# Building Sustainable Development Corridors

## Insights for Kenya

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# What is the Development Corridors Partnership?

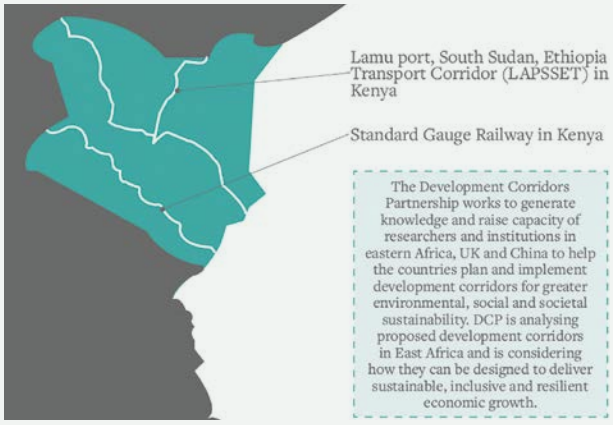
The **Development Corridors Partnership (DCP)** is a research and capacity-building collaboration that brings together British, African and Chinese institutions. The partnership improved the relevance and quality of **interdisciplinary research** available to decision-makers and **built capacity for better decision-making** for African **development corridors. More sustainable development futures are feasible if these research findings are incorporated into development corridor planning, implementation, and monitoring systems**.

Across Africa today, there is a visible growth in infrastructure development. Some of these projects are conceived as single-purpose, utilitarian infrastructure projects, but increasingly, these individual projects are being aggregated as 'development corridors'. Development corridors are extensive, often transnational and linear, geographical areas targeted by governments for public and private investment to spur economic growth, with broad objectives to achieve national development visions. Development corridors aim to diversify and improve livelihoods by making trade, communications and services more efficient. They must protect the integrity of ecosystems and biodiversity, and respect the rights and livelihoods of communities from the earliest stages of planning, through implementation, to post-project completion. Effective planning that enables negative impacts to be avoided and positive impacts to be maximised is critical, and adequate mitigation of unavoidable impacts is essential for development corridors to contribute to balancing the trade-offs necessary to achieve sustainable development goals[1].

[1] Gannon, K.E., Pettinotti, L., Conway, D., Surminski, S., Ndilanha, E. and Nyumba, T., 2022. Delivering the Sustainable Development Goals through development corridors in East Africa: A Q-Methodology approach to imagining development futures. *Environmental Science & Policy*, 129, pp.56-67.

## Development corridors in Kenya

Kenya is host to several investment projects in Africa, which make up development corridors that are built from a combination of roads, ports, passenger and freight railways, pipelines and airports. The DCP has focused on the SGR and LAPSSET corridors in Kenya, which crisscross nations and provide platforms for delivering major economic and social benefits. However, their negative impact on people and nature, such as degradation of biodiverse habitat, unsustainable land-use conversion, water pollution and the marginalisation of mobile populations is a concern for the future well-being of people and nature, as investment in infrastructure development continues to boom across East Africa.



To improve the sustainability of these long-term development investments, effective social and environmental safeguards that ensure benefits to all citizens, while conserving the unique biodiversity of Kenya are crucial.

DCP partners in Kenya are the African Conservation Centre (ACC) and the University of Nairobi, and together with our UK university partners, we have researched and developed diverse insights and recommendations for different corridor practitioners, such as decision-makers in government, environmental and social researchers, as well as community organisations.

This brief begins with a summary of various development corridor stages, and global approaches to addressing impacts at each stage. We then summarize some of our project findings relevant to environmental and social impacts, and water security, along development corridors in Kenya. We finish with a section on resources that will be available by mid-2022 from the Development Corridors Partnership, to help guide corridor developments in Kenya.

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# Stages of a Development Corridor

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# 1. Tools and approaches to create better development corridors for East Africa

Corridor programmes are complex, and are often not linear, but all corridors have four core components:

1. Concept planning

2. Approval

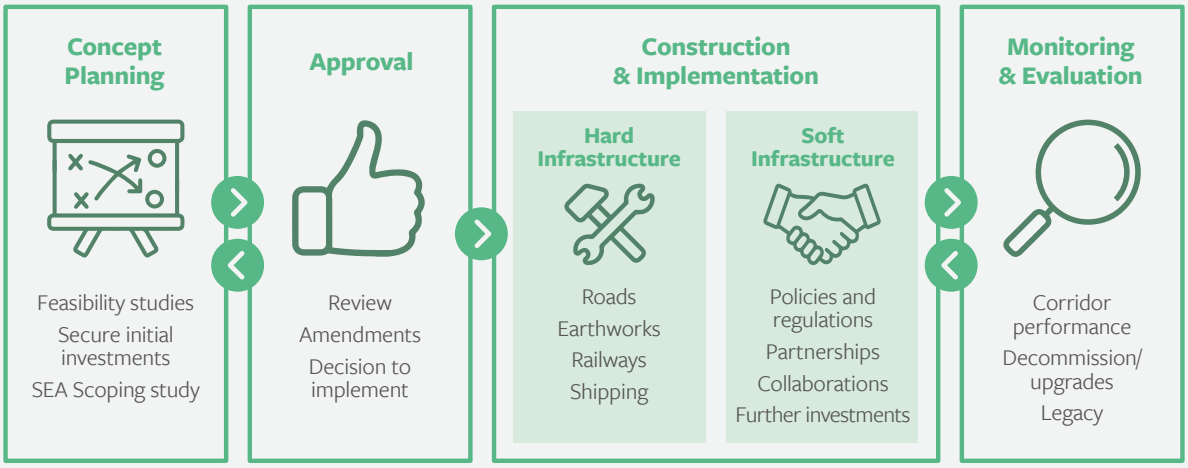
3. Implementation

4: Monitoring and Evaluation.

Effective planning is necessary to create sustainable, climate resilient, nature positive, and inclusive development corridors. **Planning** involves conceptual design, investment procurement, contractual negotiations, and detailed engineering design. Planning can therefore determine the success or failure of the development of corridors. At the **approval** stage, the plans and assessments from the concept planning stage are scrutinized for compliance with lender and legal requirements, and the corridor programme is given the green light if no changes are required.

The **implementation** phase is the creation of the soft and hard infrastructure components of the corridor. Soft infrastructure includes the terms of policies, programmes and partnerships, and hard infrastructure is the physical construction of the development. Successful implementation involves following the plans and standards as agreed at the planning stage (and amended during the approval stage) - using international best practice guidance and tools from across sectors for maximum success.

**Monitoring** allows assessment of progress towards achieving the corridors' intended development outcomes, and ensuring lessons are learned to improve processes and inform future projects. Monitoring processes should be an embedded element of all phases of a corridor's lifecycle, creating an enabling environment to iteratively improve impact.




Source: Juffe-Bignoli *et al* 2021[2]

[2] Juffe-Bignoli, D., Burgess, N.D., Hobbs, J., Smith, R.J., Tam, C., Thorn, J.P. and Bull, J.W., 2021. Mitigating the Impacts of Development Corridors on Biodiversity: A Global Review. *Frontiers in Ecology and Evolution*, p.477.

## So which tools and approaches must be kept in mind at each stage?

*At the concept planning stage,* ***feasibility and scoping studies*** *must be carried out to identify whether a corridor is economically, socially and environmentally viable:*

- Ideally, a Strategic Environmental Assessment should be conducted first, to identify key initial projects in the proposed corridor, do a preliminary stakeholder consultation, and secure investor buy-in. Significant risks and impacts to local people and nature need to be identified at this stage, and actions proposed according to the Mitigation Hierarchy: First try to avoid, then minimize, restore and compensate.
- Environmental Impact Assessments, or EIAs, are one of the established methods of identifying the impact that a project within a development corridor may have on society and the environment. These assessments and deliberations need to take place before any approval can be given for the projects within the corridor to go ahead. Each individual project in a corridor will require an EIA according to the law in the country where it is proposed.
- Incorporating sound land use planning, as well as nature-based solutions in the planning phase are a critical component of sustainable development corridors. To reduce impacts through human-wildlife conflicts and roadkill, planners need to consider integrating technical, social and ecological factors into planning to improve human safety and reduce biodiversity loss. Participatory scenario planning is an approach that considers multiple alternative futures, and can be used to facilitate meaningful community engagement to integrate all these factors.

*At the construction and implementation stage, it's now time to put sound planning into action.* The approved design and plans are implemented through hard and soft infrastructure, supported by further investment. It is critical that **impact mitigation measures** identified in the first stage are implemented within corridor construction.

*Something that's critical for sustainable development through corridors is having a strong monitoring and evaluation phase.* This phase involves **tracking the economic, social, and environmental performance** of the development corridor and its individual projects through the indicators identified in previous phases. Evidence of positive and negative impacts are documented in **post development audits**. Monitoring and evaluation should be led by designated corridor authorities and lenders and government agencies of individual projects, and it should start with implementation.


DCP team carrying out stakeholder engagement workshops in Taita Taveta County, Kenya, December 2021


A training workshop on futures foresight tools and scenario planning for sustainable development in Kenya. Wangari Maathai Institute for Peace and Environmental Studies, Nairobi, Kenya, February 2022.


# Environmental safeguards & community participation in Kenya

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# 2. Environmental safeguards & community participation in Kenya

## Why do development corridors need more comprehensive environmental safeguarding from project onset?

To limit future environmental impacts and increase benefits to nature along the next phases of Kenya's SGR (Phase III) and LAPSSET corridors, development projects should incorporate more robust environmental safeguarding practices to reduce the risk posed by unsustainable infrastructure to critical ecosystems and natural resources.

Strategic Environmental Assessments (SEA)[3] are now the benchmark standard for implementing best practices to avoid a net loss to biodiversity, and further tools such as the Mitigation Hierarchy[4] provide feasible means to develop routes to biodiversity net gain.

## Why should we use these recommended assessments?

- To avoid further damage to key biodiversity areas across Kenya and beyond, including protected areas such as Tsavo East, Tsavo West, and Nairobi National Parks.
- To prevent degradation of community and private conservancies, which offer key dispersal and dry season grazing areas, breeding zones, refuges for threatened wildlife species and landscape connectivity.
- To maintain water resource security, especially surface and groundwater (quantity and quality). Degraded watersheds and wetlands could lead to an increase in water demand and water scarcity.
- To protect remote ecosystems characterized by low human population, and areas inhabited by vulnerable low-income and marginalised communities and difficult climatic conditions.

## What did we determine as the key environmental risks[5] for local communities?

- Reduced access to biodiversity and ecosystem services.
- Habitat for wildlife was damaged or fragmented, which can lead to long term biodiversity loss and increased human-wildlife conflict.
- Communities relying on wetlands and rivers have lost access to critical resources e.g. as seen along the SGR in Voi, Kibwezi, Tuala and Narok areas.
- Change in land use and land resources.
- Vulnerable people lost their land or were evicted, while land prices continued to increase.

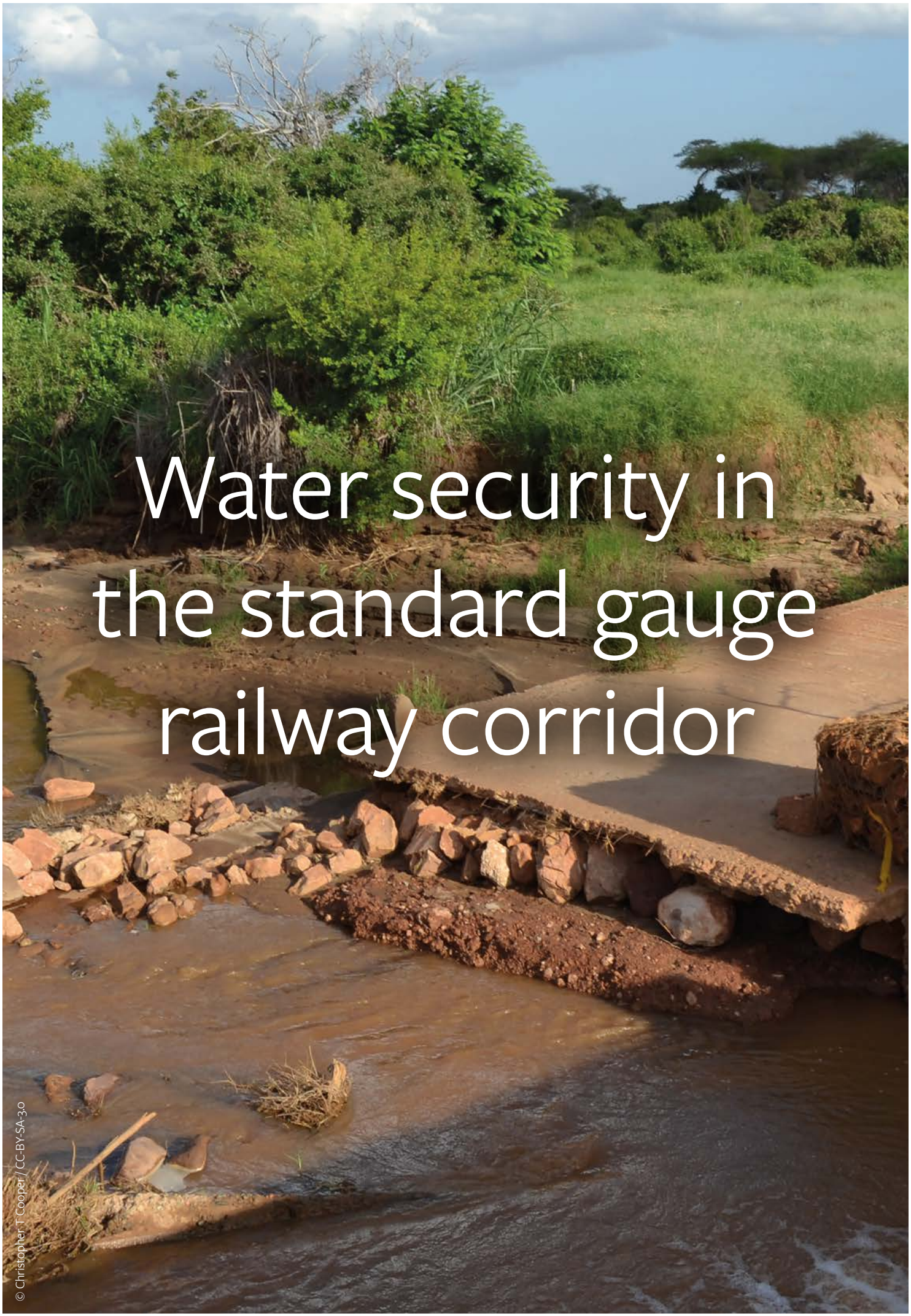
## We also researched the effectiveness of public participation processes in Kenya, and determined areas for improvement:

- The SGR's EIA had minimal overlap with best practice in its approach to public participation, while LAPSSET's use of a SEA approach enabled improved participation and oversight. However, there is still much room for improvement.
- The implementation process for public participation during development projects is weak and sometimes overlooked despite legislated requirements.
- The public is mostly involved at the "pre-feasibility" stage – i.e. during the initial stages of planning. However, best practice demonstrates that participation should be possible throughout all stages, including implementation and monitoring.

## Why is it important to get meaningful public participation?

- Public participation, when carried out meaningfully, can legitimise projects from the ground up.
- Public understanding, support and will for project implementation increases when public participation approaches are meaningful.

[3] https://www.nema.go.ke/index.php?option=com_content&view=article&id=42&Itemid=185
[4] http://www.csbi.org.uk/our-work/mitigation-hierarchy-guide/
[5] Nyumba, T.O., Sang, C.C., Olago, D.O., Marchant, R., Waruingi, L., Githiora, Y., Kago, F., Mwangi, M., Owira, G., Barasa, R. and Omangi, S., 2021. Assessing the ecological impacts of transportation infrastructure development: A reconnaissance study of the Standard Gauge Railway in Kenya. *PLoS one*, 16(1), p.e0246248.



# Water security in the standard gauge railway corridor

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# 3. Water security in the standard gauge railway corridor

Kenya has limited water resources, and water pollution is very common. The SGR corridor, for example, traverses many water basins and political jurisdictions, making it difficult to manage water resources from source to point of use. Moreover, water supply infrastructure is under-developed, and water coverage is currently at ~57%. Only ~27% of Kenya's population has access to safely managed water services, and rising demands are aggravated by risks such as climate change and economic development.

## How has the SGR impacted security, access and quality of water resources?

*Changes in land cover and reduced quality*

- Decreased forest cover has led to an increase in surface runoff which has, in turn, accelerated soil erosion and subsequently caused the siltation and sedimentation of water bodies, thus compromising the water quality. This has been aggravated as water has been directed to underpasses, leading to gully erosion too.
- Wetlands, such as Kiboko, have been adversely affected by stone quarrying for concrete, which significantly disrupted water tables.
- Reduced river flows due to water flow diversions have caused water shortages downstream.

*Varied access*

- Some railway-adjacent communities have benefited from water resources developed by contractors e.g. tap water, boreholes and water pans.
- However, overall access to the main water supplies have declined (increase use of vended water).
- Most water infrastructures were designed without consideration for future development projects, and the increase in demands for development will bring more challenges.
- The decline of wetland areas affects surface and groundwater resources.

**Increased disaster risk** – If current approaches are maintained, the effects of climate change, including increased frequency and intensity of droughts, will lead to water scarcity along the SGR and other development corridors. Simultaneously, when heavy rains do occur, flash flooding is now more common along the Standard Gauge Railway corridor, as natural water channels have been blocked, confined, and re-directed to single channels.

## What are the key challenges for water resource management in the SGR corridor?

Development corridors bring together multiple water-dependent sectors such as settlements, railway freight transport, passengers transport, pipeline transport, crop cultivation, and health services. Water demand scenarios developed by DCP's team in the University of Nairobi project that the higher water demand created by construction of development corridors such as the SGR, and the associated urbanization and population growth as people migrate to urban centres, will cause a greater water deficit across Kenya (full results in preparation for publication).

## Opportunities for sustainable water resource management in development corridors

- Surface runoff needs to be harvested and stored effectively to enhance water availability and reduce flooding. Improving vegetation cover to reduce runoff and increase groundwater penetration would also be a good nature-based solution to explore as a mitigation option.
- Sustainable groundwater exploration and extraction needs to be developed further.
- Sustainable methods to desalinate Kenya's water resources should be explored to enhance water supply.
- Sustainable inter-basin transfer options should be considered with improved coordination amongst water and climate management authorities for better regulated monitoring systems.


DCP experts presented 3-year research findings that assessed the interactions between corridor projects with water resources, key biodiversity areas, and land use change within the SGR. Kajiado and Narok Counties, Kenya, December 2021

# Tools from the Development Corridors Partnership to help decision-makers

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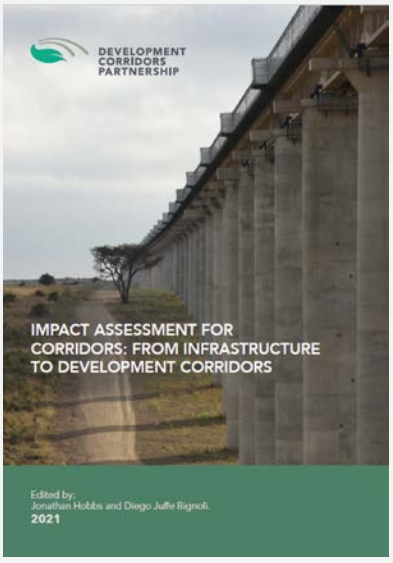
# 4. Tools from the Development Corridors Partnership to help decision-makers

## 1. DCP Impact Assessment Sourcebook

To be launched in March 2022, this sourcebook contains over 20 independently contributed research papers that critically review diverse corridor developments and recommend how they can align with the UN Sustainable Development Goals.

It will include case studies of corridor developments in Africa, Asia, and Latin America, and the tools explored will include:

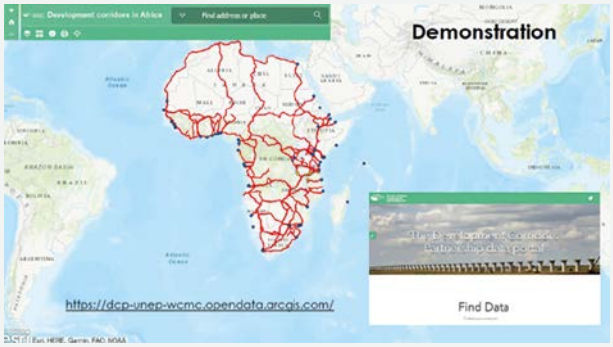
- Scenario planning
- Cumulative effects assessment
- Transboundary impact assessment
- Mitigation hierarchy
- Sensitivity mapping
- Social Impact assessments
- Human rights impact assessments




## 2. African development corridors database

To improve the monitoring of development corridors, the African Development Corridors Database has been developed to understand the ongoing and planned development corridors across Africa.

The database aims to improve coordination, efficiency and monitoring for diverse corridor decision-makers such as investors and strategic planners, urban planners, hydrologists, donors, and conservationists in development corridors. Across Africa, approximately 87% of linear projects bisected protected areas at some point of their existing or proposed trajectories. The total length of linear corridors crossing protected areas is 14,262 km. When a 50 km buffer is applied to the dataset, the intersection increases dramatically to 3,126 protected areas; putting at risk 589,356 km$^2$ of protected areas across Africa, an area larger than the size of Botswana.



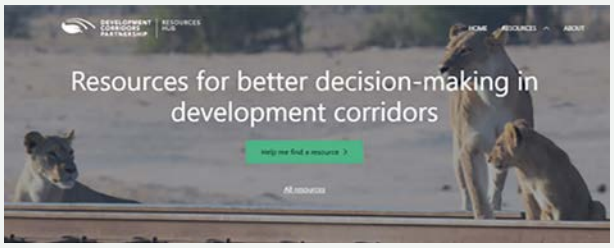

Map of all development corridors and their infrastructure type (Thorn et al., 2021, in review Nature Scientific Data)

All DCP resources will be available online through: **www.developmentcorridor.org**

## 3. DCP Resources Hub

In early 2022, to improve decision-making in development corridors, the DCP team will publish an online Resources Hub to help all corridor practitioners access robust scientific information and capacity-building materials from the research partnership.

The Resources Hub will provide an access route to make better-informed choices in each stage of a corridor's lifecycle. From project concept planning to post-project completion, the Resources Hub will produce appropriate resources for the user to help guide more sustainable choices for people and nature in current and future development corridors.




## 4. Development corridors e-learning course

In early 2022, DCP will release a development corridors e-learning course. The aim of the course is to provide decision-makers with a clearer understanding of the ongoing environmental and social issues and available tools for better environmental and social safeguarding.

The course will provide a baseline understanding to a broader audience of stakeholders interested in development corridors, including (but not limited to) public officials making corridor related planning and implementation decisions, investors and financing bodies, impact assessment professionals, environmental and social standards setting bodies, contractors and corridor developers, civil society organizations, academics, and multilateral organizations.

The course also includes supplementary modules directed towards specific actors such as project financiers including development banks and national authorities, and impact assessment practitioners to build greater capacity for environmental and social safeguarding.

All DCP resources will be available online through: **www.developmentcorridor.org**

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