DEVELOPMENT CORRIDORS PARTNERSHIP (DCP)

GENERAL DISSEMINATION WORKSHOP REPORT

18 February 2022
SAGCOT Centre, Dar es Salaam, Tanzania

Workshop Participants

- Kamwesige Mtembei, Agricultural Officer, Ministry of Agriculture
- Hamza Kijo, Senior Researcher, TAWIRI
- Catherine Nasao, Lecturer/Researcher, University of Dar es Salaam
- Michael Moongwe, University of Dar es Salaam
- Wilson Masele, Univerisity of Dar es Salaam
- Severin Kalonga, Partnership Development Manager, WWF Tanzania
- John Banga, Kilombero Head of Cluster and Partnerships, SAGCOT Centre Ltd
- Christian Chonya, Freshwater Coordinator, WWF Tanzania
- Abubakary Kijoji, WWF-CARE Alliance Manager, WWF Tanzania
- Neil Burgess, Principal Investigator, DCP & Chief Scientist, UNEP-WCMC
- Daudi Chagfane, SAO, Iringa District
- Christine Tam, Senior Advisor, Development Corridors Partnership (DCP)
- Happiness Minja, Sustainable Investments Programme Manager, WWF Tanzania
- Reuben Salum, Rufiji Basin Water Board
- Ruth Emanuel, Researcher, Sokoine University of Agriculture (SUA)
- Japhet Kashaigili, Professor, Sokoine University of Agriculture (SUA)
- Lilian Kolukwi, Research Assistant, Sokoine University of Agriculture (SUA)
- Nyemo Chilangane, Research Assistant, Sokoine University of Agriculture (SUA)
- Panteleo Munishi, Professor, Sokoine University of Agriculture (SUA)
- Gladness Mtega, DCP Project Coordinator, WWF Tanzania
- Xu Yinlong, Chinese Academy of Agricultural Sciences (ONLINE)
- Xue Han, Chinese Academy of Agricultural Sciences (ONLINE)

Workshop Support

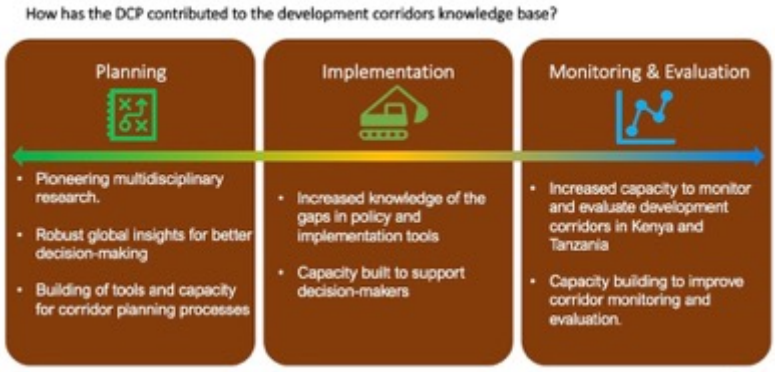
- Matrida Simfukwe, M & E Manager, WWF Tanzania (facilitation)
- Baruti H Mbaga, TAWIRI (driver)
- Amani Moshi, accountant, WWF Tanzania
- Japhary Kiwanga, communications, WWF Tanzania
- ITV
- WTPO Radio
- Fortune Francis, Mwananchi (journalism)
- Hamisi Mwege (camera)
- Evelyin Fransis

DEVELOPMENT CORRIDORS PARTNERSHIP GENERAL DISSEMINATION MEETING
17 FEBRUARY 2022
PROTEA SEAVIEW HOTEL

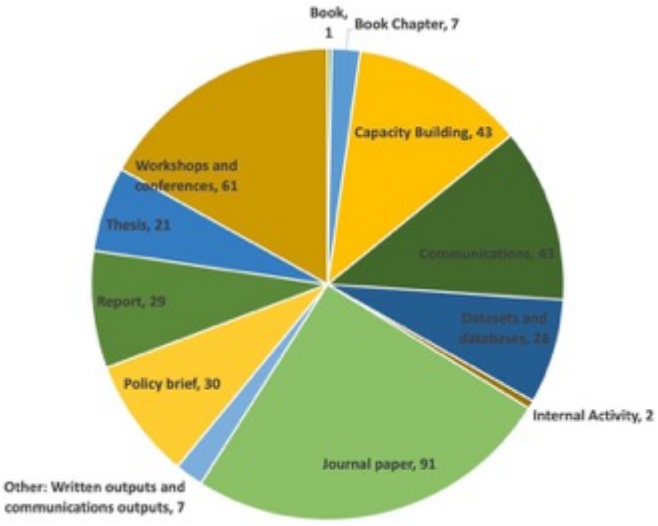
Key Objectives:
To share and discuss the headline findings and outputs from the DCP project.

Objectives, Welcome Remarks
The workshop was launched first with self-introduction of participants.
Professor Japhet Kashaigili then laid out the objectives of the workshop.
Welcome remarks were made by Professor Munishi of Sokoine University of Agriculture and Dr Severin Kalonga, Acting CEO of WWF Tanzania.

Global Context of DCP Project and Overview of Outputs (Neil Burgess)
Professor Neil Burgess, Principal Investigator for DCP, provided an overview of the DCP project as well as a summary of key outputs. He emphasized the promises and risks posed by development corridors and reviewed how DCP was addressing these challenges.



He then provided an overview of output delivery and synthetic resources being produced, such as the synthesis of corridor science, the African Corridors Database, the EIA/SEA Source Book, Corridor Resources Hub, the Corridors E-learning course, and synthetic journal article "Toward a sustainable future for development corridors". The figure below summarizes these outputs.



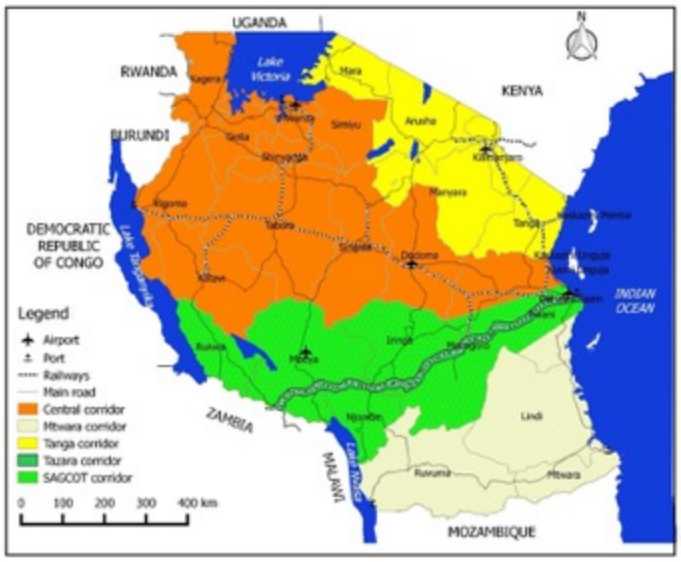
Key links:
https://developmentcorridors.org
info@developmentcorridors.org

Research Findings – Sokoine University of Agriculture (presented by Nyemo Chillange)
This presentation summarized SUA's research findings from the DCP project, highlighting:

- General development corridors of Tanzania
- Natural capital, ecosystems and ecosystem services in the SAGCOT region
- Co-benefit assessment of natural capital and ecosystem services in the SAGCOT region
- Assessment of impact of Development Investments on Natural Capital and Ecosystem Services
- Payment for Ecosystem Services

Overall SUA has produced: 13 manuscripts, 3 reports (1 scoping, 2 field), 8 Masters students, 1 PhD graduate, and 16 various manuscripts and final reports on specific research projects.

Firstly, SUA provided an overview of development corridors in Tanzania, of which there were five main ones identified. These corridors pose numerous sustainability challenges, including inequality and inflation as well as biodiversity and ecosystem service impacts. On the other hand, they may be promising at delivering tax revenue and employment. An integrated approach is needed to guide investment for sustainable development.



SUA continued by introducing results of biodiversity surveys that have been conducted in the SAGCOT region revealing high biodiversity. They then specially noted pollination services from bees for agriculture as an underappreciated though critical ecosystem service. Maps of ecosystem service distribution particularly related to land use/cover were then shown.

The next topic covered by SUA was a prioritization of ecosystems in the Kilombero cluster where they found that the most important ecosystem services for locals were water provision, food, medicine, energy, timber, shelter and bee products. They also found that experts and local communities had different perspectives on priority ecosystems with experts favoring climate services and communities favoring water services. Economic contributions of ecosystem services were also monetized. Fish were found to contribute up to 500,000 tsh monthly to local households and contribute between 24% to 78% of subsistence protein. Timber also provided important services, generating between 50,000 tsh to 3 million tsh of livelihood income annually.

SUA also showed historic land use and land cover changes that have happened in the SAGCOT region from 1995 to 2018, with significant decreases in forest, woodland and wetland and substantial increases in cultivated lands and settlements. These land use changes stemmed from such land uses as grazing, agricultural expansion and charcoal production, and resulted in changes in various ecosystem

services, notably increased annual surface runoff and sediment loading (erosion), and decreased ground water recharge and dry season river flows. These changes also accompanied a decrease in carbon storage and sequestration across the region. Resulting recommendations include promulgation of proper land management practices, more inclusive land use planning at all levels, and potential alternative livelihood strategies to better enhance critical ecosystem services.

Additional research results included:

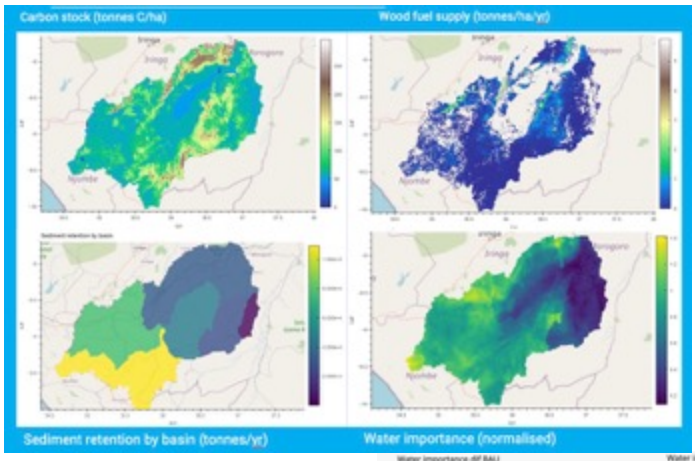
- Macroinvertebrates and water quality in the Lumemo River, showing poorer water quality linked to less sustainable land uses. Healthy riparian systems should also be maintained, and locally developed standards for riparian management are essential.
- Payment for ecosystem services, through a study of the Usangu plains, indicating lack of willingness-to-pay additional amounts beyond water fees. However, most important was to have inclusive decision-making about possible PES systems to account for the varying perspectives of different stakeholders
- Agroforestry as potential greenhouse gas mitigation. Agro-silvo-pasture systems and home garden practices are the best for climate change mitigation. Fruit trees are also a good strategy for quick economic and carbon sequestration benefits.

This closed the SUA research team section, which was followed by other DCP Research (conducted by DCP team members external to Sokoine University of Agriculture)

Future Scenarios of infrastructure-driven land use and social-ecological transformations
Jessica Thorn from the University of York and the DCP project, presented on *Kesho Mpya (New Tomorrow): Envisioning a Sustainable Future* to describe the utility of participatory scenario planning in decision-making when faced with uncertainty. This approach facilitates the connection between on-the-ground voices and high-level strategic decision-making. She then proceeded to describe work done over the last several years in Kilombero to use stakeholder perceptions to produce four diverse, plausible socio-economic and land use scenarios to identify trajectories of spatial patters of land use change into the future (i.e., 2030 and 2063). She described historical trend analysis in the region as well as the four scenarios identified by the diverse local stakeholders: “Kilombero Mpya” (New Kilombero – best case scenario), “Running fast, Going nowhere”, “Get rich, forget about the future”, and “Shrinking Kilombero” (worst case scenario). She then reviewed for each scenario what implications there might be for the local economy, strategic value chains, and climate change to develop policy recommendations.

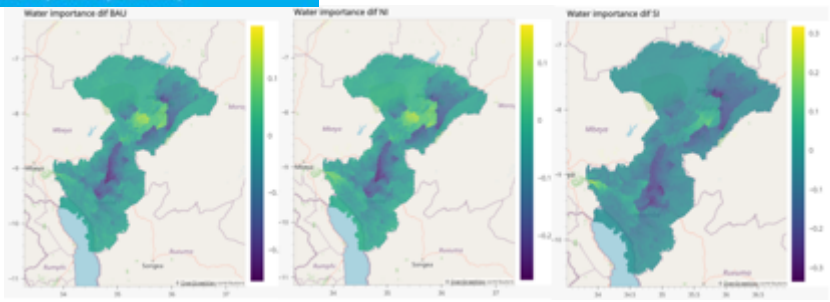
Using Natural Capital Assessments for Land Use Decision-making
Arnout van Soesbergen, from UNEP-WCMC, then presented work on natural capital mapping across the Ihemi and Kilombero clusters. In contrast to historical changes, these results focused on looking forward at the future scenarios of Ihemi cluster, developed in a similar manner to the future scenarios presented by Jessica Thorn.

This analysis generated such maps as those featured below of carbon stock, wood fuel supply, sediment retention, and water importance for Kilombero cluster. The water importance map integrates supply and demand for water such that higher values show where there is more water production that benefits more users downstream. Darker colors reflect these most important areas for both supply and demand of water.



Modeling was done to map these same areas looking into the future (2030) when looking at a Business-as-usual scenario versus a best-case and worst-case scenario. (Figures below)

The conclusion of this work is to demonstrate that spatial mapping of natural capital and ecosystem services provides a better understanding of important areas for delivery of services, which can support various types of land use planning. It is clear that SAGCOT strategic clusters provide many valuable ecosystem services to a wide range of beneficiaries. Improved agricultural practices can have a large positive impact on carbon, soil erosion and water production. Indeed, Highlighted areas may require special management.



Mapping of species connectivity networks and identification of priority locations for conservation in the SAGCOT corridor in Tanzania (Miguel Ramirez/Pablo Araujo)

Pablo Araujo – a masters student associated to DCP - presented work done in the Kilombero Valley (across the basin) to identify priority locations for conservation (via protection and/or restoration) of wildlife corridors in light of future development in SAGCOT, focusing on elephant connectivity. In total, 65 connectors were identified as priorities. These types of results can help identify locations for new projects that avoid or minimize negative impacts to wildlife connectivity.

Development Corridors: global overview of biodiversity impact mitigation applications in Tanzania (Diego Juffe Bignoli)

Diego Juffe Bignoli, formerly employed by UNEP-WCMC on the DCP project, presented a global review of impact mitigation, reviewing best practice in biodiversity impact mitigation, the mitigation hierarchy itself, and results of an analysis of 271 papers on development corridors. Only 1 in 5 of these studies proposed any biodiversity mitigation measures. It is unclear if

positive outcomes (no net loss – net gain) approaches can deliver for development corridors although some global advances seem promising.

Diego also reviewed the situation of biodiversity mitigation in the Mtwara Development Corridor, a corridor in southern Tanzania in its early stages of development, which does not have a full Strategic Environmental Assessment yet for the entire corridor, but was included (at least in parts) of others. The conclusion was that while the existing SEAs stated the intention to avoid, minimize and offset significant impacts on biodiversity, the reports do not contain sufficient detail on how that will be achieved. Overall, best practice in biodiversity impact mitigation does not seem to be followed in the development corridor assessments. Only direct impacts are looked at, though there are advances in mitigation science and policy instruments that can and should be used more widely for development corridors. Active and proactive application of the mitigation hierarchy can guide the impact assessment process better, especially in such situations as the Mtwara Development Corridor.

Scientific Guidelines on Adaptation Planning for Climate Change: A Case Study of SAGCOT (Xu Yinlong)

Xu Yinlong, a senior researcher on the DCP project and an expert on climate change and adaptation at the Chinese Academy of Agricultural Sciences CAAS, presented work done on climate adaptation planning in the SAGCOT region. He and his team firstly conducted an extensive review of relevant climate documents and identified gaps and priority issues. The steps for adaptation planning outlined included (1) analysis of climate risks and vulnerabilities; (2) setting up of adaptation objectives; (3) identification of adaptation pathways; (4) task assignments within the categories of capacity building, financing, technological improvement, and policies; (5) monitoring and evaluation. These were each elaborated in more detail.

Discussion Session

The discussion session then focused on break-out groups to discuss and elaborate ideas for the contribution of these research findings to sustainable development in Tanzania. The three groups were (1) water; (2) forestry/agriculture/wildlife; and (3) land use planning and infrastructure development. Participants self-selected into groups with some encouragement to balance numbers and institutions out. The guiding questions provided were as follows:

(1) how can research findings be integrated into and improve current policy/program implementation in Tanzania?

(2) how can the research findings influence future policy / programs?

The resulting discussion from the groups were as follows:

<u>#1 Water Group</u>

- Retain grassland when change LULC
- No farming slopes; conserve mountain forests
- Improve hydrological data management e.g., new sensors/loggers, how integrate new technologies
- Lack of data, we should also use data sets that are already there – e.g., we think gauges are better

- We need to triangulate methods to see what works better.
- Importance of reducing poverty in communities. e.g. people who cultivate in the wetlands/ In the valley bottom farming, damming to collect water and support the communities to access irrigation. Provide alternative livelihoods for the poor
- Advocate for the allocation of more resource - Influence the government to fund water
- Communicate to the relevant ministries
- Retain mountain forests and grasslands
- The future is not certain – these are just predictions
- Enhance water supply – we need to collect water in the wet season like dams for storage and use in the dry season;
- Use global thinking on local thinking
- Share knowledge of baselines

#2 Forestry/Agriculture/Wildlife Group

- Use the wildlife corridor connectivity maps which could be integrated to decide what we invest in, and make sure that the investments (plantations, factories, infrastructure) don't interfere with the movement of wildlife. Also track where the corridors are lost or degraded and need to be enforced
- Use the land use change scenarios to tell you in the next ten years how the ecosystem will be, and the rate of change – this can inform priority areas to mitigate the risk we see in terms of biodiversity loss
- To ensure that the information is utilized for advocacy, include sharing of results with relevant ministries and stakeholders (e.g., Ministry of Natural Resources and Tourism)
- Incorporate other forms of habitats when discussing afforestation and woodlots – advocate and show the importance to respective ministry for carbon and ecological benefits.
- Develop a forum of experts across levels to discuss wildlife agriculture and forestry
- "Wise use" of agricultural land should be given priority to reduce pressure to expand, improve livelihoods, more productive and increase yield. Set aside land for conservation in agricultural landscape. Intensification. Reduction and proper management of agrochemicals. Affordable fertilizers which are not chemical based. Climate smart agriculture to use inputs below a threshold amount that should be used.
- In the forest policy there is nowhere you see restoration for wildlife habitat – need to understand where to and what to restore, including wetlands. Update of the forestry strategy which must address agriculture. We were trying to advocate tree planting in the scheme
- Policy harmonization – issue at the national level. Other sectors are not appropriately considered.
- What tangible values do we get from wildlife and forestry? – this needs to be quantified. People go for agriculture because they can realise the direct benefits. What was critical

in communities was food and income generation. Therefore we need to ensure forestry and wildlife are recognized for immediate benefits.

- Implementation and operationalization of land use plans. Planners to increase investment in land use planning for different uses. Most of the land use plans stop after demarcation. In land use planning there are several steps to follow (seven). We don't need all the stages of the land use planning. It's very expensive, so we need to minimize the length, cost and process of land use planning.
- Plant useful indigenous trees, and pay more attention to the species planted
- Have a strategy to ensure that everyone knows where there are areas which are suitable for cultivation e.g. in Bolivia the land maps and parcel maps tell you which land is suitable for agriculture and other activities
- Expand the knowledge/ know how on climate smart agriculture to people.

#3 Land Use Planning / Infrastructure development

- Land use suitability analysis is key. Land uses are being implemented in areas not supporting those uses; e.g., villages around a hydroelectric dam, likely should not be agriculture. Better land uses/livelihoods may be fisheries or livestock. Target NLUPC, Village LGA
- Promote economic activities that are more suitable, for instance in agricultural bottomland – agriculture developed in the wrong places; agricultural bottomland may be better for more suitable economic activities, such as bee-keeping. Influence local planning (not necessarily district or national), laws that govern community actions e.g., 60 m buffer. Target: Ministry of Agriculture, District agricultural officials, LGA, Ministry of Natural Resources and Beekeeping
- Promote environmentally friendly tree species – take from pollination work. Share pollinator info (extension/awareness). Prepare demonstration pilot for maize; compare productivity. Target: LGA, District agricultural officers, TFS
- Update laws/regulations – for instance, how to compute penalties? calculate value of destruction like in national parks if hit elephant → value → make penalty
- Inclusion in green infrastructure development: nature based solutions: Target: village LUP
- Irrigation infrastructure – needs money but needs awareness; influence irrigation planning; maybe seek to increase rainfall capture.
- Target: research institutions can use this type of info to identify / fill gaps

ANNEX 1. Agenda

Day 1	Time	Activity	Responsible person(s)
		Moderator: Matrida	
Thursday, February 17, 2022	8:30-9:00	Arrival and registration	All/ Secretariat
	9:00-9:15	Self-introduction of participants	All
	9:15-9:20	Objectives of the workshop	Prof. Japhet Kashaigili
	9:20-9:40	Welcome remarks • *Welcome note from SUA* • *Welcome note from WWF*	Prof. P.K.T. Munishi Dr. Severin Kalonga
	9:40-10:00	Global Context of DCP Project and Overview of Outputs	Prof Neil Burgess
	10:00-10:30	Tea break and Group Photo	
	10:30-12:00	Presentation of Research findings and discussion • Overview of DCP SUA Team project outputs • Development Corridors of Tanzania: ✓ *What is DC, Implementation Status, Impacts and Sustainability Challenges* • Natural capital, Ecosystems and Ecosystem services in the SAGCOT ✓ *Understanding on Natural capital, ES and ES services* ✓ *Spatial distribution of Natural capital and E.S in the SAGCOT* • Co-benefit assessment of Natural capital &Ecosystem services in the SAGCOT ✓ *Current status and Prioritised E.S in the SAGCOT* ✓ *Contributions of Natural capital/ES to local economy and Livelihood in the SAGCOT* ✓ *Biodiversity status in the SAGCOT* • Assessment of Impact of Development Investments on the Natural Capital and ES of the SAGCOT	DCP SUA Team Tanzania

	✓ *Changes and driver of changes in the Natural Capital and ES in the SAGCOT* ✓ *Impact of land use transformation on the ES of the SAGCOT (Hydrology, Aquatic ecosystems, & Carbon stock)* • Payment for Ecosystem Services ✓ *Willingness to pay and accept compensation for conservation of ES services in the SAGCOT – A case of Usangu Plains*	
12:00 – 13:00	• 12:00-12:10 Futures scenarios of infrastructure-driven land use and social-ecological transformations". ✓ *Changes in investments in Africa are occurring very rapidly, domestic and FDI* ✓ *A new tool to assess the spatial-temporal distribution and potential impacts of infrastructure investments* ✓ *Past drivers of historic land use change in the Kilombero catchment area* ✓ *Current adaptation to climate change* ✓ *Future scenarios of land use change in SAGCOT development corridor.* • 12:10-12:20 Using Natural Capital Assessments for Land Use Decision-Making ✓ *Understanding natural capital and ecosystem services in Ihemi and Kilombero clusters* ✓ *Potential impacts of future land use change* • 12:20-12:30 Mapping of elephant connectivity networks and identification of priority locations for the conservation of connectivity in the SAGCOT corridor in Tanzania. The contents include: ✓ *Production of a habitat/land cover map of Kilombero* ✓ *Identification of elephant wildlife corridors* ✓ *Prioritization of wildlife corridors to be protected* ✓ *Prioritization of wildlife corridors to be restored taking into account the efforts needed for their restoration* • 12:30-12:40 Development corridors: global overview of biodiversity impact mitigation science and applications in Tanzania	Jessica Thorn Arnout van Soesbergen Miguel Ramirez/ Pablo Araujo Diego Juffe

		✓ *Global review of biodiversity mitigation on development corridors* ✓ *The situation analyses and review of strategic impact assessments relevant to the Mtwara development corridor* ✓ *The African Database on Development Corridors* • 12:40-12:50 Climate change adaptation Q&A	Prof. Xu Yinlong
	13:00-14:00	✓ Lunch break	All
	14:00-15:00	Discussion • *Contribution of Research findings to sustainable development in Tanzania*	Moderator: WWF – Matrida
	15:00-15:30	• Tea break	All
	15:30-15:45	Wrap up and announcement	Secretariat
	15:45-16:00	Closing remarks	Neil