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## Briefing note

# Making water infrastructure investment decisions in a changing climate

## A political economy study of river basin development in Kenya

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### Key messages

- Kenya's need for water infrastructure investment is urgent – the country is becoming increasingly water scarce due to population growth and rising demand across sectors, and climate change poses additional risks. Both 'natural' and built infrastructure can play a vital role in supporting resilient river basin development.
- Although policy-makers recognise the need to protect river catchments and ecosystems (natural infrastructure), in practice built infrastructure development and management is often prioritised, resulting in missed opportunities. Water governance is also highly fragmented, making integrated or collaborative approaches difficult.
- The devolution process underway offers opportunities (and challenges) for water governance, creating spaces for actors to negotiate existing arrangements and form new alliances. The 2010 Constitution also provides for public participation in decision-making, safeguards rights to water and a clean environment, and strengthens the position of regulatory authorities.
- Meanwhile, significant progress has been made in establishing a framework for action on climate change. Entry-points for putting natural infrastructure onto the climate change agenda include the execution of the National Climate Change Act, implementation of the National Adaptation Plan and Green Economy Strategy, and formulation of County Integrated Development Plans.

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## 1. The WISE-UP project: investigating natural and built water infrastructure investments

In many developing countries, investments to harness water resources for development have tended to focus on built infrastructure such as large dams for irrigation and hydropower production. Who truly benefits from these investments, and who pays their costs, however, remains contentious. Also unclear is the extent to which the health of natural ecosystems, and the services they provide to people and the environment, is considered. Built infrastructure projects can favour socio-economic development, but can also have negative impacts on the livelihoods of local communities, and may not always be the best response in the face of climate variability and change.

The Water Infrastructure Solutions from Ecosystem Services Underpinning Climate Resilient Policies and Programmes (WISE-UP) project aims to develop knowledge on how to combine natural infrastructure (e.g. wetlands, watersheds and floodplains) with built infrastructure in balanced investment portfolios, to support economic growth and poverty reduction. Using dialogue with decision-makers the project seeks to demonstrate the advantages of considering a range of investment options and deliberating on acceptable trade-offs over the long term, ensuring that the economy, people and environment can adapt to the impacts of climate change.

Under the WISE-UP project, we conducted a political-economy analysis to explore the contexts within which decisions about river basin development are made in Ghana and Kenya. The goal was to understand the bottlenecks to introducing natural infrastructure solutions in water management and development strategies, and identify entry-points to address them. This report summarises the findings and recommendations for Kenya, where we focused on two planned infrastructure developments in the Tana Basin as case studies: an inter-basin transfer from the upper Tana to Nairobi (the Northern Water Collector Tunnel) and a large multiple-purpose dam project (High Grand Falls). Both are politically contentious projects. The methodology consisted of interviews with key respondents in government, donor organisations and civil society at the national and local levels, supplemented by documentary evidence. For full details of the case studies, methodology and results please refer to the main report.<sup>1</sup>

## 2. Water as an essential ingredient for Kenya's ambitious development plans

Kenya has made notable progress in developing its economy over the last decade. The government has undertaken important economic and structural reforms, which have contributed to sustained economic growth, spurred a thriving private sector and a growing middle class, and strengthened Kenya's position as a regional

economic hub. However, a number of deep-seated challenges still confront the country in achieving its goal to reach middle-income status within the next fifteen years and poverty levels remain high. Among other factors, inadequate infrastructure continues to hamper economic and social development. Built water infrastructure (e.g. dams for hydropower or urban water supply) features prominently in key policies and strategies driving Kenya's development.<sup>2</sup> Such investments are viewed as an important means to achieve the aims laid out in Vision 2030 – the blueprint that guides Kenya's national development – as well as to adapt to climate change.

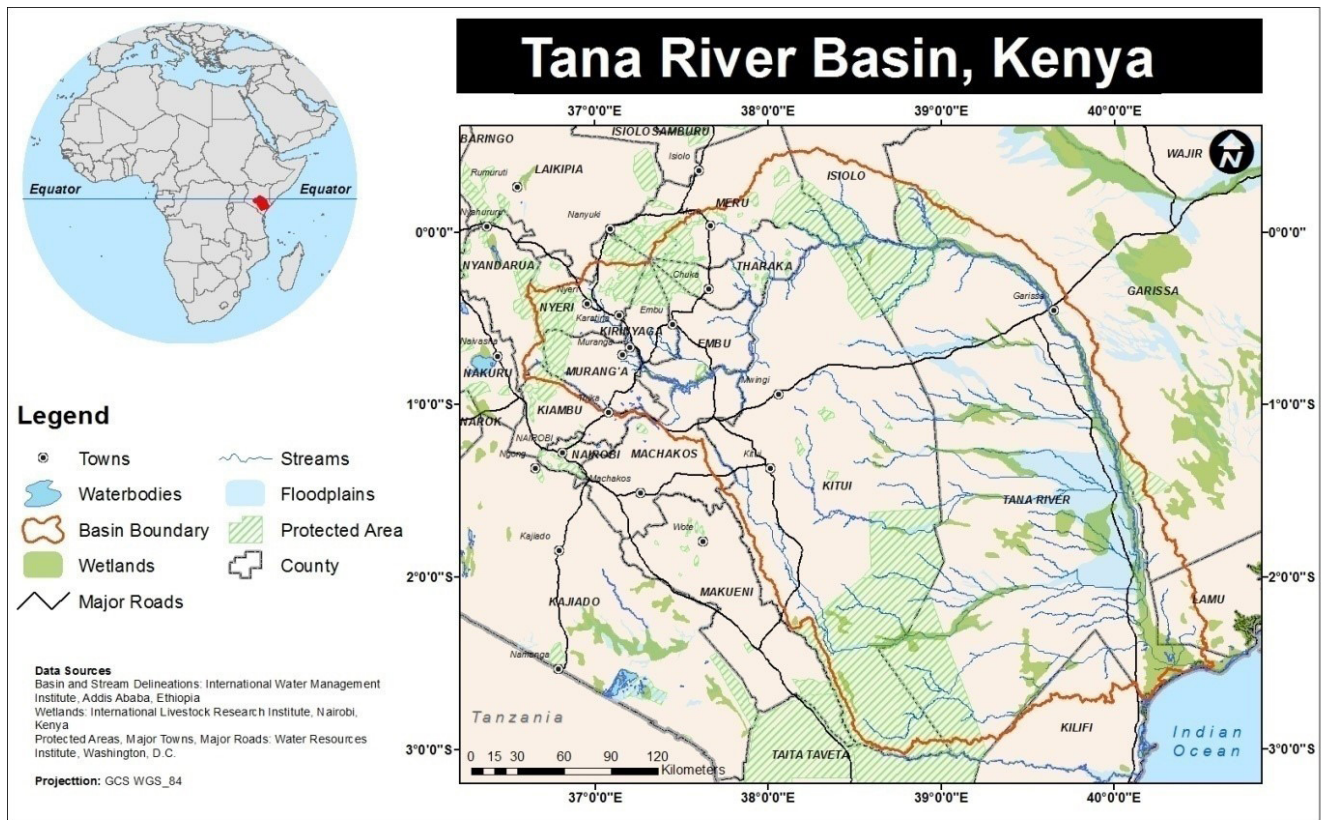
## 3. Water infrastructure projects in the Tana Basin

The Tana River Basin (Figure 1) is one of six major river basins in Kenya, covering 22 percent of the country's land area and supporting the livelihoods of some 6.5 million people. It is the principal water source for the capital city Nairobi, has significant potential for irrigation development and produces around 70 percent of the country's hydroelectric power.<sup>3</sup> Many rural communities in the basin intimately and intricately depend on river ecosystems for their livelihoods. The Tana Basin is also home to several national parks and reserves key to Kenya's vital tourism sector.<sup>4</sup> However, socio-economic and biophysical changes are putting the Tana River Basin and its ecosystems under increasing stress. Challenges that decision-makers face in the medium and long term relate to growing populations, increasing demands for water in all sectors, periodic droughts and floods, and climate change.<sup>5</sup>

Several of the flagship projects identified in Kenya's Vision 2030 and in the National Water Master Plan 2030 (updated in 2013) fall within the Tana Basin, or are dependent on water transfers from the basin. For example, to meet the needs of Nairobi's growing population and industries, a number of projects have been planned to tap water from the upper Tana catchment. Among these, the Northern Water Collector Tunnel (NWCT) Phase 1 is designed to transfer 138,000m<sup>3</sup> per day from tributaries in Murang'a County to Nairobi City and its satellite towns (60km South) via the existing Ndakaini (Thika) Dam.<sup>6</sup> The project is led by Athi Water Services Board (AWSB)<sup>7</sup> and receives high-level support from policy-makers. However, disagreements over the project have been voiced in the press and through formal channels, causing delays to implementation. Murang'a County Government has been particularly vocal in defending local interests, contesting various aspects of the project on economic, ecological and procedural grounds. The NWCT case raises questions as to how long Nairobi can continue to demand transfers of water from the (predominantly rural) Tana catchment whose inhabitants are increasingly becoming aware of their water needs and rights.

Downstream of the NWCT project and existing hydropower dams on the Tana River the Kenyan Government is proposing to build the second largest dam

**Figure 1: Map showing the boundaries of the Tana River Basin, its counties and key natural features**



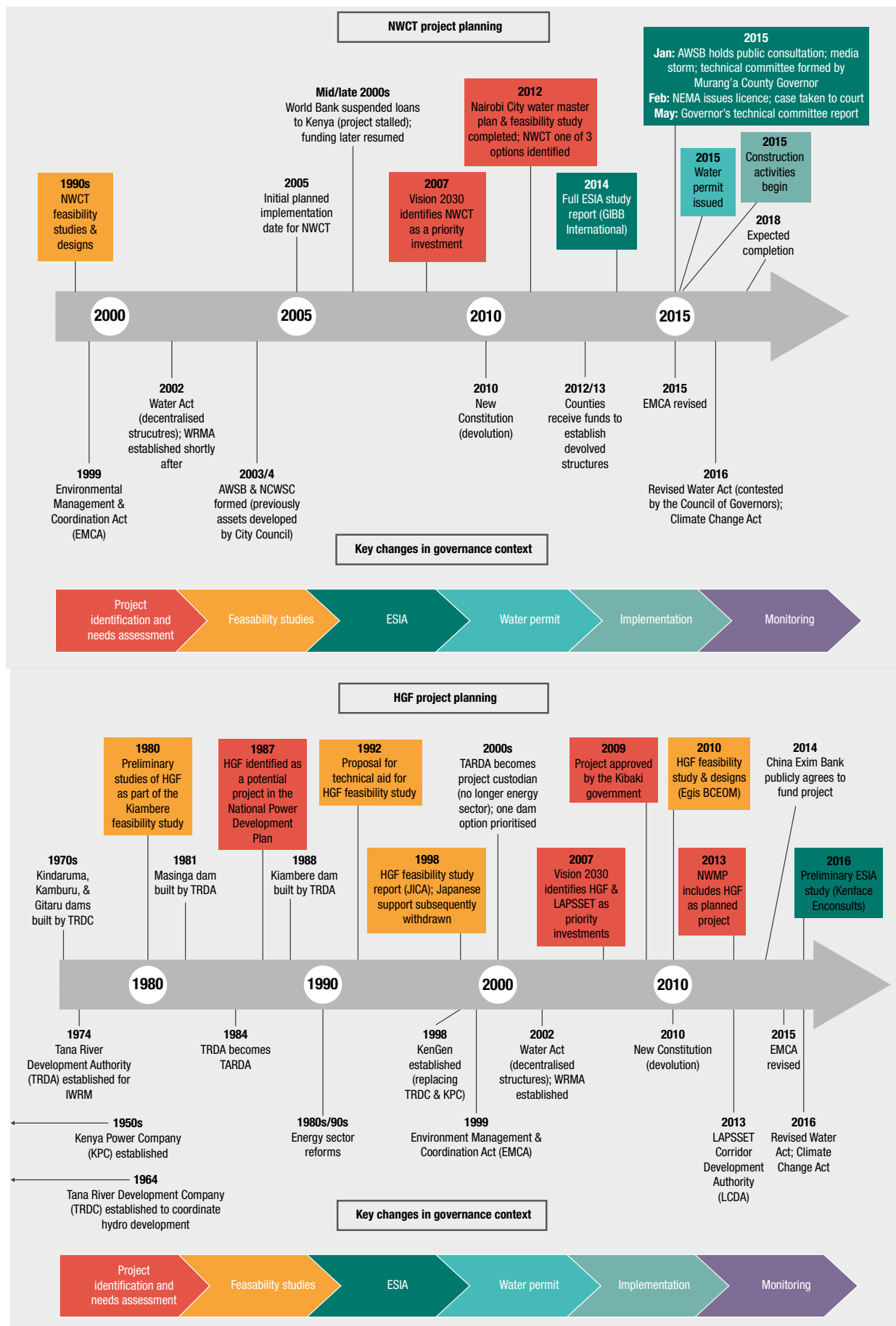
Source: map created by the International Water Management Institute (IWMI) in 2015, replicated here with permission

in Africa – namely the High Grand Falls (HGF) Dam. Located in the mid-catchment, the planned dam, reservoir and irrigation developments will encompass parts of Tharaka Nithi, Kitui and Tana River Counties. The dam, as planned, will have an installed power generation capacity of 500-900 megawatts and, with a reservoir storage capacity of over 5 billion m<sup>3</sup>, is expected to support over 200,000 hectares of irrigation, alongside support for tourism, fishing, flood control, and water supplies to Lamu Port and Resort City. Despite this potential, there are concerns regarding the impact of the dam on downstream riverine and delta ecosystems and livelihoods, displacement of communities and loss of cultural sites. Moreover, the

commencement of the project has been dogged by funding challenges and political disagreements. Currently the dam falls within the jurisdiction of the Tana and Athi Rivers Development Authority (TARDA).

Figure 2 depicts the history of the NWCT and HGF Dam, demonstrating how planning processes for these two infrastructure projects have unfolded over several decades, in the context of wider institutional and policy reforms affecting water governance in the Tana Basin. These structural factors and the constellation of interests (or stakeholders) surrounding the two case studies are discussed in detail in the main report.

**Figure 2: Planning the NWCT project (top) and High Grand Falls Dam (bottom) in a changing governance context**



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## 4. Key findings from the political economy analysis

Drawing on findings from our two case studies, the WISE-UP political economy analysis sheds light on the dynamics of water infrastructure investment decisions in Kenya, and identifies entry-points to support integrated, climate resilient approaches to river basin development. Here we summarise the key opportunities and challenges in promoting mixed portfolios of built and natural infrastructure in the Tana Basin, and provide recommendations for action.

### 4.1. Water governance is highly fragmented, which hinders strategic basin-level planning. There are currently few fora in which stakeholders can explore alternative portfolios of built and natural infrastructure, or negotiate trade-offs, particularly at a basin level.

Our research has found that laws and policies for water-related sectors are often inconsistent and institutional mandates are overlapping. This leads to conflicts of interest and competition for the resources intended for water infrastructure investment. Sector siloes are strong and deep-seated rivalries exist between different ministries and agencies, hindering cross-sectoral cooperation and collaboration. Leadership on integrated basin development is unclear and no single institution or agency seems to have the requisite political clout and capacity to fulfil this role at present. Meanwhile, counties (discussed further below) are formulating their own laws and establishing their own structures for resource management, adding a further layer of complexity to the institutional and political landscape.

A related issue is that mechanisms for joint planning at basin-level appear to be absent and there is no obvious forum in which different sectors and stakeholders can discuss options and negotiate trade-offs strategically. Nevertheless, there have been some notable success stories at a sub-basin or programme level, such as the Nairobi Water Fund (NWF) and Tana Delta Land Use Plan (LUP) – processes which could be learnt from, and perhaps built on. The LUP has been particularly successful in supporting bottom-up planning and fostering a sense of ownership among county-level stakeholders and national agencies alike. The NWF has taken a somewhat different approach, leveraging significant financial commitments from powerful actors (including the private sector) to invest in natural infrastructure at the local level.

### 4.2. The development of big water infrastructure is considered a national priority in Kenya, which can make it politically difficult to discuss alternatives or to contest projects. However, accountability and adherence to environmental regulations is improving thanks to the framework set by the new Constitution and other legal reforms.

As a country, Kenya wants to grow its economy to achieve the aspirations of Vision 2030 and strengthen its middle-income status. Built water infrastructure development is viewed as a key part of medium-term investment plans, and critical in tackling the challenges posed by rapid population growth and climate change. Kenya has a number of urgent development needs that directly depend on the ability to capture, store and transfer water. However, there is a risk that short-term priorities override considerations of longer-term needs and hence foreclose other options (such as investments in natural infrastructure).

There are several big projects planned for the Tana Basin with high political stakes, such as the High Grand Falls Dam and Northern Water Collector Tunnel (Phase 1). As ‘concrete’ symbols of progress, power and national pride built infrastructure projects are attractive to politicians, and are often given high profile in pledges to the electorate. This can make it very difficult for actors to contest such projects. In contrast, investments in natural infrastructure tend to be less attractive, politically, despite offering substantial ecological and socio-economic benefits. This is partly because investments such as catchment protection are less visible, but also because their socio-economic impacts are difficult to prove. Hence, there is a need to strengthen the evidence base to make the case for natural infrastructure.

Given the high stakes involved, there is a risk that political interests push projects forward despite technical concerns, or without following due process. At worst, this can serve to close down the formal (public) spaces in which stakeholders are able to discuss development options and negotiate the distribution of risks and benefits from new investments. In this regard, regulatory agencies have an important role to play in enforcing the provisions provided by the Constitution and environmental laws, for example ensuring the quality of public consultation and environmental/social impacts assessments. Whilst accountability is improving, regulatory agencies could be strengthened further, technically and politically, so that they can effectively hold powerful decision-makers to account through better planning procedures.

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### **4.3. Water governance arrangements are changing following the 2010 Constitution and revised Water Act (2016); devolution has created new opportunities for local actors to influence water infrastructure decisions.**

As noted above, water governance arrangements are changing following the 2010 Constitution and 2016 Water Act. Substantial functions, responsibilities and resources have been transferred from central government to the newly created county governments, including for water service delivery.<sup>8</sup> The process of devolution has also created new opportunities for local actors to influence (and contest) the decisions made around centrally led water infrastructure development.

Counties are eager to claim their place and space in water governance processes. Water has also become a major issue in county politics and there is a strong incentive for county politicians to be seen to be protecting local interests and securing benefits for their constituencies. Thus top-down planning by national agencies (typical of big infrastructure projects in the past) has increasingly been challenged by county politicians, who are demanding that local (and not just national) needs are addressed. Such contestations are likely to determine the direction of water planning approaches and shape future spaces for water governance processes in basins like the Tana.

More generally, there appears to be an increasing emphasis on sharing benefits from the exploitation of natural resources, particularly making sure that communities and counties receive a fair share of any profits made. Counties are beginning to assert their rights in this regard, as per the Constitution. New resource sharing laws (currently in parliament for approval) will, if passed, also influence how benefit-sharing arrangements play out at national and county levels, and the nature of contestations in future.

### **4.4. Three main strategies are used by actors to promote or contest water infrastructure projects – control of data and information, use of the media and recourse to the law.**

Data are collected by several government entities but the mechanisms to share and validate data are generally weak (or non-existent). Different institutions hold different data sets and stake their claims on this basis. Information may also be intentionally withheld from the public domain, for example due to political sensitivities (as in the case of the High Grand Falls Dam). Stakeholders without access to this information find it difficult to assess or counter claims, and this makes it difficult for them to engage in debates regarding the feasibility of a project and its potential impacts (positive and negative) on different groups.

In the case of the Northern Water Collector Tunnel project, both pro-project and anti-project stakeholders have sought to use the media to influence decision-making and public opinion to their own advantage. For example, county and national-level politicians have drawn attention to perceived inadequacies in the environmental and social

impacts assessment (ESIA) process, demanding further consultations and feasibility studies. The media has also been deployed as a vehicle to generate political controversy around the project, particularly in the run-up to elections. The ‘heat’ generated by these debates has served to put project proponents and regulatory authorities under pressure to heed stakeholder demands, and arguably led to the decision to hold additional stakeholder consultation meetings prior to project implementation.

As indicated in point 2, constitutional requirements for public consultation do not always result in meaningful stakeholder engagement and can be manipulated (or are simply inadequate). The issue of stakeholder participation in ESIA has increasingly become a point of leverage for county governments vis-a-vis national government agencies (particularly evident in the Northern Water Collector Tunnel case). However, where dialogue fails, formal (legal) processes are also available to hold project proponents to account, for example recourse to the Environmental Tribunal to challenge an environmental licence. This allows stakeholders to raise concerns that certain mandatory decision processes have not been adhered and forces parties to reach an agreement before the project proceeds.

### **4.5. Natural infrastructure is recognised as important for socio-economic development, but remains the ‘poor relation’ of built infrastructure in terms of political interest and public investment.**

The environment is recognised as a key pillar in national policy (Vision 2030) but in reality is often perceived as secondary to, or in conflict with, the goal of socio-economic development. For example, investments in built infrastructure to supply electricity or water appear to take precedence over investments in catchment conservation, because energy and water supply are key priorities in national development. Although environmental concepts such as ‘ecosystem services’ are referenced in policy documents, their significance for social and economic development is not always fully understood by decision-makers (or indeed practitioners). Thus on one hand, politicians want to build water infrastructure projects to deliver direct benefits to constituents, while on the other hand they may know little about the benefits of natural infrastructure. The problem is exacerbated where technical advisors have similar knowledge gaps.

There is perhaps more interest (and action) where investments in natural infrastructure are perceived to be necessary for the sustainability of built infrastructure. For example, considerable funding is going into catchment protection in the upper Tana through the Nairobi Water Fund, in order to protect the hydropower dams and other facilities (this is largely private and donor money, rather than coming from the public purse). This interest is sustained by perceptions that benefits will accrue to influential stakeholders operating in (or drawing water from) the upper basin, such as the Kenya Electricity Generating Company (KenGen) and Nairobi City Water and Sewerage Company (NCWSC), as well as boosting

these companies' public images. For built infrastructure to support sustainability in the lower basin, improved upstream-downstream coordination will be necessary.

In project design, there are requirements to consider downstream needs, securing environmental flows and water for other users. Evidence from our case studies suggests these are factored in, although much depends on how the infrastructure is subsequently managed and hence the impacts on the river flow regime. For example, it is unclear at present how the High Grand Falls Dam will affect implementation of the Tana Delta Land Use Plan. Management of the current and planned hydropower dams is a key determinant of the well-being of downstream ecosystems and communities. At present these dams are largely operated to meet energy production targets, with limited consideration of other water users.

#### **4.6. There has been significant progress in establishing the legal and institutional framework to address climate change in Kenya; further work needs to be done to put this into practice, and to mainstream climate change into routine planning and budgeting.**

The Climate Change Act, passed in 2016, provides an exciting opportunity to strengthen national institutions for strategic planning, and provides a framework to mainstream climate adaptation and mitigation into sectoral (and county) planning and budgeting processes. Moreover, mechanisms are now in place to enable Kenya to apply for and manage international climate finance. Development partners are also providing significant (technical and financial) support to operationalise climate change policies and develop strategies.

At national level, the mainstreaming of climate risks into routine planning and budgeting is still in its infancy, and tends to be side-lined by sectoral concerns that are perceived as more pressing; most progress has been made with respect to mitigation whereas adaptation planning has lagged behind and tends to be viewed as an 'add-on' to existing activities. That said, units are being set up in key ministries (including water) to facilitate mainstreaming, and a small number of counties are piloting the integration of climate change concerns into their development plans, with assistance from development partners. There are indications that climate change is being considered, to an extent, in catchment planning and water infrastructure project planning and design, although there is need to build technical capacity in this regard.

## **5. Recommendations for policy-makers**

### **To enable strategic basin-level planning, mechanisms (or forums) for cross-sector collaboration are needed, as well as clear leadership, starting at the top.**

Strategic planning, with all the key players around the table, is important to ensure that viable options for long-term basin development are identified and that potential trade-offs can be discussed transparently (rather than each sector doing its own thing). Given the sectoral divisions discussed above, leadership needs to come from the top, meaning the Office of the President, cabinet ministers and the Council of Governors, among other senior decision-makers. In addition to planning future investments, one area in which coordination and dialogue will be crucial is around the management of the cascade of dams in the Tana Basin, which control the river flow regimes and hence benefits derived from the river.

Based on our findings, one option to strengthen strategic planning might be to establish an inter-ministerial committee (or similar body), as a first step. The task of this committee would be to assess options for strengthening strategic planning and identify the best way forward. Such a committee should be designed to minimise staff turnover (to build institutional memory and capacity) and would need a clear mandate and strong leadership to ensure that real progress can be made. For the Tana Basin there may also be opportunities to strengthen existing multi-stakeholder platforms or initiatives, such as the Nairobi Water Fund or Tana Delta Land Use Plan, to promote investments in natural infrastructure and encourage cross-sectoral collaboration.

### **A change in mind-sets and re-organisation of government institutions may be required to achieve Vision 2030 and implement the provisions of the Kenyan Constitution.**

Significant progress has been made in reforming the water sector since the early 2000s. However, many institutions with a stake in water resource management and development, such as TARDA or KenGen, lie outside this process. Given the current overlaps in mandates, lack of integration and rivalries between government agencies, several interviewees argued that existing institutions needed to be restructured. More fundamentally, the Constitution calls for a change in mindsets to bring services and other benefits to the Kenyan people. This means putting narrow political interests aside (i.e. discarding the 'empire' mentality) and working with citizens to improve their social and economic wellbeing, protect the environment, and build resilience to climate change. Vision 2030's goals can only be achieved through decision-making processes and institutions that assess and choose between different water investment options objectively, weighing up and managing trade-offs between different sectors and communities' demands.

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**Counties need to be involved in making strategic decisions for basin-wide development, and not only in project-based consultations.**

As described above, counties of the Tana Basin are increasingly asserting themselves in the decision spaces for large infrastructure projects but also need to be included in strategic planning processes, for example through the Council of Governors or regional county blocks. Counties may also benefit from having their own basin-level fora, bringing together different stakeholders to build consensus around common concerns, for example negotiating upstream-downstream water needs. Given the diverse interests involved, and tensions between counties over resources, a step-wise dialogue-based approach is advisable. The facilitator will need to be carefully chosen, to maintain neutrality.

**Both natural and built infrastructure can play a role in supporting resilient river basin development. A priority is to put mechanisms in place to ensure climate risks are factored into routine planning and budgeting.**

Mainstreaming climate resilience into basin planning (and vice versa) is in its infancy, not only in Kenya, but around the world. An important step towards achieving this is to put in place mechanisms to ensure that climate risks are addressed in routine planning and budgeting, such as the Vision 2030 Medium Term Plans, as well as in project design and management to build flexibility into the system. This is provided for by the new Climate Change Act and urgently needs to be put in practice. As noted above, to date adaptation planning has lagged behind mitigation efforts, and needs to be given greater attention (and resources) at a strategic level. The Climate Change Council and Directorate clearly have an important role in leading these processes, but commitment is also required from sectoral ministries and agencies.

Integrated cross-sectoral approaches will be important to optimise the use of both natural and built infrastructure for climate adaptation and mitigation. The tools WISE-UP has developed can be used to make trade-offs explicit and demonstrate the (economic, social and environmental) value of considering portfolios of built and natural infrastructure for climate adaptation. These can be tailored to address specific problems that decision-makers face, whether at a strategic level, or in relation to a specific projects or programmes, and their impacts on the rest of the basin.

## **6. Recommendations for development partners**

**The case needs to be made to policy-makers for alternatives to ‘business as usual’ in river basin development, particularly given future climate change. There is likely to be appetite for this evidence in lieu of Vision 2030 ambitions.**

Political interest in water infrastructure as a means of achieving other socio-economic goals, such as energy and food security, means there is appetite for the evidence that projects such as WISE-UP can provide to inform decision-making. Results from modelling studies and other research can help demonstrate to policy-makers (such as cabinet ministers) why alternatives to ‘business as usual’ need to be considered, and what these might look like. Key findings emerging from this research should be used to engage with decision-makers through existing networks and forums, wherever possible, aimed at influencing influential stakeholders, particularly elected representatives, as well as informing the work of staff in key government agencies. Working with the Council of Governors would be a good starting point to disseminate findings to county governments, for example through the Environment and Natural Resources Management Committees of County Assemblies.

As WISE-UP’s experience has shown, ownership of results can be built by involving decision-makers in the research process. However, it is also crucial to tailor the research to meet the needs of policy-makers and planners, incorporating the research process in ‘real life’ decision processes to ensure the relevance to the problems they face. This would be an important next step for the project, now that stakeholders are familiar with the tools available.

**Support to regulatory authorities, civil society organisations and other local platforms to ensure that the provisions of the Constitution are enforced, and decision-makers held to account (countering undue political influence).**

The 2010 Constitution and new county system opens up possibilities for stronger public participation and consultation processes with regards to water infrastructure development. In this, the National Environment Management Authority (NEMA) and Water Resource Management Authority (WRMA) need to play a key role. Working closely with these agencies, and building their capacities, will be important to ensure they have the ability to assess plans and projects based on the available information, including consideration of climate change. Capacity needs relate to financial and human resources, as well as technical skills, and training, information/data and networking.

County governments and civil society groups also have an important role to play in representing local interests in water infrastructure decision-making, engaging in strategic



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planning and ensuring that ESIA consultation processes are adequate. Providing these actors with evidence regarding infrastructure options and impacts could help to inform their positions vis-à-vis current basin development priorities. Moreover, encouraging environmental organisations to engage with influential players (socio-economic interests) and demonstrating the value of this may help to avoid an ‘environment versus development’ mentality. As noted above, for the Tana Basin there may be opportunities to strengthen existing multi-stakeholder initiatives. Resources are needed for implementation of the Tana Delta Land Use Plan, for example. It has also been suggested that this land-use planning process could be extended to encompass other parts of the Tana Basin. Other fora through which to engage and disseminate research findings include the Kenya Wetlands Forum and active Water User Associations in the Tana Basin.

**Providing tailored technical and financial assistance to the Climate Change Council and Directorate, Treasury, sectoral agencies, and County Governments, will be essential to mainstreaming climate adaptation and mitigation.**

Development partners are already supporting the establishment of new institutional structures for action on climate change, provided for by the Climate Change Act. A big opportunity in promoting natural infrastructure as an adaptation option lies in working with Climate Change Directorate and Council. There is ample scope to provide technical and financial assistance to these institutions, to build their capacity and evidence-base for decision-making, and make the case for investments in both built and natural infrastructure. Current entry-points include the implementation of the National Adaptation Plan, the National Climate Change Action Plan (with revisions), and

Green Economy Strategy. The Council, in particular, has potential to be an influential platform, given the high-level (ministerial) representatives involved.

At a sectoral or thematic level there are opportunities opening up to work with working groups (e.g. on clean energy) and the new climate desks/committees (e.g. in Ministry of Water and Irrigation, or in the Ministry of Energy and Petroleum), supporting the technical staff who are responsible for mainstreaming climate change actions. In a similar vein, it will be important to engage with the agencies responsible for planning and design of infrastructure investments, such as WRMA and TARDA, as well as KenGen.

Counties are currently in the process of formulating (or already have) their own laws and development plans, which presents an opportunity to ensure that both natural infrastructure investments and climate change are on the agenda. Some counties are piloting the mainstreaming of climate change into their planning processes, with support from development partners (the Adaptation Consortium). There are likely to be opportunities to support the upscaling of such initiatives in future.

Finally, the proliferation of climate finance is diversifying the funding instruments available for river basin investments, including supporting environmental sustainability and bottom-up adaptation. The National Treasury (as the National Designated Authority) is currently leading on several proposals to access funds from the Global Environmental Facility (GEF), Green Climate Fund (GCF) and other sources, and is leading on the development of a National Climate Change Fund (NCCF). To this end, the evidence generated by projects such as WISE-UP will be important in demonstrating the need to ‘climate-proof’ investments, and in understanding the role that natural infrastructure plays in building resilience.

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# Notes

- 1 The main report is downloadable at: [odi.org/wise-up-water-infrastructure-decisions-climate-kenya](http://odi.org/wise-up-water-infrastructure-decisions-climate-kenya)
- 2 For example see GoK (2013) *Vision 2030 Second Medium Term Plan 2013-2017: Transforming Kenya, Pathways to Devolution, Socio-economic development, Equity and National Unity*. The Presidency, Ministry of Devolution and Planning, Government of the Republic of Kenya, Nairobi.
- 3 WRMA (2013) National Water Master Plan 2030. Water Resources Management Authority, Government of Kenya, with support from Nippon Koei Co. Ltd and Japan International Cooperation Agency
- 4 Baker et al. (2015) *Baseline review and ecosystem services assessment of the Tana River Basin, Kenya*. IWMI Working Paper 165. Colombo, Sri Lanka: International Water Management Institute (IWMI).
- 5 WRMA (2013)
- 6 Feasibility studies and the Environmental and Social Impacts Assessment have been completed, and water abstraction permits obtained; at the time of writing construction was underway.
- 7 A national government agency responsible for developing and maintaining public water works for bulk water supply; AWSB is one of eight water boards under the Ministry of Water and Irrigation.
- 8 Revisions to the Water Act in 2016 seek to align water governance with the Constitution and to resolve some ambiguities regarding the division of responsibility between national and county government, including for infrastructure development and management. However, tensions remain regarding the role of the Water Services Boards and the new Act was initially disputed by counties in court.

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All quotations from interviewees are anonymous. Any errors or omissions are our own.

This report is a product of the ‘WISE-UP to climate’ project. WISE-UP seeks to demonstrate natural infrastructure as a ‘nature-based solution’ for climate change adaptation and sustainable development. The project is developing knowledge on how to use combinations of built water infrastructure (e.g. dams, levees, irrigation channels) together with natural infrastructure (e.g. wetlands, floodplains, watersheds) for poverty reduction, water-energy-food security, biodiversity conservation, and climate resilience. It seeks to demonstrate the advantages of combined built and natural infrastructure approaches using dialogue with decision-makers to agree acceptable trade-offs. Research is being carried out in the Tana (Kenya) and Volta (Ghana-Burkina Faso) river basins.

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The full version of this report is available at [odi.org/wise-up-water-infrastructure-decisions-climate-kenya](http://odi.org/wise-up-water-infrastructure-decisions-climate-kenya)



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