

Wildlife Corridor Restoration (CORRESTOR)

What evidence is required for wildlife corridor restoration interventions in human-inhabited landscapes, and how do we include these in the restoration management process?

Product A – Written Report of CORRESTOR Workshop 4 Outcomes

CORRESTOR Workshop 4

October 12th – 13th 2022

Morogoro, Tanzania

The project is fully funded by the Science for People and Nature Partnership. This workshop was the final workshop of the project. In this workshop, we aimed to build on the previous workshop outcomes and further evidence collected since February 2022 to co-develop and co-design final restoration plans in the upper Kilombero Valley. Specifically, we worked through four action points:

- Agenda item 1: Co-development of a synthesis plan for collaborative action on ecological restoration activities in the landscape (focus on riparian zones, village forest reserves, and home gardens)
- Agenda item 2: Identification of capacity strengthening requirements to meet stakeholder needs (focus on approaches, funding and time lines)
- Agenda item 3: Co-design of a knowledge exchange platform on restoration activities in the landscape (structure, stakeholders, type of engagement activities, format of knowledge sharing activities, sustainability)
- Agenda item 4: Discussion of co-financing of restoration in the Kilombero Valley (who, **how**, **what**)

Discussion Overview – Day 1

1. Agenda item 1: Co-development of a synthesis plan for collaborative action on ecological restoration activities in the landscape (focus on riparian zones, village forest reserves, and home gardens)

We asked key representatives implementing restoration activities in the landscape to share their plans before the meeting. As these did not materialise we asked them to draw these plans (however vague) on the map provided as large-scale print.

1.1. The elephant corridor restoration plan

The elephant corridor has been designed and drafted by STEP to reconnect historical elephant movement pathways between the Selous-Mikumi-Udzungwa ecosystems which have been blocked by agricultural expansion. The corridor is now being implemented by the government rather than STEP. The route is formed and the location of the corridor has been negotiated with the farmers who have been compensated for their loss of land. The corridor largely travels along riverine areas (seasonal) crossing through land farmed by smallholder farmers. Once the corridor is in place the area will not be used for farming or

community use. Previous plan on electric fencing are currently being explored again to take into account what villages may want (type of fence, height of fence, management of crossings) but at the same time, planting of trees outsourced to Reforest Africa will already be under way starting early next year (no fence). The vision by STEP is to have electric fences, powered by solar, and small gates, manned with village game scouts and larger gates for cars. The number of gates is to be determined by the villagers. 'Hard' electric fencing will only extend the length of the corridor. 'Soft' funnel fencing consisting of beehive fences will exist at either corridor end to corral elephants into the corridor. Funding for this vision is not clear. Admin and future management responsibility for this vision is not clear. Some of the inspiration it seems came from a trip of STEP's team to the Serengeti National Park. STEP now considers themselves as facilitator of government work.

Challenges:

- Logistical specifics of the corridor are not clear with much confusion between stakeholders about what the corridor will actually consist of.
- Despite the desire for an electric fence by STEP delegation of responsibility is placed on the villagers for the final decision. Villages and communities do not have clarity on the location of the corridor nor fence type which will be used. Processes used to engage villagers in decision making is also not clear. Processes for mitigation/compensation due to crop:elephant conflicts are not effective. Conflicts are expected to increase after corridor installation.
- Some farmers have started to plant crops within the fenced area despite having sold the land suggesting lack of clarity on rules or expectations from either side: NGO STEP and communities.
- Other 'problem species' likely: e.g. vervet monkeys and large carnivore species.
- How farmers voices will be heard: village chairmen have been invited onto a committee but that does not necessarily mean that farmers are included in process (depends on the chairman).

Options:

- Need to develop guideline of best practice for communication (process to have informed and free and prior consent when farmers are included in design process).
- Need to develop guidance on process of conflict management.
- Magombera Stakeholder Forum: needs a process of monitoring and trials – what works and what does not -> generate an evidence base including identification of indicators for effectiveness and success based not just on tree survival in corridor but also on people outcomes (stakeholder participation, biodiversity restoration, social indicators).
- Develop stakeholder network analysis: weak and strong links of actors.

1.2 Reforest Africa's current activities

Aim to restore trees informed by tree planting trials (methods, species: six) outside and within Magombera FR (60 plots at the southern edge?). Tree survival rates are low and Herman points to excursions of illegal farming to within park boundaries that are currently being followed up. The planning evolves around native tree species and dry forest species with three evolving species lists. Community surveys were done in four villages: Kanjenya, Katarukila, Mangula, Msolwa Stn, although the reasoning and aim of these surveys is not clear. A botanic garden has been created for tree planting trials with plans for visits by local communities and tourists and training of farmers for planting trees. The botanic garden will be electrically fenced to prevent elephants from eating planted saplings. The NGO is also rapidly scanning and surveying the wider landscape (53000 km²) to expand their remit and identify other village forest reserves for planting and area-based protection schemes. The NGO has been having a couple of

meetings for the Udzungwa Kilombero Restoration Forum but the stakeholder present there are the same that are always there with no indication for wider representation of community and how benefits from forests to them will change/may change as protection and restoration plans expand.

Forests mentioned include Ikebe, Mahenge and the Udzungwa Carbon Forest project.

Challenges:

- Access to clear spatial plans not provided making it difficult to evaluate feasibility and process used.
- Lack of clarity on accounting for communities in scouting plans.
- No clear process yet for monitoring fire, monkeys, baboon and elephants and their impacts on people or interaction with trees.
- At present lack of capacity training/upskilling activities or community benefits from projects.

Options:

- Reforest Africa ideally shares their restoration species lists and evidence underlying species choice.
- Develop and share reports for progress on botanic garden mission objectives.
- Engagement process with village assemblies.
- Train students and upskill local community members to benefit from activities of the NGO and contribute to its growth.

1.3 Overview of current Association Mazingira activities and general tree planting recommendations

Association Mazingira are currently running tree planting initiatives and providing education in local schools on the environmental benefits of nature. Tree planting is more recently is funded by a carbon credit scheme [Treedom](#) which provides farmers will financial incentives for planting native tree species and managing tree survival. Other workshop participants include the recommendation of planting indigenous tree species with economic benefits such cashew trees and cacao pushed by government at district level as alternative livelihood. Locally, farmers have strong interest in mango trees and other fruit trees. But there are further land use change pressures in the region as farmers look to advance opportunities. This includes conversion (and associated removal of previously planted trees) to plant sugarcane to provide to the expanding sugarcane plantation and its mill.

Challenges:

- Tree survival monitoring is needed: damage to seedlings by goats and other livestock, insect pests, bacteria damaging seedlings and irrigation for seedlings. Training on identification of insect and fungal/viral/bacterial vegetation pests and mitigation methods.
- Mango trees/fruit trees very attractive to elephants and other wildlife: damage and crop loss.
- Water shortage for tree growth in drier season.
- Incentives for farmers to look after trees once planted.
- Community changes preference for desired tree species. Association Mazingira trees have been uprooted to make way for sugarcane expansion in some villagers.

- Tree ownership. Carbon credit scheme Treedom allows farmer full rights to trees. If renting land, farmers have to seek permission from landowner to plant or alter trees. If native trees, government has rights.
- Carbon credit schemes come with rules in Tanzania that need to be followed.

Options:

- Need capacity training for tree growing and management of that growth at different scales and tree species selection pending soil and location in farm.
- Further explore geotagging trees scheme mentioned by Mazingira association: survival of tree for carbon credit schemes (Treedom mentioned as company in Europe that Mazingira Association has been working with).
- Identify rules of government with regards to carbon credit schemes (lead: Dr Shirima).
- Compensation for disservices of tree planting. Clearer communication of consolation process to all including TANAPA, NGOs and farmers: the government stance is that damage/conflict events are reported to village game scouts and extension officers (2-3 per village?). These then report to District Game officer via form, who signs it and sends to Ministry. Then TAWA comes out to pay directly. Consolation processes are currently failing at District level as incidents get reported but no consolation is provided. There is no compensation if the farm is in the buffer zone. Are buffer zone demarcations clear?

1.4 IUCN Sustain 2

IUCN is changing its strategy learning from the first round of interaction on issues. Their plan is to include presence at local scale in the SAGCOT – Kilombero Cluster. This should include presence in the field with local staff, co-hosted with the African Wildlife Foundation (AWF). Their plan comprises two components, Kilombero Phase 1 which includes tree planting, tree nursery, river restoration and buffer zone. Phase 2 includes productive Landscapes (scaling up climate smart agriculture funded by NORAD which has been started already) and Ecosystems Stewardship for a green growth agenda, funded by Sweden which will start around December. Key contact: Anthony Mhagama.

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One of their foci is on river zone protection and restoration delivered working with government organisations. Their plan is to do a baseline survey on what, when and where should be planted and they are running a workshop on agroecological practices (partnering with governmental and non-governmental organisations TARI, SUA, TOAS).

Challenges:

- Lack of engagement with evidence and stakeholders and focus on working with people they know.
- Lack of detailed, on the ground involvement and insights into local complexities (biophysical land use rights or socioeconomic).

Options:

- Continue to try engagement in dialogue and sharing of evidence generated with other relevant stakeholders.
- Identify clear process through which IUCN can engage with activities and evidence from the landscape including from our research Agrisys Tanzania and CORRESTOR. We have been co-

developing follow up projects, including on bird diversity benefits from riparian corridor restoration, currently under review by different funders.

1.5 KSC (Kilombero Sugar Company, part of Illovo Sugar)

Has clear intentions to restore riparian habitats on estate grounds and to promote such activities on targeted outgrower land. Within the Resupply Initiative, they consider restoration within supply chains (cacao, sugarcane, coffee). They have completed the ROAM assessment and want to see a business case for restoration. They are also looking at value chains for sunflower, soybean and rice.

Challenges:

- Overwhelmed with different actors trying to engage with them.
- Will to restore areas on plantation but lack the evidence and knowledge to do so.
- Cannot use plantation grounds as a positive example of restoration for small-holder farmers if restoration activities fail.

Options:

- Beneficial for KSC to share the output for the ROAM assessment.
- Use KSC grounds as a test site for riverine restoration (which vegetation species are best to plant for biodiversity, should vegetation species hold an economic benefit for communities, how to mitigate disservices).

Day 2

2. Agenda item 2: Identification of capacity strengthening requirements to meet stakeholder needs (focus on approaches, funding and timelines).

The training needs were discussed in breakout groups. The items mentioned are listed and below ranked in order of priority (based on group feedback and frequency across groups). Focal areas include riparian zones and grasslands alongside tree cover habitats. FAO guidelines on restoration success (2015) were mentioned ([i5036e.pdf \(fao.org\)](#)): these are global guidelines for the restoration of degraded forests and landscapes in drylands - Building resilience and benefiting livelihoods. [FAO Publishes Guidelines on Forest and Landscape Restoration in Drylands | News | SDG Knowledge Hub | IISD](#). This was followed by mentioning the AURORA tool, presumably used by Reforest Africa as management tool: <https://www.auroramonitoring.org/#/>. The website and guidelines on how to implement the tool are not clear from the webpages alone.

2.1 Capacity training needs identified by working group:

We highlight that below outlined capacity training as identified by participants will be followed up in a first step with a Newcastle University funded project January – March 2022, led by Pfeifer.

Need to ensure that any training aligns with tools the organisation is already using. TANAPA as organisation is using Survey123 app: [ArcGIS Survey123 | Create Smart Surveys & Forms for Data Collection \(esri.com\)](#): how to work with data collected through this. See also this: [Collector Integration with Survey123 | GeoMarvel](#) KSC as organisation and the NGO STEP use Kobo collect for data collection: [KoboToolbox | Data Collection Tools for Challenging Environments](#).

Furthermore, the participants were clear on the need for funding of international exchange programmes: SUA – UK for example. Students. Staff.

Indicators and proxies, general	
Choice for different objectives. Method for collection following standardised protocols. Analyses	<ul style="list-style-type: none"> • Number of species • Vegetation cover • Soil fertility • Crop yield • Species identity and role in ecosystem • Microclimate • People wellbeing: education, economy, health • Camera trap data: processing of data after readout and analyses of data for simple metrics (species richness, species abundance variation) <ul style="list-style-type: none"> • Maps of abundance in landscape. Point based • Map of species richness in landscape. Point based
River restoration focus	<ul style="list-style-type: none"> • Water quality • Sediment loss • Bank loss/degradation/erosion • Surface runoff • Number of fish and size • Diversity of stream wildlife/plants: insects, fish • Flow • Livelihood relevant benefits: pasture biomass, fodder biomass • Motivations and perceptions
Grassland restoration focus	<ul style="list-style-type: none"> • Diversity of plants • Soil quality • Grazing pressure • Legacy effect?
Corridor restoration	<ul style="list-style-type: none"> • Elephant movements and observation • Conflict observations: record in standardised way and map. To understand how they move through the landscape across the season • Tree impacts across age groups • Habitat quality and use by elephants and other wildlife • Wildlife spillover and associated crop damage • Before and after data needed to evaluate impacts without and without mitigation (e.g. fences of different types) on conflicts and subsequently livelihoods and/or food security
Baseline data	<ul style="list-style-type: none"> • Ecological history • Social indicators
Ecotourism	<ul style="list-style-type: none"> • Metrics for income generation • Metrics for people/community benefits

Community health	<ul style="list-style-type: none"> • E coli prevalence • Malnutrition
Data availability and accessibility	
Sources	
Access	R Packages, Download from website
Data use	Challenges, uncertainties, constraints for interpretation
Data storage	Data harmonisation, Metadata, Geotagging
Feedback to stakeholders	
Corridor	TANAPA and STEP have agreed on a platform -> elephant monitors
Data analyses for reports and engagement	
Camera Trap Data	Sampling design: how to think about matching data collection to objectives of project. Automatisation of data read in and processing using R. Use camera trap ID guide and expand if more species are found and added. Process of analyses and data visualisation: maps in QGIS and points data, hotspot maps, habitat dependencies and response to human pressure (distance to roads, towns).
Satellite data, maps	Simple steps of display and image analysis in GIS software. In R: Data extraction to spatial coordinates in dataframe for subsequent analysis. Set up workflow.
River system	How to build a sampler? What core equipment needs exist? Which method that is affordable and usable for assessing indicators (see above)
TANAPA system	Survey123 (ArcGis compatability, app for phone): how to use data from that system for simple analyses in R. How to display data in that system
KSC system	KoboCollect: how to visualise data and export for analyses in R. The app is used for data collection, integration and visualisation.
Holistic approach	From identifying needs to planning and objectives to data collection and analyses and monitoring for reporting against objectives
People to take part in capacity training	
KSC	Grower support officers (they already collect data) Check in with Megan about KSC support in terms of time
TANAPA	Park rangers Field assistants Chief ecologist (Christina Kibwe)
Government	Water Board – technicians in environment office TAWIRI TARI

Challenges:

- Follow up with regards to data collected by NGOs in the landscape (type, frequency, sampling period, design, purpose, future plans).

- There is a lack of clarity on type and format of data, underlying protocols and ethics and what these data have been collected for (which objectives, which funder) and data storage for access. This applies to all NGOs operating in the landscape. KSC has provided access to many of their datasets for further analyses (crop health and yield related). The poor data management approach implemented by NGOs is currently a missed opportunity for improving our understanding of ecological and social processes in the landscape and prevents governmental institutions like TANAPA to implement holistic planning and management for both people and biodiversity. It also prevents understanding of relationships for upscaling and effectiveness of interventions.

Options:

- Enforce strict criteria and rules for the process of data management, sharing and reporting on all projects/NGOs working in the landscape. All data should be freely available for all stakeholders and if needed be made accessible in different formats and style depending on the stakeholder needs and capacities (e.g. management versus NGO versus farmers versus KSC versus government). Geocoding of data is crucial but needs thinking through for social data and sensitive data (e.g. presence of threatened species) to ensure compliance with data protection laws. This needs support by KSC or government.
- Restoration projects should be spatially registered with TAWIRI / government body. Data management plan should be scrutinised as part of that registration and followed up on. Data are required to be deposited by the end of an activity and the only activities allowed should be the ones listed during the registration. This will avoid NGOs operating on ideas not licenced for under permits and ethics clearance.

3. **Agenda item 3: Co-design of a knowledge exchange platform on restoration activities in the landscape**

A key platform that has been started is the Udzungwa Kilombero Restoration Platform, highlighted by Dr Andrew Marshall as big step into the direction of better dialogue and knowledge sharing. At the moment, the platform features the same actors typically already engaged with the work and it certainly needs expanding (Side note: Another platform/forum previously discussed in the KSC meeting was a Interaction Forum they were willing to start and maintain).

Options:

- A structured process for engagement and knowledge sharing including data, data sharing, data justice, data use and capacity strengthening around data analyses and management needs to be a component of the dialogue in the platform.
- A platform needs to engage government at district and regional level throughout and early on.
- The knowledge needs to be assembled for specific management questions and community needs, with planning that is solutions orientated. There are multiple objectives to consider throughout, covering both ecological and social components. Clear processes need to be generated for feedback of outcomes to communities and other actors with an interest.
- Village meetings should be regularly attended whilst the cinema van and leaflets and other methods are adding values.

In this discussion, the following issues were mentioned:

- Training/Upskilling
- Dialogue: how to set up a process for this that has long-term sustainability
- Extend dialogue to exchange with communities
- Subgroups/Themes with interest in certain regions
- Platform meetings. Every six months?
- Needs to ensure representativeness for all stakeholders but perhaps have subgroup meetings, eg. Academic meeting group.
- A previous platform that existed was the Kilombero Sectoral Platform focussed on land conflict issues and conservation: AWF, IUCN, Landesa,other players. Chaired by Land Use Commission. This platform is now defunct. Why? What can we learn from the failure of the platform?
- Dialogue -> can we invest time and then use dialogue outputs to inform funding applications?
- Learning Alliance about climate smart agriculture, now established in District government (Agriculture Ministry).
- Feedback from agricultural extension officer present at meeting. Face to face meeting needed in addition to leaflets and other information sharing. Ideally via village assembly. Demonstration plots would be useful. Videos distributed in the Cinema van might be good to create (run by TANAPA). Agricultural extension officers need more training. Communities need more information on soil fertility.
- TANAPA wants to know more about invasive species management. They have been funding local people to study for UG degree t then come back (Scholarship scheme). Ecotourism route highlighted as wanted.

4. Agenda item 4: Discussion of co-financing of restoration in the Kilombero Valley (who, how, what)

This is a contentious issue. There is no money there to sustain a knowledge exchange platform. TANAPA has an Ecological Monitoring Budget to be aimed at invasive species management. They otherwise rely on external income through tourism and they did not get budget increase despite having more areas to manage. The regional government has no budget for restoration. The Water Board has a budget for river buffer zone restoration but details are missing. KSC has a Strategic Plan and Estate Agricultural Plan for riparian zones. Reforest Africa has contracts with donors for restoration and to establish pathways for carbon financing. IUCN has substantive projects in the pipeline but needs to asked for follow up. It looks to integrate with other projects.

Workshop Attendees

NAME	ORGANISATION
Dr Marion Pfeifer	Newcastle University
Miss Lauren Barnes	Newcastle University
Dr Deo Shirima	Sokoine University of Agriculture

Dr Susannah Sallu	University of Leeds
Dr Andrew Marshall	Reforest Africa/University of Sunshine Coast
Mr Richard Nchasi	Director, Associazione Mazingira
Mr Joseph	Southern Tanzania Elephant Program (STEP)
Miss Eleanor Moore	Newcastle University
Dr Zarah Pattison	Newcastle University
Mr Abel Peter Mtui	Assistant Conservation Commissioner, Udzungwa Mountains National Park - TANAPA
Mr Arafat Mtui	Udzungwa Ecological Monitoring Centre
Mr Herman Lyatuu	Reforest Africa
Mr Henry Mbele	Kilombero Sugarcane Company
Mr Petro Nnyiti	Research Assistant Under Agrisys and Newcastle University PhD Projects
Mr Charles Chuwa	Tanzania Agricultural Research Institute (TARI) Kibaha
Mr Anthony Mhagama	IUCN Sustain programme manager
Ms Mary Lawrence	Rufiji water Basin
Ms Mamjiva Geogrey Mzumda	Morogoro Game Officer - Regional Commissioners Office