The Water Game Changers Day

Rapporteurship

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A day full of inspiration that featured prominent representatives from Denmark, Mexico, South Africa, Switzerland, the United Nations Office of the High Commissioner for Human Rights, the University of Pretoria, Academia and the Organized Civil Society. It celebrated exemplary nature-based experiences such as wetland restoration, rainwater harvesting and water infiltration. The event included three panels of intergenerational dialogue on the right to water and sanitation, the right to nature and the gender dimension of water; water and sustainable development; and nature-based ecotechnologies, indigenous knowledge and innovation, as well as a hybrid training session by the Mexican Institute of Water Technologies (IMTA) and the launch of the 'Water Game Changers Award'. The event followed up on the November 2024 Human Rights Forum panel that addressed the impacts of El Niño and climate change on the right to food in Southern Africa. In the dialogue powerful transformative experiences emerged. The Moderator-Sherpa of the day, Arch Graham A. Young, suggested three practical steps or lines of work for the future in South Africa: prioritizing the repair of water leaks, decentralizing water design through eco-technologies (such as rainwater harvesting) and educating the public about water conservation, in light of the right to water and sanitation, the gender dimension of water and sustainable development. The greatest learning: the centrality of community participation in any effort, as well as of the concept of sustainability of life, which refers to the need to place the maintenance and regeneration of life - human and non-human - at the centre of political, economic and social systems; eco-technologies that are not only environmentally sound, but also socially just, inclusive and rights-based; and a profound reflection on the historic transformations that have brought us to the current situation.

The embassies of Mexico, Switzerland and Denmark, the Mexican Institute of Water Technologies (IMTA), the Center for Human Rights, the Center for Environmental Justice, the Landscape Architecture Program of the Department of Architecture of the University of Pretoria (UP) and the Regional Office for Southern Africa of the Office of the United Nations High Commissioner for Human Rights (OHCHR), organized on July 28, 2025 at the Future Africa Center of the University of Pretoria, a day of multidisciplinary dialogue between experts, students and community leaders to exchange knowledge on ecotechnologies that have transformed the lives of many people in Mexico, Denmark and South

Africa which are based on nature, human rights and the gender perspective as components of sustainable development.

Opening session

Professor Viljoen, former Director of the Centre for Human Rights at the University of Pretoria, welcomed the participants on behalf of Prof. Loretta Ferris, Academic Vice-Chancellor of the UP. He stated that it was a great honour to participate in the launch of the Water Game Changers Award, an international initiative aimed at addressing the water crisis. The day's programme brings together diverse voices from different nations and disciplines, united by a common goal: to raise awareness of the human right to water and explore innovative solutions to water-related challenges. The initiative is co-sponsored by the Embassies of Mexico, Denmark and Switzerland, along with the Mexican Institute of Water and Technology. Among the participants are Ambassador Karin Poulsen of Denmark, Mr. Marino Cuenant of Switzerland, Min. Elía Sosa of Mexico and Ms. Luisa Solchaga of AMEXCID, representatives of various organizations, diplomatic missions and academic institutions, the Center for Human Rights, the Center for Environmental Justice in Africa and the Landscape Architecture Program of the Faculty of Engineering of the UP, the Office of the United Nations High Commissioner for Human Rights and academic colleagues from other institutions. The Water Game Changers competition focuses on water, nature, and eco-technologies, addressing issues such as climate change, environmental degradation, and equitable access to clean water. It stresses that despite access to water being a fundamental human right, water is still unevenly distributed, especially in schools and farming communities, often placing a heavier burden on women and disadvantaged people. This event highlights the need for legal and policy reforms to ensure that water becomes an accessible resource for all, not just the wealthy. It is a call to action in the social, economic and political spheres to address inequalities and ensure a sustainable future for all South Africans, and beyond. UP's departments are deeply committed to water conservation, sanitation, human rights, and inclusive development. Whether through design, business, academia or organizations, the invitation to the award is open to all. Through collaboration and innovation, we will be able to transform the landscape, so that new games can begin.

Ms. Karin Poulsen, Ambassador of Denmark to South Africa, expressed her pleasure to participate in the launch of the Water Game Changers Award, which puts the spotlight on African-led innovation in one of the most critical areas of our time: Water, a precondition for health, economic development, food production and human dignity. Water is under increasing pressure as a result of climate change, urbanization, drought and infrastructure gaps, pollution and inequality, and there is no one-size-fits-all solution. The meeting was convened

for all those who are reflecting on how to manage, conserve and use water, through research, technology, community participation and public policy. The Africa Strategy, launched by the Danish Ministry of Foreign Affairs in 2024, calls for change supported by genuine partnerships, green transition and local solutions. It emphasizes the value of African expertise, leadership, and innovation, and the importance of building strong, long-term relationships through knowledge sharing. This approach is also rooted in Denmark's Development Policy Strategy launched in June 2025, which reaffirms Denmark's commitment to global development by allocating 0.7% of GDP annually to development programs, being one of only four countries in the world to maintain this commitment. It focuses on critical areas such as climate action, water security and sustainable development, while putting youth, education and partnerships at the centre of attention. Denmark and South Africa have a strong foundation of collaboration in this area based on the six strategic sectoral collaboration programmes, under which knowledge and skills transfer between Danish and South African public authorities taking place in a peer-to-peer model, as well as through research. The University of KwaZulu-Natal and Aalborg University are working together on the topic of urban water resilience, focusing on nature-based solutions for stormwater and wastewater management in rapidly urbanized areas. The University of Cape Town and DTU (Technical University of Denmark) have collaborated on smart water systems and leak detection, using digital tools to improve water efficiency in cities such as Cape Town. The University of Pretoria and Aarhus University are focusing on nature-based solutions and community engagement strategies in the CONSUS project. These projects are funded through the Building Stronger Universities (BSU) programme, funded by Danida, and by the Ministry of Foreign Affairs research grants administered by the Danida Scholarship Centre. This is the same ethos that animates the Water Game Changers Award initiative: to honour those who are creating change from within, change that is scalable, sustainable and rooted in the local context. Also, to find the next Game Changers and give them a platform from which they can show off their skills. The Water Game Changers Award is more than just a prize. It is a symbol of the values we share: trust in science, belief in youth, commitment to equity, and the courage to do things differently. Let's continue to learn from each other, invest in ideas that work, people who lead, let's build resilient and inclusive water futures together.

Ms. Abigail Noko, Regional Representative of the United Nations Office of the High Commissioner for Human Rights (OHCHR), considered this event to be a melting pot of innovation, education and human rights. It is both visionary and timely to address one of the most pressing challenges of our time: the crisis of water insecurity. It is based on a simple but powerful truth: access to safe, clean, affordable, and sustainable water is a human right. So is the right to a clean, healthy and sustainable environment, a right that has been recognized by

the United Nations General Assembly and is increasingly reflected in national constitutions, including that of South Africa. These rights are not aspirational: they are legal rights based on international human rights law. They are also embedded in the Sustainable Development Goals, in particular SDG 6 on clean water and sanitation, and SDG 13 on climate action. Human rights only have meaning when they are realized in people's lives. And that's why the Water Game Changers Award is so important. The award doesn't just address technology. It is above all an incentive for transformation. It invites young people to become agents of change, by designing **eco-technologies that are not only environmentally sound, but also socially just, inclusive and rights-based**. A human rights-based approach to water and environmental sustainability means putting people – especially those most affected – at the centre of designing and implementing solutions. It means ensuring that the voices of women, youth, Indigenous Peoples, people in informal settlements and rural communities, to name a few, are not only heard but also have the opportunity to exercise leadership. A participatory, non-discriminatory, responsible and empowering approach is especially urgent in South Africa, where water scarcity, pollution and infrastructure challenges intersect with deep inequalities. As the concept note highlights, communities in Gauteng and other provinces face the real threat of "Day Zero" when taps run dry. But for many in informal settlements and rural areas, that day has come and gone, many times. The Water Game Changers Award responds to this crisis not with despair, but with hope and action. Urges students and young innovators to **develop nature-based eco-technologies that save, protect and harvest water; clean, reuse and recycle it; reintegrate it into natural systems; and do all of this in a sustainable, affordable, and community-driven way. It also fosters a culture of water and an understanding of water not only as a resource, but as a living system, intrinsically linked to the environment. This view aligns with the human right to water, which guarantees everyone access to sufficient, safe, acceptable, accessible and affordable water for personal and domestic use. Recognizing water as a human right means treating it as essential to human dignity, health and life, and managing it through the principles of equality, non-discrimination, sustainability and participation. It calls us to rethink our relationship with nature not as something to exploit, but as something to respect, restore, and regenerate, ensuring that water systems respect human rights and protect the ecosystems on which they depend.** The concept of an Ubuntu care economy is rooted in the principles of social and environmental care, reminding us that our well-being is deeply interconnected with that of others. It urges us to **prioritize community, solidarity, and sustainability over individual benefit.** It offers a powerful lens through which to understand water justice and environmental stewardship. Young people play a crucial role in advancing this vision, bringing fresh ideas, bold imagination and

a deep commitment to building a stronger, more just and sustainable world. Their innovations not only address technical challenges, but also promote human dignity, equity, and resilience. At the Office of the United Nations High Commissioner for Human Rights, this initiative is welcome because it embodies the very essence of its mandate: to promote and protect human rights for everyone, everywhere. **Human rights provide a powerful framework for moving forward in fair, inclusive, and sustainable ways**. The Water Game Changers Day, therefore, is a time of celebration, creativity, commitment, and perhaps even the birth of a movement. A movement that places human rights, environmental justice, and community empowerment at the center of water innovation.

Mr. Marino Cuenant, Chargé d'Affaires of the Swiss Embassy, said that although his country is blessed by water, this does not mean that Switzerland does not care about the current water challenges facing the planet. Billions of people lack safe drinking water or basic sanitation. Climate change worsens this situation; it increases cycles of floods and droughts that threaten water resources and put pressure on communities and ecosystems. Switzerland is convinced that **cooperation on rivers, lakes and groundwater is not only about sustainability. It is about building trust, fostering peace, and boosting prosperity around the world.** In today's wars, states have used water as a deadly weapon. For more than a century, Switzerland has been working with its neighbors to manage shared water resources responsibly and peacefully. In 2010, it launched the Blue Peace initiative, which transforms competition for freshwater into collaboration, helping countries and communities work together. **Switzerland advocates a human rights-based approach to water management that encompasses access to water, non-discrimination and care for vulnerable groups**. In South Africa, Switzerland is involved in various water-related activities: economic cooperation to support the water and sanitation sector in South Africa since 2016 at the municipal level to address underinvestment in water infrastructure, poor planning and lack of private investment. During the devastating drought in Cape Town in 2018, Switzerland helped the city implement its desalination program. Since then, it has provided technical assistance and funding for pipeline development, water reuse and sanitation infrastructure projects. It is also supporting the government to improve its disaster risk management and financial response. Together with the Asivikelani program, it has empowered communities to engage more effectively with their municipalities in aspects such as service budgeting, procurement, and delivery, while holding municipalities accountable. Switzerland offers financial guarantees to help Swiss SMEs access large-scale projects in the field of the environment. More recently, in partnership with Johannesburg Water, a Swiss-led AI water management project is expected to save 100 million litres of water

per year. The Geneva Science and Diplomacy Anticipator (GESDA) brings together scientists and diplomats to address challenges such as water insecurity before they escalate. GESDA reminds us that **water is not just a technical issue. It is linked to equity, sustainability and peace.** In the field of research and innovation, partnerships dating back to 2010 have yielded tangible results. From solar-powered water technologies like Swoxid and Ennos, to the LaundReCycle off-grid laundry in Cape Town and SDG Village models in Venda. These projects demonstrate what is possible when local ownership and scientific collaboration come together. Mr. Marino Cuenant finally referred to the **personal behavioral dimension of water, because the way one travels, uses water in the garden or eats matters**. To produce a kilo of beef, 15,000 liters of water are required, while a kilo of chicken meat is 4 times less. The recommendation is not to become a vegetarian overnight, but at least to be aware and try to adapt your behaviour accordingly.

The intervention **of Luisa Solchaga, Director General of Cooperation Policy of the Mexican Agency for International Development Cooperation (AMEXCID)** -read by Martin Borrego of AMEXCID-, recalled that for many years it was believed that development meant building more infrastructure, expanding agricultural frontiers and intensifying extraction. In an effort to grow, wetlands were sacrificed, forests were cut down, aquifers were polluted, and the link between water and ecosystems was severed. Among others, the result was a fragmented and unequal distribution of water and a growing number of communities living along polluted rivers without access to clean water. These errors have brought great lessons: **any technical solution that ignores the environmental and social dimensions will give rise to new and deeper problems**. **Infrastructure must go hand in hand with community participation, cultural respect and the regeneration of ecosystems**. We are hopeful by the efforts to restore, reimagine and regenerate. **Nature-based solutions offer powerful answers**. **They harness natural processes to address societal challenges, such as climate adaptation, water scarcity, and disaster risk, while protecting biodiversity and community well-being**. In Mexico, ecotechnologies are used in wetland restoration, forest conservation, watershed rehabilitation, and sustainable agriculture. South Africa and Mexico have a lot to learn from each other. Both countries face structural inequalities, increased water stress, and institutional challenges. Both are megadiverse and multicultural countries, endowed with ancestral knowledge and a new generation that is increasingly better prepared. Water management is a national security priority. Mexico is promoting what we call anticipatory water governance, an approach that integrates science, participation, and strategic foresight to design scenarios, identify risks, and make decisions before a crisis becomes irreversible. Mexico's National Water Plan (2024-2030) is structured around four main pillars:

sovereignty, justice, aquifer recharge, and wetland restoration and irrigation. Water management has also a human right dimension. The signing of the National Agreement for the Human Right to Water and Sustainability of Mexico marked a turning point. For the first time, the federal government, state authorities, municipal councils, civil society organizations, and private sector partners committed to a unified, legally binding roadmap that ensures universal access, protects ecosystems, and shares accountability. Programs such as *Water for All* and local initiatives of Civil Society Organizations, such as Isla Urbana, promote the installation of rainwater harvesting systems in schools, homes, and rural health centers. These efforts are part of a broader and growing movement of decentralized water solutions powered by cross-sector collaboration. Mexico celebrates the launch of this initiative and is grateful for the privilege of being part of it. We are confident that the participation of the Mexican Institute of Water Technology (IMTA), which for decades has provided technical assistance in Central America, will bring a valuable opportunity to share experiences with South Africa, strengthen research capacities, and contribute significantly to the achievement of the Sustainable Development Goals. We hope that water as a source of life and connection will continue to inspire partnerships, learning and solidarity in all continents.

Minister Elía del Carmen Sosa Nishizaki, Embassy of Mexico, launched the Water Game Changers Award as an initiative of the Embassies of Mexico, Denmark, Switzerland, IMTA through AMEXCID, the Center for Human Rights, the Center for Environmental Justice in Africa and the Landscape Architecture Program of the Faculty of Engineering, Built Environment and Information Technology (EBIT) of the University of Pretoria, together with the Regional Representation of the Office of the United Nations High Commissioner for Human Rights (OHCHR). The initiative was born out of the desire to connect the right to water and sanitation with the natural generation of water, its cultural values and its sustainable use among ancestral cultures and nature-based ecotechnologies. On that subject, the organizers concluded that nature-based ecotechnologies are a conducive means to realize the right to water for current and future generations without affecting the environment and to connect water with the rights, ecology and dignity of the community. With this vision in mind, the award aims to:

- Create a culture of water based on the human right to water and sanitation, and to nature, and on a gender perspective.
- Increase awareness of the short- and medium-term impacts of water cycle disruption.
- Create an understanding of the main sources of water loss and water pollution.

- Promote understanding of concepts such as sustainable development, nature-based solutions, systems thinking, traditional knowledge, circular economy, Ubuntu economy, indigenous knowledge systems and local ways of doing and knowing, and traditional and regenerative agriculture.
- Develop and innovate eco-technologies and nature-based systems that are based on the water cycle to orient themselves towards water autonomy and sovereignty, sustainable water generation for safe human use and consumption, agricultural and recreational use, and accessibility and affordability for all, including people living in municipalities and rural areas.
- Develop community-based approaches so that eco-technologies and methodologies that are (co) created or (co) developed with local communities can be integrated, acceptable, and usable in communities for long-term transformative change. This includes indigenous knowledge systems and ways of thinking.
- Raise awareness/educate and share information with the public and communities.

Finally, she reported that the award has a website (watergamechangers.com) on which the call has been placed, inviting participants to consult it.

The Water Game Changers Day

The event began with the projection of a video made for the occasion by **Dr. Víctor Ávila Akerberg, professor and researcher at the Institute of Agrarian and Rural Sciences of the Autonomous University of the State of Morelos, Mexico**, who presented his experience in the Water Forest, a region surrounding Mexico City, which ensures the supply of water for more than 70% of the water demand of the metropolitan area and its more than 25 million inhabitants, as well as many other ecosystem benefits. Like South Africa, this protected area of 250,000 hectares has enormous biodiversity (between 10% and 15% of Mexico's endemic flora and fauna) and vast traditional ecological knowledge within different indigenous groups. However, land-use change, deforestation, forest fires, water pollution, urban sprawl, illegal land exploitation, illegal logging, and inadequate afforestation have not been completely stopped. **The worldview of the indigenous peoples of the area, which does not differentiate between humans and non-humans, thus giving equal value to all species and to their conservation, on equal terms, represents a source of hope.** In this sense, Dr. Ávila favors a more integrative assessment of Nature, such as the **"Contribution of Nature to People" (NCP) paradigm** – which is above the nature-based solutions-, because it **recognizes and underlines intrinsic and relational**

values. To the question, what can we do?, he answered: **Environmental education of youth; avoid buying illegal resources; planting to restore suitable species in suitable locations; changing our consumption patterns to satisfy our needs and not our desires; and establish biocultural water reserves for national security reasons, prioritizing the restoration of indigenous peoples and youth.**

Panel on the right to water and sanitation, the right to nature and the gender dimension of water.

This panel aimed to provide an overview of the human rights framework and gender dimension related to water as an integral part of nature. It examined the intersection of human rights, environmental sustainability, and gender equality in addressing water scarcity. It assessed the contribution of solutions to water scarcity for human beings and the right to water and sanitation and the right to a healthy environment. The panel focused on the local level and provided an opportunity to incorporate the topic of the current water situation in South Africa, particularly in the Gauteng province. The discussions highlighted the complexity of the water crisis, unequal gender impacts, and the need for localized, rights-based solutions. The panel addressed different aspects, namely the water crisis in South Africa, gender inequality in access to water, the normative framework on the right to water, community perspectives on water, and grassroots advocacy.

Dr. Anja du Plessis, Associate Professor in the Department of Geography, School of Ecological and Human Sustainability, Faculty of Agriculture and Environmental Sciences, University of South Africa (UNISA), highlighted the importance of understanding the wider context of the growing water crisis in Gauteng. While it may appear that the infrastructure is in good condition and the dam reservoirs are stable, the reality is more complex. A significant portion, about 75%, of Gauteng's serviced water is directed to manufacturers, not residents, so many communities are experiencing water shortages and others are unconnected. Paying water taxes does not guarantee access to running water, which highlights a large disconnect in the provision of water service. The root problems include municipal management and poor infrastructure. Currently, 105 of the 144 municipalities that act as Water Service Authorities (WSAs) are underperforming and failing to deliver on their mission to provide water in appropriate quantity and quality, which has led the Department of Water and Sanitation to focus on the worst case scenarios. Failures in wastewater treatment are contaminating water sources, severely affecting agriculture and ecosystems. Farmers are losing contracts due to water quality not meeting standards, leading to economic strains. The infrastructure is aging, with frequent pipe failures and leaks. The crisis, which is already affecting households, industry and agriculture, is intensifying. Since 2021, Gauteng has been under immense

pressure and the water supply is expected to change significantly over the next 25 years if no action is taken. Looking ahead, South Africa will need an estimated R7.2 trillion by 2050 to adequately address water challenges. Professor du Plessis called for urgent and coordinated action at all levels of government, stakeholders and civil society to address this issue. The crisis affects all aspects of life and requires informed, practical, and immediate implemented solutions. This is a shared challenge and, if not addressed promptly, the consequences for Gauteng and the rest of the country, including the Vaal River system and even Cape Town, could be severe and far-reaching.

Ms. Ayanda Mvimbi, Women's Economic Empowerment (WEE) Specialist at UN Women, highlighted her organization's core mission to promote gender equality and women's empowerment, especially in the context of the Sustainable Development Goals (SDGs). Women still face a disproportionate burden in collecting water and fuel, especially in rural and underserved communities. This unpaid care work limits women's opportunities to participate in paid employment, education, and leadership roles. Addressing gender inequality in access to water is key to achieving sustainable development and economic empowerment. While gender equality indicators in South Africa show some progress, the data also reveals a worrying trend related to access to basic infrastructure, particularly water, which has significant gender impacts. According to research focused on economic infrastructure, water scarcity is hitting urban communities especially hard and exacerbating social inequalities. Qualitative and quantitative data collected between 2019 and 2024 indicate an increasing burden on women, who are disproportionately responsible for water supply. This time-consuming and unrecognized task limits women's opportunities for personal development, education and participation in economic activities. UN Women considers this issue urgently and actively advocates for a transformation in the way society addresses the water crisis. The organization calls for a change in the ecosystem so that not only the burden of women with respect to access to water is recognized, but also action is taken to redistribute responsibilities, reduce the burden and maintain sustainable access to clean water. She emphasized the need to generate practical proposals and inclusive dialogue that address poor infrastructure, promote alternative sources of water such as rainwater, and ensure equitable access to water. She estimated that improving infrastructure is essential since it directly influences access, especially for women in underserved areas. Addressing these challenges will help women move from water collectors to active participants in the economy, contributing to their empowerment and protecting their fundamental human rights.

Dr. Lydia Chikwe, Project Officer at the Women's Rights Unit and Research Centre for Human Rights and Researcher at the University of Pretoria, spoke

about the gender dimensions of water and sanitation in South Africa. She emphasized that **access to safe drinking water and adequate sanitation is not only a basic service, but a fundamental human right, which is intrinsically linked to dignity, health and gender equality**. In her view, the current water crisis in South Africa is driven by declining infrastructure, rapid urban population growth and the effects of climate change. These challenges are especially acute in **informal settlements, where access to water and sanitation is often limited or non-existent**. She stressed that **women and marginalized groups are disproportionately affected** by such deficiencies. In communities like Mabopane, women are often the ones who fetch water for daily needs, often at great personal cost. This burden delays their personal and professional development. At the same time, men often face the pressure of working in circumstances of lack of basic access to water, which affects their productivity and family well-being. Low access to water also affects students, not only physically but psychologically. Women and girls bear the heaviest burden of inadequate access, affecting their health, safety, education, and economic opportunities. She also referred to relevant legal frameworks, i.e. the South African Constitution which specifically recognises the right to sufficient water, and General Comment No. 15 of the UN Committee on Economic, Social and Cultural Rights, which requires access to water to be equitable and physically accessible. **The African Charter also reinforces the idea that access to natural resources, including water, is inseparable from reproductive rights and human rights in general**. She stressed that discrimination in access to water, particularly against women, must be recognized and addressed as a systemic violation of human rights. She called for **gender considerations to be fully integrated into water and sanitation planning and policy**. Moving forward, she advocated for stronger local initiatives, including programs in places like Tshwane that support water access and agricultural sustainability. She also encouraged awareness campaigns and organisational engagement focused on improving infrastructure and sanitation, as they are crucial to transforming access to water and promoting equality across South African society. She concluded by underscoring the need to **advocate for gender-transformative water frameworks that address the root causes of inequality and integrate women's voices into decision-making.**

Dr. Elvis Fokala, Associate Professor at the Faculty of Law of the University of Pretoria and Director of Programmes at the Child Rights Unit of the UP Centre for Human Rights, emphasized the importance of access to safe drinking water particularly for children. He echoed the concerns of the other panelists, stating that South Africa's water crisis is not new and is getting worse year after year. The situation has become increasingly critical, especially in the urban areas - Johannesburg and Pretoria - where water problems have persisted without an effective solution. He compared the country's experience with the shortage of

electricity since 2007 and considered that water scarcity has become a persistent and normalized crisis in the national discourse, although it continues to barely addressed. He stated that the only way to truly solve this problem is through a direct and honest approach that recognizes that the crisis is rooted in South African society. He identified three distinct groups of people affected by and dependent on access to water, each with unique relationships with water. First, people with stable access tend to view water through a rational and utilitarian lens, often separate from struggles due to scarcity. Second, people in rural communities who depend on water for traditional and cultural activities and whose access is often inconsistent or limited. Third, religious groups, including Muslims and Christians, who use the water for essential spiritual practices and rituals. Despite their differences, the three groups share a common need: to access clean water reliably to be able to carry out daily life and basic functions. He concluded by stating that water scarcity must be a national priority. Water is vital to all facets of life, whether practical, cultural or spiritual, and its absence affects all levels of society. Therefore, solving the water crisis is not only a matter of infrastructure, but a moral imperative for the well-being and progress of society.

Ms. Shumani Luruli, Project Coordinator at Plan Act, highlighted that the Asivikelane initiative works closely with disadvantaged communities and informal settlements. She emphasized that many people in these marginalized communities are struggling with natural water scarcity due to systemic failures in infrastructure, service delivery, and social inequality. Unlike those who have stable access to water, these communities are often defined by their lack of access and the daily challenge for their survival. She raised the critical problem of inefficiency generated by current methods of supply. Some residents rely on government-supplied water tankers, which often arrive during the day when people are at work, making the service ineffective and unreliable. These realities need to be recognized and addressed through platforms like this one, where such challenges can be openly discussed. She called for immediate municipal action to address damaged infrastructure, including leaky pipes, malfunctioning faucets and inconsistent clean water supply. Municipalities must take responsibility and respond in a timely manner to community advisories about leaks, shortages, or damaged systems. She noted that waste management remains a persistent problem in areas such as the city of Tshwane, where neglect continues to worsen living conditions. It is important to highlight how poor access to water disproportionately affects women and reinforces existing gender inequalities. On the contrary, formal communities often benefit from the overuse and even waste of water resources. She proposed addressing these disparities not only in terms of improving the quality of life, but also as an opportunity to create employment and develop community-based skills. **Training to repair pipes, maintain water tanks, and manage water infrastructure could help**

improve services and empower people economically. Ultimately, she emphasized that **accountability, timely response, and meaningful inclusion of affected communities are essential to solving the water and sanitation crisis.** These are not just problems of service delivery, but issues of dignity, equality and sustainable development.

Mr. Albert Van Zyl, Country Director in South Africa of the International Budget Partnership, in his capacity as moderator of the panel, summarized the discussion as follows:

- Human rights framework: The right to water and sanitation is fundamental and intersects with environmental rights and the emerging recognition of the right to nature.
- Gender dimension: Water scarcity has disproportionate gender impacts, reinforcing existing inequalities.
- Local realities: Solutions must address infrastructure gaps, maintenance failures, and specific community needs.
- Water value: Different communities perceive and use water in a variety of ways, and this should inform policy and service delivery.
- Community engagement: Grassroots organizations like Asivikelane play a vital role in highlighting lived experiences and holding municipalities accountable.

The panel stressed that addressing water scarcity in South Africa requires integrated action: improving infrastructure, embedding gender equality in policies, recognizing the cultural and spiritual value of water, and ensuring active community participation. The human rights framework provides a strong legal and moral basis for demanding change. In rural South Africa, some girls miss school altogether during the dry seasons due to daily demands for water collection. Panelists, including Ayanda Mvimbi of UN Women and Dr. Lydia Chibwe of the Center for Human Rights, emphasized that realizing the right to water and sanitation requires going beyond infrastructure. The systemic barriers that prevent women and girls from thriving must be dismantled. Empowering women in water governance could create a ripple effect of change, transforming not only access to water, but also community resilience, health, and economic development.

Panel on Water and Sustainable Development

This panel addressed sustainable development with special emphasis on Sustainable Development Goal (SDG) 6. Building on the broad approach of the

2030 Agenda that interconnects the environment, economy and society, it departed from the Water Cycle and ecosystems – as water is part of Nature and nourishes ecosystems – to focus on sustainable and regenerative uses of Water in the Economy and Society.

Ms. Mariana Gomes Neto of the OHCHR, in her capacity as Moderator of the panel, highlighted Sustainable Development Goal 6 (SDG 6), which guarantees the availability and sustainable management of water and sanitation for all as part of the 2030 Agenda. She emphasized that this agenda is deeply rooted in human rights, as set out in the Universal Declaration of Human Rights, and linked to environmental considerations. SDG 6 specifically supports the human right to water and sanitation, ensuring access to safe, affordable, sufficient, acceptable and available water for personal and domestic use. She stressed that water is a fundamental element of life and is closely linked to other essential human rights such as the right to food, health and education. In South Africa, a significant number of people, including children, still lack access to adequate water and sanitation services. This was highlighted at the United Nations General Assembly in 2022. She reiterated that access to water and sanitation is not only a basic human need, but also a crucial aspect of socio-economic development and human rights, as highlighted in the 2030 Agenda and underscored that community participation is essential in the management and sustainability of water and sanitation systems, especially in local contexts. In many informal settlements in South Africa, residents still have limited or no access to safe drinking water and sanitation. The panel therefore needed to focus on how to intersect environmental resolutions, sustainable practices and the fundamental right to water and sanitation.

Dr. Adesola Ilemobade (Xola), Professor at the School of Civil and Environmental Engineering at the University of Witswatersrand, welcomed the discussion on the **water cycle** and its meaning. He explained the basic components of the water cycle: **at the top, "white water" (condensed water that precipitates as rain or snow into the lithosphere), followed by "green water" (moisture absorbed by plants and partly returned to the atmosphere by evapotranspiration) and "blue water" (surface and groundwater from rivers and seas), along with variations such as gray, yellow, and brown water after human use**. He recalled that the water cycle is based on the principle of matter conservation: water is constantly transformed, but it is never lost. He explained how 100% of white water in southern Africa is redistributed: 65% returns to the atmosphere, 20% remains in vegetation, 14% remains as blue water in rivers and 1% as fossil water, which is largely inaccessible but can be usable with technological advances. He also addressed the cycle of diversion,

which refers to human decisions about water use, including positive and negative environmental impacts. In this regard, he expressed concern about human interference that pollutes water and alters the natural cycle and raised a central question: how can engineers positively influence the water cycle? In this regard, he referred to the rainwater harvesting system developed by Wits, aimed at improving water accessibility. The system consists in capturing rainwater through roofs and pipes connected to storage tanks to use it for irrigation. Wits studies indicate that this method could satisfy 107 days of water with a 90 m² roof, a 205 m² garden and daily watering of 370 liters. Other calculations showed that a 5,000-litre tank could support a daily domestic demand of 13.51 litres, with an investment of approximately R14,263.48 and a payback period of six years, which would generate R1.15 in profit for every R1 spent. Finally, he referred to **the last water cycle: the recycling cycle, which involves the reuse of water within communities through direct potable use (treated water for drinking), indirect potable use, and non-potable applications.** In this regard, he pointed out that currently **all the water we consume has already been previously used by someone else, whether or not it has been previously treated.** The presentation closed by reminding the audience that **natural water systems predate humanity and must be managed responsibly to ensure sustainable development. The water in our bodies was long before on earth and will continue to be when we are no longer on this planet.**

Dr. Luxon Nhamo, Research Manager of the Water Research Commission presented the water-food-energy nexus, a modern and essential framework to foster a shift towards more sustainable and integrated approaches. Originating around 2008 in the framework of the Millennium Development Goals (MDGs), this nexus highlights how water, food and energy resources are becoming increasingly scarce and interdependent, threatening long-term sustainable development. He cited alarming United Nations projections for Africa: by 2050, Southern Africa is expected to meet only 30% of its water and food needs, raising a critical question about where the remaining 70% will come from. Currently, 45% of the population of southern Africa lacks access to water, food and energy. If current trends continue, 600 million people could be left without basic access to all three resources by 2050 across the continent. The speaker emphasized that water, food and energy are not only deeply interconnected, but are also victims and contributors to the current crisis. The sectors are fragile and must be addressed together. He called for an inclusive and urgent transition strategy that ensures no one is left behind, especially given rapid population growth, particularly in underdeveloped and informal areas, which will further strain already limited resources. As an example of a proactive approach, he highlighted Ethiopia's efforts in building an alternative dam to improve access to water in response to its growing population. He concluded by underlining the importance

of **transforming water systems to support food and energy sustainability, especially in rural regions**, before the situation becomes unmanageable.

MA Tamzin Hudson, Programme Manager at Planact, focused on the circular economy and its deep connection to human rights and the Sustainable Development Goals (SDGs), emphasizing the growing urgency to address environmental crises globally. She stressed that water plays a vital role in all sectors, including infrastructure, agriculture and reproduction, and reaffirmed that access to water is a basic human right, protected also by international law. She underlined that the path to sustainable development must be inclusive, participatory and equitable. **Society must act collectively to protect future generations, paying attention to social equity, cultural preservation, and responsible management of natural resources.** Key areas include pollution control, waste management, and material regeneration to ensure long-term efficiency and resource sufficiency. **The transition from sustainability to a more resilient economy involves the integration of economic, social and environmental systems. For example, increased population growth increases demand for services and natural resources, which in turn leads to resource depletion, ultimately affecting supply and damaging the economy.** At the same time, this challenge presents an **opportunity to reform and reshape both the economy and sustainable development through innovative and circular models.** She pointed to aging infrastructure, reduced agricultural activity, and environmentally damaging industries such as mining as major contributors to unsustainable resource use. She noted that approximately 35% of the losses of key systems in South Africa have had a negative economic impact and that efforts are being made to improve such systems and strengthen economic resilience. To move forward, **she proposed solutions such as water conservation, improving infrastructure, improving food preservation methods, adopting better agricultural practices, and implementing sustainable drainage systems**. These actions could significantly improve water quality, boost sustainable economic growth, and strengthen environmental management.

Entrepreneur Tebogo Moalusi referred to the Ubuntu economy, framing Ubuntu not only as a cultural or spiritual concept, but as a foundation for shaping a more inclusive and interconnected socio-technological economy. He explained how Ubuntu reflects the humility and shared value of water in various sectors on the basis of the Creative (connecting people), Care (care and social workers), and Climate Economies. He was emphatic in pointing out that the most affected women are the domestic workers, who end up subsidizing the people they work for – perhaps in the Core Economy - without the proper recognition or income, and stressed the urgency to transition to the Care Economy. This perspective connects to the broader problem of water scarcity and its unequal impact on

different dimensions, especially in women of vulnerable communities. Water is deeply interconnected with food and energy, and its absence leads to exacerbated scarcity in these three areas. In the creative economy, water is vital not only as a resource but as a symbol, as it allows the communication of ideas, for example, through engineering projects that raise awareness of the water crisis. In the care economy, those who support society, such as social workers who address addictions, violence, and mental health, are often the most affected by water scarcity, contributing to broader social instability. In the climate economy, limited access to water slows down productivity and business development, further damaging the economy. He drew attention to specific challenges and solutions, particularly in the South African context. About 40% of women and children are disproportionately affected by water scarcity. He outlined five key priorities: 1. **Ensure equitable access to water and sanitation. 2. Improve infrastructure, such as taps and pipes. 3. Ensure clean water sources. 4. Expand access to underserved communities through technologies such as pumping tanks. 5. Promote inclusive water distribution systems**. He concluded by emphasizing that **water must be placed at the center of the national dialogue, including in political agendas such as local elections**. These actions are essential to achieve long-term environmental sustainability and social well-being.

Ecotechnologies for Mexico City

Arch. Desiré Martínez Uriarte, Director of Paisaje Radical and former President of the International Federation of Landscape Architects, presented through pre-recorded video the unique experience of water management in the basin of Mexico City in the times of Netzahualcóyotl (15th century). The outstanding Arch. Martinez acknowledged that ancient cultures often have a strong bond with the Earth and deeply understood the landscape and the cycles of nature. He described the environmental characteristics of the site, a lake area - originally without drainage - that joined five lakes (Texcoco, Zumpango, Xaltocan, with salted water, and Xochimilco and Chalco - with fresh water). She offered historical background information including on the foundation by the Mexica or Aztecs of the city of Tenochtitlan 700 years ago, in the middle of Lake Texcoco, thanks to the use of chinampas. The chinampas are a pre-Hispanic method that allows the expansion of the soil along the banks of a body of water. It is estimated that this planting technique originated 900 years ago in the basin of Mexico City and was widely used by the kingdoms that settled there, originally for agricultural purposes. They were built by collecting soil from

the bottom of the lake that in many parts of the basin was shallow, thus creating artificial channels and islets. The edges were stabilized by planting ahuejotes, a columnar willow native to the region. With their deep roots, these trees anchor the chinampa to the lakebed, preventing erosion and displacement. The chinampas allowed the development of larger platforms capable of supporting much heavier structures called tlateles and with them the construction of temples and later the city of Tenochtitlan. Due to its settlement, the city has not stopped facing the challenge of flooding. King Netzahualcóyotl, the great Tlatuani of Texcoco, was born in 1402. He became a legendary figure in Mesoamerica because of his many talents. He is best known as the poet king. In his kingdom, wisdom, justice and humanism predominated. He promulgated civil and criminal laws and founded the schools of astronomy, languages, medicine, painting and history. He rebuilt the city of Texcoco by organizing it into neighborhoods, each with its own industry. However, perhaps his main contribution was the introduction of an integrated water management system, with a basin management approach, which has become an extraordinary example of environmental sustainability. The system was planned to solve environmental and food supply problems and was made up of: 1. **Flood control** by: 1.1 a massive dam (Netzahualcóyotl's albadarrón) 17 kilometers long (crossing from Atzacoalco to Iztapalapa) to divide Lake Texcoco in the Lake Texcoco and Lake Mexico that, in addition to preventing flooding, separated fresh water from salt water. 1.2 the Mexico-Tacuba Causeway, the Guadalupe Causeway and the Iztapalapa Causeway with their respective gates and locks. 1.3 Numerous agricultural terraces around the basin, which slow down water velocity and promote infiltration, while making agriculture possible such as those of Caño Quebrado and Tetcotzingo Park. 2. **Reforestation**: Netzahualcóyotl ordered the planting of an ahuehuete forest in Chapultepec to recharge the aquifer. 3. **Intensive agriculture in terraces and chinampas**, complemented by the agricultural milpa system. 4. **Fresh water** for human consumption and agriculture: he built an aqueduct that introduced drinking water to the city of Tenochtitlan from the springs and hills of Chapultepec. This experience reveal that indigenous peoples accepted the conditions of the watershed and adapted to it. During the conquest, this work was destroyed, as well as its conception and relationship with nature. The construction of canals began to dislodge water from the basin and, paradoxically, the drying up of the city.

The renowned architect, landscape architect and urbanist **Mario Schjetnan, General Director of GDU,** presented through pre-recorded video a strategy for rainwater harvesting and subsoil infiltration for Mexico City, based on his project Tecnoparque. He considers that this experience resulted in a successful model

of water collection-infiltration that can be replicated in other areas of Mexico City to solve one of its main water problems. The analysis began with an expert presentation of the hydrological characteristics of Mexico City's basin, a very peculiar urban space as it sits on a lake, reason that explains the floods it has suffered for several centuries. He recalled the enormous engineering work carried out in the 70's that created a deep drainage to extract through the mountains approximately two-thirds of the rainwater entering the basin, which a posteriori generated other problems for the city that require to be solved in the first half of the twenty-first century to secure the future for the city. In this regard, he pointed out that it is imperative to stabilize the infiltration of water in the subsoil and in the aquifers of the city, as more water is extracted than the quantity of water entering in the aquifer. On that basis, he explained the Tecnoparque project, which involved changing the use of the land from industrial to commercial (offices) use on the condition that the municipality did not have to provide any additional drinking water to the site, while prohibiting any entry of rainwater and sewage into the municipal drainage, making necessary a solution based on harvesting, recycling and reinfiltrating of water. Thus, the project was developed to allow rainwater to infiltrate at a distance of 55 meters deep at a rate of 90 liters per second through a system of concrete cells passing the last one through an activated carbon filter, while gray water is treated and poured into water mirrors and is used to irrigate green areas. Extrapolating this experience, Arch. Schjetnan presented a model to restore balance in the Mexico City basin, which is made up of simultaneous actions and strategies at six levels: rainwater harvesting; infiltration into aquifers; water treatment for recycling; equity and fiscal sustainability; distribution (elimination of leaks) and quality; forests-parks and water factories. Ecotechnologies in this case focus on the artificial infiltration of rainwater, presenting architectural solutions that have the capacity to alleviate the large amount of water that precipitates in summer storms (176 mm/hr. average) in a densely populated and paved city thanks to the infiltration into the subsoil. In this regard, he proposed a scheme of cylindrical excavations with a diameter of 1 meter at a depth of 50 to 80 meters (crossing the two volcanic strata located at a depth of 50 and 80 meters), by means of a pipe with perforations at its end for the infiltration of the water collected in 24 hours. He estimated that rainwater harvesting on rooftops with an area of 4 million square meters could infiltrate the aquifer with enough water to reach back an equilibrium in Mexico City or, if necessary, more water could be harvested in the neighbouring State of Mexico. This would address two of the 6 pillars of his model and give hope for the continuity of Mexico City.

Panel on nature-based water ecotechnologies: indigenous knowledge and innovation.

The panel explored examples of nature-based water eco-technologies (for saving, protecting, harvesting, cleaning, reusing, recycling or infiltrating water into natural systems), enabling solutions that meet human needs with minimal or no environmental impact.

The renowned **Landscape Architect and Professor at the University of Pretoria, Graham A. Young**, in his capacity as Moderator-Sherpa of the day, presented the focus of the panel: the impact of water ecotechnologies on communities, with special emphasis on women, community approaches and indigenous knowledge.

Dr. Jean Hugo, Dr. Sean Patrick and Mr. Jason Oberholster, professors in the Department of Architecture at the University of Pretoria, presented a project in the informal settlement of Melusi, in the province of Limpopo.

Dr. Jan Hugo commented on the vulnerabilities of informal settlements to climate change, and their limited infrastructure and water security. He highlighted the complex interplay between the environment, social systems, governance and infrastructure in informal settlements. Traditionally well-served urban areas now face challenges that were once predominantly rural, such as the impacts of climate change, poor water management, and growing vulnerability. These issues manifest themselves in informal urbanization and environmental degradation trends, with clear examples in both urban and rural settings, specifically, the Melusi informal settlement in Pretoria West and Thohoyandou in rural South Africa. He emphasized the interconnectedness between human well-being and the environment, highlighting how social structures, policy frameworks, urban development and infrastructure directly influence and are influenced by the environmental health. This relationship forms a complex nexus that involves spatial, material, environmental and social dimensions, giving rise to multi-layered risks and challenges. In the case of Melusi, the context map reveals the fragmented nature of access to basic services: Melusi 1 maintains an illegal supply connection with Melusi 2; Melusi 2 receives official water and electricity from the city of Tshwane (COT); and Melusi 3 remains completely disconnected. The area is zoned as Industrial 1, complicating service delivery and urban planning.

Mr. Jason Oberholster discussed the environmental and social issues related to water quality and safety in the Melusi settlement, including the presence of contaminants in the water storage tanks. A community survey found that 60% of the population in that place depends on contaminated water sources and 65%

store water in dirty containers. Jason Oberholster also presented the process of developing a community action plan in the locality: the first year of the project focused on physical mapping and data collection. An analysis of human needs was conducted in 2024. The final phase in 2025 focuses on developing a comprehensive community action plan as co-creation with the community. Regarding water, he indicated that under the plan, wetlands, quarries, groundwater and runoff were identified and more specifically, wastewater discharge sites that coincide with the location of latrines, with their consequent risk to health. The information collected allows to observe how floods impede economic activity for the population in situations of poverty or extreme poverty.

Dr. Sean Patrick conducted a mixed-methods study in Melusi focused on water quality and practices, using chemical analysis and community surveys. The findings revealed the prevalence of poor quality water, dangerous usage patterns, and associated public health risks, underscoring the urgent need for sustained community monitoring and education. To address these issues, the team launched the "Melusi: Ground Level Mapping and Survey, Co-Creating Wellness and Human Dignity Project," an initiative that runs from 2023 to 2025. The research identified four local water sources: wetlands, quarries, groundwater, and runoff. Water samples from urban and rural areas showed chemical contamination and estrogenic activity. The water from the urban dam reached 0.216 nitrogen (ng/L) and the water from the rural river ranged from 0.08 to 0.69 ng/L. Well water in rural areas proved safer but still under pressure. Pharmaceutical contamination patterns also differed in the two contexts. Urban pollution is likely due to poor sanitation infrastructure and unsafe water storage, while rural areas face chronic exposure to antibiotics, which could create antimicrobial resistance. The aim of the project is to foster an empowered urban community in Melusi through improved urban landscapes, economic well-being and transformative education, promoting human dignity and resilience in the face of environmental and social vulnerability.

Dr. Ida Breed, Associate Professor and Coordinator of the Department of Architecture at the University of Pretoria presented the project "Green Infrastructure Improvements along the Sand River", funded by the Danish Ministry of Foreign Affairs. The conceptual framework of the project lies in green and blue infrastructure, sustainable transformation and community engagement. The phases of the project consist of: assessment of the status quo, co-centred unit, centre design and co-implementation. Among the challenges faced, she mentioned legal barriers, board divisions and political interests, and the importance of ownership and community awareness. **Dr. Breed** gave an overview of the CONSUS research project, which began in June 2023 and will conclude in June 2027. Its main objective is to generate context-specific knowledge that aligns with South Africa's development strategies and needs as

a partner country of Denmark, while contributing to Denmark's international cooperation agenda. An important component of the project focuses on strengthening research capacity in the region. Based on the postulates of the 2021 World Bank reports, he highlighted the multiple benefits of green spaces, such as environmental resilience, improved public health, and social cohesion. The CONSUS project aims to support sustainable transformation driven in the context of South Africa's blue-green cityscapes using nature-based solutions (NBS) and collaborative learning models. Funded by the DANIDA Fellowship Centre, CONSUS is organised into five interrelated work packages, led by researchers from Tshwane, South Africa, and Aarhus, Denmark. These are: 1) Institutional transformative capacity building, 2) Community action and ownership, 3) Nature-based design experiments, 4) Awareness of the ecological state and restoration potential, 5) Communication and outreach. In the second year of the project, CONSUS had already achieved several key milestones such as: research advances, environmental improvements, skills transfer, environmental awareness, capacity building and project scale-up. The project is developed in multiple phases: Phase 1 (September 2023): Assessment of the status quo. Phase 2 (August-December 2024): Community-focused co-design. Phases 3 and 4 (January 2025-March 2026): Co-implementation and adaptive co-management. Final phase (October 2026): Project delivery event. CONSUS is guided by five strategic pillars for its Multi-Stakeholder Groups (MSGs): 1) Landscape research and design, 2) community empowerment workshops, 3) green space improvement projects, 4) partnerships and knowledge sharing, 5) institutional strengthening. Despite its progress, CONSUS faces several challenges, including legal, political, and financial barriers, which can hinder project implementation and long-term sustainability.

Dr. Kathy Berger from Denmark focused on the learnings shared between Denmark and South Africa around nature-based solutions (NBS), emphasizing the importance of co-engagement in environmental restoration efforts in two distinct contexts: Aarhus, Denmark and Tshwane, South Africa. She began by providing a European perspective, pointing out how degraded ecosystems in Denmark are now subject to the European Union's Nature Restoration Act, prompting a shift from intensive agriculture to the rehabilitation of natural landscapes. In Denmark, this transition is guided by frameworks such as the Danish Tripartite Green Deal, which supports collaborative environmental transformation. The focus is on the joint engagement for the "new nature", where communities and stakeholders come together to determine what changes are needed and for whom, based on shared values and participatory principles. In the context of the CONSUS project, similar approaches are being applied in Mabopane, Tshwane, with specific objectives including nature rehabilitation, nature-based design and environmental awareness. For example, a biodiversity bingo event was organised to help children and families engage and learn about

local green spaces, as well as a construction workshop in June focused on building skills for sustainable infrastructure improvements. The presentation highlighted how co-engagement activities are critical in both contexts, despite the different cultural, ecological and political environments. These activities aim to build relationships between people and nature, foster co-ownership, and instill hope for a more sustainable and connected future. A key idea shared was that restoration without people is insufficient. In Europe, where much of the natural environment has already been lost, **there is an urgent need not only to restore landscapes, but also to relearn and reconnect with nature, something that has eroded along with the loss of indigenous knowledge and deep-rooted ecological connections**. Similarly, in South Africa, they highlight **involving communities in co-design and decision-making and ensuring that restoration efforts are meaningful, inclusive, and lasting. The broader lesson is that true environmental restoration must be people-centered, combining design, planning, education, and cultural reconnection, from the grasslands of Denmark to the rivers of South Africa.**

Emilio Becerril Laversin presented **Isla Urbana**, an initiative dedicated to rainwater harvesting in Mexico and abroad. He highlighted scalable solutions for water sustainability in Mexico and Latin America, focusing on the use of rainwater harvesting systems. The initiative began in 2009 and has been operating for more than 15 years, having positively impacted about 475,000 people through the installation of approximately 45,000 rainwater harvesting systems for human contact and consumption, reducing the need for other local water sources and the overexploitation of aquifers and surface waters. The model also includes socio-environmental education; community relations and capacity building and dissemination of information to transform people's relationship with water. A fundamental change in the Isla Urbana model is the transformation of the perception of a situation of water scarcity in Mexico City to a situation of abundance, by taking advantage of the intense summer rains, and with it, the strengthening of people's autonomy with respect to water. Isla Urbana has developed technologies that can be adapted to virtually any context and that comply with Mexico City's drinking water standards. Its systems can generate autonomy for families, schools, community centers, industries, government offices, agriculture, among others, providing devices for essential services such as first discharge, sedimentation, decantation, disinfection and filtration of sediments. First, it seeks to reduce the need for water from other resources (aquifers, rivers, lakes) and provide a safe source of water for 5 to 6 months a year, satisfying at least 40% of the annual water demand. Beyond the installation, community participation and knowledge transfer are promoted to develop capacities, which has an impact on the full adoption of the systems by the communities and on permanent access to water. In order to move from harvesting equipment as tools to a daily practice, the community is required to

actively participate in both the construction and maintenance of the systems through social work and awareness-raising. This approach not only ensures the sustainability of the project, but also fosters skills development and community empowerment. Historically, access to rainwater during the rainy season was the norm, but this initiative ensures water availability even during dry periods, improving water security throughout the year. The distribution of the systems is equitable among the communities, with the aim of inclusive access. Many of the systems are subsidized and rely on government funding or private funding. The objective is to achieve massification.

After a series of questions and answers, **Arch. Graham A. Young** summarized the key points of the presentations and emphasized the importance of practical solutions. **He suggested three practical steps or lines of future work in South Africa: prioritizing the repair of water leaks, decentralizing water design through eco-technologies (such as rainwater harvesting), and educating the public about water conservation.**

He highlighted the need for government support, tax incentives and community participation in solving water issues and concluded by thanking the organizers, panelists and audience for their participation and contributions to the discussion.

IMTA hybrid session as part of the Water Game Changers Award

M.G.I.A. Juan Manuel Figueroa Mendiola, Dr. Alejandra Peña and Viridiana Guerrero Arroyo, experts from the Mexican Institute of Water Technologies (IMTA) referred to the implementation of ecotechnologies, particularly rainwater harvesting systems (RHW) in rural communities in central and northern Mexico. They also presented the dry toilets installed to improve sanitation. The discussion extended to the broader context of access to water and sanitation. Mexico has faced significant challenges in accessing safe, sufficient, and high-quality water, sanitation, and hygiene services, particularly in rural and peri-urban areas. Panelists noted that the human rights framework informs government action as a matter of social justice and public policy and has placed people at the center of attention, particularly those who invariably fall outside institutional arrangements, budget availability, and political will. Speakers highlighted the positive role of government programmes that deploy decentralized and alternative technologies to meet local water needs. They also highlighted the importance of a two-phase training model, first focused on construction and design and second, on post-construction maintenance and operation because many implemented water eco-technologies fail shortly after installation due to

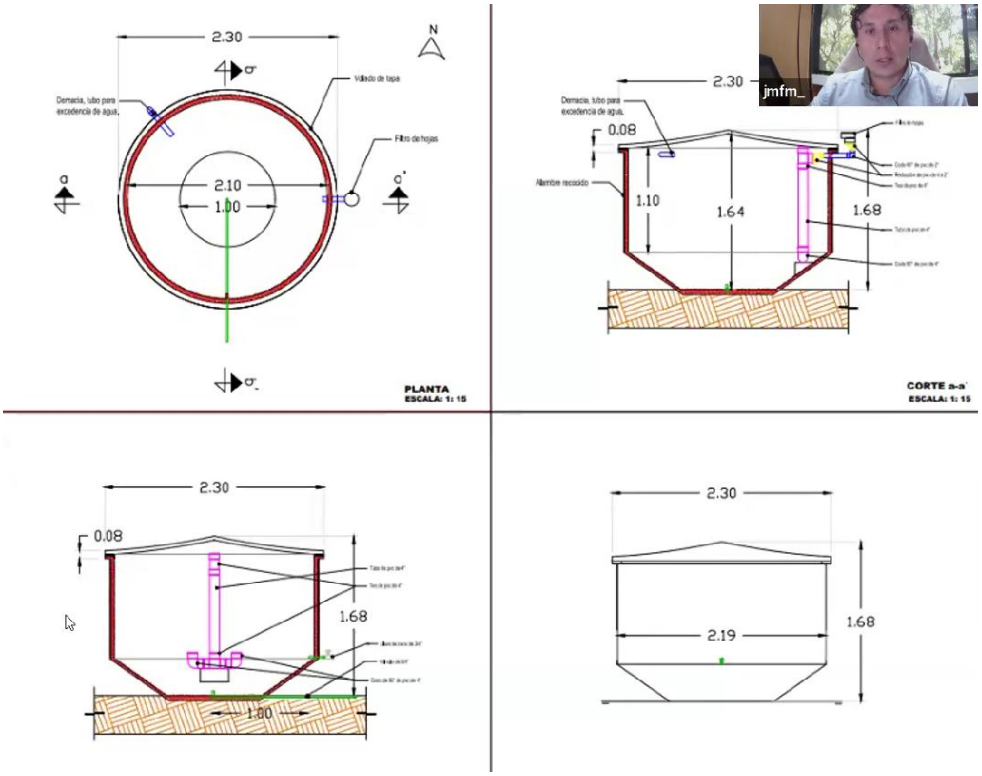
factors such as maintenance or poor fee collection. **They recognized that ultimately, the long-term success of the use of eco-technologies depends on how they are introduced. Effective implementation requires respecting local knowledge, ensuring community participation, and promoting environmental and social sustainability. It also requires fiscal support such as the deduction of taxes for the acquisition of technologies by families and communities. These components are essential to foster social adaptation and collective action, ensuring the resilience and effectiveness of water and sanitation initiatives in marginalized areas.**

Cisterns

MGIA Juan Manuel Figueroa Mendiola of IMTA presented the following types of cisterns

Calabash Cistern

(developed jointly with Isla Urbana in Chihuahua, northern Mexico).



This type of cistern has an approximate radius of 2.20 meters. It is known by that name because it is shaped like a pumpkin (“calabaza” in Spanish). It is the most economical because it uses materials made by the community, such as adobe.

How to build

Once the diameter of 2.20 meters has been established on the soil, an excavation is made in the center. The adobe bricks are placed vertically and then filled with soil, given them a firm finish with cement-sand in the proportion of 1 to 5.



Once the above has been done, a chicken coop-type mesh is placed for structural reinforcement over the adobes in the shape of a cross. Subsequently, the adobes are pilled up horizontally until reaching an approximate height of 1.5 meters.


A soil-like finish is then applied to the inside surface of the adobes.

Once dried, a first cement-sand flattening is applied in the inside.

In parallel, the lid of the cistern is built up on the first day. It is built with pre-fired wire and sand cement.

Subsequently, another four flattenings are applied inside the cistern with at least 6 hours of waiting between each leveling.

Subsequently, the lid of the cistern is placed on the top of the cistern with the help of about 10 people.

On the sixth day, the adobes -that functioned as centring or formwork- are removed from the outside of the cistern, and the dust is removed with a wire brush.

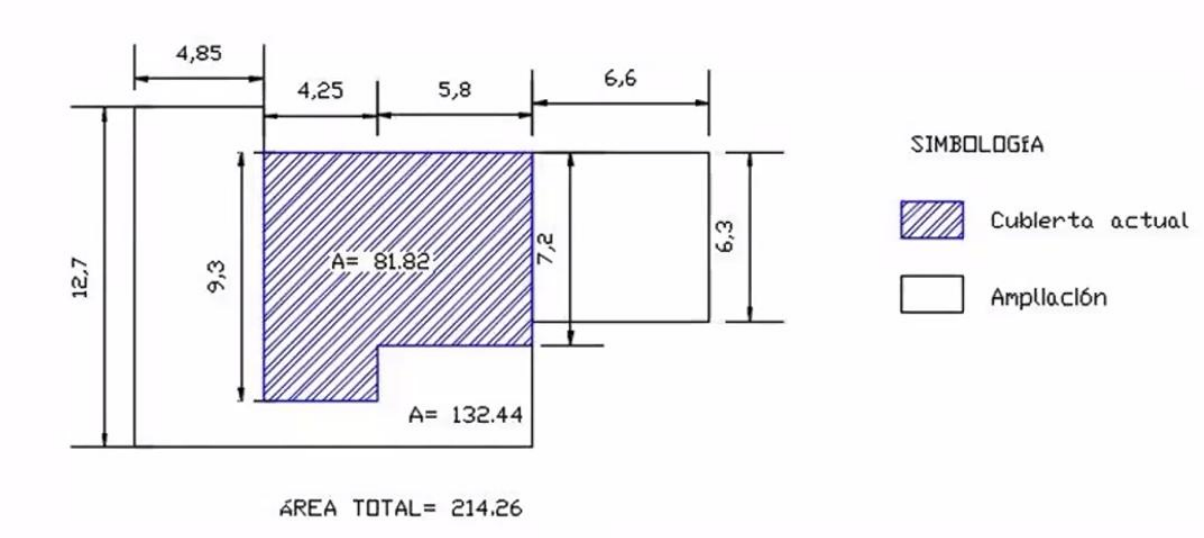
A pre-fired wire is placed in the outside circumference of the cistern with a separation of 1 or 2 centimeters between each wire.

Subsequently, the adobes are removed from the lower part, along with the soil and dust, and a single flattening is given on the outside of the cistern to cover the pre-fired wire.

The cistern must be watered daily during its construction process and six days later.

Capuchin Cistern

It has a capacity of 50,000 to 70,000 liters, much larger than the calabash cistern. It was developed in the community of El Mirador, in Puebla, calculating that each person in the community has a consumption of 50 liters of water per day.



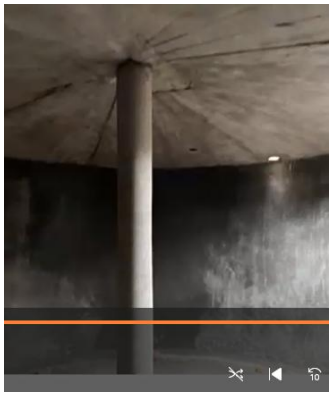
This type of cistern can be built superficially or half-buried.

It is built with partitions (bricks) placed on the edge (horizontally).

How to build

A wall of approximately 2.20 meters high is raised.

A concrete column is placed in the center of the cistern to support the monolithic concrete slab.



The partition walls are reinforced with an electro-welded wire mesh of half an inch it as well as rod belts at a distance of 80 centimetres.

This type of cistern also has five interior flattening and one exterior flattening covering the metal entirely. The metal has to be covered completely because otherwise it will rust.

A separation system for the first rain can be installed such as the one below, which separates the dirt before the water enters the cistern.

A person step can be placed on it to facilitate its maintenance or cleaning.

An outlet pipe can also be installed so that the water can be drained from the cistern when it reaches a certain level.

Yukuchaac Cistern

It is an iron-cement cistern with an approximate diameter of 2.50 meters and a height of 1.75 meters.

How to build

The surface is cleaned. A diameter of 2.20 meters is drawn and a sand cement template is placed. Then the structure is assembled with an electro-welded wire mesh and chicken koop-type wire. It is important that a plastic is placed around this structure to work as a formwork.

Subsequently, a first flattening is applied with a slightly hard mixture. The plastic sheet will be used to spread the mixture from bottom to top over both meshes.

This cistern consists of 6 flattening, waiting at least 6 hours between each flattening.

The lid of the cistern is very similar to that of the calabash cistern, which is made on the first day and placed on the fifth day at the top of the cistern with the help of approximately 10 to 12 people.

On the sixth day, the cistern is finished with a cement and water coat in the inside with the use of a brush, to close the pores and prevent leaks.

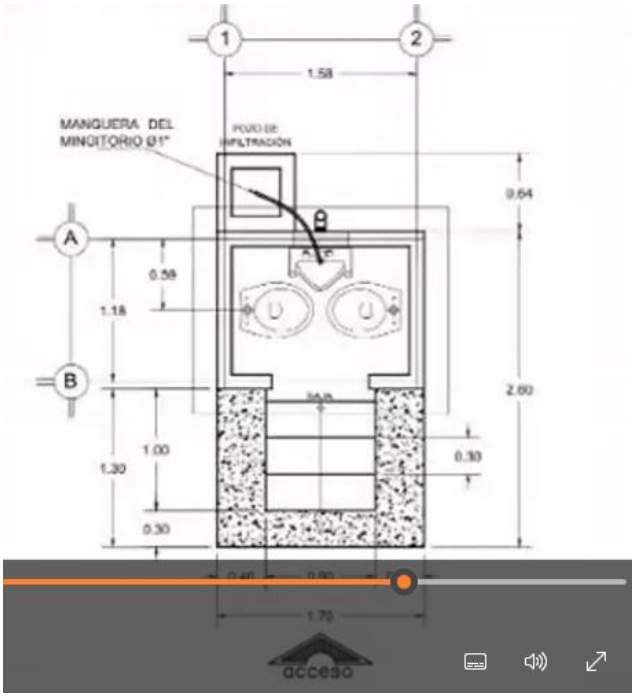
On the outside, the cistern is flattened with cement covering the electro-welded wire mesh.

During its construction and at the end of the day, the cistern must be covered with a plastic, as well as in the following six days.

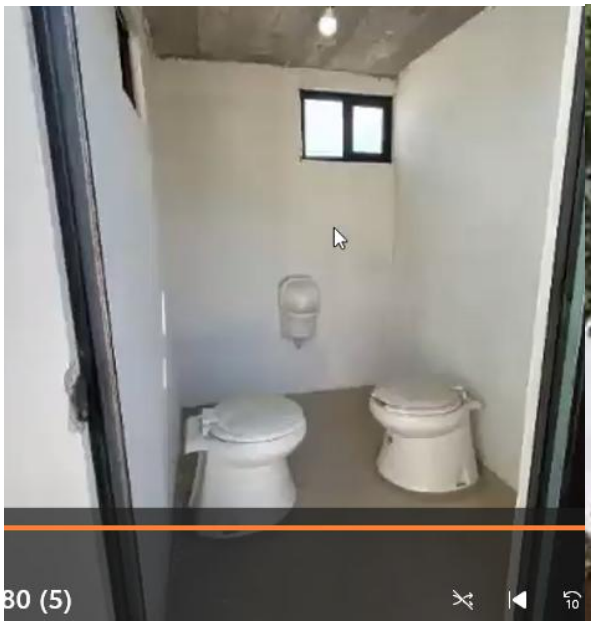
It must be watered daily during its construction process and six days later.

Dry toilets

This bathroom has two toilets to be used every six months, which gives time for the waste to be de-composted and used as fertilizer for agriculture.



Because it has two chambers for de-composting, dry toilets are usually built overhead.



There are other models of dry toilets available that, in addition to contributing to an effective saving of 40% of water consumption, are one of the most sustainable and nature-friendly solutions. Multiplied by the number of people on the planet, their use would contribute to a true revolution in the field of water and waste management, to the right to water and sanitation, and to the enrichment of the soil.

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