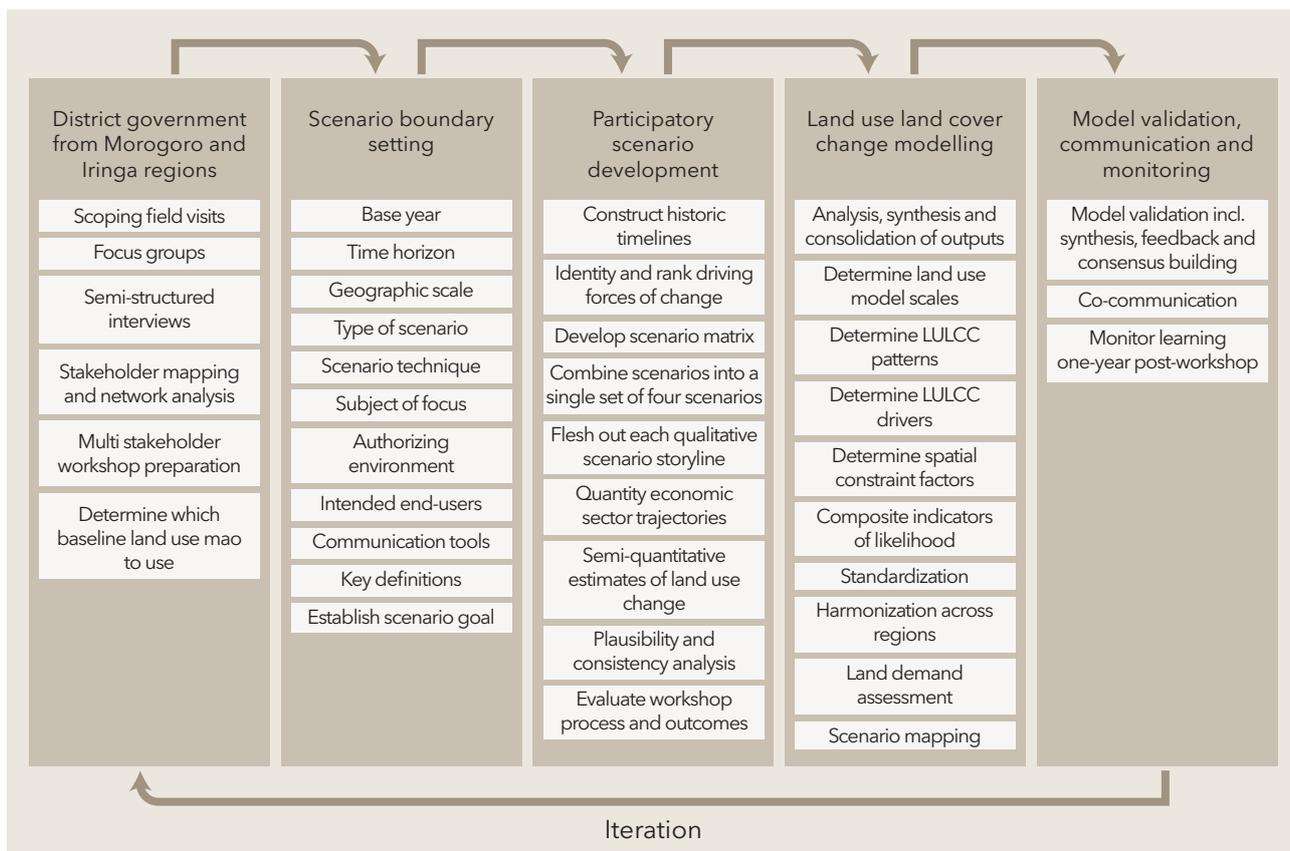


Figure 1. Key steps in the KESHO participatory scenario development and land use modelling.

The aim of this brochure is to share the main policy-relevant messages that can inform planning and land management, provide a broad overview of the methods used to gain these insights (i.e., scenario planning), and summarise the findings of these workshops.²

What were envisioned desirable and undesirable futures for Kilombero?

Desirable futures

- Natural resource management and conservation planning which accounts for wildlife corridors, improved delivery of key ecosystem services
- Improved infrastructure
- Improved provision and access to social services
- Sustainable agricultural production and food security
- Increased availability of smart technology
- Good land use planning and reduced land use conflicts
- Improved livelihoods and stable economic growth
- Improved government policies and implementation
- Strong, accountable, inclusive, and transparent institutions
- Community participation in planning processes
- Sufficient energy production and access



² See Thorn, et al (in review) Future participatory land use scenarios for agricultural green growth in Kilombero, southern Tanzania for the full results.

Undesirable futures

- Environmental degradation
- Overstocking and overgrazing, encroachment into forest and wetlands
- Land use conflicts over scarcity, tenure, lack of planning
- Deforestation
- Illegal poaching and mining and blocked or degraded wildlife corridors
- Climate change increases flooding, higher temperatures, shrinking water bodies due to drought leading to soil erosion and pest/disease outbreaks, invasive species, shortage, erratic, and uneven distribution of rainfall, heatwaves, extended dry seasons
- Poor infrastructure and social services
- Political interference, poor governance, and contradicting policies



While keeping these futures in mind, participants then collaboratively developed in-depth narratives for various, plausible future scenarios for the Kilombero catchment. What do they look like? Here's a summary, with names decided by the participants.

The stories

Local stakeholders decided that these futures could be described by two axes, representing low and high levels of (a) governance of development and (b) natural resource management. These narratives play out against a backdrop of other drivers - as described in the narrative summaries in the following pages. We explore each scenario through the backdrop of key value chains and climate change.

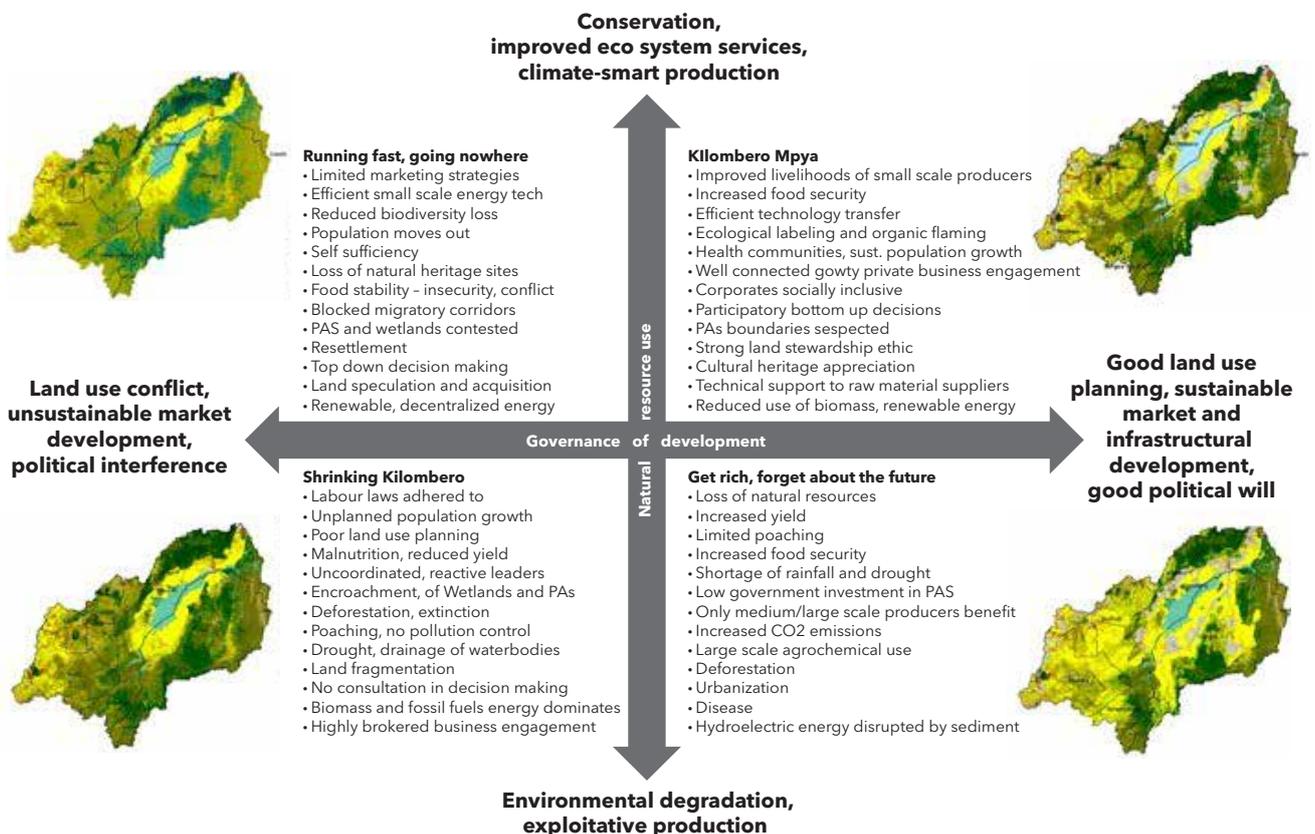


Figure 2. Summaries of the four scenarios developed during the workshops.

Comparative table of drivers across the four scenarios

	Present day	Kilombero Mpya	Get rich, forget about the future	Shrinking Kilombero	Running fast, going nowhere
 Transport Infrastructure	Untarred, difficult access roads and disused railway, but helped by new bridges to adjacent districts.	Low emission, low-cost transport options helped by an international airport and well-functioning railway.	Safe, efficient, and affordable mechanized transport and good roads.	Heavy emphasis on investment in transport infrastructure, but poor returns as environment and low-income earners are neglected.	High investment in transport infrastructure wasted due to poor management, Higher use of motorbikes but more road accidents.
 Primary Energy Mix	Monopoly by state-owned TANESCO, supplying hydroelectricity, with less private sector investment.	SAGCOT stimulates rural renewable electrification by attracting funding and strengthening regional cooperation.	Hydroelectric dams affected by poor water management and energy intensive manufacturing processes.	Illegal electric lines to houses and businesses, with deforestation for biomass use.	Increased demand for renewable energy promoted by NGOs.
 Energy Distribution	Centralised. Regular power cuts.	Decentralised	Centralised	Urban areas depend on old, centralised grid. Regular power cuts.	Mini grids serving rural and urban communities.
 Water	Kilombero floodplain encroached, over extracted and polluted, while fisheries concessions and illegal dynamite fishing continue.	Wetland protection and integrated water resource management regulations, such as polluter pays, are enforced.	Degradation of Ramsar wetland, pollution, and human and livestock water demands leads to uncontrolled extraction.	Rufiji hydroelectric dam restricts downstream water access, with agrochemical pollution and reduced potable water from aquifers.	No regulations or pricing mechanisms to restrict water use, leading to water use conflicts between herders and farmers.
 Agriculture	Large commercial ventures for monocrop rice and sugarcane with irrigation expansions and out-grower schemes	SAGCOT promotes green growth, with high productivity from climate smart agriculture, intensification, food security and income for smallholders.	SAGCOT boosts productivity more than any other scenario. Donors and private investors fund irrigation schemes in villages and new rice processing factories with foreign investment.	Initial increases in production of rice, sugarcane, cocoa, teak etc., but over utilization of land and agrochemicals causes decline in yield by 2063.	Farmers apply climate smart agroecological practices in short term, but commercial investments in subsistence agriculture decline by 2063, leading to a labour cash economy
 Migration	In-migration increased in the last decade, particularly of pastoralists, commercial agricultural enterprises, and land speculators	Controlled migration enabled by employment, investment prospects, arable land, and agricultural intensification.	In-migration increases as people search for arable land and employment opportunities	Population leaves Kilombero due to the lack of employment opportunities, conflict, and resource scarcity.	Migration increases due to the attractiveness of Kilombero, but lack of enforcement and good governance leads to increased resource conflict.
 Equity, Power, and Influence	Growing inequality with rising corporate power, where larger landowners tend to benefit more and have a greater negotiation power than smaller outgrowers.	Improved productivity, livelihood improvement with social services.	Needs of local business owners and wealthy override the needs of producers.	Only elite benefit, while competition over scarce resources marginalize others.	Political interference as the elite gets richer, and the poor are marginalised.



Governance

Public private partnerships and liberalization of agricultural reform policies, with decentralisation of power to empower local actors, complicated by political interference during elections. Weak accountability and capacity overall.

Top-down/ Bottom-up. Iterative, holistic, and participatory planning processes responsive to emerging dynamics. SAGCOT works with government in policy and legislation development, enforcement, oversight, and harmonisation.

Top-down/ Bottom-up. International standards of good governance applied, and corruption declines, while supportive markets and incentives expand land under production. Local authorities control licenses, but there is little attention to environmental governance.

Top-down. Corruption, bribery, and unfair competition by "rich investors" influence leadership, with lack of transparency in pricing commodities. SDGs have limited local relevance, communities are not empowered to act at a local level, and there is a lack of environmental awareness.

Bottom-up. Private sector plays a stronger role in environmental governance, but there's inconsistent national agricultural market policies, and the prevention and combating corruption ceases to function at the national level



Carbon Emission Permits

Some trading of carbon emission permits, however there's no tax on carbon.

Global carbon markets reward those who sequester carbon including trees, grasslands and below ground.

Carbon tax in export markets applied to goods that are produced in Tanzania, and the manufacturing industry suffers.

Very limited carbon emissions permitting with variable pricing, and externalities in carbon taxation are not considered.

Youth develop payment systems that reward people who sequester carbon and restore ecosystems.



Environmental Management

Degradation of critical biodiversity, soil fertility and erosion. Larger companies carry out due diligence, and ESAs carried out but not always enforced.

Effective networks of protected areas, with demarcated land uses, less encroachment, integrated pest management, monitoring of environmental pollution, and environmental safeguards enforced through the National Environmental Management Act.

Good policy and investment, but human centred technical and infrastructural interventions lead to increased deforestation, soil erosion, acidification, deforestation, and overgrazing of pasture. ESAs are not participatory.

Large agricultural investments dominate, causing fragmentation and monocropping. Poor environmental management leads to increased unregulated land clearing, fire risk, air pollution, burning of crops and unsustainable mining.

Loss of vegetation is slowed through some restoration efforts and expansion of protected areas. However, disregarding people's needs increases conflict between pastoralists, farmers and conservationists,



Wildlife Habitat

Rapid increase in land fragmentation with increased edge effects and small habitat patches. Increase in human-wildlife conflict and new invasive species (e.g., Lantana Camara). Some wildlife tourism.

Sweeping restoration of wetlands, grasslands and forests leads to wildlife populations' growth. Resource managers enforce boundaries and minimize poaching.

Increased pressure on natural habitat from farming, population growth and land fragmentation. Blockages of wildlife corridors, road collisions, wildlife populations decline. People encroach protected areas.

Complete removal of vegetation, replaced by infrastructure with no regard for ecosystem services provisioning and loss of botanical and traditional knowledge. Protected areas decline and are encroached or mismanaged due to negligence and corruption.

Initial expansions of protected areas are lost as the Ministry of Natural Resources loses control, and wildlife populations decline by 2063. Tourism and hunting blocks are opened in Game Controlled Areas.



Land Use Planning

Limited recognition of the value of incorporating local traditional knowledge and cultural heritage into planning, and conflicts associated with a lack of clarity in land use planning

More agricultural land allocated in Village Land Use Plan areas, where land use is well demarcated, and alternative land designated to pre-empt encroachment,

Increased demand for land and mining activities controlled somewhat through land use planning, and penalties are enforced.

With a lack of land use planning, pastoralists extend their search for feed, bringing their livestock into cropped areas, while informal settlements expand.

Land use plans are not enforced, and lack of penalties by local authorities for encroachment into protected areas.

Scenario 1: Kilombero Mpya (New Kilombero)

This is the best-case scenario where there are high levels of governance and benefits derived from ecosystems as well as climate-smart agriculture (e.g., maintaining soil health and using renewable energy) while integrating conservation activities in the planning process to maximise farm benefits. Infrastructure, communications, and transportation networks are developing, but at a pace that is sustainable. SAGCOT's green growth initiative stimulates climate smart agriculture and effective environmental policy, and transformative changes occurs as companies are compliant with Inclusive Green Growth principles.

<p>Economy</p> <ul style="list-style-type: none"> - Steady investment in circular- and bioeconomy with good leadership - SAGCOT development promotes widespread green growth - Companies are socially inclusive, and more cash crop agricultural opportunities sold at a premium - Regional and national trade increases with better market access 	<p>Rice</p> <ul style="list-style-type: none"> - Small-scale farmers who wish to exit sugarcane and transition to another crop and bolster small-scale rice and other food-crop production are supported - Increased intensification, both commercial and subsistence based on integrated pest management, and agroecological techniques that limit soil degradation 	<p>Cocoa and sugarcane</p> <ul style="list-style-type: none"> - Value chains are inclusive, helping small holder farmers link with contract farmers and out grower arrangements - Outgrowers improve their negotiation capacity for the length of contracts with single buyers (e.g., more than three years)
<p>Horticultural crops</p> <ul style="list-style-type: none"> - SAGCOT ensures accountability of all agro-dealers, who are registered, so farmers can hold sellers to account when products are polluting or not performing in the way they were advertised 	<p>Poultry and dairy</p> <ul style="list-style-type: none"> - Livestock producers benefit from increased market access (e.g., connectivity to Arab countries to sell refrigerated beef internationally at a high price) - The Cattle Policy is implemented to limit the number of pastoralists with large herds 	<p>Climate change adaptation</p> <ul style="list-style-type: none"> - Nature-based solutions and climate smart agriculture - SAGCOT works to improve accuracy of site-specific predictions and resilience to uncertain events, climate campaigns and risk reduction and increase access to forecast and market price information for farmers - Adoption of green technology and strategic visioning linked to the National Adaptation Plan of Action





In the future, who leads? State and citizens participate in governance, working with foreign, national, and local businesses.

Who benefits? State leaders, communities, NGOs, agribusiness, landless, local villagers, cooperatives, fishermen.

Who loses? Fossil fuel-based companies, land speculators, elite, large monopolistic corporations

Key policy implications of scenarios

1. **Companies must proactively monitor pollution, generate quality employment, while working together** with small-scale producers for production intensification and management.
2. **Implementation, monitoring and enforcement of Strategic Environmental Impact Assessments**, the Polluter Pays principles, and regulation on the use of Genetically Modified crops are crucial, as is harmonizing environmental, transport and agricultural policies.
3. **A transition from biomass to other more sustainable forms of renewable energy** should be encouraged as should the **bioeconomy**, i.e., the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy.
4. **The training of government officials in the KESHO scenarios methodology** would help establish the institutional capacity to analyse and address continuous changes.

Scenario 2: Get rich, forget about the future

This scenario describes a situation where economic development is prioritized over environmental conservation. Despite innovative technology, infrastructure, good political will and market access, and a government dedicated to social equity and participatory decision-making, development is based on cash crops, fossil fuels, and a culture of consumption, leading to environmental degradation.

<p>Economy</p> <ul style="list-style-type: none"> -Unsustainable rapid economic growth benefiting mostly agricultural and extractive industries - Most employed in large-scale plantations, processing plants and in urban centres with low waged labour of job-seeking youth -By 2063, reduced water flow negatively affects agriculture, fishing, and hydroelectricity 	<p>Rice</p> <ul style="list-style-type: none"> -Donor-funded irrigation schemes occur in some villages supporting the establishment of rice processing factories that improve livelihoods and increase production -Improved irrigation such that farmers can cultivate in two seasons rather than one -Soil degradation with lack of rotation, fallowing and continuous cropping -Pesticides used in the rice farms impact biodiversity, reduce fish stocks 	<p>Cocoa and sugarcane</p> <ul style="list-style-type: none"> - Farmers expand land area under agricultural production - Most farms rely on mechanised agriculture - Increased population and demand of water resources lead to prolonged cessation of dry season flow that affects production
<p>Horticultural crops</p> <ul style="list-style-type: none"> - Local authorities drive capacity development of smallholder farmers in conventional farming practices - Agricultural land fragmentation with urbanization decreases availability of agricultural land and food production leaving rural populations food insecure 	<p>Poultry and dairy</p> <ul style="list-style-type: none"> - Ministry of Livestock and partners promote animal feed production and utilization - Overgrazing increases widespread environmental degradation and loss of ecosystem services 	<p>Climate change adaptation</p> <ul style="list-style-type: none"> - Flood defences with poor EIAs, lack on renewable energy - Investment in biological control technology and more extension services improves farmers resilience in short term - Mining legislation enables the government to circumvent safeguards to land tenure security - Loss of traditional ecological knowledge





In the future, who leads? State entities driven by industrialization drive, influenced by foreign direct investors, business.

Who benefits? International and local corporates, ministers, banks national debt, land speculators agribusinesses.

Who loses? Biodiversity, people living downstream in the Rufiji River basin.

Key policy implications of scenarios

- 1. Technology transfers must be accessible and context specific.** Place-based knowledge and adaptation to global environmental change must recognize the value of Indigenous and traditional ecological knowledge. Public-private partnerships celebrate cultural heritage.
- 2. The current policy of opening the country up to regional and global markets is seen as a threat by local populations living in Kilombero to sustainable development and local autonomy.** It is important to develop a clear vision of development in SAGCOT based on local desirable futures.
- 3. There is a disconnect between international commitments and local implementation.** As the African Union Agenda takes shape, more work is needed to counter this disconnect and ensure that diverse actors benefit from investments.
- 4. Unclear land ownership continues to pose a significant challenge to land use planning.** Investment in Village Land Use Planning that is participatory is urgently needed to be scaled up. Land use planning needs to be coordinated across scales, arise from a bottom-up approach, and ensure enforcement. Scaling up the regularisation and issuance of certificates that clarifies land boundaries and ownership is key to addressing conflict.

Scenario 3: Shrinking Kilombero

This scenario is the worst-case scenario. Land use conflicts, unsustainable markets, and political interference is rife, combined with exploitative production. Inequality grows and subsistence producers become dependent on a low skilled labour economy. Agriculture is completely automated. Large companies privatize land and elites dominate decision-making. Environmental degradation is rapid, and the window to act is closing before tipping points are surpassed.

<p>Economy</p> <ul style="list-style-type: none"> - Investments from SAGCOT do not get reinvested locally, over time industries collapse. - Tanzania goes into economic recession. - There are many middle level traders, and poor return on post-harvest sales. - Poverty increases, high unemployment, and national debt. - Land is privatized for cash crop agriculture. 	<p>Rice</p> <ul style="list-style-type: none"> - Expansion of agriculture into wetland areas, fragmentation and monocropping. - Large scale farmers are much more technically advanced than smallholder farmers and the capacity gap to apply new technologies increases. 	<p>Cocoa and sugarcane</p> <ul style="list-style-type: none"> - Water bodies, particularly around small and large outgrower schemes and the Kilombero Sugar Company, are polluted due to the indiscriminate and prolonged use of nitrate-rich fertilizers and agro-chemicals. - Land use conflicts where agriculture expands into protected areas or where land was traditionally used for grazing.
<p>Horticultural crops</p> <ul style="list-style-type: none"> - Nuclear farms transition from food crop production (mainly rice, maize, banana, fruits and coconuts) to cash crop production (e.g., mainly sugar cane, teak and cocoa). - Market dominated by a few large companies, which puts value chains at risks and increases focus on exports rather than the need of local food security. 	<p>Poultry and dairy</p> <ul style="list-style-type: none"> - More pressure in the dry seasons in upland protected areas and people move where there is water for pastoralists to feed their livestock. - High livestock densities overwhelm fish stocks leading to their collapse and destruction of water resources. - Little awareness of sustainable grazing practices. 	<p>Climate change adaptation</p> <ul style="list-style-type: none"> - No investment in resilience, adaptation, risk reduction or early warning systems. - Skills are not developed with mostly low wage labour - Large-scale monocrops are not adapted to droughts, disease and floods. - Mismanagement causes many economic and environmental refugees. - Uncontrolled fire outbreaks, flooding. - People need to spend more money to produce yields.





In the future, who leads? Foreign direct investor, co-opting national leaders, elites dominate while others comply.

Who benefits? SAGCOT investments benefit only corporations, managers, foreign direct investors, agribusinesses, and large monopolistic corporations.

Who loses? Farmers, the poor, landless, migrants, biodiversity.

Key policy implications of scenarios

1. To manage the increased cost of land, **village councils and the assemblies must better understand the land value** and the costs, technical requirements and engagement processes to implement land use plans. Villagers must build their capacity to negotiate costs and local authorities ensure only official channels of procuring land are used.

2. **Water contamination** - Agrochemical contamination occurs as commercial agricultural production schemes change, with implications on water security for downstream users in the Rufiji River basin. Hydropower will have major detrimental impacts on the downstream use of water resources. The high cost of water resources due to drought or private ownership is a future social-economic risk. Riparian buffer zones need to be enforced.

3. **Local authorities need to build capacity and raise awareness about the importance of wildlife, forests, and wetlands for ecosystem service provisioning and reduce human wildlife conflict.** Wildlife corridors and habitats are at risk of fragmentation, and roads and railways must be permeable.

4. **There is need for commodity boards to advocate for more stable market prices for smallholder farmers** so farmers can safeguard their income, while both ensuring the quality of dairy, poultry and livestock products and maintaining the carrying capacity of the land.

Scenario 4: Running fast going nowhere

This scenario reflects an abundant natural resource base but poor governance. Growth is reliant on tourism recognizing that Kilombero is a unique site for biodiversity. SAGCOT uses local resources for livelihoods. However, without leadership, bottom-up initiatives and NGOs step in to mitigate impacts, and progress is made to build adaptive capacity and restore landscapes, but with limited success.

Economy

- More self-employment and casual labour.
- Unpredictable national and international market policies and poor regulation lead to export bans arising; rice imported internationally, rather than from domestic markets.
- Alternative livelihood diversification, more retail shops and restaurants with increased tourism.

Rice

- Better infrastructure increases demand for Kilombero rice from East and Southern African countries, raising land demand while impacting the rice market in other parts of Tanzania.
- Rice is imported to Kilombero from external markets in Eastern and Southern African countries rather than from domestic markets.
- Irrigation expands with commercial crop expansion increasing competition for water access and availability.

Cocoa and sugarcane

- Commercial investments in agricultural value chains lead to a transition to a cash economy, with increased labour in sugar mills with a shortage of food crops (i.e., food security declines).
- Uncontrolled imports and exports of agricultural commodities (especially sugar). Export bans arising from poor governance negatively affect agricultural producers.

Horticultural crops

- Poor land use planning leads to fragmented landscapes where agricultural lands are adjacent to protected areas.
- With the ban of foreign produce, small scale consumers will access produce at lower price while the import ban favours the producers with higher prices for local commodities.

Poultry and dairy

- The number of livestock will increase due to immigrants, exceeding the carrying capacity of the land.
- Pastoralists move during flooding/wet season and dry season inland into protected areas, where there is water to feed their livestock.

Climate change adaptation

- Farmers apply climate smart and agroecological practices in the short-term.
- Community-based and autonomous adaptation.
- Ecosystem based initiatives such as REDD+, land restoration and reforestation buffer against some of the impacts but to a limited degree.
- NGOs, and business support food insecure small holders, ecotourism companies play a stronger role in supporting restoration efforts.





In the future, who leads? Authoritarian state enforces power, and new leaders of community driven initiatives emerge during crises.

Who benefits? Conservation organizations, tourism companies, the elite, rich investors with access to classified market information.

Who loses? Pastoralists, fishermen, women, farmers who are not outgrowers.

Key policy implications of scenarios

- 1. Systematic land use planning at multiple scales that is subsequently enforced can help reduce conflict and maximize beneficial use of land.** Land use conflicts are likely to increase into the future, in part driven by climate change, for instance between pastoralists and agriculturalists, with encroachment into buffer zones of protected areas.
- 2. Consultation processes and input from local communities is paramount,** as the needs of the local population need to be better understood and prioritized for true sustainability. Adequate community engagement at all stages of agricultural and infrastructural investments will ensure conflict is mitigated and prevent spill over into other areas.
- 3. Many policies and strategies often describe win-win scenarios, but the reality there needs to be a more explicit descriptions of the trade-offs** across different sectors (e.g., climate, water, food, energy, livelihoods). Understanding scenarios can help to mitigate or minimise losses and maximize benefits, emphasizing the need for more coordination.
- 4. More active contributions of land officers and extension officers are needed at the village level,** and more human resources are need to enforce protected area boundaries.



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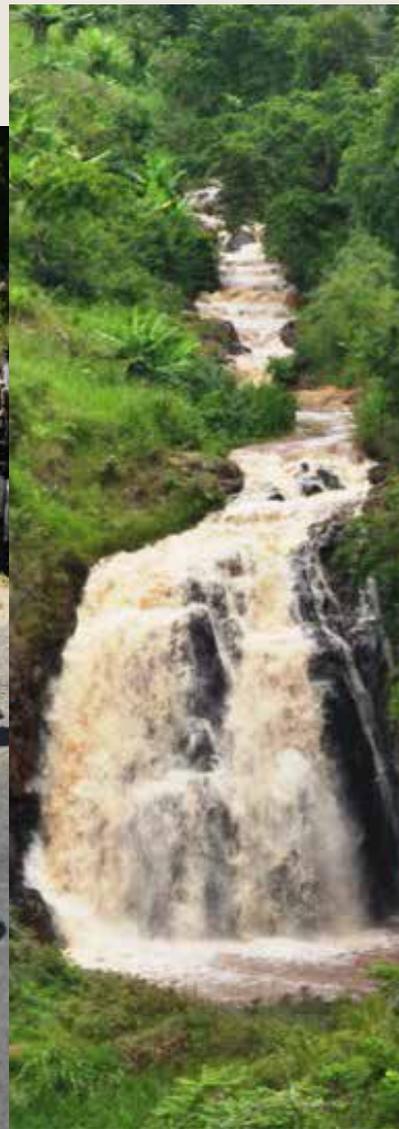
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