

Addressing WEFE nexus challenges in the Inkomati-Usuthu river basin

The Inkomati-Usuthu Water Management Area (IUWMA) spans South Africa's eastern border, covering the Inkomati and Usuthu River catchments, with key sectors including agriculture, mining, and eco-tourism. Agriculture and forestry dominate job creation and water use, while the region's economy, is driven by manufacturing and mining.



The Inkomati-Usuthu River basin faces multiple interconnected challenges, including inequitable access to water, energy, ecosystem services, and food resources; impacts from upstream mining on water quality; overallocation of water; and mismanagement of water treatment facilities. Additional issues include widespread algal blooms, land conversion for export crops, unreliable energy supply, and climate change effects on heat, precipitation, and biodiversity.

NEXOGENESIS' actions in the River basin

The outcomes from the Nexogenesis activities within the basin include:

- **Connecting stakeholders** across the WEFE sectors during stakeholder engagement workshops.
- Enhancing the knowledge base **on problems** within the catchment.
- Enhancing the knowledge base **on governance and policy coherence** within the catchment.
- With stakeholders' aid, mechanisms are developed to enhance **WEFE thinking and governance** within the catchment.
- Complete **Systems Dynamics Models (SDM)** of the basin and incorporate into the Nexus Policy Assessment Tool (NEPAT).
- Visualise **potential trade-offs and synergies** between WEFE sectors when implementing policies.
- Develop a Decision Support System (DSS) to assist in identifying suitable policies to meet selected goals.

Stakeholder Engagement Goals

The primary goals of engaging stakeholders are to gain:

- **System knowledge:** Understand the area's contexts, incorporate insights from stakeholders and analyse WEFE interactions.
- **Target knowledge:** Identify sustainable development drivers, infrastructure needs, balance of cross-sectoral needs, and promote WEFE Nexus interactions.
- **Transformation knowledge:** Determine infrastructure needs, transition to renewable energy with worker re-skilling, link conservation to the WEFE Nexus, and support policy development.

Roadmap & preliminary results

NEPAT (inclusive of the DSS)

- The SDMs and validated policy instruments are implemented in the NEPAT. The results of the SDMs and NEPAT have been through a series of results validation steps and updates to the SDM and NEPAT.
- During Workshop 5, stakeholders used NEPAT to:
 - Apply policy instruments.
 - Using the Decision Support System results, identify a starting point to discuss a set of policies that would move towards achieving a desired set of goals.

Governance Assessment and Policy Coherence Analysis

The assessment found that the current governance system is 'restrictive' towards WEFE nexus governance with:

- Barriers within the catchment include few inter-sectoral policies; low awareness of the need for cross-sectoral management; lack of communication, cooperation, compliance, and accountability.
- Levers within the catchment include the short-term flexibility of the governance system (high adaptive capacity); the use of the Sustainable Development Goals as an entry point for cross-sectoral management; multi-level cross-sectoral governance within regional and local levels; and match between the scale of governance structures and the scale of bio-geophysical systems.
- There is a high level of policy coherence between the water and ecosystem sectors, with policies from the ecosystem sector creating the most coherence.
- Illegal activities and a lack of coordination between different authorities with overlapping responsibilities diminish policy coherence.

Governance Roadmap

The stakeholders have validated three policy instruments to be incorporated in the validated policy package, with a fourth food-related policy under consideration. Draft governance roadmaps have been compiled for two of the validated policies:

- Maintenance and repair of water treatment infrastructure and
- Securing of strategic water source areas (SWSAs).

The roadmaps' outcomes and actions will be finalised during bilateral sessions with stakeholders responsible for implementing the policies.

Stakeholder agreement

- Stakeholders have been introduced to potential ideas for a stakeholder agreement.
- During bilateral sessions with stakeholders, various potential agreements have been identified.
- Further potential agreements with stakeholders emerged during governance roadmap discussions in Workshop 5.
- These potential agreements will be explored in further bilateral sessions.

Key lessons from the Inkomati-Usuthu River Basin Case study

- The **involvement** of energy sector stakeholders in the Nexogenesis Project and other water or ecosystem-focused projects and forums **is limited**.
- **Bi-lateral sessions with key stakeholders** is essential to ensure they are kept abreast of project progress and to ensure participation from these stakeholders.
- **Stakeholder engagement** has been instrumental in understanding the constraints, challenges and general nature of the IUWMA.
- **In-person meetings** allow for better engagement with SHs than virtual meetings. However, due to the scale of the catchment and location of SHs, virtual meetings allow for greater attendance.
- The method of **display or presentation of the project results** is key to ensure the correct message is provided to stakeholders and to ensure effective knowledge sharing.
- An **extended period of time and training** is required to ensure a complex tool such as NEPAT is understood.
- Due to the intricacies of the nexus, efforts were focused on modelling the critical aspects of the nexus, where feasible. An early challenge experience in the modelling was related to **obtaining the necessary local data at a catchment scale**.
- Mapping and modelling of the impact of the mining sector is key within the catchment, however information is not readily shared from this sector due to the commercial nature of the sector. **The lack of information and mining-related policies** resulted in the omission of mining and its impacts on the nexus.
- The **visualisation of the synergies and trade-offs** on the WEFE sectors when implementing policies, as demonstrated in the NEPAT, is appreciated by stakeholders.



Recommendations

1. **Encourage Multi-Sectoral Engagement** – Establish integrated platforms where water, energy, mining, agricultural and ecosystem stakeholders can engage in meaningful dialogue rather than operating in isolated silos.
2. **Mandate Participation of Key Players** – Government policies should require active participation from dominant entities like mining corporations in stakeholder meetings to ensure balanced decision-making.
3. **Balance Economic and Environmental Needs** – Develop policies that address immediate economic necessities while incorporating sustainable practices. Incentivizing responsible corporate behaviour through policy frameworks can assist in bridging the gap.
4. **Enhance Government Capacity and Transparency** – Invest in strengthening local governance structures by addressing resource shortages, investing in capacity building, combating corruption, and improving public service efficiency.
5. **Expand the Use of Decision-Support Tools** – Utilise tools like NEPAT to help stakeholders visualise trade-offs and synergies, facilitating informed and cooperative decision-making.
6. **Institutionalize Crisis-Induced Collaboration** – Formalise collaboration mechanisms initiated during crises to ensure they persist in non-emergency scenarios. This could involve structured agreements and long-term planning committees.
7. **Create Neutral Spaces for Dialogue** – Foster environments where different sectors can engage without dominance by a single interest group. Independent facilitators can help bridge divides and ensure balanced discussions.

By implementing these recommendations, the Inkomati-Usuthu region can move toward a more sustainable and equitable resource management framework, balancing economic and resource needs with environmental sustainability for long-term prosperity.

More about the project on our website: <https://nexogenesis.eu/>
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