SPARKE Workshop Report

Developing Science-Policy Exchange in Malawi's Water Sector

12th March 2025

Organised by: Hydro Nation International Centre (HNIC), BASEflow, and BAWI Consultants

Location: Golden Peacock Hotel, Lilongwe, Malawi & Online via Zoom

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Executive Summary

Summary of the SPARKE Workshop on Science-Policy Exchange in Malawi's Water Sector

This SPARKE (Scotland's Global Partnership for Knowledge and Expertise in Water and Climate) workshop aimed to enhance science-policy exchange (SPE) within Malawi's water sector. Held with 26 participants from government ministries, academia, and NGOs, the workshop focused on aligning research with Malawi's National Research Agenda (NRA) to support evidence-based policymaking.

Key Objectives:

1. **Enhancing SPE:** Strengthen dialogue and collaboration between researchers and decision-makers to promote evidence-based policymaking in water sector.
2. **Addressing Barriers:** Identify and overcome challenges hindering effective SPE.
3. **Fostering Structured Engagement:** Develop mechanisms to promote strategic stakeholder engagement, cross-sectoral collaboration, and the use of scientific knowledge in decision-making.
4. **Operationalising the NRA:** Ensure ongoing and future research aligns with Malawi's national priorities and contributes directly to impactful policy development.

Methodology

The workshop employed a participatory and consultative approach to assess the alignment of research activities in the water and sanitation sector with the National Research Agenda (NRA) as presented by the National Planning Commission (NPC). The methodology consisted of the following: Stakeholder Engagement and Presentations, Group-Based Participatory Activities focused on aligning water and sanitation research priorities with selected NRA pillars; Strategy Formulation and Implementation Approaches, among others.

Workshop Highlights

Dr. Andrew Jamali, Research Manager, from the National Planning Commission presented the NRA, emphasising water as a cross-cutting priority. The NRA aims to stimulate research aligned with development priorities, increase uptake of research outputs, improve resource mobilisation, and foster multi-institutional collaboration.

Participants engaged in group activities to align research with the NRA, focusing on pillars such as Human Capital Development, Agricultural Productivity, and Environmental Sustainability. Proposed strategies included capacity building, governance reforms, targeted data collection, innovative sanitation technologies, and increased private sector and donor engagement. Implementation approaches emphasised strengthening coordination, supporting postgraduate research, promoting systems-thinking, and ensuring research reaches decision-makers in accessible formats.

Developing a Science-Policy Exchange Roadmap:

The final session focused on creating a roadmap to establish an SPE mechanism in Malawi's water sector. Participants collaborated to identify key steps, assumptions to avoid, and risks to mitigate in building an effective SPE framework.

The resulting six-stage roadmap includes:

1. **Baselining:** Establishing a central repository for research and mapping stakeholders to clarify roles and sector gaps.
2. **Institutional Structures:** Creating a knowledge translation platform within the Ministry of Water and Sanitation and forming research committees at multiple levels.
3. **Innovative Funding:** Mobilising resources through levies, joint initiatives, and cross-sector partnerships.
4. **Stakeholder Engagement:** Involving policymakers from the start in co-designing research and ensuring collaboration throughout the process.
5. **Communication & Accessibility:** Simplifying research outputs for non-experts, building communication capacity, and using media and outreach for wider dissemination.
6. **Monitoring & Evaluation:** Developing indicators to measure research impact on policy and practice.

Key Risks Identified:

Participants identified several risks associated with establishing an SPE mechanism:

- Poor institutional structures for research synthesis and dissemination
- Weak engagement of policymakers in the research process
- Complex scientific communication for non-experts
- Resource constraints for implementing research findings
- Political resistance to adopting research recommendations
- Competing interests among stakeholders that may undermine collaboration

The roadmap aims to address these challenges through structured collaboration, inclusive planning, and continuous learning informed by monitoring and evaluation.

Key Takeaways and Outcomes

The workshop underscored the importance of aligning research with national development priorities, enhancing communication between knowledge creators and decision-makers, and fostering a culture of evidence-based decision-making. Participants emphasised the need for a centralised inventory of ongoing water research and researchers, improved coordination among stakeholders, and the development of policy briefs as tools for knowledge translation. The establishment of a coordinating body within the Ministry of Water and Sanitation or the Ministry of Planning was recommended to guide, track, and evaluate research aligned with the NRA.

Conclusions

Evidence-based decision-making is crucial in addressing global water-related challenges, particularly in Malawi. The SPARKE initiative, a partnership between Scotland and Malawi, but lead by in-country partners, aims to share knowledge and experience of science-policy exchange to support evidence-based decision-making. The workshop marked a significant step in this partnership, working alongside local colleagues to bridge the gap between research and policy in Malawi's water sector, while reinforcing the importance of aligning academic work with national development objectives.

Recommended Next Steps for SPARKE and Beyond

1. **Develop a strategic blueprint for SPARKE's evolution**, informed by insights and lessons learned from the SPARKE workshops. This blueprint should outline immediate, short-term, and long-term development pathways, while assessing associated risks and proposing mitigation strategies. It should clearly define SPARKE's purpose, principles, objectives, and unique value proposition (UVP); propose models for financing and managing partnerships within Scotland, with partners in-country, and across global development alliances; and outline practical approaches to research, policy engagement, and impact monitoring. The blueprint should also provide clarity on how SPARKE engages with its broad network of collaborators, including building global partnerships with international actors working in development, ensuring these relationships are grounded in equity, respectful mutual benefit, and shared vision.
2. **Establish a Central Repository:** Create a centralised platform to store and share research outputs, ensuring accessibility to all stakeholders.
3. **Strengthen Institutional Structures:** Develop knowledge translation platforms within relevant ministries and form research committees at various levels to oversee and coordinate research activities.
4. **Mobilise Resources:** Identify and secure funding through levies, joint initiatives, and partnerships with academia, civil society organisations, and the private sector.
5. **Enhance Stakeholder Engagement:** Involve policymakers and other relevant stakeholders in co-designing research questions and throughout the research process to ensure relevance and ownership.
6. **Improve Communication:** Simplify scientific communication by translating research findings into easily digestible formats and utilising media and community outreach programs to disseminate research findings to the public.
7. **Implement Monitoring and Evaluation:** Develop indicators to measure the impact of research on policy and practice, ensuring continuous learning and improvement.

It is recommended that by implementing these steps, Malawi can strengthen its science-policy interface, enabling research to effectively inform policy decisions and support sustainable water management and development.

In addition, HNIC suggests that a specific focus might be usefully placed first on agreeing how to identify and define priority research tasks informed by the NRA, as well as how that mechanism will advise and guide any research being undertaken in the water sector to ensure adequate alignment with the NRA and the consequent research priorities.

Introduction

The United Nations World Water Development Report (2024) indicates that none of the targets for Sustainable Development Goal 6 (Clean Water and Sanitation) appear to be on track, with 2.2 billion people having no access to safe drinking water as of 2022. Those without access to basic drinking water live in sub-Saharan Africa (UNICEF, 2022), including Malawi, where 31% of the population are without access to basic drinking water services, 64% are without access to basic sanitation and 72% are without basic hygiene services (UNICEF, 2023).

The impacts of climate change are projected to exacerbate global water challenges, to which the Sub-Saharan region is most vulnerable (Ofori et al., 2021). In Malawi, the 2023 cyclone Freddy led to a devastating impact and significantly worsened the deadliest Cholera outbreak in a decade (Adriano *et al.*, 2023). Further, the drought of 2024 prompted the Government of Malawi to declare a state of disaster, impacting food security for more than 9 million people (IOM, 2024).

To overcome water challenges and increase resilience, information and knowledge transfer needs to be both robust and transparent for effective evidence-based policy and decision-making (Cairney and Oliver, 2017). Despite evidence-based policymaking being practiced in public health sectors in most of Sub-Saharan Africa for decades (Stewart, 2015; Uneke et al., 2020), sufficient evidence and information on decision and policymaking processes in the water sector is lacking. Despite Malawi recognising the vital role that data, information, and knowledge play in advancing its Malawi 2063 Vision and National Research Agenda, effective knowledge exchange between knowledge-makers and decision-makers in the water sector is lacking (HNIC, 2024).

SPARKE

Starting in 2023, Scotland's Global Partnership for Knowledge and Expertise in Water and Climate (SPARKE) is a peer-to-peer partnership with the Global South, designed to foster collaboration with a wide range of global stakeholders in the water and climate sectors through the sharing of knowledge and experience in science-policy exchange. The project builds on a long-standing partnership in knowledge sharing between Scotland and Malawi. Previous SPARKE activities included engagement with 40 people from 18 Malawian water- and climate-focused organisations and a workshop with 28 participants from national government, local government, public sector, private sector, non-governmental organisations and academia.

These initial SPARKE engagements identified a lack of science-policy engagement in Malawi's water sector and a number of barriers (HNIC, 2024). Individual, institutional and systemic barriers to science policy exchange in Malawi were identified, including poor collaboration between sectors, limited access to data, outdated data, a lack of policy guidelines and discrepancies between knowledge maker and government needs.

Workshop aim and objectives

Building on our findings from previous activities, the recent SPARKE Workshop was convened to further explore identified barriers and develop steps towards creating a science-policy exchange mechanism for Malawi's water sector. Malawi's National Research Agenda (NRA) was used to frame the need for science-policy exchange through the identification of relevant water-related national pillars that will inform Malawi's 2063 vision.

Key objectives of the workshop included:

- **Enhancing Science-Policy Exchange (SPE)**: Strengthening SPE to support evidence-based decision-making in the water sector.
- **Addressing Barriers**: Overcoming challenges that hinder effective SPE.
- **Fostering Structured Engagement**: Promoting mechanisms, cross-sectoral dialogue, and strategic stakeholder engagement to improve knowledge utilisation in decision-making.
- **Operationalising the National Research Agenda (NRA)**: Ensuring research efforts align with national priorities to drive impactful policy development.

This report outlines the participants contributions and provides key recommendations and next steps for decision- and knowledge-makers.

Workshop Participation

A total of 26 participants joined the workshop from a range of different sectors, including government, the public sector, academia and both local and global non-governmental organisations. Participants included policymakers from the Ministry of Water and Sanitation, the Ministry of Health and the Ministry of Agriculture and Food Security, researchers from the University of Malawi, Mzuzu University, Malawi University for Business and Applied Sciences, the Catholic University of Malawi and the University of Strathclyde. Organisations including the National Planning Commission, the National Commission for Science and Technology, the Malawi Environmental Health Association, the Basic Services Development Agency, the Water and Environment Sanitation Network, UNICEF and BAWI Consultants were also represented.

Workshop Agenda

The workshop agenda (Table 1) was designed to set the scene with an overview of Malawi's NRA and inform discussions regarding strengthening the connection between science and policy. The day began with registration and an introductory session, followed by a refresher on SPARKE from Scotland and an overview of the NRA presented by Dr. Andrew Jamali from the National Planning Commission in Malawi. Throughout the day, participants engaged in discussions and activities aimed at enhancing the impact of the NRA research pillars, aligning research with national priorities, and developing a roadmap for science-policy exchange. The workshop concluded with a brief overview of next steps for SPARKE and closing remarks.

Workshop Methodology

The SPARKE workshop employed a participatory, consultative methodology designed to foster dialogue between knowledge-makers and decision-makers and to align ongoing and future research in Malawi's water sector with the country's National Research Agenda (NRA). The approach sought to promote evidence-based decision making through structured stakeholder engagement, collaborative learning, and strategic planning.

Workshop Design and Structure

The workshop was delivered in a hybrid format on 12 March 2025, combining in-person sessions at the Golden Peacock Hotel in Lilongwe with virtual participation via Zoom. The event brought together 26 participants from across government ministries, academic institutions, civil society organisations, and development partners. These included representatives from the Ministry of Water and Sanitation, the Ministry of Health, the Ministry of Agriculture and Food Security, the National Planning Commission, and various universities and NGOs.

The agenda (**Table 1**) was designed to build shared understanding of Malawi's National Research Agenda (NRA) and catalyse action to strengthen science-policy exchange (SPE). The day included presentations, plenary discussions, group-based activities, and participatory roadmap development, as outlined below.

Participatory Activities

The workshop used a combination of individual and group exercises to:

- Build capacity and common understanding around the NRA and its relevance to the water sector.
- Reflect on barriers to effective science-policy exchange.
- Align existing and proposed research efforts with NRA pillars.
- Co-create an actionable roadmap for operationalising SPE in Malawi.

Facilitated small group sessions engaged participants in identifying water sector research priorities under specific NRA pillars. Groups were composed to ensure representation from both academia and policy institutions, fostering collaboration across sectors and disciplines. Each group worked through a structured template to formulate research questions, outline implementation approaches, and anticipate outcomes related to chosen NRA pillars (primarily Pillars 1, 8, and 10).

Science-Policy Exchange Roadmap Development

The final session involved the collaborative design of a six-stage SPE roadmap. This was developed through a facilitated, co-creative process in which workshop groups identified key actions, assumptions, and potential risks associated with establishing an effective science-policy interface. The roadmap includes baselining and stakeholder mapping, institutional structure development, funding mobilisation, inclusive stakeholder engagement, research communication and dissemination, and monitoring and evaluation.

Data Collection and Documentation

Data were collected in real time through group templates, plenary session notes, and facilitator observations. Templates captured detailed outputs from group work on aligning research with NRA priorities and developing the SPE roadmap. Discussions were recorded and synthesised by the organising team to identify cross-cutting themes, recommendations, and next steps.

This participatory methodology ensured that workshop outputs were grounded in local priorities, informed by diverse perspectives, and actionable within the context of Malawi's policy and research systems.

Table 1: SPARKE Workshop agenda

Time	Item	Time	Item
9:30-10:00	In-person registration	**12:35-13:35**	Lunch
10:00-10:15	Welcome and introductions	**13:35-14:35**	Activity: Creating a science-policy exchange roadmap
10:15-10:25	SPARKE refresh	**14:35-14:50**	Break
10:25-10:50	Overview of National Research Agenda (NRA) by Dr. Andrew Jamali	**14:50-15:20**	Discussion: How can we make science-policy exchange a reality?
10:50-10:55	Q&A	**15:20-16:00**	Next step for SPARKE & meeting close
10:55-11:05	Break		
11:05-11:35	Discussion: Opportunities for enhancing the impact of NRA pillars		
11:35-12:35	Activity: Aligning research with the NRA pillars		

Overview of National Research Agenda (NRA)

Setting the scene

Dr. Andrew Jamali from the National Planning Commission (NPC) presented a very informative and comprehensive overview of the National Research Agenda (NRA). The NPC which was established by Act of Parliament in 2017 and given the mandate to provide guidance on quality research, conceptualised the idea of a NRA, with the National Commission for Science and Technology (NCST) providing technical support throughout the NRA development process.

The NRA was designed to be entirely aligned with Malawi2063, the current aspirational vision for development in Malawi and also draws on relevant international and SADC regional development frameworks including:

- Sustainable Development Goals, Agenda 2030
- Regional Indicative Strategic Development Plan 2020-2030 | SADC
- SADC Vision 2050
- AU Agenda 2063

Consequently, there is consistency and harmony between Malawi2063 and the NRA and the language and approaches they adopt.

Figure 1: Overview of Malawi's National Research Agenda

Key aspirations of MALAWI2063 include:

- *An inclusively wealthy and self-reliant industrialised upper middle-income country.*
- *A vibrant knowledge-based economy with a strong and competitive manufacturing industry that is driven by a productive and commercially vibrant agriculture and mining sector*

In order to realise these aspirations, Malawi2063 has highlighted key elements, and these are of great relevance to this present workshop, namely:

- *Strong emphasis on Research and Development.*
- *Highly skilled workers with advanced education and specialised knowledge as the driving force of the economy.*
- *Utilises innovation and technology to create high-value services and products.*
- *Collaboration between Academia and Industry.*
- *A culture of continuous learning and adaptation.*
- *Robust information infrastructure enabling -knowledge sharing.*
- *Knowledge as the key input for economic growth, rather than physical labour or raw materials.*

Malawi2063 is operationalised through ten-year implementation plans with the current plan being the Malawi Implementation Plan 1, MIP 1. Those implementation plans have been conceived to reflect

lessons learned from the evaluation of previous national planning tools in Malawi including Vision 2020 as well as through broad consultation with the population. (see the evaluation at Vision-2020-Review-Report.pdf)

The NRA therefore goes on to provide the guidance necessary to fully grasp an understanding of how the aspirations of Malawi2063 and the implementation plans are to be interpreted and actioned specifically and identifies focused objectives:

Main objective

> To *guide* researchers, academic institutions, think-tanks, Centres of Excellence (CoE), local and international research and development stakeholders in *generating knowledge, technologies and innovations that will build a knowledge-based economy* for Malawi, towards *inclusive wealth creation and self-reliance.*

Specific Objectives

1. *Provide prioritised broad-based areas to guide research, science, technology, and innovations development.*
2. *Facilitate and enhance multidisciplinary and multi-institutional coordination and collaboration in the implementation of research, innovation, and technology programmes.*
3. *Increase uptake of research outputs, innovations, and technologies in Malawi's development space.*
4. *Stimulate effective resource mobilisation for research, technologies, and innovations development; and*
5. *Promote research and innovations that address implementation challenges and needs for the MIP-1*.

A deliberate intention of these planning instruments is to galvanise a common understanding that the flagship and innovative projects which need to emerge are driven by what Malawians have said is needed and which will align and combine to achieve effective impact in making Malawi a knowledge-based economy and an upper middle-income country. This can only be achieved where we jointly inform, prioritise, operationalise, track, and evaluate our interventions and this has to be guided by evidence. This is why a National Research Agenda is critical to realising Malawi2063.

Ten Pillars of the NRA and their practical implications

Dr Jamali went on to give an overview of the 10 pillars of the NRA (**Table 2**), showing their priority and focal areas which highlight critical present research gaps. Dr Jamali noted that water is a cross-cutting issue relevant to most of the pillars and thus requiring effective cross sectoral collaboration. So, for example, to achieve competitive manufacturing industries this must be driven by productive and commercially vibrant agriculture and mining sectors, and these will rely upon sustainable water supplies. Innovation and Technology are also vital to realise Malawi2063 – with relevant research identifying and helping to operationalise and underpin their development.

Table 2: The 10 pillars of Malawi's National Research Agenda

NRA Pillar	Theme
1	Agricultural Productivity and Commercialisation
2	Industrialisation (including Mining)
3	Urbanisation (including Tourism)
4	Mindset Change
5	Effective Governance Systems and Institutions
6	Enhanced Public Sector Performance
7	Private Sector Dynamism
8	Human Capital Development
9	Economic Infrastructure
10	Environmental Sustainability

Therefore, the science policy interface has to be active in making these changes happen and research has to be well guided with policy makers and the science community working effectively together to achieve National Development Priorities and programming. This will call for multidisciplinary and institutional coordination and collaboration.

The presentation emphasised the importance of ensuring that research outputs are accessible to policymakers and program designers, and that these stakeholders effectively utilise innovations, technologies, and evidence-based findings to address implementation challenges.

The presenter noted that much of the past research in Malawi has tended to conclude with the identification of challenges, without offering practical, implementable solutions—particularly those that consider the capacity and resources required for effective implementation

Given that Malawi is one of the leading producers of research publications in the SADC region (UNESCO (2021); **Figure 2**), there is a clear need to align this research capacity with the National Research Agenda (NRA) and ensure that findings effectively inform decision-makers. Achieving this requires enhanced coordination, collaboration, and cooperation among stakeholders in the water sector, including academia, government, and policy institutions

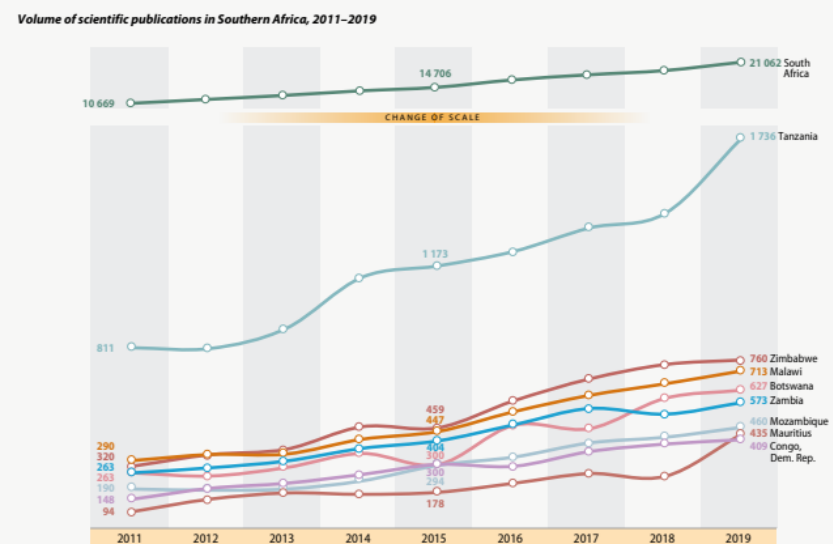

Figure 2: Volume of Scientific Publications in Malawi reported in the 2021 UNESCO Science Report for Southern Africa

Dr Jamali closed his presentation by highlighting some of the opportunities which arise out of the NRA:

- Provide prioritised broad-based areas that will guide research, science, technology, and innovations development.
- Facilitate and enhance **multidisciplinary and multi-institutional coordination and collaboration** in the implementation of research, innovation, and technology programmes.
- **Science-Policy interface** - Increase uptake of research outputs, innovations, and technologies in Malawi's development space.
- **Stimulate** effective resource mobilisation for research, technologies, and innovations development; and
- Promote research and innovations that address implementation challenges and needs for the MIP-1.

Summary of the Q&A session

A major challenge was seen to be the issue of donor funding being the lion's share of research funding available in Malawi – and the need to align the aspirations of these donors behind the NRA if the efforts of academia and others are to be focussed properly on the right research priorities. It was suggested that if the research community stands together in collaboration with all the universities, this would be an important means to leverage funding behind the NRA. It was noted that "there will never be enough funding to the range of research we will need" so using what is available in a more focussed and effective fashion is the way to go.

It was also recognised that this challenge extends beyond funding agencies, as there is a need for a shared understanding and support for the National Research Agenda (NRA) among politicians, the civil service, and development partners. The NRA should be widely acknowledged as essential to Malawi's future development, with an emphasis on producing research that is practical and actionable. Broad-based support would enable evidence and knowledge to circulate effectively among stakeholders, thereby strengthening and transforming the various sectors and systems involved.

Academics were recognised as having a critical role in aligning research with the National Research Agenda (NRA) by translating broad research questions into focused, actionable components that can drive practical outcomes and contribute meaningfully to overarching development goals. There is a lot of work that needs to be done to ensure that research is effectively aligned with the NRA, such that its outcomes are accessible to all relevant stakeholders, and that evidence-based learning is in place to demonstrate the value and impact of research.

At the same time, it was pointed out that the challenge extends beyond merely absorbing the research outputs it requires actively supporting and implementing its recommendations derived from them. It was recognised that this can be a very slow process and is in fact why "Changing Mind Sets" is one of the 10 pillars of the NRA. People can actively resist change, and so it calls for a deliberate approach where messages are made clear and followed up and active learning can take place. It was noted that some earlier examples from the Hydro Nation International Centre (Figure **3**) demonstrated how inclusive and collaborative approaches to research are yielding measurable benefits.

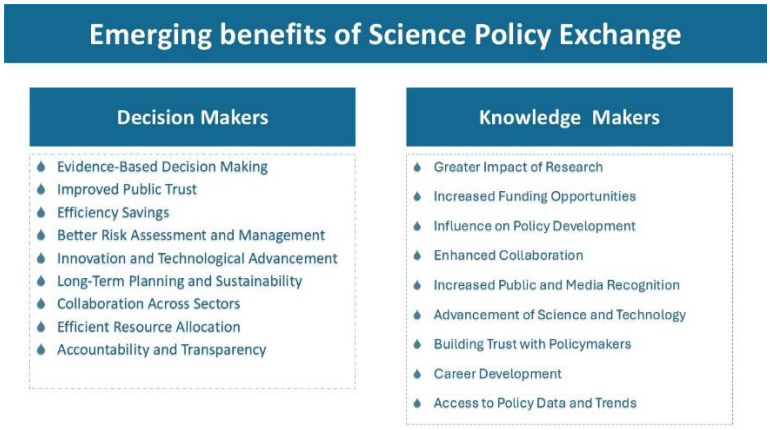

Figure 3 Benefits of Science Policy Exchange

The discussion also highlighted recent shifts in the Government of Malawi's Ministry of Water and Sanitation (MoWS), which is reorganizing its research approach by forming cluster groups based on priority research areas, moving away from a department-driven model.

Discussion: Opportunities for Enhancing the Impact of NRA Pillars

This session followed the presentation on the NRA by Dr Jamali and its Q&A session. The purpose of this session was to engage participants to express ideas around how the pillars of the NRA could have impact in the broad sense. The previous Q&A session had begun to draw out the nature of opportunities and challenges that arise through attempting to bring together the wide range of stakeholders necessary for the collaboration, focus, designing and delivering research together and ensuring it reached decision makers and resulted in measurable impact.

Research under the MoWS

Participants expressed keen interest in learning more about how research is being organized within the MoWS, recognizing the importance of fostering collaboration to effectively direct available resources towards the NRA Pillars. Currently, each Directorate within the MoWS is responsible for conducting research through its own research unit, with the primary focus being on addressing the Ministry's immediate and long-term needs. While the MoWS has access to a substantial amount of data that informs its research activities, the findings are typically not published or made accessible beyond the Ministry's internal use. As the research outputs do not appear in the public domain, this gives the impression that MoWS is not active in research, however, the Staff of MoWS are willing to provide information and support to researchers. Financing also limits the amount of research which the MoWS can undertake.

There was seen to be a gap in collaboration, coordination and communication between Academia, civil society and the MoWS regarding research which is presently being conducted, and this would need to be addressed if stakeholders are to work effectively together to focus on the NRA. It was noted that a functional review of the MoWS has been conducted, and it is likely that there may be changes in its organisational structure where research could all fall under a designated department – rather than being spread across all the departments.

Adoption of research outcomes

The discussion linked several aspects together; research is being done in Academia, by civil society and by MoWS but there is no certainty that the outputs are made in a format or through a process that ensures the outputs reach others, and that they reach decision makers in a digestible and accessible format. There are numerous physical opportunities and forums where stakeholders can be informed about ongoing research, World Water Day being such an opportunity. It was pointed out that there is no clear pathway to begin the dissemination of research outputs and to support the adoption of research outcomes.

One key aspect was said to be that there are no requirements for the format of the products of research outputs, and properly scoped and formulated policy briefs were seen as an important means to convey information to all stakeholders. Some participants shared experiences of producing policy briefs as research outputs but noted the difficulty in demonstrating their uptake by decision-makers.

It was pointed out that producing reports and policy briefs does not mark the end of the process, all stakeholders need to work together to ensure uptake, and this may need some development and effort to enable it to work.

Policy briefs and learning from other Ministries and Communication

The approach of the Ministry of Health was used to illustrate that there are good working examples in Malawi of how to disseminate research outcomes, ensure adoption and act on the recommendations. It would therefore be useful to learn from those Ministries who have been effective in this regard. For Pillar 8 of the NRA—Human Capital Development—which focuses on WASH, it is vital to establish a mechanism that ensures the adoption and application of research outcomes to effectively improve basic water supply and sanitation in Malawi. This calls for a mechanism to ensure that policy briefs influence actions on the ground.

A number of research studies on WASH, water quality, water governance, and transboundary waters—some involving PhD students from Mozambique—are currently underway in Malawi at the master's and PhD levels. Additionally, Chancellor College has produced several policy briefs on governance. However, many of the stakeholders who would be expected to engage with this research may be unaware of its existence.

Research & Researcher Inventory and access to data

It was noted that there is currently no centralized inventory of water sector research, including details on ongoing studies, involved organizations, and key personnel. Challenges also exist around data, both in terms of accessing existing datasets and generating new, relevant data. The absence of effective cooperation among stakeholders was identified as a key reason behind the lack of such inventories and data-sharing mechanisms

Research is being done but it is not having impact

The AFRIDEV handpump was cited as an example of a missed opportunity. The AFRIDEV is probably the most common handpump found in Africa, yet it was invented, designed, built and tested as the MALDEV handpump. However, the outcomes of that Malawian research were not widely recognized, partly because the Ministry's focus at the time was heavily directed toward the MALDEV development initiative.

This lack of recognition for that work is likely to be due to the absence of publications from Malawi about it. It is clearly important that given all the research, which is ongoing in Malawi , it is necessary to ensure that research is published in some way and disseminated.

Organisation of Research

There are both structural and coordination gaps hindering the effective mobilization of the research community in support of the NRA. It should be possible to coordinate water related research through one body, which would also be part of a mechanism to monitor if the research is achieving its intended impact. This requires institutions and stakeholders across the water sector to collaborate and communicate effectively in support of the National Research Agenda (NRA). A key starting point could be better communication between MoWS and Academic institutions on research, and the recent functional review of MoWS may offer an entry point to explore how this might be achieved to align research efforts more effectively. There also needs to be dedicated forums where research outputs are presented or made available and shared. Currently, Universities are hosting dissemination events, but these are not well attended by wider stakeholders.

Coordination

Discussions revolved around the opportunities for a coordinating role existing in the Department of Policy and Planning or the MoWS or through a hybrid approach. There were seen to be several possibilities which would be opportunities to support the implementation of the NRA. Such a coordination mechanism would also enhance the strategic guidance of the NRA and help identify targeted research activities that contribute directly to the overarching goals of Malawi 2063. This was seen as an important development to pursue.

Need for a pathway to ensure adoption and action on research outcomes

This was suggested as a mechanism to ensure the maximum benefits from completed research and could involve a set format for policy briefs as a required outcome of research, guidance for the process of dissemination, adoption and actions – which could then be monitored to determine impact.

It would also be important to link this pathway to the various dissemination meetings such as World Water Day to gain the maximum possible exposure for the research.

Learning and using best practices

Given that it is known that there are Ministries in Malawi with effective research outcome implementation mechanisms, Ministry of Health being one example, it was suggested that the water sector should look into the possibility of adopting these national “best practice” approaches. It was noted that the Hydro Nation International Centre has examples of policy brief formats and that these should be shared with colleagues in Malawi.

Aligning Research with the NRA Pillars

The NRA presentation and subsequent discussion set the stage for a focused group activity aimed at aligning research projects and other initiatives with the NRA while fostering collaboration between academia and policymakers.

In-person participants were divided into four groups, each representing a different university: the University of Malawi (UNIMA), Malawi University of Business and Applied Sciences (MUBAS), The Catholic University of Malawi (CUNIMA), and Mzuzu University (MZuni). To ensure policy relevance, each group included at least one government official, providing insights from a decision-making perspective. A fifth group, composed of online participants from Scotland and Malawi, also contributed to the discussions.

The core of the session centred on project development, which lasted approximately one hour. Each group selected a pillar from the NRA, with particular emphasis on Pillars 1, 8, and 10. They worked through the following guiding questions:

- Which pillar are you addressing?
- What research question or activity will support this pillar?
- How will you implement the research or activity?
- What outcomes do you anticipate?

The objective was to ensure research efforts aligned with national priorities and addressed critical gaps. To facilitate structured reporting, each group recorded their responses in a pre-provided template.

Participants engaged in approximately 30 minutes of group discussions and response recording, followed by a reporting phase where each group had two minutes to present their responses to the wider audience. The session concluded with a 15-minute plenary discussion, allowing for broader exchange and refinement of ideas.

The responses from the five groups focused primarily on **Pillar 8: Human Capital Development**, particularly in the Water, Sanitation, and Hygiene (WASH) sector. One group also viewed water resources as being cross-cutting with **Pillar 1: Agricultural Productivity & Commercialisation** (emphasising groundwater management for irrigation) and **Pillar 10: Environmental Sustainability** (focusing on climate resilience, land and water resource management, and smart infrastructure).

To support these pillars, various research questions and activities were proposed. In terms of human capital development, groups explored the future workforce needs in the WASH sector, the current number of professionals and graduates, and the cost of maintaining and training staff. Governance-related research focused on identifying existing barriers and finding strategies to improve coordination among government, NGOs, the private sector, and local communities. Water resource management research aimed to assess the impact of climate change on water availability, quality, and ecosystems

while identifying climate-smart adaptation strategies. Additionally, groups proposed investigating innovative technologies in WASH, such as improved latrines, better borehole maintenance solutions, and sustainable methods for sludge disposal and reuse. Another crucial research area involved cross-sectoral water resource management, addressing groundwater efficiency, governance strategies, and the link between research, donors, and private-sector involvement.

The key implementation strategies identified by the participants included:

1. Capacity Building & Workforce Development

- Conduct functional reviews of the Ministry of Water and Sanitation (MoWS) and WASH NGOs.
- Assess current and future workforce needs in the WASH sector.
- Support postgraduate research on WASH governance and water resource management.
- Incorporate WASH education in primary, secondary, and tertiary institutions.

2. Governance & Policy Strengthening

- Review existing governance structures and identify barriers in WASH governance.
- Promote better coordination among the government, NGOs, the private sector, and local communities.
- Promote systems-thinking not only in resource allocation but also in fostering collaboration between decision-makers and knowledge producers to avoid siloed approaches.
- Develop and implement policy recommendations based on research findings.
- Strengthen decentralised WASH functions at the district level.

3. Research & Data Collection

- Conduct literature reviews and research on WASH governance, workforce needs, and climate impacts.
- Map stakeholders and identify gaps in the WASH sector.
- Analyse water quality in major rivers, including turbidity and temperature assessments.
- Research adaptation strategies and climate-smart water technologies.

4. Innovation & Technology Development

- Investigate new latrine and handwashing technologies.
- Improve borehole functionality and maintenance strategies.
- Explore safe and sustainable pit emptying, sludge disposal, and reuse solutions.
- Promote the circular economy by converting sludge into usable products (e.g., oils, fertilisers).

5. Private Sector & Donor Engagement

- Encourage private-sector involvement in WASH research and innovation.
- Improve communication between research institutions and donor-funded projects.
- Identify opportunities for private-sector partnerships in large-scale water infrastructure projects.

6. Climate Resilience & Water Resource Management

- Assess the impact of climate change on water availability and quality.
- Develop strategies for sustainable groundwater and surface water management.
- Implement climate-smart infrastructure solutions to enhance resilience.
- Strengthen governance and regulatory frameworks for efficient resource allocation.

The anticipated outcomes of these research and implementation efforts include an increase in qualified WASH professionals, stronger decentralised WASH governance, and improved decision-making and collaboration among stakeholders. Effective water resource management strategies and policy reforms will enhance climate resilience, ensuring sustainable water access and sanitation services. Innovation in sanitation and water management technologies will contribute to cost-effective solutions, while circular economy initiatives, such as sludge-to-energy projects, will create economic opportunities. Ultimately, these efforts aim to improve public health, increase access to clean water and sanitation, enhance infrastructure resilience, and reduce risks associated with inadequate WASH facilities.

This exercise fostered a more targeted approach to strengthening the NRA pillars to ensure that proposed initiatives can be both actionable and impactful. It also promoted interdisciplinary collaboration so that research efforts remain academically rigorous and policy relevant. By facilitating dialogue between knowledge creators and decision-makers, the session served as a practical exercise to start bridging the gap between research and policy, reinforcing the importance of aligning academic work with national development objectives.

Making Science-Policy Exchange a Reality

Based on the previous presentations, discussions and activities of the workshop, the final exercise of the workshop was to discuss and develop a science-policy exchange roadmap for Malawi's water sector. The exercise aimed to identify key steps and actions that would enable the creation of a science-policy exchange mechanism. While developing the roadmap, participants were asked to identify the key assumptions that shouldn't be made, as well as risks associated with creating a science-policy exchange mechanism and how they can be mitigated. Participants remained in the same groups as the previous activity, again allowing for discussion, knowledge sharing, and co-creation between knowledge-makers and decision-makers.

Science-Policy Exchange Roadmap

We developed a six-stage roadmap by compiling the responses from each group (**Figure 4**), providing details of specific task workshops participants recommended to achieve each stage in the roadmap.

1. Baselining

- Create a centralised repository for research outputs accessible to all stakeholders.
- Conduct a stakeholder mapping exercise to identify knowledge-makers and decision-makers and understand the roles and gaps in the sector.

2. Establishing institutional structures

- Develop a knowledge translation platform within the Ministry of Water and Sanitation to coordinate the communication with knowledge-makers, including the communication of knowledge-needs.
- Form research committees at ministry and district levels to oversee and coordinate research activities.

3. Identifying resource and innovative funding mechanisms

Identify and mobilise funding through levies, joint funding initiatives, and partnerships with academia, CSOs, and the private sector.

4. Engaging stakeholders from the start

- Co-design research questions with policymakers and other relevant stakeholders to ensure the relevance and ownership of research projects. Involving decision-makers or end-users throughout the research process, from planning to dissemination.
- Implement collaborative research to strengthen partnerships and multidisciplinary approaches.

5. Enhancing communication and accessibility

- Promote regular interactions between knowledge-makers and decision-makers through structured mechanisms.
- Simplify scientific communication by translating research findings into easily digestible formats. Ensure capacity building for entities involved in research to undertake credible and impactful studies.
- Utilise the media and community outreach programs to disseminate research findings to the public.

6. Regular monitoring and evaluation

- Develop indicators of change to measure the impact of research on policy and practice.

Figure 4: The six-stage roadmap for science-policy exchange in Malawi's water sector

Barriers and risks that should be mitigated

When discussing the stages and tasks required to make science-policy exchange a reality, participants recognised the following barriers and risks:

- Inadequate institutional structures for research synthesis and dissemination.
- Limited engagement of policymakers in the research process.
- Challenges in simplifying scientific communication for non-experts.
- Resource constraints for implementing research findings.
- Political resistance to adopting research recommendations.
- Competing interests among stakeholders that may undermine collaboration.

The six-stage roadmap seeks to mitigate the first four barriers. Addressing potential political resistance and mitigating the effects of competing stakeholder interests on collaboration will require piloting the roadmap and applying insights gained through continuous monitoring and evaluation.

Key Workshop Takeaways and Outcomes

- Knowledge-makers and decision-makers from Malawi's water sector **co-developed a six-stage science-policy exchange (SPE) roadmap** to support evidence-based decision-making.
- Malawi's National Research Agenda provides prioritised broad-based areas that will guide research, science, technology, and innovations development and facilitate and enhance **multidisciplinary and multi-institutional coordination and collaboration** in its implementation.
- Knowledge is being generated by Academia, civil society, donor organisations, and the government, but outputs are not being communicated in a format or process that ensures effective evidence-based decision-making.
- Currently, there is no centralised inventory of what relevant water sector knowledge is being generated or which organisations and personnel are involved. Lack of data can also be an issue, both in terms of access to existing data and the need to generate new data. The lack of effective cooperation between stakeholders was seen to be a reason why no inventories or data access systems exist presently.
- A key starting point could be better communication between MoWS and knowledge-generating institutions. The recent functional review of MoWS may offer an entry point to align research efforts across actors and towards the NRA more effectively.
- Workshop activities and discussion facilitated dialogue between knowledge creators and decision-makers, serving as a practical exercise to start bridging the gap between research and policy and reinforcing the importance of aligning academic work with national development objectives.

Next Steps for SPARKE

Recommended next steps for SPARKE and beyond are aligned to the roadmap co-developed by workshop participants:

1. **Develop a strategic blueprint for SPARKE's evolution**, informed by insights and lessons learned from the SPARKE workshops. This blueprint should outline immediate, short-term, and long-term development pathways, while assessing associated risks and proposing mitigation strategies. It should clearly define SPARKE's purpose, principles, objectives, and unique value proposition (USP); propose models for financing and managing partnerships within Scotland, with partners in-country, and across global development alliances; and outline practical approaches to research, policy engagement, and impact monitoring. The blueprint should also provide clarity on how SPARKE engages with its broad network of collaborators—including building global partnerships with international actors working in development—ensuring these relationships are grounded in equity, respectful mutual benefit, and shared vision.
2. **Establish a Central Repository:** Create a centralised platform to store and share research outputs, ensuring accessibility to all stakeholders.
3. **Strengthen Institutional Structures:** Develop knowledge translation platforms within relevant ministries and form research committees at various levels to oversee and coordinate research activities.
4. **Mobilise Resources:** Identify and secure funding through levies, joint initiatives, and partnerships with academia, civil society organisations, and the private sector.
5. **Enhance Stakeholder Engagement:** Involve policymakers and other relevant stakeholders in co-designing research questions and throughout the research process to ensure relevance and ownership.
6. **Improve Communication:** Simplify scientific communication by translating research findings into easily digestible formats and utilising media and community outreach programs to disseminate research findings to the public.
7. **Implement Monitoring and Evaluation:** Develop indicators to measure the impact of research on policy and practice, ensuring continuous learning and improvement.

It is recommended that consideration of implementing these steps, Malawi can strengthen its science-policy interface, ensuring that research effectively informs policy and contributes to sustainable water management and development.

Conclusions

Evidence-based decision-making will be vital in tackling global water-related challenges, particularly in vulnerable nations such as Malawi. Scotland's Global Partnership for Knowledge and Expertise in Water and Climate (SPARKE) has worked in partnership with Malawi to share knowledge and experience of science-policy exchange to support evidence-based decision-making. Previous SPARKE activities identified a lack of science-policy engagement in Malawi's water sector and the associated barriers. Our latest workshop involved 26 participants across Malawi's water sector, including government, the public sector, academia and both local and global non-governmental organisations to develop steps towards creating a science-policy exchange mechanism for Malawi's water sector. Malawi's National Research Agenda (NRA) was used to frame the need for science-policy exchange through the identification of relevant water-related national pillars that will inform Malawi's 2063 vision.

Knowledge-makers and decision-makers from Malawi's water sector co-developed a six-stage science-policy exchange (SPE) roadmap. The first stage is baselining and the need to map both knowledge-

makers and decision-makers in the water sector and develop a centralised repository for research outcomes. Secondly, institutional structures need to be established with recommendations for knowledge translation platforms and research committees. Thirdly, the resourcing of a SPE mechanism and innovative funding streams need to be identified. The fourth stage involves engaging decision-makers and end-users in the co-design of research questions and throughout the knowledge-generation process. The fifth stage highlights the need for regular interactions between knowledge-makers and decision-makers through structured mechanisms and the simplification of science communication. Finally, stakeholders emphasised the need for regular monitoring and evaluation of the SPE mechanism.

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