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GROUNDWATER MANAGEMENT INSTITUTE

SADC-GMI NEWSLETTER



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On Behalf of the Organizing Committee, the Technical Committee, the Namibian Government (Ministry of Agriculture, Water and Land Reform) and other partners I would like to warmly welcome all our stakeholders and partners to the 5th SADC Groundwater Conference, in Windhoek, Namibia (the Land of the Brave). This conference provides us with another opportunity to interact physically after a lengthy break imposed on us by Covid-19 Pandemic. Even though we continued with virtual conferences, we have learnt that nothing beats meeting physically, especially after a three-year break. We are grateful to have survived the COVID-19 to partake in this year's edition of the SADC Groundwater Conference.

Building on the successes of the previous conferences, this year's theme is Groundwater: Making the Invisible Visible for Socio-Economic Development, a very pertinent theme considering the role continuously played by groundwater resources in mitigating the impacts of climate change. This theme builds on the World Water Day 2022 Campaign, and it aims to highlight groundwater – the hidden resource.

Groundwater contributes to poverty alleviation, food security, water resilience and sustaining ecosystems, and this conference attempts to showcase some of the advances made in the SADC region to promote the sustainable development and management of the resource. The importance of groundwater makes such a conference an indispensable event on our calendars for stakeholders to share information and knowledge about groundwater success stories and challenges that we are still facing as the region.

The 5th SADC Groundwater Conference is organized into 4 sub-themes that support the central theme. The 4 sub-themes are: Groundwater as a catalyst for attaining



from the SADC-GMI Executive Director
Eng. James Sauramba

SDGs, Groundwater and Ecosystem Services, Groundwater and livelihoods, and Resilient Groundwater Infrastructure innovations for Socio-economic Development and rural and urban water security.

We have assembled an exciting program with seasoned keynote speakers and presenters to share knowledge with us. The program will allow us as a community to reflect upon and celebrate our past accomplishments, renew friendships, and extend our networks, and jointly explore current and future research directions. We hope you will have a productive and fun-filled three days as we get more enlightened on groundwater resources in our region.

Putting together a conference of this magnitude together is a humongous task that requires collaboration of multiple expertise. To that end, I take this opportunity to extend my sincere gratitude to everyone that has been instrumental in putting this supreme event together. This includes our Organizing Committee, led by the Ministry of Agriculture, Water and Land Reform, the Technical Committee, and other partners who supported the vision in various ways.

To our sponsors, thank you for supporting us to fulfil our mandate – to promoting sustainable groundwater management and provide solutions to groundwater challenges across the SADC region for improved livelihoods and socio-economic development.

Last but certainly not least, thank you to all our participants (physical and virtual). You are the foundation of this conference. Without your presence and much needed support, there would be no conference. We hope you will enjoy the deliberations and the program we have put together on your behalf.

I welcome you all and wish you fruitful deliberations!!!!

NOTE DE BIENVENUE DU DIRECTEUR EXÉCUTIF DE LA SADC-GMI

Ingénieur James Sauramba (French)

Au nom du comité d'organisation, du comité technique, du gouvernement namibien (ministère de l'agriculture, de l'eau et de la réforme agraire) et d'autres partenaires, je voudrais souhaiter chaleureusement la bienvenue à toutes les parties prenantes et à tous les partenaires à la 5e conférence de la SADC sur les eaux souterraines, à Windhoek, en Namibie (le pays des braves). Cette conférence nous offre une nouvelle occasion d'interagir physiquement après une longue pause que nous a imposée la pandémie de Covid-19. Même si nous avons continué à organiser des conférences virtuelles, nous avons appris que rien ne vaut une rencontre physique, surtout après une pause de trois ans. Nous sommes reconnaissants d'avoir survécu à la COVID-19 pour participer à l'édition de cette année de la Conférence sur les eaux souterraines de la SADC.

S'appuyant sur les succès des conférences précédentes, le thème de cette année est « Les eaux souterraines : Rendre l'invisible visible pour le développement socio-économique », un thème très pertinent compte tenu du rôle que jouent continuellement les ressources en eaux souterraines dans l'atténuation des impacts du changement climatique. Ce thème s'appuie sur la campagne de la journée mondiale de l'eau 2022 et vise à mettre en lumière les eaux souterraines - la ressource cachée.

Les eaux souterraines contribuent à la réduction de la pauvreté, à la sécurité alimentaire, à la résilience de l'eau et au maintien des écosystèmes, et cette conférence tente de présenter certaines des avancées réalisées dans la région de la SADC pour promouvoir le développement et la gestion durables de la ressource. L'importance des eaux souterraines fait d'une telle conférence un événement indispensable sur nos calendriers pour que les parties prenantes puissent partager des informations et des connaissances sur les réussites en matière d'eaux souterraines et les défis auxquels nous sommes toujours confrontés dans la région.

La 5e conférence sur les eaux souterraines de la SADC est organisée en 4 sous-thèmes qui soutiennent le thème central. Les 4 sous-thèmes sont : Les eaux souterraines comme

catalyseur pour atteindre les ODD, les eaux souterraines et les services écosystémiques, les eaux souterraines et les moyens de subsistance, et les innovations en matière d'infrastructures d'eaux souterraines résilientes pour le développement socio-économique et la sécurité de l'eau en milieu rural et urbain.

Nous avons réuni un programme passionnant avec des conférenciers et des présentateurs chevronnés qui partageront leurs connaissances avec nous. Le programme nous permettra, en tant que communauté, de réfléchir à nos réalisations passées et de les célébrer, de renouer des amitiés, d'étendre nos réseaux et d'explorer ensemble les orientations actuelles et futures de la recherche. Nous espérons que ces trois jours seront productifs et divertissants et que nous serons mieux informés sur les ressources en eau souterraine de notre région.

L'organisation d'une conférence de cette ampleur est une tâche colossale qui nécessite la collaboration de multiples compétences. À cette fin, je saisiss cette occasion pour exprimer ma sincère gratitude à tous ceux qui ont contribué à la mise en place de cet événement suprême. Cela inclut notre comité d'organisation, dirigé par le ministère de l'Agriculture, de l'Eau et de la Réforme foncière, le comité technique et les autres partenaires qui ont soutenu la vision de diverses manières.

A nos sponsors, merci de nous soutenir pour remplir notre mandat - promouvoir la gestion durable des eaux souterraines et fournir des solutions aux défis liés aux eaux souterraines dans la région de la SADC pour améliorer les moyens de subsistance et le développement socio-économique.

Enfin, et surtout, merci à tous nos participants (physiques et virtuels). Vous êtes le fondement de cette conférence. Sans votre présence et votre soutien indispensable, il n'y aurait pas de conférence. Nous espérons que vous apprécierez les délibérations et le programme que nous avons élaborés en votre nom.

Je vous souhaite la bienvenue et des délibérations fructueuses !!!!.

NOTA DE BOAS-VINDAS DO DIRECTOR EXECUTIVO DA SADC-GMI

Eng. James Sauramba (Portuguese)

Por detrás do Comité Organizador, do Comité Técnico, do Governo Namibiano (Ministério da Agricultura, Água e Reforma Agrária) e de outros parceiros, gostaria de saudar calorosamente todos os nossos intervenientes e parceiros à 5ª Conferência da SADC sobre águas subterrâneas, em Windhoek, Namíbia (a Terra dos Bravos). Esta conferência proporciona-nos outra oportunidade de interagir fisicamente após uma longa pausa imposta pela Pandemia de Covid-19. Apesar de termos continuado com conferências virtuais, aprendemos que nada é melhor do que uma reunião física, especialmente após uma pausa de três anos. Estamos gratos por termos sobrevivido à COVID-19 para participar na edição deste ano da Conferência da SADC sobre águas subterrâneas.

Com base nos sucessos das conferências anteriores, o tema deste ano é Águas Subterrâneas: Tornar o Invisível em Visível para o Desenvolvimento Sócio-Económico, um tema muito pertinente tendo em conta o papel continuamente desempenhado pelos recursos de águas subterrâneas na atenuação dos impactos das alterações climáticas. Este tema baseia-se na Campanha do Dia Mundial da Água de 2022, e visa destacar as águas subterrâneas - o recurso oculto.

As águas subterrâneas contribuem para o alívio da pobreza, segurança alimentar, resistência à água e sustentabilidade dos ecossistemas, e esta conferência tenta mostrar alguns dos avanços feitos na região da SADC para promover o desenvolvimento sustentável e a gestão do recurso. A importância das águas subterrâneas faz desta conferência um evento indispensável nos nossos calendários para as partes interessadas partilharem informações e conhecimentos sobre histórias de sucesso e desafios das águas subterrâneas que ainda enfrentamos como a região.

A 5ª Conferência da SADC sobre águas subterrâneas está organizada em 4 sub-temas que apoiam o tema central. Os 4 subtemas são: As águas subterrâneas como catalisador para alcançar os SDGs, os Serviços de Águas

Subterrâneas e de Ecossistemas, as Águas Subterrâneas e os meios de subsistência, e as inovações de Infra-estruturas de Águas Subterrâneas Resilientes para o Desenvolvimento Sócio-económico e a segurança da água rural e urbana.

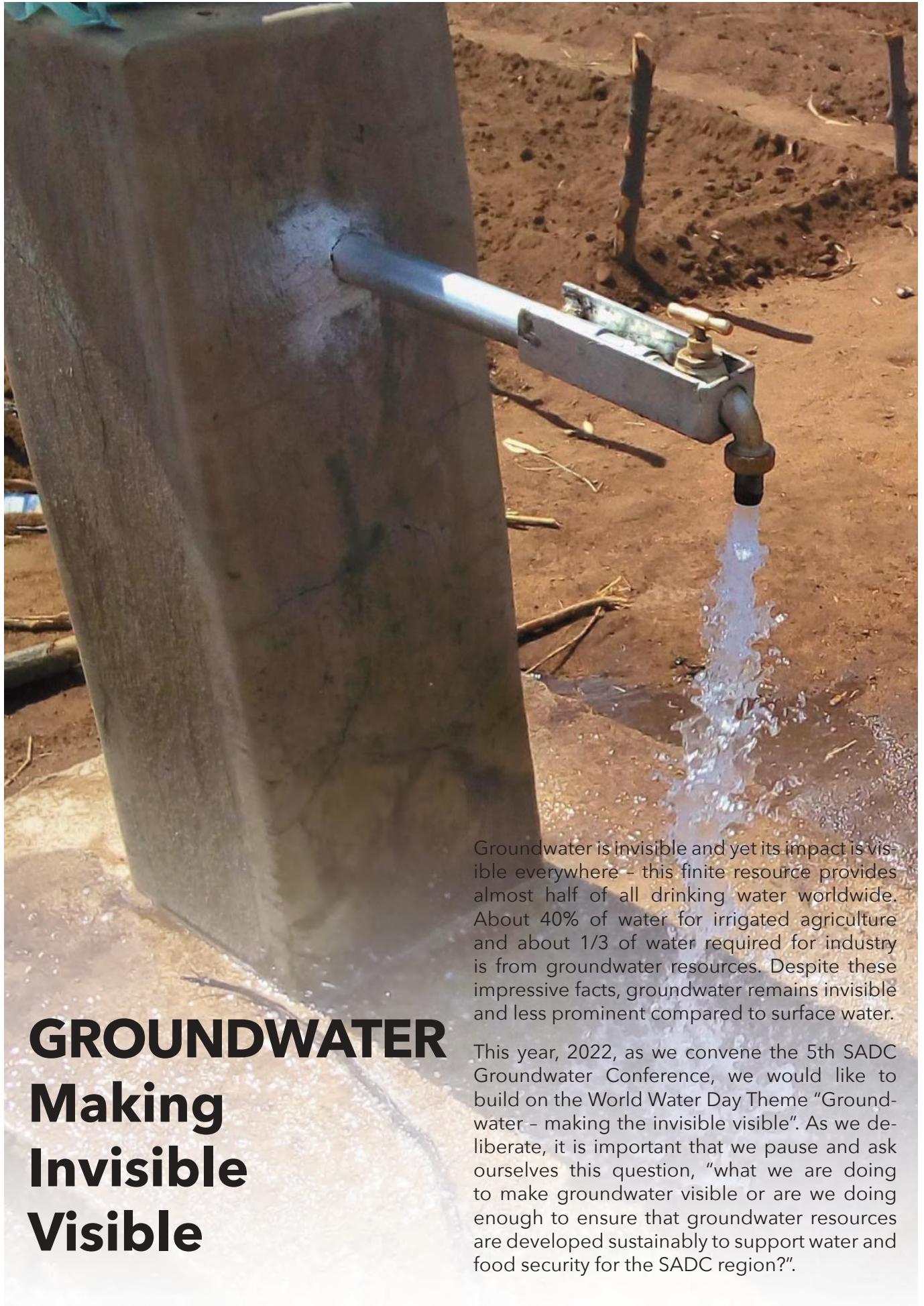
Reunimos um programa emocionante com oradores e apresentadores experientes para partilhar conhecimentos connosco. O programa permitir-nos-á, enquanto comunidade, reflectir e celebrar as nossas realizações passadas, renovar amizades, e alargar as nossas redes, e explorar conjuntamente direcções de investigação actuais e futuras. Esperamos que tenham três dias produtivos e cheios de diversão à medida que nos esclarecemos mais sobre os recursos hídricos subterrâneos da nossa região.

Reunir uma conferência desta magnitude é uma tarefa humilhante que requer a colaboração de múltiplos especialistas. Para tal, aproveito esta oportunidade para estender a minha sincera gratidão a todos os que têm sido fundamentais para a realização deste evento supremo. Isto inclui o nosso Comité Organizador, liderado pelo Ministério da Agricultura, Água e Reforma Agrária, o Comité Técnico, e outros parceiros que apoiaram a visão de várias formas.

Aos nossos patrocinadores, obrigado por nos apoiarem no cumprimento do nosso mandato - promover a gestão sustentável das águas subterrâneas e fornecer soluções para os desafios das águas subterrâneas em toda a região da SADC para uma melhor subsistência e desenvolvimento socioeconómico.

Por último mas certamente não menos importante, obrigado a todos os nossos participantes (físicos e virtuais). Vós sois a base desta conferência. Sem a vossa presença e o apoio muito necessário, não haveria conferência. Esperamos que desfrute das deliberações e do programa que elaborámos em seu nome.

Dou-vos as boas-vindas a todos e desejo-vos deliberações frutuosas!!!!



GROUNDWATER

Making Invisible Visible

Groundwater is invisible and yet its impact is visible everywhere – this finite resource provides almost half of all drinking water worldwide. About 40% of water for irrigated agriculture and about 1/3 of water required for industry is from groundwater resources. Despite these impressive facts, groundwater remains invisible and less prominent compared to surface water.

This year, 2022, as we convene the 5th SADC Groundwater Conference, we would like to build on the World Water Day Theme "Groundwater - making the invisible visible". As we deliberate, it is important that we pause and ask ourselves this question, "what we are doing to make groundwater visible or are we doing enough to ensure that groundwater resources are developed sustainably to support water and food security for the SADC region?".

Used sustainably, groundwater could provide potable water for the estimated 40% of the SADC region's estimated 345 million inhabitants that currently lack access to safe drinking water and sanitation services. It could also alleviate pressure on the region's surface water and help communities endure the nowadays very frequent and severe dry spells

Groundwater plays a critical role in providing water and food security and improving livelihoods of many in the SADC region, especially vulnerable communities in the rural areas and in the poor urban settlements.

"With the worsening impacts of climate change, we need to recognize that groundwater could be a catalyst for economic and social development in the SADC region. Furthermore, groundwater could play a significant role in sustainable development and building resilience - if sustainably developed and managed" says Eng. James Sauramba, SADC-GMI Executive Director.

The Sustainable Development Goal 6 underpins ensuring access to water and sanitation for all. If sustainably developed, groundwater could be instrumental in the achievement of SDG 6 as set out in the United Nations agenda 2030.

Eng. Sauramba continues to say, as climate change impacts intensify and many people turn to groundwater for their primary water supply, it becomes even more critical that we work together to sustainably manage this precious resource and make it more visible.

Communication pertaining to groundwater related issues is key to making groundwater visible. Stakeholder participation, shared knowledge, and informed decision-making are integral cornerstones of good water governance and can never be over emphasized.

It is important that we seek innovative ways to create awareness and communicate groundwater issues. Although some progress has been made in this area in the last five years, more still needs to be accomplished.

The SADC region currently extracts a mere 1.5% of the estimated 2,500 m³ per capita per year of the renewable groundwater resources available. This means that groundwater remains largely untapped at a time when the gap between water demand and availability is growing drastically.

The Earth's population of nearly 8 billion in 2020 is

expected to reach 11 billion by 2100. Humans will have to learn to produce sufficient food without destroying the soil, water, and climate. This has been dubbed the greatest challenge humanity has to confront and resolve. Sustainable management of groundwater is at the heart of the solution.

SADC-GMI strives to making groundwater visible

SADC Groundwater Management Institute (SADC-GMI) as the Centre of Excellence in promoting equitable and sustainable groundwater management in the SADC region since 2016 has to date implemented various impactful small scale infrastructure development projects in 10 SADC Member States to support the development and management of this finite resource.

The projects ranged from groundwater monitoring and evaluation systems, community water supply schemes, exploration of deep aquifers, and groundwater mapping and development. These projects contributed to enhancing water security and improved livelihoods for the benefiting communities. Approximately 93000 beneficiaries (of which 53% were women) across the SADC region benefitted from the interventions.

Transboundary cooperation among Member States sharing groundwater resources was also promoted through undertaking research to generate knowledge in six of the estimated 30 trans-boundary aquifers in the SADC region.

Three new boreholes were drilled in Chongwe, Zambia to augment the settlement's water supply and reduce the devastating effects of water shortage for approximately 12,000 residents. The project augmented the existing cluster of boreholes while easing the water shortage in the area.

Again, SADC-GMI implemented a similar project in Muchucholo in the Matutuine district of Maputo Province, Mozambique where safe and clean drinking water was provided for approximately 2 000 people and their livestock. Another milestone was recorded in the Kingdom of Eswatini where a groundwater monitoring project was completed. The project involved 10 monitoring sites, four of which use renewable solar energy to pump the water.



LES EAUX SOUTERRAINES

Rendre l'invisible Visible

Les eaux souterraines sont invisibles et pourtant leur impact est visible partout - cette ressource finie fournit près de la moitié de l'eau potable dans le monde. Environ 40 % de l'eau destinée à l'agriculture irriguée et environ un tiers de l'eau nécessaire à l'industrie proviennent des ressources en eau souterraine. Malgré ces faits impressionnantes, les eaux souterraines restent invisibles et moins visibles que les eaux de surface.

Cette année, en 2022, alors que nous organisons la 5e conférence de la SADC sur les eaux souterraines, nous aimerais nous appuyer sur le thème de la Journée mondiale de l'eau « Les eaux souterraines - rendre visible l'invisible ». Au cours de nos délibérations, il est important que nous fassions une pause et que nous nous posions la question suivante : « que faisons-nous pour rendre les eaux souterraines visibles ou en faisons-nous assez pour garantir que les ressources en eaux souterraines soient développées de manière durable afin de soutenir la sécurité de l'eau et de l'alimentation dans la région de la SADC ? »

Utilisées de manière durable, les eaux souterraines pourraient fournir de l'eau potable aux quelque 40 % des 345 millions d'habitants de la région de la SADC qui n'ont actuellement pas accès à l'eau potable et aux services d'assainissement. Elles pourraient également atténuer la pression sur les eaux de surface de la région et aider les communautés à supporter les périodes de sécheresse, aujourd'hui très fréquentes et sévères.

Les eaux souterraines jouent un rôle essentiel dans la fourniture d'eau et de sécurité alimentaire et dans l'amélioration des moyens de subsistance de nombreuses personnes dans la région de la SADC, en particulier les communautés vulnérables dans les zones rurales et dans les établissements urbains pauvres.

« Avec l'aggravation des impacts du changement climatique, nous devons reconnaître que les eaux souterraines pourraient être un catalyseur du développement économique et social dans la région de la SADC. En outre, les eaux souterraines pourraient jouer un rôle important dans le développement durable et le renforcement de la résilience - si elles sont développées et gérées de

manière durable », déclare Eng. James Sauramba, directeur exécutif de la SADC-GMI.

L'objectif de développement durable 6 vise à garantir l'accès à l'eau et à l'assainissement pour tous. Si elles sont exploitées de manière durable, les eaux souterraines pourraient contribuer à la réalisation de l'objectif 6 du développement durable, tel qu'il est défini dans l'agenda 2030 des Nations unies.

Ingénieur Sauramba poursuit, alors que les impacts du changement climatique s'intensifient et que de nombreuses personnes se tournent vers les eaux souterraines pour leur approvisionnement principal en eau, il devient encore plus crucial de travailler ensemble pour gérer durablement cette précieuse ressource et la rendre plus visible.

La communication relative aux questions liées aux eaux souterraines est essentielle pour rendre les eaux souterraines visibles. La participation des parties prenantes, le partage des connaissances et la prise de décision en connaissance de cause sont les pierres angulaires d'une bonne gouvernance de l'eau et on n'y insistera jamais assez.

Il est important que nous cherchions des moyens novateurs de sensibiliser et de communiquer sur les questions relatives aux eaux souterraines. Bien que certains progrès aient été réalisés dans ce domaine au cours des cinq dernières années, il reste encore beaucoup à faire.

La région de la SADC extrait actuellement un maigre 1,5 % des 2 500 m³ par habitant et par an des ressources renouvelables en eau souterraine disponibles. Cela signifie que les eaux souterraines restent largement inexploitées à un moment où l'écart entre la demande et la disponibilité de l'eau s'accroît considérablement.

La population de la terre, qui s'élève à près de 8 milliards d'habitants en 2020, devrait atteindre 11 milliards en 2100. L'homme devra apprendre à produire suffisamment de nourriture sans détruire les sols, l'eau et le climat. C'est ce que l'on a appelé le plus grand défi que l'humanité doit affronter et résoudre. La gestion durable des eaux souterraines est au cœur de la solution.

La SADC-GMI s'efforce de rendre les eaux souterraines visibles

L'Institut de gestion des eaux souterraines de la SADC (SADC-GMI), en tant que centre d'excellence pour la promotion d'une gestion équitable et durable des eaux souterraines dans la région de la SADC depuis 2016, a à ce jour mis en œuvre divers projets de développement d'infrastructures à petite échelle ayant un impact dans 10 États membres de la SADC afin de soutenir le développement et la gestion de cette ressource limitée.

Les projets alliaient des systèmes de surveillance et d'évaluation des eaux souterraines aux systèmes d'approvisionnement en eau des communautés, en passant par l'exploration des aquifères profonds, la cartographie et le développement des eaux souterraines. Ces projets ont contribué à renforcer la sécurité de l'eau et à améliorer les moyens de subsistance des communautés bénéficiaires. Environ 93 000 bénéficiaires (dont 53 % de femmes) dans la région de la SADC ont profité de ces interventions.

La coopération transfrontalière entre les États membres partageant des ressources en eau souterraine a également été encouragée en entreprenant des recherches pour générer des connaissances dans six des 30 aquifères transfrontaliers estimés dans la région de la SADC.

Trois nouveaux puits ont été forés à Chongwe, en Zambie, afin d'augmenter l'approvisionnement en eau de peuplements et de réduire les effets dévastateurs de la pénurie d'eau pour environ 12 000 résidents. Le projet a permis d'augmenter le nombre de forages existants et d'atténuer la pénurie d'eau dans la région.

Là encore, la SADC-GMI a mis en œuvre un projet similaire à Muchocolate, dans le district de Matutuine de la province de Maputo, au Mozambique, où de l'eau potable et propre a été fournie à environ 2 000 personnes et à leur bétail. Une autre étape importante a été enregistrée au Royaume d'Eswatini où un projet de surveillance des eaux souterraines a été achevé. Le projet comprenait 10 sites de surveillance, dont quatre utilisent l'énergie solaire renouvelable pour pomper l'eau.



As águas subterrâneas são invisíveis e, no entanto, o seu impacto é visível em todo o lado - este recurso finito fornece quase metade de toda a água potável em todo o mundo. Cerca de 40% da água para a agricultura de regadio e cerca de 1/3 de água necessária para a indústria é proveniente de recursos hídricos. Apesar destes factos impressionantes, as águas subterrâneas permanecem invisíveis e menos proeminentes em comparação com as águas superficiais.

Este ano, 2022, na convocação da 5ª Conferência de Águas Subterrâneas da SADC, gostaríamos de aproveitar o tema do Dia Mundial da Água "Águas Subterrâneas - tornando visível o invisível". Ao deliberarmos, é importante que façamos uma pausa e nos façamos esta pergunta: "o que estamos a fazer para tornar as águas subterrâneas visíveis ou estamos a fazer o suficiente para garantir que os recursos das águas subterrâneas sejam desenvolvidos de forma sustentável para apoiar a água e a segurança alimentar para a região da SADC?".

Utilizadas de forma sustentável, as águas subterrâneas poderiam fornecer água potável para os cerca de 40% dos cerca de 345 milhões de habitantes estimados da região da SADC que atualmente não têm acesso a serviços de água potável e saneamento seguros. Também poderia aliviar a pressão sobre as águas superficiais da região e ajudar as comunidades a suportar os períodos de seca muito frequentes e severos

As águas subterrâneas desempenham um papel fundamental no fornecimento de água e segurança alimentar e na melhoria dos meios de subsistência de muitos na região da SADC, especialmente comunidades vulneráveis nas zonas rurais e nas pobres povoações urbanas.

"Com o agravamento dos impactos das alterações climáticas, temos de reconhecer que as águas subterrâneas podem ser um catalisador para o desenvolvimento económico e social na região da SADC. Além disso, as águas subterrâneas podem desempenhar um papel significativo no desenvolvimento sustentável e na resiliência da construção - se forem desenvolvidas e geridas de forma sustentável", diz o Eng. James Sauramba, Diretor Executivo da SADC-GMI.

O Objetivo de Desenvolvimento Sustentável 6 está subjacente a garantir o acesso à água e ao saneamento para todos. Se se desenvolver de forma sustentável, as águas subterrâneas poderão ser determinantes para a realização de SDG 6, tal como estabelecido na agenda das Nações Unidas para 2030.

ÁGUAS SUBTERRÂNEAS

Tornar o Invisível Visível

O Eng. Sauramba continua a dizer que, à medida que os impactos das alterações climáticas se intensificam e muitas pessoas recorrem às águas subterrâneas para o seu abastecimento primário de água, torna-se ainda mais crítico que trabalhemos em conjunto para gerir de forma sustentável este recurso precioso e torná-lo mais visível.

A comunicação relativa às questões relacionadas com as águas subterrâneas é fundamental para tornar as águas subterrâneas visíveis. A participação das partes interessadas, o conhecimento partilhado e a tomada de decisões informadas são fundamentais integrais da boa governação da água e nunca poderão ser sublinhados.

É importante que procuremos formas inovadoras de criar consciência e comunicar as questões das águas subterrâneas. Embora nos últimos cinco anos se tenha feito alguns progressos neste domínio, ainda é necessário realizar mais progressos.

A região da SADC extrai atualmente uma fusão de 1,5% dos cerca de 2.500 m³ por ano estimados para os recursos de águas subterrâneas renováveis disponíveis. Isto significa que as águas subterrâneas permanecem em grande parte inexploradas numa altura em que o fosso entre a procura de água e a disponibilidade está a aumentar drasticamente.

A população terrestre de quase 8 mil milhões em 2020 deverá atingir os 11 mil milhões em 2100. Os humanos terão de aprender a produzir alimentos suficientes sem destruir o solo, a água e o clima. Este foi apelidado de o maior desafio que a humanidade tem de enfrentar e resolver. A gestão sustentável das águas subterrâneas está no centro da solução.

Os projetos variaram desde sistemas de monitorização e avaliação de águas subterrâneas, esquemas comunitários de abastecimento de água, exploração de aquíferos profundos e mapeamento e desenvolvimento de águas subterrâneas. Estes projetos contribuíram para o reforço da segurança da água e para a melhoria dos meios de subsistência das comunidades beneficiantes. Cerca de 93000 beneficiários (dos quais 53% eram mulheres) em toda a região da SADC beneficiaram das intervenções.

A cooperação transfronteiriça entre os Estados-Membros que partilham recursos hídricos foi igualmente promovida através de investigações destinadas a gerar conhecimento em seis dos 30 aquíferos transfronteiriços estimados na região da SADC.

Três novos furos foram perfurados em Chongwe, Zâmbia, para aumentar o abastecimento de água do povoado e reduzir os efeitos devastadores da escassez de água para cerca de 12.000 residentes. O projeto aumentou o aglomerado existente de furos, ao mesmo tempo que aliviava a escassez de água na área.

Mais uma vez, a SADC-GMI implementou um projeto semelhante em Muchocolate, no distrito de Matutuine, na província de Maputo, Moçambique, onde foi fornecida água potável e segura para cerca de 2 000 pessoas e seus animais. Outro marco foi registado no Reino de Eswatini, onde foi concluído um projeto de monitorização das águas subterrâneas. O projeto envolveu 10 locais de monitorização, quatro dos quais utilizam energia solar renovável para bombear a água.

SADC-GMI esforça-se por tornar visíveis as águas subterrâneas

O SADC Groundwater Management Institute (SADC-GMI) como Centro de Excelência na promoção de uma gestão equitativa e sustentável das águas subterrâneas na região da SADC desde 2016 tem até à data implementado vários projetos impactantes de desenvolvimento de infraestruturas de pequena escala em 10 Estados-Membros da SADC para apoiar o desenvolvimento e gestão deste recurso finito.



ACCESS TO DATA AND INFORMATION Could Be A Game Changer!!

While groundwater is an abundant resource in the region, its potential remains subdued by limited amount of data on aspects of availability, quality, quantity, and abstraction. The limited capacity to predict hydrogeological behaviour and water resource development in sufficient detail over long periods of time affects extents to which groundwater as a resource is appreciated and therefore managed.

Proper and adequate groundwater data collection and data management is therefore crucial for effective groundwater management.

It is observed that while policies, strategies and technical guidelines on groundwater data collection are available in the SADC Region, there is need to connect the policies with the existing technical guidelines which are not being effectively utilised due to lack of clear direction on how to use them.



In 2018 the SADC-GMI in collaboration with the International Groundwater Resources Assessment Centre and the Institute for Groundwater Studies of the University of the Free State carried an assessment on the status of groundwater data collection and data management in SADC. The assessment confirmed that the region faced some serious challenges pertaining groundwater data collection and management.

These challenges were viewed as hindrance to sustainable groundwater development and for decision makers in making well informed decisions. The assessment confirmed that limited human resources, equipment, and financial capacity appropriate for collection, analysis, management, retrieval, and sharing of data, inconsistency in data collection and routine quality control, data storage in different formats and difficulty in data access, use or interpretation were the main issues.

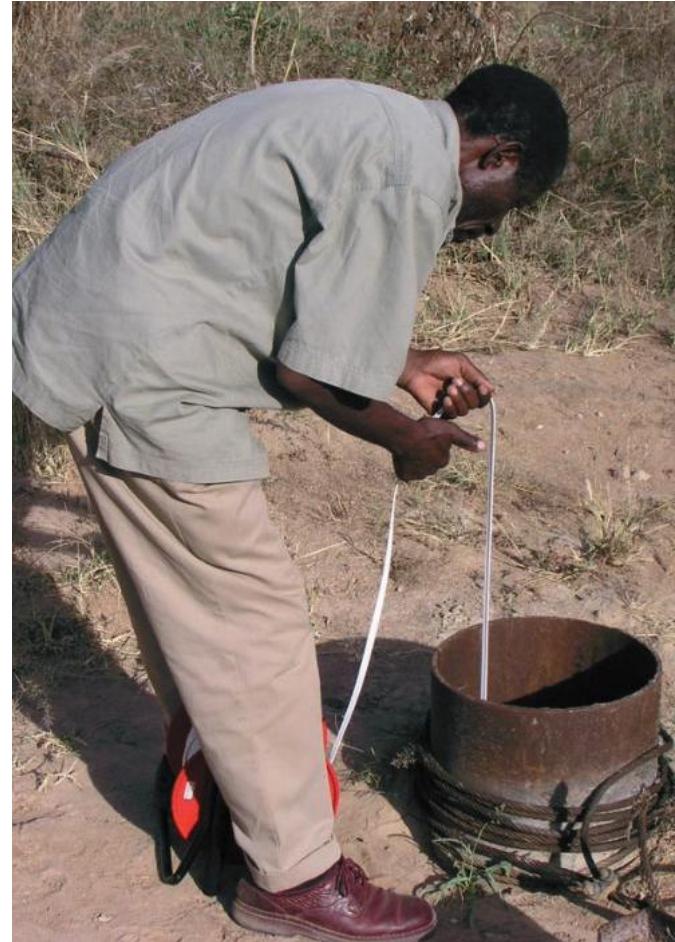
In SADC there is no appropriate organisational and planning framework for use of the technical guidelines to implement the existing policies and strategies on water resources that include groundwater. Thus, the SADC Framework for Groundwater Data Collection and Data Management serves as an instrument to drive implementation of policies and strategies making use of the existing technical guidelines.

The Framework is targeted at officials who have a coordinating role in groundwater data collection and data management. These are usually senior level professionals who coordinate field technicians as well as interact with managers and directors of departments.

The framework provides Member States and other interested partners with the following benefits:

Provides organisational and planning structures for collection and management of groundwater data in strategic, innovative and cost-effective ways.

Assist SADC Member States which are currently facing difficulties in groundwater data collection and data management to develop adequate procedures at national level that match their financial and human capacity and level of development; and enhance transboundary and regional cooperation through harmonisation of practices across Member States in terms of data collection and management and facilitate data exchange.



The overall objective of the Framework is to provide organisational and planning structures for collection and management of groundwater data in strategic, innovative and cost

In 2018

The assessment carried out by the International Groundwater Resources Assessment Centre and the Institute for Groundwater Studies of the University of the Free State in 2017/2018, on the state of groundwater data collection and data management in SADC, confirms challenges the region is currently facing. The constraints include limited human resources, equipment and financial capacity appropriate for collection, analysis, management, retrieval, and sharing of data; inconsistency in data collection and routine quality control; data storage in different formats and difficulty in data access, use or interpretation.

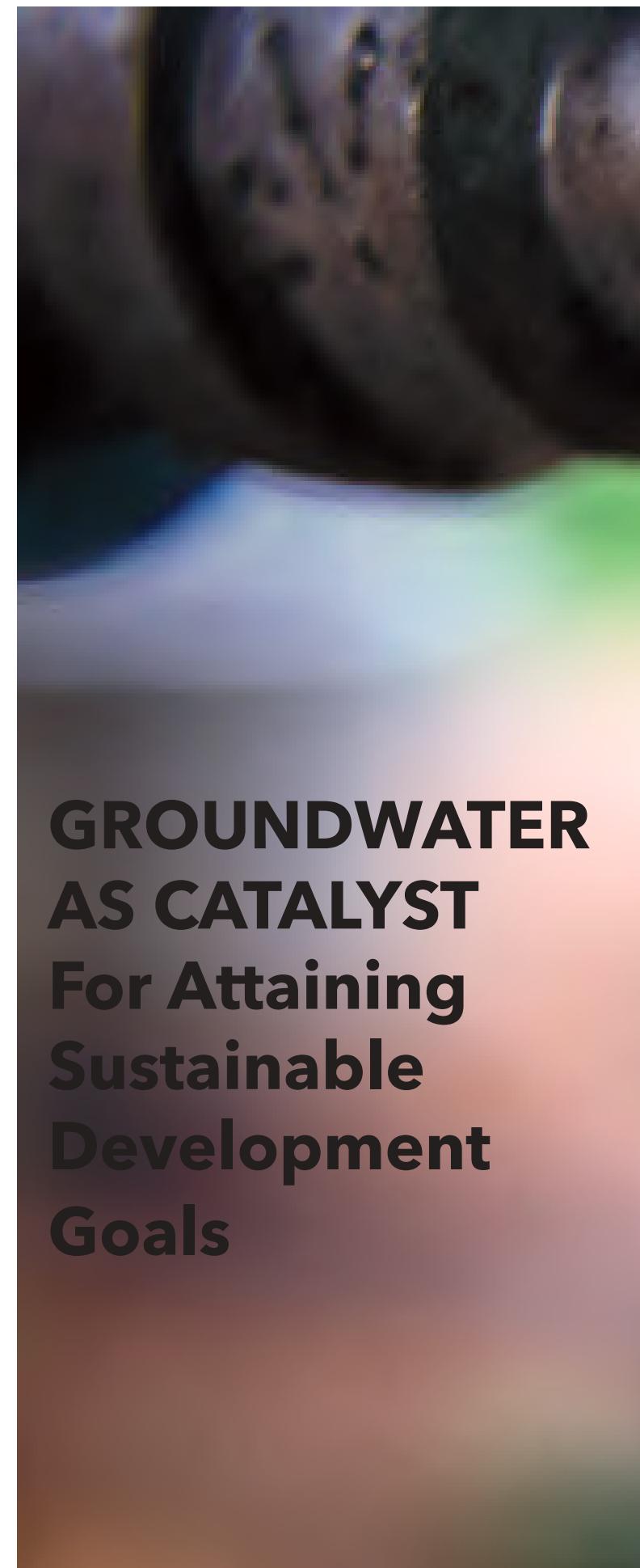
The assessment of the state of groundwater data collection and management in SADC Member States relies on information obtained from four project activities: a literature review, interviews with groundwater professionals in the Member

States, assignments of young professionals engaged in the project and a workshop with senior officials from the Member States in November 2018. Most information is derived from the interviews undertaken during the country visits. The four activities are briefly described the next sections below.

While groundwater is an important resource in the region, it remains somewhat hidden due to limited amount of data on its availability, quality and use, which hinders an accurate assessment of groundwater status and trend. Without proper knowledge of the resource and sound governance principles, this huge resource can be rapidly and irreversibly degraded.

Studies on transboundary aquifers and regional groundwater studies on the impacts of climate variability and change, as well as socio-economic developments, require regional data and As part of the project Capacity Building on Groundwater Data Collection and Data Management in SADC Member States (IGRAC and IGS, 2019a) an assessment was carried out in 2017 and 2018 on the state of groundwater data collection and data management in SADC Member States. information to be compiled, harmonised and made easily accessible.

This chapter describes the current state of groundwater data collection and data management in the SADC Member States, based on the information from the literature review, interviews during country visits, the 1st assignment of the young professionals and inputs from the project workshop in November 2018 (see previous chapter). Most information was derived from the 145 professionals interviewed during the country visits. To a lesser extent, the young professionals' assignments also contributed to provide additional information. The literature review provided limited additional insight, as few documents are available with concrete information relevant for this project. Review of the draft report by senior officials and young professionals during the November 2018 workshop resulted in some last (mostly minor) corrections and additions.



GROUNDWATER AS CATALYST For Attaining Sustainable Development Goals



The United Nations (UN) Sustainable Development Goals (SDGs) present an agenda to reduce hunger and poverty whilst protecting the environment. As the 2019 edition of the SADC Groundwater Conference has shown, groundwater is key to achieving SDG 6 and several other SDGs. Yet groundwater is not always captured adequately in formulating SDG indicators. For instance, the water stress indicator (6.4.2) does not differentiate groundwater from surface water. Indicator 6.6.1 on water-related ecosystems does not distinguish ecosystems depending on groundwater (GDEs).

Moreover, there are important groundwater data collection issues, including in SADC Member States, resulting in a low level of reporting on some key indicators, such as the one addressing the quality of groundwater resources (6.3.2).

Sustainable and equitable groundwater use plays a critical role in attaining Sustainable Development Goals. Groundwater is explicitly linked to ensuring availability and sustainable management of water and sanitation for all (Goal 6). But also, groundwater can directly contribute to poverty eradication (Goal 1) and Food security (Goal 2).

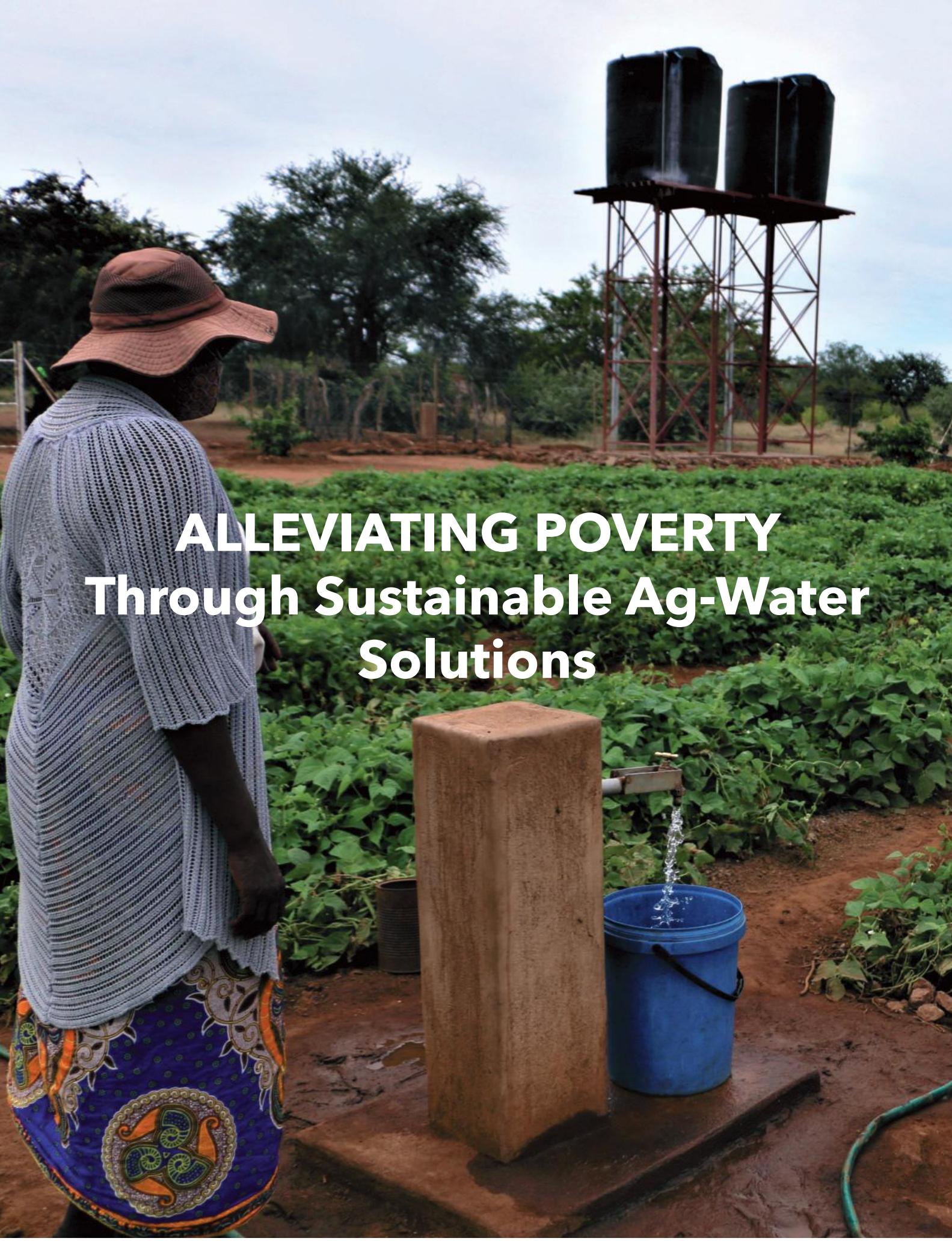
Reporting on transboundary groundwater co-operation (Indicator 6.5.2) appears to be reasonably good in SADC, although there are inconsistencies between the reports submitted by riparian states. The weak formulation of groundwater indicators in the SDGs, data gaps and other reporting challenges call for improvements. It might require developing additional sub-indicators, enhancing groundwater data collection in SADC, technical assistance for completing the reports, or further coordination between Member States. Reporting on transboundary groundwater cooperation requires the inclusion of additional indicators and modification of data collection protocols.

In most national institutional arrangements and transboundary agreements, groundwater is less conspicuous, resulting in suboptimal interventions. Transboundary groundwater issues identified by the SADC Member States include weak institutional frameworks, limited functioning of RBOs concerning groundwater management, and limited scientific data sharing between countries. These shortfalls limit groundwater contribution towards the achievement of the SDGs, especially Goal 6.

To enhance the groundwater contribution to SDGs and national development plans, stable legal frameworks are required to enable the governments and groundwater users to plan for resource management over the long term and to deal with competing interests, including those of the environment and future generations.

Groundwater is critical to achieving global food security. Irrigated lands accounts for 40% of global food production and productivity of groundwater.

Prof. David Kreamer, President of IAH, said the lack of systematic communication, data and information on groundwater is one of the most significant impediments to its sound management and governance.



ALLEVIATING POVERTY Through Sustainable Ag-Water Solutions

In contrast to its strategic role as an essential resource to help achieve community development and poverty alleviation in the Southern African Development Community (SADC) region, groundwater has remained a poorly understood and managed resource. This was according to a scoping study regarding the status of groundwater resources management in SADC.

Groundwater is used for over 40% of global irrigation on almost 40% of irrigated land. It has become indispensable for agriculture production in many countries, and it accounts for half of South Asia's irrigation and in China where it supports two-thirds of grain crops produced.

Sustainable groundwater development for water and food security is extremely important for the SADC region to mitigate against the worsening impacts of climate change. As surface water becomes more variable and uncertain, groundwater provides an important buffer for commercial and small holder farmers. It responds to the water demands in a more flexible and reliable way, which allows farmers to increase their yields and mitigate effects of extreme water shortages.

While water in general is a critical input for agricultural production and plays a significant role in food security, science reveals that Sub-Saharan Africa is not on track to reach the sustainable development goal on eradicating hunger. Although the percentage of under-nourished people has decreased, from 30% to 23%, the absolute number has increased, from 204 million to 220 million.

"More food needs to be produced to meet future demands due to population growth, lifestyle change and dietary changes and this calls for robust agricultural water solutions to sustainably manage water resources," says Dr Manuel Magombeyi Regional Researcher from the International Water Management Institute.

Dr. Magombeyi further asserts that it is critical that people understand that as the food demand

increases, so the water usage, and all these increases happen amidst climate change, therefore, innovative agricultural water solutions play a critical role in helping famers save water for improve livelihoods.

Unfortunately, according to the United Nations Development Programme, at least 821 million people were estimated to be chronically under-nourished as of 2017, often as a direct consequence of environmental degradation, drought, and biodiversity loss. Under-nourishment and severe food insecurity appear to be increasing in almost all regions of Africa. Such statistics indicate that innovative Agricultural Water Solutions are urgently required if we want to meet Sustainable Development Goal 2, Zero Hunger for everyone by 2030 as promulgated by the United Nations.

About 70 % of all groundwater used goes to agriculture, mostly irrigation. At a global scale, between 20 and 40 % of irrigation water needs are satisfied by groundwater, however, groundwater will also soon deplete if not used sparingly.

In the SADC region alone, at least 11 million people are facing critical food shortages due to the drought caused by climate change. This situation calls for groundwater practitioners to think deeper and look for innovative solutions to support agricultural sector to improve food security. According to Agricultural Water Management in Southern Africa Report, investments by both public and private sectors in Ag-water solutions represent an untapped opportunity. It is important that both sectors invest in Ag-water solutions to achieve overall objective of poverty alleviation and broad based agricultural growth.

Most of these ag-water solutions have been implemented at a smaller scale. It is now important that they get upscaled for the benefits of larger communities, especially if the solution is working well.



GROUNDWATER MONITORING

In The
SADC Region

There is limited groundwater monitoring taking place in SADC-countries, and the state of development of national monitoring networks in the SADC region is highly diverse. That is according to the Groundwater monitoring in the SADC region report.

As it has been always articulated, "we cannot monitor what we don't know". In groundwater context, this means we need accurate data and information to monitor our groundwater resources efficiently. Monitoring our groundwater resources is crucial for assessment, prediction, and sound groundwater management.

In the SADC region, groundwater monitoring is a hindrance towards sustainable groundwater management. Most countries do not have well established monitoring networks to provide accurate data.

In Botswana for example, Groundwater resources are used throughout the country for livestock, municipal supply, and for small areas of irrigation. However the country's monitoring system is still failing to provide accurate data on quantity and quality of groundwater in the country. Spatial density of observation wells in Botswana is not yet adequate, groundwater quality is not well coordinated and delays in data series has always generated data series with numerical gaps.

Groundwater resources are vital for drinking water supply, irrigation and the sustainability of rivers, lakes, and wetlands. However, increased demand, population growth and climate change are increasingly putting pressure on our groundwater resources. Lack of and inappropriate management have already led to contamination and over-exploitation of aquifers in some areas and could result in additional water supply problems, land subsidence and deterioration of groundwater dependent ecosystems

According to The State of Groundwater Collection and Management in SADC Member States Report, a lack of groundwater information and resistance to share groundwater data among member States is one of the key challenges hindering proper groundwater monitoring.

According to the Groundwater monitoring in the SADC region report, the biggest challenge is that some government departments do not recognize the need to monitor, and that leads to inaccurate understanding of groundwater levels and quality for sustainable management of the resource. Additional challenges stem from lack of coordination.

Groundwater quality monitoring is not well coordinated. Also, delay in data processing has resulted in inconsistent data series, which subsequently generate time series with numerous data gaps.

In Lesotho groundwater is an important natural resource and a principal source of potable water for most of the rural population. Lakes and wetlands in the country are sustained by groundwater discharge. Groundwater systems in the country often responds to short-term and long-term changes in climate variables, withdrawal, and land use. While more accurate and quality data is necessary, the Department of Water Affairs as the custodian of water resources has always struggled to secure and maintain a monitoring schedule of the resource due to poor spatial representation of monitoring points countrywide. The Department could not provide data and relevant information on the status of groundwater quality and quantity to other government agencies or private individuals as there was no well-designed and reliable monitoring system.

Through the "Expansion of National Groundwater Monitoring Network" Project in Lesotho, funded by the World Bank through SADC-GMI, Lesotho was able to improve the monitoring of groundwater country wide. Through the project that was completed in 2021, accurate data and information are now available as and when required.

Lesotho is now able to monitor groundwater resources countrywide as well as provide accurate data and information to decision makers for well informed decisions.

In 2021, SADC-GMI recorded another milestone in the Kingdom of Eswatini where another groundwater monitoring project was completed. The project involved 10 monitoring sites, four of which use renewable solar energy to pump the water.

"We embarked on this project because we wanted to know the effect of climate change on groundwater resources" emphasized Ncamiso Mhlanga, WaterAid Country Director.

Through the project, the Kingdom of Eswatini is now able to monitor and manage the water resources effectively which means accurate information for better planning.

Approximately 67 109 people are benefitting directly and indirectly from the project.



FROM NOVICES TO EXPERTS Of The Industry

For every sector to strive, succession plan is key. It is important that the sector equips the future experts and leaders for the sustainability of the sector. From 2018 SADC-GMI made a conscious decision to invest in the Young Professionals programme aimed at granting young professionals an opportunity for development. The programme entailed recruiting young professionals (below 35 years old) from each Member State to be part of the SADC-GMI development programme.

During the 1st phase of the Sustainable Groundwater Management in SADC Member States



project funded by the World Bank, the SADC Groundwater Management Institute (SADC-GMI) implemented several initiatives aimed at promoting sustainable groundwater management and capacity development activities, aimed at capacitating groundwater professionals/practitioners in the SADC region. One such initiative was a three-year Young Professionals Internship Programme which commenced in 2018.

This exciting programme was linked to three projects that SADC-GMI implemented, namely: Capacity Building on Groundwater Data Collec-

tion and Management in SADC Member States, SADC Groundwater Information Portal, and SADC Groundwater Literature Archives.

By the end of the programme, 65 young professionals drawn from 13 SADC Member States, 23 women and 42 men were capacitated. The programme provided these young professionals with the opportunity to work with experts in the field and be part of the international community of practice where drew knowledge and inspiration for their career development.



Tlhoriso Morienyane LESOTHO

In this issue we got up close with Mr Tlhoriso Morienyane to find out about his trajectory since joining the programme in 2018. Tlhoriso hails from the Mountains Kingdom (Lesotho). He joined the programme in 2018 as part of the cohort that worked under the Data Collection and Management project in SADC Member States. When he joined the programme, he had just completed his MSc in Hydrogeology with the IHE DELFT University Netherlands and was served as a volunteer at the Department of Water Affairs - Lesotho.

"It was very exciting being part of the programme because it allowed me to put into practice what I had learned at school," he emphasized. He continues to say he is still utilising the skills he acquired in the programme.

After joining the programme in early 2018, Morienyane landed a permanent position as the Principal Hydrogeologist in the Department of Water Affairs and attributes this milestone to the programme and the commitment he demonstrated as an intern in the programme and a volunteer at the Department. He says the programme provided him with an opportunity to interact with experts in the field both inside and outside Lesotho.

In his current position as the Principal Hydrogeologist, Mr Morienyane is responsible for advising the Ministry on groundwater related issues for the country, which comes with enormous responsibil-

ity. Now Morienyane manages a team of experts, Hydrogeologists and Technical staff that look after groundwater and surface water for the country. This is an extraordinary growth and achievement in the space of four years.

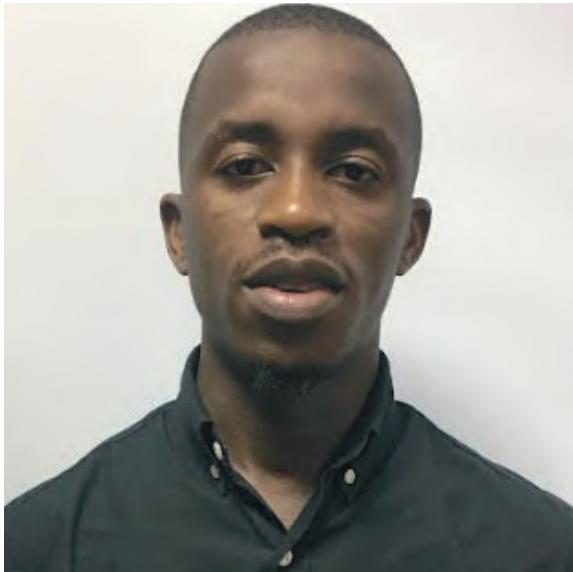
He acknowledges that being part of the programme gave him access to a multi-cultural environment and international groundwater community which also aided him in expanding his network beyond the programme.

Five years from now Tlhoriso would like to pursue his PhD, he says he sees a lot of potential in the Ministry, and he still wants to be part of the ministry before he ventures into other avenues, he says he aspires to be part of the academia one day.

In his closing Mr Morienyane says he is very proud to have been part of SADC-GMI, especially because they were part of the institute in its infant stage, he believes that his and other young professionals' input helped the institute to fulfil its mandate.

Morienyane believes in the saying "work hard and play hard", he says if he is not working, he spends his time watching soccer and playing chess. Locally he is a die fan of Lioli Football club based in Lesotho, internally he supports Chelsea and Real Madrid.

SADC-GMI would like to wish Tlhoriso all the best in his career as he keeps reaching for the stars.



Omar Sirage

MOZAMBIQUE

Omar Sirage is passionate about groundwater issues and would like to make his contribution to sustainable groundwater management in Mozambique, a country with 70% of the population dependent on groundwater resources.

Omar was seconded by the Ministry of Public Works, Housing and Water Resources to the programme in 2018. Prior to joining the programme, he was already employed by the Ministry but had very limited practical experience "Being integrated in the programme with young professionals from other SADC countries amplified my skills in many ways", say Omar.

He says the programme equipped him extensively on data collection and management skills as part of his responsibilities during the programme involved data collection. He continues to say the programme improved his presentations skills. More importantly, he got an opportunity to learn of challenges other country are experiencing pertaining to groundwater and data collection and management.

Omar says working in diverse group with representatives from different Member States taught him immensely about different cultures.

He is currently working as a Technician for the Ministry of Public Works, Housing and Water Resources and he attribute his career development to the Young Professionals programme which groomed him to be a dedicated professional he is today. He says his work as Technician contributes to the objectives of the department.

Omar holds an Honours degree in Geology from Eduard Mondlane University, and he aspires to pursue his master's degree in Hydrogeology in the near future, a qualification that he believes will help him to grow further in his career and ambition of contributing constructively to groundwater agenda in Mozambique.

Omar is a great sports enthusiast - during his spare time, he enjoys playing soccer with colleagues, he is playing for the Ministry's soccer team.

I would like to thank SADC-GMI for the priceless opportunity that they gave me and other young professionals who were part of the programme. I'm sure my fellow young professionals share the same sentiment.

SADC-GMI

IMPLIMENTS PHASE 2

Of The Sustainable Groundwater Management In SADC Member States Project

After the completion of the Sustainable Groundwater Management in SADC Member States Phase 1, SADC-GMI is now implementing Phase 2 of the same project. The 4-year project is funded by the Global Environment Facility (GEF) and the Multi-Donor Trust Fund Cooperation in International Waters in Africa (CIWA).

The Project commenced on 15 November 2021, and it was officially launched to Member States and other partners on 20 April 2022 at the Capital Hotel Menlyn Maine in Pretoria, South Africa.

The project is aimed at addressing water challenges faced by the region as a result of the worsening impacts of climate change. The SADC Secretariat secured the grant funding to the tune of US\$9 million from the Multi Donor Trust Fund Cooperation in International Waters in Africa (CIWA) and US\$4.4 million from the Global Environment facility (GEF) channeled through the World Bank to implement Phase 2 Project.

The SADC Groundwater Management Institute (SADC-GMI) as the Centre of Excellence in the sustainable groundwater management in the region and a Subsidiary structure of the SADC Secretariat, is implementing this enormously significant project on behalf of the SADC Secretariat. The CIWA grant will run for 4 years until November 2025, whereas the GEF grant will run for 5 years from the date of effectiveness which is projected to be before the end of 2022.

This phase 2 project builds on the achievements of the Sustainable Groundwater Management in SADC Member States Project implemented by SADC-GMI with funding from CIWA and the Global Environment Facility (GEF) through the World Bank until 30th June 2021. The new project considers the conclusions of the regional Policy, Legal and Institutional Gap Analysis conducted by SADC-GMI in 2019 which revealed that gaps exist in Capacity development, Knowledge management, and building resilient livelihoods of key stakeholders in the region.

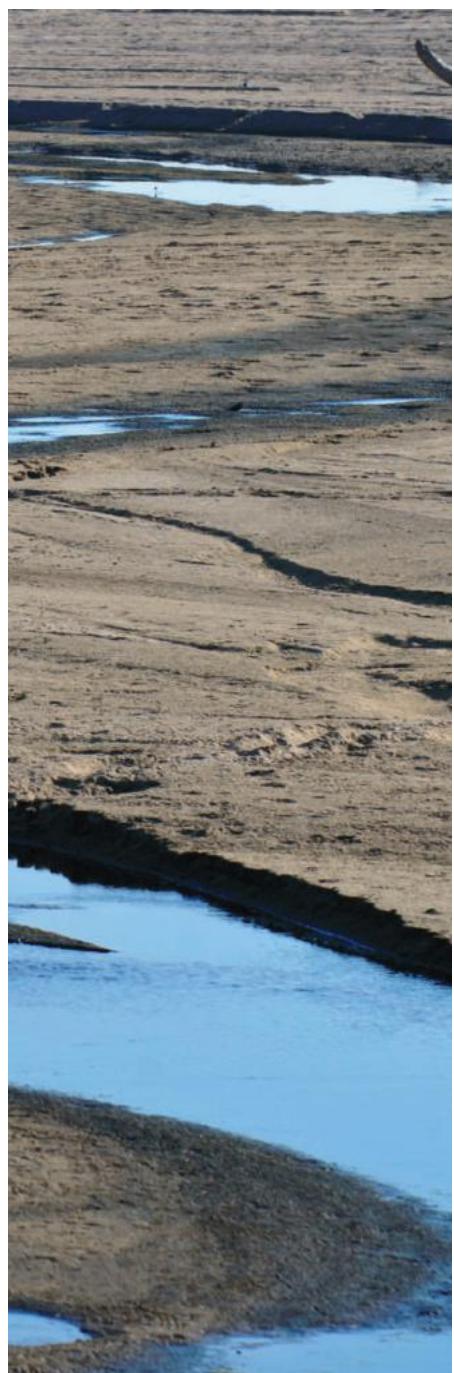
Sustainable water management, water infrastructure, and access to safe, reliable, and affordable supply of water and adequate sanitation services are critical to improving living standards, expanding local economies, and creating more decent jobs and sustainable economic growth for the region. This project aims to achieve the above through 3 critical components:

- Component 1 – Capacity building for sustainable groundwater management
- Component 2 – Knowledge development, dissemination, and advocacy
- Component 3 – Building resilient livelihoods and inclusive groundwater management

This project will play a critical role as groundwater resources are perceived to play an increasingly strategic role in the SADC region, particularly for most vulnerable rural communities. At least 40 percent of the people in the Southern African Development Community (SADC) have no access to safe water, leaving them vulnerable to water-borne diseases and rendering the realization of their other socio-economic goals precarious.

The Sustainable Groundwater Management in SADC Member States Project Phase 2 seeks to address some of the water related challenges faced by the region, and contribute to the achievement of the Sustainable Development Goals 1 - No Poverty, 2 - Zero Hunger and 6 - Access to water for everyone as stipulated in the United Nations agenda 2030.





COMMON UNDERSTANDING FOR JOINT GOVERNANCE AND MANAGEMENT Of Transboundary Aquifers

Transboundary aquifers may be subject to conflicts of interests as the result of unequal resource partitioning and different management capacities within the societal, economic, and environmental context of sharing countries. Therefore, equitable and sustainable use of these resources and cross - border dialogue is critical.

The connectedness of natural resource systems such as groundwater goes beyond the geopolitical divides, as the result, it is necessary for countries to cooperate to realize the important development goal (water and sanitation for all) and navigate challenges such as climate change.

By sharing common goals and pooling resources, benefits from shared resources can be maximised and risk minimized, also, healthy international relations can harness peace and stability over shared resources and ultimately prevent conflicts.

Patience Mukuyu, Researcher at the International Water Management Institute (IWMI) says despite the importance of international cooperation, it is often a delicate case of diplomacy among sovereign states, when interests diverge, and parties cannot reach a common understanding, conflicts arise. She continues to say disputes are not good but sometimes do allow countries to foresee challenges and force them to find collective solutions.

The Southern African Development Community (SADC) 30 transboundary aquifers that hold potential to supply water to the habitants of the region if sustainably managed.

Governance of transboundary aquifers is becoming a critical need. Over abstraction, contamination and degradation of recharge areas are the main threats to the sustainability of aquifers worldwide (Wijnen et al. 2012).

Considering the fact that our groundwater sits in aquifers, both national and transboundary, it becomes critical that common understanding for joint governance and management of these resources is achieved at all levels.

It must be recognized that equitable multilateral management of a transboundary aquifer is not an easy accomplishment.

(Lautze and Giordano, 2005; SARUCHERA and Lautze, 2016) Joint management of these aquifers can foster progress towards the region's socio-economic development goals including strengthening of resilience to climate change and variability, improving agricultural production, enhancing water security, and achieving sustainable economic growth.

There are still challenges that impede the International Cooperation of transboundary aquifers, which includes lack of information and data, Limited capacity, Legal and regulatory limitations, poor consideration given to groundwater resources, implementation mechanism, Poor appreciation of shared aquifers.

In the SADC region, groundwater is of strategic importance, particularly for the up-liftment and

prosperity of thousands of communities living in poverty. It also serves as a critical buffer during droughts, which are endemic within the region, and will play a crucial role in adaptation to climate change. Despite this evident importance, international cooperation pertaining shared water resources is still lagging behind and this phenomenon could hinder the potential of transboundary aquifers in contributing towards water and food security in the region.

The SADC Secretariat plays an essential role in fostering regional integration and encouraging peaceful relations among Member States. As the region is interconnected, a collective understanding of shared resources is imperative. The SADC 2000 Revised Protocol on Shared Watercourses provides the overarching framework for countries to align on the sustainable use of water resources, including groundwater.

"Nonetheless, there is still scope to enhance regional frameworks further to strengthen international cooperation on groundwater considering global challenges such as climate change - and increasing water resource scarcity", say Mukuyu.

Related, the SADC GMI has played a central role in advancing groundwater knowledge among member States through extensive studies on shared aquifers. The sharing of data has provided a steppingstone in promoting international cooperation such as in the case of the Tuli Karoo (shared by Botswana, South Africa and Zimbabwe) and Ramotswa (Shared by Botswana, South Africa) transboundary aquifers. Studies conducted by the International Water Management Institute in these two shared aquifers offered countries insights into their shared resources on the availability and use of ground and surface water. Countries had an opportunity to deliberate on the structures needed for future engagement. The Limpopo Groundwater Committee has since been established to have oversight on groundwater management and development in the Limpopo watercourse.

To realize the full potential of groundwater resources in the SADC region, it is imperative that a culture of international cooperation is promoted, and Member States are made to realize the benefits that lie thereof.

UNE COMPRÉHENSION COMMUNE POUR UNE GOUVERNANCE ET UNE GESTION CONJOINTES **Des Aquifères Transfrontaliers**

Les aquifères transfrontaliers peuvent faire l'objet de conflits d'intérêts en raison d'une répartition inégale des ressources et de capacités de gestion différentes dans le contexte sociétal, économique et environnemental des pays qui les partagent. Par conséquent, l'utilisation équitable et durable de ces ressources et le dialogue transfrontalier sont essentiels.

La connectivité des systèmes de ressources naturelles tels que les eaux souterraines dépasse les clivages géopolitiques. Par conséquent, il est nécessaire que les pays coopèrent pour atteindre l'important objectif de développement (eau et assainissement pour tous) et relever les défis tels que le changement climatique.

En partageant des objectifs communs et en mettant en commun les ressources, il est possible de maximiser les avantages tirés des ressources partagées et de minimiser les risques. En outre, des relations internationales saines peuvent favoriser la paix et la stabilité sur les ressources partagées et, en définitive, prévenir les conflits.

Patience Mukuyu, chercheuse à l'Institut international de gestion de l'eau (IWMI), affirme que malgré l'importance de la coopération internationale, il s'agit souvent d'un cas délicat de diplomatie entre États souverains, lorsque les intérêts divergent et que les parties ne parviennent pas à s'entendre, des conflits apparaissent. Elle poursuit en disant

que les conflits ne sont pas bons mais qu'ils permettent parfois aux pays de prévoir les défis et les obligent à trouver des solutions collectives.

La communauté de développement de l'Afrique australe (SADC) compte 30 aquifères transfrontaliers qui peuvent fournir de l'eau aux habitants de la région s'ils sont gérés de manière durable.

La gouvernance des aquifères transfrontaliers devient un besoin critique. Les prélèvements excessifs, la contamination et la dégradation des zones de recharge sont les principales menaces pour la durabilité des aquifères dans le monde (Wijnen et al. 2012).

Compte tenu du fait que nos eaux souterraines se trouvent dans des aquifères, à la fois nationaux et transfrontaliers, il devient essentiel qu'une compréhension commune pour une gouvernance et une gestion conjointes de ces ressources soit réalisée à tous les niveaux.

Il faut reconnaître que la gestion multilatérale équitable d'un aquifère transfrontalier n'est pas une tâche facile.

(Lautze et Giordano, 2005 ; SARUCHERA et Lautze, 2016) La gestion conjointe de ces aquifères peut favoriser les progrès vers les objectifs de développement socio-économique de la région, notamment le renforcement de la résilience au changement et à la variabilité climatiques, l'amélioration de la production agricole, le renforcement de la sécurité de l'eau et la réalisation d'une croissance économique durable.

Il existe encore des défis qui entravent la coopération internationale des aquifères transfrontaliers, notamment le manque d'informations et de données, les capacités limitées, les limitations légales et réglementaires, la faible prise en compte des ressources en eau souterraine, le mécanisme de mise en œuvre, la faible appréciation des aquifères partagés.

Dans la région de la SADC, les eaux souterraines revêtent une importance stratégique, notamment pour le développement et la prospérité de milliers de communautés vivant dans la pauvreté. Elles servent également de tampon critique pendant les sécheresses, qui sont endémiques dans la région, et joueront un rôle crucial dans l'adaptation au changement climatique. Malgré cette importance évidente, la coopération internationale concernant les ressources en eau partagées est

toujours à la traîne et ce phénomène pourrait entraîner le potentiel des aquifères transfrontaliers à contribuer à la sécurité de l'eau et de l'alimentation dans la région.

Le secrétariat de la SADC joue un rôle essentiel pour favoriser l'intégration régionale et encourager les relations pacifiques entre les États membres. La région étant interconnectée, une compréhension collective des ressources partagées est impérative. Le protocole révisé de 2000 de la SADC sur les cours d'eau partagés fournit le cadre général permettant aux pays de s'aligner sur l'utilisation durable des ressources en eau, y compris les eaux souterraines.

"Néanmoins, il est encore possible d'améliorer les cadres régionaux afin de renforcer la coopération internationale en matière d'eaux souterraines, compte tenu des défis mondiaux tels que le changement climatique et la raréfaction des ressources en eau", a déclaré Mukuyu.

Dans le même ordre d'idées, la SADC-GMI a joué un rôle central dans l'avancement des connaissances sur les eaux souterraines parmi les États membres grâce à des études approfondies sur les aquifères partagés. Le partage des données a servi de tremplin pour promouvoir la coopération internationale, comme dans le cas des aquifères transfrontaliers de Tuli Karoo (partagé par le Botswana, l'Afrique du Sud et le Zimbabwe) et de Ramotswa (partagé par le Botswana et l'Afrique du Sud). Les études menées par l'Institut international de gestion de l'eau dans ces deux aquifères partagés ont permis aux pays de mieux connaître leurs ressources communes en matière de disponibilité et d'utilisation des eaux souterraines et de surface. Les pays ont eu l'occasion de délibérer sur les structures nécessaires à leur engagement futur. Le comité des eaux souterraines du Limpopo a depuis été créé pour superviser la gestion et le développement des eaux souterraines dans le cours d'eau du Limpopo.

Pour réaliser le plein potentiel des ressources en eaux souterraines dans la région de la SADC, il est impératif de promouvoir une culture de coopération internationale et de faire en sorte que les États membres prennent conscience des avantages qui en découlent.

ENTENDIMENTO COMUM PARA A GOVERNAÇÃO CONJUNTA E GESTÃO De Aquíferos Transfronteiriços

Os aquíferos transfronteiriços podem estar sujeitos a conflitos de interesses em consequência da divisão desigual dos recursos e das diferentes capacidades de gestão no contexto social, económico e ambiental dos países que partilham. Por conseguinte, uma utilização equitativa e sustentável destes recursos e da transfronteiriça - o diálogo fronteiriço é fundamental.

A ligação dos sistemas de recursos naturais, como as águas subterrâneas, ultrapassa as divisões geopolíticas, pelo que é necessário que os países cooperem para concretizar o importante objectivo de desenvolvimento (água e saneamento para todos) e navegarem em desafios como as alterações climáticas.

Ao partilhar objetivos comuns e a reunir recursos, os benefícios dos recursos partilhados podem ser maximizados e o risco minimizado, também, as relações internacionais saudáveis podem aproveitar a paz e a estabilidade sobre os recursos partilhados e, em última análise, prevenir conflitos.

Patience Mukuyu, Investigadora do Instituto Internacional de Gestão da Água (IWMI) diz que apesar da importância da cooperação internacional, é muitas vezes um caso delicado de diplomacia entre estados soberanos, quando os interesses divergem, e as partes não conseguem chegar a um entendimento comum, os conflitos surgem. Continua a dizer que as disputas não são boas, mas por vezes permitem que os países prevejam desafios e os obriguem a encontrar soluções coletivas.

A Comunidade de Desenvolvimento da África Austral (SADC) 30 aquíferos transfronteiriços que têm potencial para fornecer água aos habitantes da região se forem geridos de forma sustentável.

A governação dos aquíferos transfronteiriços está a tornar-se uma necessidade crítica. Sobre a abstração, a contaminação e a degradação das áreas de recarga são as principais ameaças à sustentabilidade dos aquíferos em todo o mundo (Wijnen et al. 2012).

Tendo em conta que as nossas águas subterrâneas se situam em aquíferos, tanto nacionais como transfronteiriças, torna-se fundamental que o entendimento comum para a governação conjunta e a gestão destes recursos seja alcançado a todos os níveis.

Há que reconhecer que uma gestão multilateral equitativa de um aquífero transfronteiriço não é um feito fácil.

(Lautze e Giordano, 2005; SARUCHERA e Lautze, 2016) A gestão conjunta destes aquíferos pode promover o progresso para os objetivos de desenvolvimento socioeconómico da região, incluindo o reforço da resiliência às alterações climáticas e à variabilidade, a melhoria da produção agrícola, o reforço da segurança da água e a consecução de um crescimento económico sustentável.

Subsistem ainda desafios que impulsionaram a Cooperação Internacional de Aquíferos transfronteiriços, que inclui a falta de informação e dados, capacidade limitada, limitações legais e regulamentares, má consideração dada aos recursos das águas subterrâneas, mecanismo de implementação, má apreciação dos aquíferos partilhados.

Na região da SADC, as águas subterrâneas são de importância estratégica, nomeadamente para o aumento e prosperidade de milhares de comunidades que vivem na pobreza. Serve também como um tampão crítico durante as secas, que são endémicas na região, e desempenhará um papel crucial na adaptação às alterações climáticas. Apesar desta importância evidente, a cooperação internacional relativa aos recursos hídricos partilhados continua a ficar para trás e este fenómeno pode dificultar o potencial dos aquíferos transfronteiriços em contribuir para a segurança da água e dos alimentos na região.

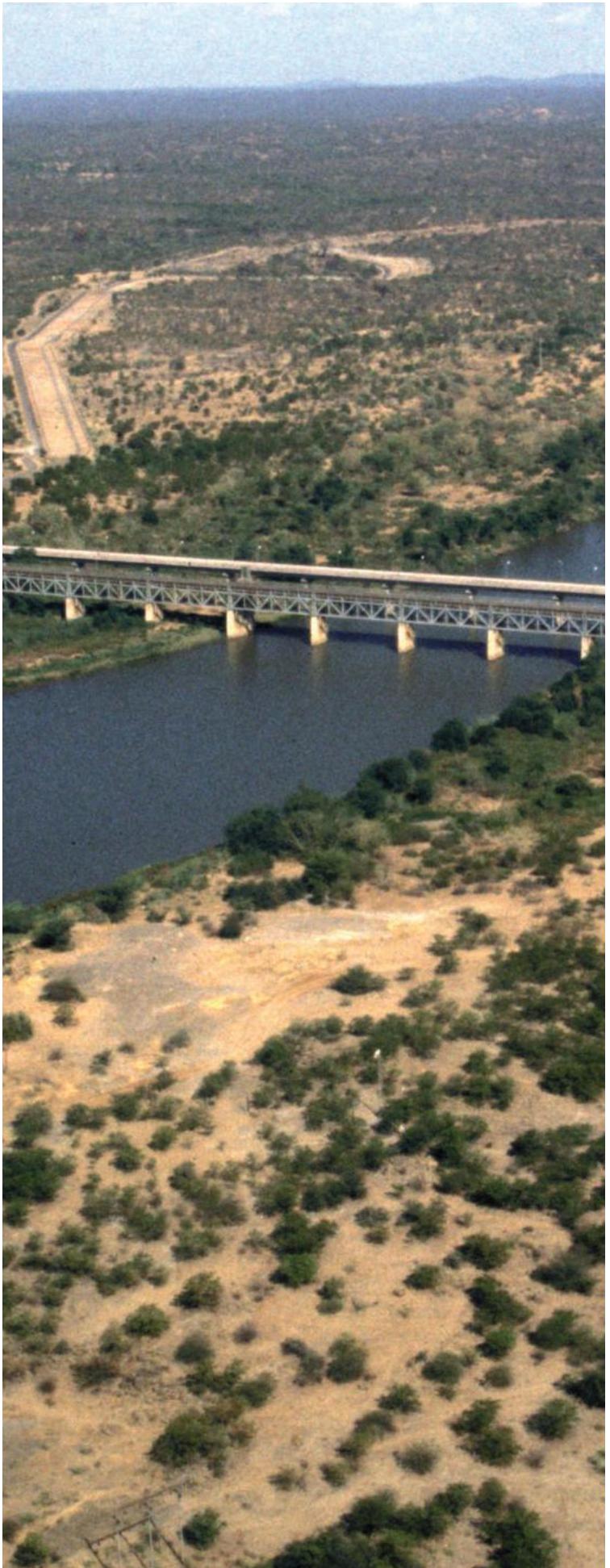
O Secretariado da SADC desempenha um papel essencial no fomento da integração regional e

no incentivo às relações pacíficas entre os Estados-Membros. À medida que a região está interligada, é imperativo um entendimento coletivo dos recursos partilhados. O Protocolo Revisto da SADC 2000 sobre os cursos de água partilhados prevê o quadro geral para os países se alinharem na utilização sustentável dos recursos hídricos, incluindo as águas subterrâneas.

"No entanto, ainda há um objetivo para reforçar ainda mais os quadros regionais para reforçar a cooperação internacional em matéria de águas subterrâneas, considerando os desafios globais, como as alterações climáticas - e o aumento da escassez de recursos hídricos", diz Mukuyu.

Relacionado, o GMI da SADC tem desempenhado um papel central no avanço do conhecimento das águas subterrâneas entre os Estados-Membros através de estudos extensivos sobre aquíferos partilhados. A partilha de dados forneceu um passo em frente na promoção da cooperação internacional, como no caso dos aquíferos transfronteiriços de Tuli Karoo (partilhados pelo Botsuana, África do Sul e Ramotswa (Partilhado pelo Botsuana, África do Sul). Estudos realizados pelo Instituto Internacional de Gestão da Água nestes dois aquíferos partilhados ofereceram aos países informações sobre os seus recursos partilhados sobre a disponibilidade e utilização das águas subterrâneas e superficiais. Os países tiveram a oportunidade de deliberar sobre as estruturas necessárias para o futuro empenhamento. Desde então, foi criada a Comissão das Águas Subterrâneas do Limpopo para ter a supervisão da gestão e desenvolvimento das águas subterrâneas no curso de água do Limpopo.

Para concretizar todo o potencial dos recursos hídricos da SADC REGIÃO, é imperativo que se promova uma cultura de cooperação internacional, e que os Estados-Membros sejam obrigados a concretizar os benefícios que daí residem.



HIGHLIGHTS FROM THE STOCKHOLM World Water Week 2022



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