First International Forum for Climate Adaptation (ICAF)

AGRO | WATER | ENERGY | HEALTH

FORUM REPORT

Organized by the consortium : MENSUR | CERD | ADAC | IRD

Ayla Palace, Djibouti | January 19-21 2026

TABLE OF CONTENTS

EXECUTIVE SUMMARY **3**

INTRODUCTION **6**

FORUM OBJECTIVES **6**

DAY 1 – MONDAY JANUARY 19TH, 2026 ..... **8**

OFFICIAL LAUNCH OF THE FORUM: OPENING REMARKS **8**

SESSION 1: THE SCIENTIFIC AND POLICY CHALLENGES OF ADAPTING TO CLIMATE CHANGE (PANELS 1–4) **22**

PANEL 1 - ALIGNING SECTORAL PRIORITIES FOR ADAPTATION: A PUBLIC GOVERNANCE CHALLENGE 22
PANEL 2 - RESEARCH FOR ADAPTATION: CURRENT STATUS AND CHALLENGES 28
PANEL 3 - FINANCING ADAPTATION: SCALES OF ACTION, CHALLENGES, AND STAKEHOLDERS 32
PANEL 4 - HIGHER EDUCATION AND MULTI-STAKEHOLDER TRAINING FOR ADAPTATION 35

DAY 2 – TUESDAY, JANUARY 20TH 2026 ..... **38**

SESSION 2 : FROM VULNERABILITY TO SUSTAINABILITY: THE CHALLENGE OF PRIORITY AREAS FOR ADAPTATION AND INNOVATION (ZAPI) (PANELS 5–9) **38**

PANEL 5 - TROPICAL MOUNTAINS AND HIGHLANDS (ZAPI IN TANZANIA AND ETHIOPIA): WHAT DOES THE FUTURE HOLD FOR THESE BIODIVERSITY HOTSPOTS? 40
PANEL 6 - SEMI-ARID AND ARID AGRO-PASTORAL ZONE (ZAPI KENYA & DJIBOUTI) – TOWARD SUSTAINABLE AND INNOVATIVE TERRITORIES 43
PANEL 7 - CLIMATE, VULNERABILITY, AND RESILIENCE: WHAT OBSERVATIONS AND OPEN SCIENTIFIC DATA PLATFORMS? 47
PANEL 8 - THE WATER-ENERGY-INFRASTRUCTURE NEXUS: INTEGRATED SOLUTIONS FOR REGIONAL RESILIENCE 51
CS4RRA INITIATIVE: CO-CONSTRUCTION OF RESEARCH AND INNOVATION IN CLIMATE SERVICES BETWEEN AFRICA AND EUROPE 54
PANEL 9 - BIODIVERSITY – FOOD SECURITY – HEALTH LINK: NATURE-BASED SOLUTIONS AND RESILIENT FOOD SYSTEMS 55

SESSION 3 : INNOVATING AND CREATING BUSINESSES FOR CLIMATE CHANGE ADAPTATION (PANELS 10–11) **59**

PANEL 10 - INNOVATION FOR ADAPTATION: YOUNG INNOVATORS AT THE FOREFRONT 59
PANEL 11 - NEW TECHNOLOGIES FOR ADAPTATION (DIGITAL TOOLS, AI, AND EARLY WARNING SYSTEMS) 1

RECOMMENDATIONS **4**

CLOSING REMARKS **15**

ACKNOWLEDGEMENTS: **16**

ANNEX I – BIOGRAPHIES OF PANELISTS AND MODERATORS **16**

ANNEX II – EXHIBITOR PROFILES (INNOVATION STANDS) **25**

ANNEX III – LIST OF PARTICIPANTS **29**

ACKNOWLEDGMENTS

The Ministry of Higher Education and Research (MENSUR) of Djibouti extends its most sincere thanks to the Steering Committee of the FEF-ADAC project and the General Directorate of CERD, as well as to the national, regional, and international partner institutions.
MENSUR also thanks the IRD's East Africa office and its representative in Djibouti for their ongoing support. Finally, this event would not have been possible without the support of the French Embassy in Djibouti, particularly its Department of Cooperation and Cultural Action, supported by Expertise France: We extend our warmest thanks to them all.

EXECUTIVE SUMMARY

Held in Djibouti City from January 19 to 21, 2026, under the High Patronage of His Excellency the President of the Republic and under the auspices of the Ministry of Higher Education and Research, with the support of 11 international institutional partners, the first International Forum on Climate Adaptation (ICAF 2026) marks a major paradigm shift: climate adaptation is becoming a pillar of public action, research, and international cooperation—a commitment and investment in sovereignty, stability, and development. For the most vulnerable countries, particularly in East Africa, fragmented, sector-specific, and reactive responses are no longer adequate to address the scale of climate risks. Adaptation now requires a proactive approach, grounded in science, data, human capacity building, and the local anchoring of public policies.

ICAF 2026 positions science and higher education as policy levers in their own right, capable of informing decision-making, reducing uncertainty, and transforming climate constraints into viable development pathways. The Priority Adaptation and Innovation Zones (ZAPI) and the Doctoral Alliance for Climate Adaptation (ADAC), a project co-financed by the Équipe France Fund of the French Ministry for Europe and Foreign Affairs (MEAE), constitute two complementary and foundational instruments addressing these challenges. The Forum highlights that the countries least responsible for greenhouse gas emissions are suffering the most severe climate impacts. This asymmetry creates systemic risks affecting water and food security, public health, social cohesion, and political stability.

In this context, the ability of states to generate, manage, and utilize their own scientific knowledge and climate data becomes a matter of decision-making sovereignty. Reliance on data that lacks contextualization limits the relevance of public policies and undermines their feasibility.
Effective climate policies rely on systemic and integrated approaches. The water–energy–infrastructure and biodiversity–agriculture–health (One Health approach) interfaces constitute priority operational frameworks. Climate adaptation is not merely an environmental issue: it concerns land-use planning, production systems, essential services, and public governance.

The lack of climate, environmental, and socioeconomic data, weak national capacities in observation, modeling, and analysis, and difficulties with data access, interoperability, and ownership seriously threaten countries' ability to commit to adaptation.
The challenge is no longer merely access to data, but its governance, scientific quality, temporal continuity, and effective use in public decision-making. Without these prerequisites, advanced digital tools, including artificial intelligence, cannot produce a real impact.

The ICAF 2026 asserts that the legitimacy and sustainability of research funding depend on its ability to generate actionable knowledge that can be directly utilized by public decision-makers, local governments, and economic and social stakeholders.
The convergence of climate sciences, life sciences, humanities and social sciences, digital technologies, and local knowledge appears to be an essential prerequisite for designing robust, acceptable, and locally tailored solutions.
Universities and research institutions are called upon to become key interfaces between science, politics, and society. The Forum emphasizes the modernization of educational programs (specialized master's degrees, interdisciplinary doctorates), the development of hybrid skills linking data, modeling, governance, and local action, and regional and international academic cooperation (South–South and South–North). In this context, the Doctoral Alliance for Climate Adaptation (ADAC) is a partnership instrument dedicated to these challenges and to the emergence of a new scientific community capable of supporting local, national, and regional adaptation strategies oriented toward sustainable solutions.

In this context, the Doctoral Alliance for Climate Adaptation (ADAC) is a partnership initiative dedicated to these challenges and to fostering the emergence of a new scientific community capable of supporting local, national, and regional adaptation strategies focused on sustainable solutions.
The ZAPIs are the main operational tool proposed by ICAF 2026 to bridge science, public policy, and local action. They target the most vulnerable regions and populations, generate context-specific data and knowledge, and test and scale up co-developed adaptation solutions. ZAPIs function as territorial laboratories, integrating scientific observation, doctoral research, community participation, and innovation.
Experiences in mountainous areas, highlands, and arid agro-pastoral systems show that:
• land degradation and climate variability directly threaten the viability of socio-ecosystems,
• integrated management of water, soil, and biodiversity is a priority,
• active community involvement enhances the effectiveness and sustainability of solutions.

ZAPIs also demonstrate the value of enhanced regional cooperation in addressing cross-border issues (water basins, pastoralism, biodiversity) and in feeding the data and knowledge-sharing platforms (open science) necessary for everyone's adaptation.
The Forum emphasizes that data is a strategic infrastructure for adaptation. ZAPIs offer a prime framework for structuring open and sovereign data platforms, adhering to FAIR principles, and integrating instrumental, satellite, and socio-economic data with local knowledge.

Open science is presented not as an end in itself, but as a means to make public policies more effective, provided it is guided by clear governance and mechanisms for mediation between scientists, citizens, and decision-makers.
ICAF 2026 highlights the central role of youth and innovation in climate adaptation. The solutions presented demonstrate that effective innovation rests on solid scientific foundations. Digital technologies, AI, and early warning systems are only relevant if they are backed by robust data and institutions capable of utilizing them, and ZAPIs provide a relevant framework for testing, validating, and disseminating these innovations. Investing in the training, incubation, and networking of young innovators thus emerges as a long-term social and economic driver.

The ICAF 2026 already calls for three key priorities:
• Integrate climate adaptation as a cross-cutting priority in public policy and research (sustainability science)
• Sustainably strengthen national and regional scientific capacities for adaptation
• Embed ZAPIs and ADACs within stable institutional and budgetary frameworks, making science, data, and higher education explicit pillars of climate governance. In conclusion, the First International Forum on Climate Adaptation establishes that climate adaptation is a long-term political, scientific, and societal endeavor that requires continuous investment in knowledge, institutions, and territories.

For policymakers, academics, and financial stakeholders, the challenge is no longer to demonstrate the necessity of adaptation, but to create the structural conditions for its effective implementation, grounded in science, cooperation, and foresight.

****

INTRODUCTION

In response to the climate emergency, which is having a particularly severe impact on arid and semi-arid regions, the Republic of Djibouti took the initiative to organize a collective and concrete response by hosting the first edition of the International Climate Adaptation Forum (ICAF 2026). Held under the High Patronage of His Excellency the President of the Republic and under the auspices of the Ministry of Higher Education and Research, this major event took place from January 19 to 21, 2026, at the Ayla Hotel in Djibouti City.

ICAF 2026 emerged from a strategic observation: in the Horn of Africa, the combined effects of aridity, climate variability, and socioeconomic pressures directly threaten the foundations of development and the resilience of populations. Adaptation was therefore no longer an optional or sector-specific issue, but a cross-cutting imperative concerning water and food security, public health, risk management, and social cohesion. This forum was part of a dual ambition: that of adaptation diplomacy, aimed at positioning Djibouti as a leading regional platform for climate solutions in arid environments, and that of pragmatic action, to bridge the gap between science, public policy, and on-the-ground realities. The goal was to translate commitments into tangible results for the most vulnerable communities.

FORUM OBJECTIVES

ICAF 2026 was designed to serve as a catalyst for accelerated and measurable action on climate resilience. Its strategic objectives were structured around four key pillars:

1. Facilitate the coordination and strengthening of public adaptation policies. The aim was to create a direct dialogue between policymakers, national and regional institutions, and technical and financial partners to align priorities. The ambition was to contribute to the development of integrated policy roadmaps grounded in the specific realities of arid and semi-arid zones.

2. Strengthen scientific, technical, and institutional capacities. The Forum aimed to place science at the heart of public action by ensuring the sharing of the latest knowledge, up-to-date data, and the most relevant modeling tools for adaptation. A key objective was to precisely identify critical skills gaps in order to design targeted and operational training programs.

3. Highlight and promote the exchange of innovations and concrete solutions. ICAF 2026 served as a demonstration platform for applicable solutions, such as resilient agriculture techniques or early warning systems. It sought to disseminate feedback and compelling case studies to inspire and facilitate their replication on a larger scale.

4. Foster the development of partnerships and operational collaborations. The Forum was designed to catalyze networking and the development of concrete projects among governments, the private sector, researchers, civil society, and donors. The ultimate goal was to produce actionable recommendations and secure firm commitments to ensure effective implementation following the event.

Key figures
ICAF 2026

Total number of participants

350+

Panels

11

Exhibitors

7

Partners & organizers

5

ADAC

CERD

ICAF 2026
INTERNATIONAL CLIMATE ADAPTATION FORUM

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

Day 1 – Monday January 19th, 2026

Official Launch of the Forum: Opening Remarks

His Excellency Mr. Ismail Omar Guelleh, President of the Republic of Djibouti

In opening the International Climate Adaptation Forum (ICAF) from Djibouti, *"a historic crossroads of peoples, exchanges, and knowledge"* the President of the Republic of Djibouti shared the fundamental conviction that the fight against climate change is won through the convergence of political will, the collective intelligence of nations, and a determined reliance on science.

He forcefully reiterated that climate change is no longer a distant hypothesis, but a tangible reality that affects us all. Its effects—droughts, water stress, and pressure on ecosystems—pose an increased risk to the economic, social, and environmental stability of nations, particularly the most vulnerable ones. He denounced a profound global injustice: the countries least responsible for greenhouse gas emissions are also those suffering the most severe impacts.

In light of this situation, the President emphasized the need to act without delay, building on three inseparable pillars: foresight, resilience, and action. Adaptation, at the heart of the national strategy, directly concerns food security, land-use planning, coastal protection, and biodiversity. There can be no effective adaptation without reliable data or the integration of local expertise. It is within this framework that the Doctoral Alliance for Climate Adaptation (ADAC) was established, designed as a strategic tool to support knowledge and decision-making.

The President emphasized that climate adaptation must be driven by strong political will. Training new researchers and strengthening national capacities means investing in African youth and sending them a message of confidence: their work is an act of responsibility for the future. For, as he stated, "there is no sustainable sovereignty without sovereignty over knowledge."

Addressing the central issue of financing, the President issued a clear call to technical and financial partners, inviting them to support the efforts of Djibouti and vulnerable countries. He reaffirmed that South-South and North-South partnerships, as well as private-sector engagement, are essential levers. He presented ADAC as an open and synergistic platform, complementary to existing efforts.
In conclusion, the President framed the forum around a choice: knowledge versus ignorance, foresight versus reaction, and cooperation versus isolation. He affirmed Djibouti's determination, demonstrating that a nation, through the strength of its conviction, can play a major role in the global climate response. In this context, the ADAC positions itself as a sustainable driver of transformation and hope, capable of uniting efforts toward resilience grounded in knowledge, cooperation, and international solidarity.

HE. Mr Ismaïl Omar Guelleh
President of the Republic of Djibouti

H.E. Dr. Nabil Mohamed Ahmed, Minister of Higher Education and Research (MENSUR) of Djibouti

In his speech, the Minister placed the fight against climate change within the broader framework of the policy of good neighborliness and peace championed by the President of the Republic, asserting that it was a shared responsibility in the face of a global challenge.
He presented an indisputable scientific assessment, emphasizing that greenhouse gas concentrations have reached historic levels and that the effects are now measurable and visible: ocean warming, an increase in extreme weather events, and threats to coastal areas. Faced with this emergency, he insisted, it is no longer a matter of observing but of anticipating, adapting, and taking action.

Guided by the Head of State's clear vision, Djibouti's response is strategic: placing higher education, research, and innovation at the heart of climate action. For, as the Minister noted, "there is no sustainable resilience without science, and no effective climate policy without solid, context-specific knowledge." He thus praised the crucial role of women, who are on the front lines facing the impacts and are essential actors in building resilience.

The ICAF, he explained, embodies this ambition: to make Djibouti a think tank and a bridge between Asia, Africa, and the West to develop solutions. This approach is based on fostering ambitious academic partnerships, such as the ADAC, and on training a new generation capable of developing innovative technologies.

In conclusion, the Minister reaffirmed the central role of youth in this effort. Adaptation cannot be conceived without those who are already experiencing its consequences. Involving young people in knowledge production and decision-making is, in his view, the key to ensuring sustainable, inclusive, and realistic solutions.

HE. Dr Nabil Mohamed Ahmed
Minister of Higher Education and Research

Dr. Jalludin Mohamed, Director General of the Djibouti Center for Studies and Research (CERD)

In his remarks at the opening ceremony, the Director General of CERD painted a grim picture of the impacts of climate change, which are profoundly affecting the populations of East Africa: shifting seasons, disappearing pastures, rising temperatures, infrequent but violent rains, soil degradation, forest decline, and water scarcity in arid zones. He emphasized that these upheavals are undermining biodiversity, traditional ways of life, and economic activities, while exacerbating climate-induced migration.

He highlighted a major limitation for the region: the inadequacy of global climate models, which are often unreliable when applied to the specific realities of East Africa, thereby weakening the scientific foundation of public policy and sustainable development.
More than twenty years ago, in the face of this emergency, a clear choice was made: to act rather than to suffer. This decision gave rise to the vision of building a regional scientific community dedicated to climate research, mitigation, adaptation, and resilience. The Director-General expressed special gratitude to the President of the Republic of Djibouti, His Excellency Mr. Ismaïl Omar Guelleh, whose steadfast support has made this vision a reality.

It was in this context that he presented the ADAC project, funded by France, which brings together scientific institutions from Djibouti, Ethiopia, Kenya, Somalia, and Tanzania, in partnership with the French Embassy in Djibouti, the French National Research Institute for Sustainable Development (IRD), and the University of Djibouti. He explained the innovative concept of ZAPIs (Priority Adaptation and Innovation Zones), designed as spaces that foster a multidisciplinary and participatory approach. These zones bring together scientists, decision-makers, and local communities to co-develop knowledge, conduct long-term observations, and propose concrete solutions tailored to on-the-ground realities.

He noted that the forum was intended to facilitate the drafting of the ADAC Charter, a founding document committing partners to putting science at the service of climate adaptation, sustainable development, and resilience. He emphasized the indispensable role of science in filling knowledge gaps and informing decisions, particularly in regions where a lack of understanding of the specific impacts persists.

In conclusion, he emphasized that climate adaptation is a vital necessity and that this forum marks a decisive step toward a regional research strategy, based on cooperation, knowledge sharing, and scientific excellence, for the benefit of the people of East Africa. He concluded by thanking the regional and international scientific community, the experts, members of civil society, and the entire organizing team.

Dr Jalludin Mohamed
Director General of CERD

Dr. Valérie Verdier, President and CEO of the French National Research Institute for Sustainable Development (IRD)

After thanking the Djiboutian authorities for their commitment to science and acknowledging long-standing partners such as CERD, the IRD CEO began her remarks by highlighting the tangible and harsh reality of climate change. Droughts, floods, coastal erosion, and food insecurity are already weakening societies, making adaptation an immediate necessity and a collective endeavor.

She praised Djibouti's visionary initiative through the ADAC and the ZAPI concept. These ZAPIs are presented as laboratories where concrete, locally rooted solutions are developed in collaboration with local communities.
In the face of the climate emergency and geopolitical tensions, the CEO advocated for science as a strategic lever for resilience and sovereignty. She called for strengthened scientific multilateralism and sustainable research funding, the only means capable of providing the necessary long-term observation.

She outlined her vision of a science that is universal yet also interdisciplinary, participatory, and innovative, capable of integrating scientific and local knowledge. Emphasis was placed on open science, strengthening the links between research and public decision-making, and the imperative to facilitate the transition from knowledge to action, particularly by relying on young people and tools such as artificial intelligence, used in an ethical manner.

In conclusion, Dr. Verdier called for intensifying collective engagement with the hardest-hit regions. She emphasized that the ICAF provides a valuable space for jointly building fair, inclusive, and sustainable adaptation pathways, grounded in dialogue and scientific cooperation.

Dr. Valérie Verdier
President and CEO of IRD

Prof. Daniel Olago, Department of Earth and Climate Sciences, University of Nairobi, Kenya; former member of the Intergovernmental Panel on Climate Change (IPCC)

He highlighted the fundamental role of scientific assessments, such as those by the IPCC, in establishing a solid evidence base essential for developing effective climate policies at all levels, from the international to the local. He emphasized that climate change directly threatens progress toward sustainable development, as well as food and water security, ecosystems, biodiversity, and socioeconomic stability.

He presented the ADAC as a concrete response to these challenges. This alliance brings together universities, research centers, donors, and public and private partners around a central objective: to strengthen training through research and produce adaptation solutions in ZAPIs. Essential activities such as monitoring, forecasting changes, decision support, and early action are at the heart of its program.

Professor Olago emphasized the imperative of building a critical mass of young researchers, equipping them with 21st-century skills, particularly in artificial intelligence and machine learning. This new generation of scientists must be capable of generating the knowledge and solutions needed to manage the systemic risks of climate change and build resilience on a large scale—a path seen as essential to sustainable growth.

In conclusion, he expressed his expectations regarding the implementation of this program, calling for large-scale collaboration among all stakeholders (universities, research institutions, donors, the private sector, and political leaders) to realize the vision of cohesive and sustainable socio-ecosystems, particularly those currently in vulnerable situations.

Prof. Daniel Olago
Chairman of the Department of Earth and Climate Sciences,
University of Nairobi

Signing of the Charter of the Doctoral Alliance for Climate Adaptation (ADAC)

On the sidelines of the thematic sessions, the First International Forum on Climate Adaptation (ICAF 2026) served as the setting for a major institutional commitment with the signing of the Founding Charter of the Doctoral Alliance for Climate Adaptation (ADAC). This signing marks a concrete step towards the implementation of enhanced scientific cooperation for climate resilience.

The signatories :

1. **Prof. Yassine Zaghloul, President of Mohamed I University of Oujda, representing the Moroccan Minister of Higher Education and Research.**
2. **Dr. Valérie Verdier, President and CEO of the French National Research Institute for Sustainable Development (IRD), France.**
3. **Prof. Jeanick Brisswalter, President of the Université Côte d'Azur, France.**
4. **Dr. Djama Mohamed Hassan, President of the University of Djibouti.**
5. **Dr. Jalludin Mohamed, Director General of the Djibouti Center for Studies and Research (CERD).**
6. **Eng. Mohamed Ahmed Mohamud, President of Jamhuriya University of Science and Technology, Somalia.**
7. **Prof. Abdi Omar Shuriye, Vice-Chancellor of Hormuud University, Somalia.**
8. **Prof. Dr.-Ing. Benedict M. Mutua, Vice-Chancellor of the Technical University of Kenya.**
9. **Prof. Leonidah Kerubo Omosa, Deputy Vice-Chancellor of the University of Nairobi, Kenya.**
10. **Prof. Feleke Zewge, Director of the African Center of Excellence in Water Management (ACEWM), Addis Ababa University, Ethiopia.**
11. **Prof. Mostafa Ezziyyani, University of Tangier, Morocco.**
12. **Prof. Seloua Jemjami, University of Settat, Morocco.**
13. **Dr. Joël Nobert, Professor at the University of Dar es Salaam, Tanzania.**
14. **Dr. Victor Mose, Senior Research Director at the African Conservation Center, Kenya.**

This agreement commits the 14 represented research and higher education institutions from Djibouti, Ethiopia, France, Kenya, Morocco, Somalia, and Tanzania to a structured partnership. The Alliance aims to strengthen training through research, scientific mobility, and the generation of shared knowledge for climate adaptation, thereby embodying the spirit of international cooperation that characterized ICAF 2026.

ICAF 2026 – Official group picture for the opening ceremony

ICAF 2026 – Group picture of the ADAC Charter signatories

ICAF 2026 – Group picture of the signatories of the framework agreements between MENSUR–IRD and CERD–IRD

Session 1: The Scientific and Policy Challenges of Adapting to Climate Change (Panels 1–4)

Panel 1 - Aligning Sectoral Priorities for Adaptation: A Public Governance Challenge

Key Points	
Title	Aligning Sectoral Priorities for Adaptation: A Public Governance Challenge
Moderator	H.E. Dr. Nabil Mohamed Ahmed, Minister of Higher Education and Research (Djibouti)
Objective	Establish evidence-based interministerial coordination to prioritize high-impact adaptation actions in arid and semi-arid areas.
Expected Outcomes	By the end of the panel, participants are expected to agree on a limited number of cross-sectoral priorities, designate technical focal points within each ministry to follow up on specialized sessions, and identify short-term actions that can be tracked using simple indicators. These elements should inform an operational roadmap and facilitate the mobilization of technical teams over the following days.
Keywords	Cross-sectoral coordination, science-based public policy, planning, budgets, data, accountability

Background :

This panel, structured into two distinct yet deeply interconnected thematic sessions and driven by the imperative to transform cross-sectoral coordination from an aspiration into an operational reality, had the fundamental objective of establishing an evidence-based strategic dialogue among ministries. Under the guidance of a moderator ensuring overall coherence, the ambition was to move beyond sector-specific discourse to demonstrate how the imperative of climate adaptation cuts across and must unify all government portfolios, from social policies to economic infrastructure. The central challenge was to identify, based on on-the-ground realities and each entity's specific mandates, a limited number of shared priorities to underpin integrated, measurable public action specifically designed to prioritize high-impact actions in arid and semi-arid zones.

Part 1 – Education, Environment, Youth, Gender, Solidarity, and Investment :

This first part of the panel focused on integrating social and economic priorities into climate adaptation governance. The discussions clearly demonstrated that adaptation cannot be effective when approached in isolation by individual sectors, but rather requires strategic coordination among all relevant ministries. The central challenge was to show how each ministerial portfolio—beyond the environment alone—contributes significantly to building a coherent, inclusive, and financially viable national resilience.

Key points covered :

- **Science-based agricultural adaptation in the face of extreme aridity**: In a context where annual rainfall does not exceed 150 mm, food and water security are the top priorities. The strategy presented is based on targeted scientific innovation: the development of resilient crops (date palms) and the genetic improvement of livestock. Crossbreeding with Alpine goats increases milk production from 0.5 L to 4.5–5 L/day, while geophysical studies guide drilling in the most critical areas.
- **Systematic integration of gender as a prerequisite for justice and effectiveness:** Women bear a disproportionate burden of climate impacts, with an increased workload that particularly affects their health and economic autonomy. An effective adaptation policy must therefore be based on sex-specific data and gender-sensitive budgets to transform social programs into genuine drivers of household empowerment and resilience.
- **Engaging youth as a force for innovation and institutional renewal:** Far from being a passive audience, young people are key players in the solution. Their involvement is taking shape through the placement of 100 young people in rural areas (Ali Sabieh, Guirrori) and support for award-winning startups such as Dalmar Ecotourism Djibouti and the recycling startup "Seconde Vie" . Mangrove reforestation initiatives, particularly in Godoria (Obock), also illustrate this commitment. This momentum is paving the way for a committed new generation, with the upcoming integration of volunteers into environmental institutions.

- **Immediate social justice and an institutional vision of climate justice:** Symbolically identifying climate change as the cause of social harm, this approach combines an emergency response (social safety nets, access to water via the ADDS, food security) with a bold forward-looking vision: the creation of formal climate justice mechanisms, modeled after specialized legal bodies, to assign responsibility and provide redress for harm.

- **Strategic transformation of constraints into investment opportunities:** Mobilizing private capital is presented as essential to finance adaptation on the required scale. The strategy consists of developing a clear investment plan highlighting large-scale "bankable" projects, such as solar thermal power plants and desalination (based on the Moroccan model), thereby transforming climate challenges into national competitive advantages.

Key messages :

1. Cross-sectoral coordination is essential to ensure effectiveness. Climate resilience cannot be strengthened in isolation; it requires integrated governance in which the actions of each ministry are designed to work in synergy with those of others, from agriculture to social affairs to investment.
2. Equity (gender, youth, social protection) is the non-negotiable foundation of any legitimate and sustainable strategy. An approach that ignores these dimensions is structurally bound to exacerbate vulnerabilities rather than reduce them.
3. Financing large-scale adaptation relies on transforming national constraints into attractive economic opportunities for the private sector, through resilient infrastructure projects that are both profitable and strategic for national development.

Conclusion :

This first part of the panel discussion demonstrated in concrete terms that interministerial coordination is not an abstract ideal, but rather the first essential link in an effective national adaptation strategy. This session laid the practical groundwork for a roadmap in which climate resilience is built on three inseparable pillars: social justice as the foundation, bottom-up innovation driven by youth as the engine, and the transformation of challenges into investment opportunities as the lever for scaling up.

Moderator :

- **H.E. Dr. Nabil Mohamed Ahmed:** Minister of Higher Education and Research

Speakers :

- **H.E. Mr. Mohamed Ahmed Awaleh,** Minister of Agriculture, Water, Fisheries, Livestock, and Marine Resources
- **H.E. Ms. Mouna Osman Aden,** Minister of Women and Family Affairs
- **H.E. Dr. Hibo Moumin Assoweh,** Minister of Youth and Culture

- **H.E. Ms. Ouloufa Ismail Abdo,** Minister of Social Affairs and Solidarity
- **H.E. Ms. Safia Mohamed Ali Gadileh,** Secretary of State for Investment and Private Sector Development

Part 2 - Health, Energy, Decentralization, Digital Economy, Higher Education :

This second part of the panel focused on the integration of technical systems, infrastructure, and territorial governance into the national response to climate change. The discussions clearly demonstrated that a country's resilience depends on the robustness of its essential services (energy, health, digital, and education) and on the capacity of its regions—particularly the most remote ones—to anticipate and absorb shocks. The transition to a low-carbon and resilient model appears to be both a necessity and an opportunity for strategic development.

Key points discussed :

- **The energy transition as a driver of sovereignty and adaptation:** While Africa is bearing the brunt of climate impacts that are disproportionate to its low contribution to emissions, Djibouti has made the energy transition a strategic priority. The country is diversifying its energy mix with the Lac Assal wind farm (60 MW), the Grand Bara solar power plant (25 MW + storage), and geothermal and green hydrogen projects. Rural electrification via off-grid solar solutions has already connected 8 villages. The goal is to reach 90% renewable energy within 5 years, moving from the current mix of 70% renewables.

- **Public health on the front lines against emerging climate risks:** Climate change is recognized as the greatest threat to human health. The emergence of the Anopheles stephensi mosquito in urban areas since 2012 has increased the risk of malaria. The response combines biological methods and cutting-edge innovation, including the Friendly™ mosquito production and research center in Damerjog—developed in partnership with Oxitec—to limit vector populations. Enhanced coordination with the Ministry of Agriculture is crucial for combating zoonotic diseases.

- **Decentralization and strengthening the resilience of vulnerable regions :** Remote areas and nomadic populations are acutely affected by climate impacts, with increased livestock movements in search of water undermining productive assets. Strengthening local planning and access to basic infrastructure are identified as priorities for improving the resilience of rural communities and preventing rural exodus.

- **Digital technology and innovation as drivers of climate action:** The digital economy is a key tool for adaptation. Efforts include the launch of a government portal to improve interagency coordination and a project to integrate artificial intelligence to anticipate impacts. The creation of a digital platform for climate risk information (18-month to 3-year forecasts) is proposed for data sharing, early warning, and support for innovation (particularly climate startups).

- **Human capital and education, pillars of long-term resilience:** Somalia's experience underscores that building human capital is essential. This involves integrating climate change education into school curricula, ensuring schools can adapt to unforeseen events, and providing vocational training in renewable energy. Knowledge production is also encouraged, with 100 research papers on adaptation published in Somalia by 2025. The involvement of young people and women in awareness-raising and action research is fundamental.

Key messages:

1. The energy transition toward renewables is a win-win strategy that strengthens national sovereignty and infrastructure resilience while contributing to global climate mitigation, all while paving the way for future technologies (green hydrogen, renewable energy-powered desalination).

2. Public health must adopt a proactive and innovative "One Health" approach, where the fight against vector-borne diseases and zoonoses—exacerbated by climate change—relies on surveillance, research, and close cross-sectoral cooperation.

3. National resilience must be rooted in local communities and accelerated by digital technology, through the effective decentralization of resources and the strategic use of data and AI for planning, crisis prevention, and support for innovation.

Conclusion :

This second part of the panel discussion demonstrated that building climate resilience requires the modernization and interconnection of the nation's critical systems. It highlighted Djibouti's path, which—by making the energy and digital transitions central to its development—is transforming its geographical constraints into strategic assets. The success of this transformation will depend on its ability to extend these benefits to all regions and to rely on a skilled and innovative workforce, thereby linking the robustness of infrastructure to the resilience of communities.

Moderator:

- **H.E. Dr. Nabil Mohamed Ahmed:** Minister of Higher Education and Research

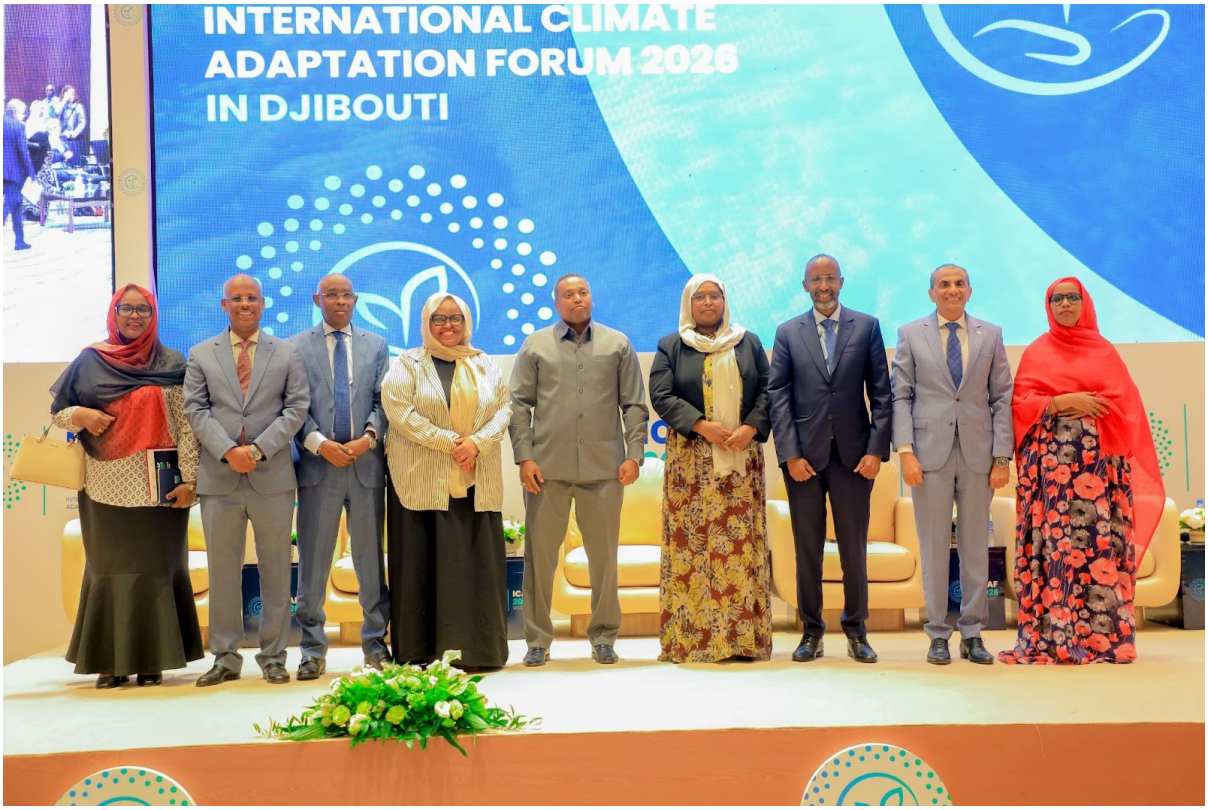
Speakers:

- **H.E. Dr. Ahmed Robleh Abdilleh,** Minister of Health

- **H.E. Mr. Farah Sheikh Abdulkadir,** Minister of Education, Culture, and Higher Education, Federal Republic of Somalia

- **H.E. Ms. Mariam Hamadou Ali,** Minister Delegate for the Digital Economy and Innovation

- **H.E. Mr. Kassim Haroun Ali,** Minister Delegate for Decentralization
- **H.E. Mr. Yonis Ali Guedi,** Minister of Energy in charge of Natural Resources



Group photo of the ministerial panel on adaptation governance

Panel 2 - Research for Adaptation: Current Status and Challenges

Key Information	
Title	Research for Adaptation: Current Status and Challenges
Moderator	Dr. Jalludin Mohamed (CERD)
Objective	To identify research priorities that are most immediately relevant to public policy and to establish effective bridges between science, decision-making, and the field.
Expected Outcomes	A shortlist of actionable scientific priorities, a proposal for science-policy bridges, and recommendations on monitoring and evaluation methods to assess the effectiveness of adaptation solutions. Concrete suggestions are also expected to strengthen the flow of data and results between institutions.
Keywords	Science for action, interdisciplinarity, knowledge gaps, transfer, co-construction, indicators, evidence of effectiveness

Background:

This panel focused on the central and urgent role of scientific research as the foundation for public adaptation action. The discussions clearly demonstrated that science must no longer be a parallel universe, but rather the driving force behind informed decision-making, concrete innovations, and rigorous policy monitoring. The central challenge was to identify how to build effective bridges between knowledge production, policymakers, and communities on the ground to transform climate challenges into actionable solutions.

Key points discussed:

- **Soils as a strategic lever for resilience and income:** Research shows that soils are living systems at the heart of food, water, and climate security. The concept of “farming carbon” positions carbon storage in soils as a new “crop” capable of generating additional income (through payments for ecosystem services estimated at ~$50 per credit). The terrestrial biosphere could store up to 333 Pg of carbon by 2100, making it a powerful tool for adaptation and mitigation.

- **Science in the service of concrete and transferable solutions:** Research on adaptation must produce tools and innovations that are directly applicable. Examples include climate modeling (the Climat Suds platform), plant breeding (early sex determination in date palms), and new technologies to combat coastal erosion or manage population movements. It is crucial to promote and facilitate the South-South transfer of solutions and knowledge, recognizing that innovation also emerges in the most affected countries.

- **The convergence of ancestral knowledge and cutting-edge technologies:** A successful approach combines the wisdom of proven practices (such as traditional underground water systems—khettaras) with modern technologies. Artificial intelligence is already reducing water consumption in agriculture by 50% through optimized management, while innovative mechanisms such as Morocco's first Water Exchange integrate economic considerations into the sustainable governance of the resource.

- **An interdisciplinary and integrated approach to complex challenges:** Managing critical resources such as water requires breaking down disciplinary barriers. A meaningful assessment of groundwater requires multidisciplinary teams (geologists, chemists, data scientists) to analyze both quantity and quality (metal concentrations). AI is becoming an indispensable tool for data analysis, modeling, and decision support in the face of this complexity.

- **Universities as a platform for science-policy-practice interface:** Higher education and research institutions have a pivotal role to play. They must evolve to become centers for co-creating solutions, linking basic research to national programs (such as the Green Morocco Plan—PMV), by developing human capital and facilitating direct dialogue between researchers, decision-makers, and communities to ensure local ownership of innovations.

Key messages :

1. Research on adaptation must be solution-oriented and grounded in social and political demand. Its legitimacy and funding depend on its ability to generate knowledge that can be directly applied to public policy, investment, and local practices.

2. The most powerful innovation arises from the convergence of knowledge: the combination of local and ancestral knowledge with disruptive technologies (AI, biotechnology, modeling) and the humanities is essential for designing solutions that are robust, culturally accepted, and economically viable.

3. Strengthening national and regional scientific ecosystems (South-South mobility, interdisciplinarity, data platforms) is a strategic investment in resilience. It enables the

development of sovereignty in the production and use of the knowledge needed to address the specific climate challenges of each region.

Conclusion :

This panel demonstrated that linking knowledge to action requires rethinking the research ecosystems themselves. It charted a course toward engaged, interdisciplinary, and co-produced science, in which researchers, policymakers, and communities work together to translate scientific priorities into investment priorities and laboratory results into effective and measurable public policies.

Moderator:

- **Dr Jalludin Mohamed**, Director General of the Djibouti Center for Studies and Research (CERD).

Keynote Address :

- **Dr Rattan Lal, Rattan Lal, Ph.D**, Director of the Lal Carbon Center at The Ohio State University.

Speakers :

- **Dr. Anne Kuria,** Transdisciplinary Researcher at the Center for International Forestry Research and Agroforestry (CIFOR-ICRAF), Kenya

- **Prof. Leonidah Kerubo Omosa,** Associate Vice Chancellor for Research, Innovation, and Enterprise at the University of Nairobi, Kenya

- **Dr. Valérie Verdier,** President and Director General of the French National Research Institute for Sustainable Development (IRD), France.

- **Prof. Yassine Zaghloul,** President of Mohammed I University of Oujda, Morocco.

Panel 2 : Research for adaptation : current status and challenges

Panel 3 - Financing Adaptation: Scales of Action, Challenges, and Stakeholders

Key Points	
Title	Financing Adaptation: Scales of Action, Challenges, and Stakeholders
Moderator	Dr. Jean-Luc Chotte, Chair of the French Scientific Committee on Desertification (CSFD).
Objective	Improving the financeability of adaptation solutions and clarifying the conditions for scaling up based on measurable objectives and impacts.
Expected results	Practical recommendations for structuring projects and portfolios, clarification of available tools, and proposals for strengthening engineering and monitoring and evaluation capacities. The report is also expected to identify funding options tailored to arid and semi-arid regions.
Keywords	Instruments, eligible projects, blended finance, project engineering, accountability, impact, scaling up

Background :

This panel addressed the critical challenge of financing adaptation, focusing on making solutions financeable and clarifying the conditions for scaling them up based on measurable impacts. The discussions confirmed the existence of a major funding gap: in 2023, only $65 billion was allocated to adaptation out of a total of $1.9 trillion in climate finance, and funding for food systems has fallen by 47% since 2019. The panel explored instruments and strategies to bridge this gap, particularly in arid regions.

Key points covered:

- **The funding gap and the need to measure impact:** Funding for adaptation remains significantly underfunded and is declining, with only a minimal portion allocated to agriculture and food systems. To direct limited funds effectively, it is crucial to develop robust, context-specific impact indicators aligned with the Paris Agreement to quantify results and ensure accountability. Measuring the effectiveness of adaptation projects—which is assessed over the long term—remains a methodological challenge.

- **The need for "bankable" projects and attractive value chains:** To mobilize the private sector beyond grants, projects must be structured with a clear value proposition. Concrete examples include the development of the date palm value chain in the Hanleh Plain, the transformation of Djibouti into a regional hub for livestock farming (modern slaughterhouses), and investments in fodder production in Damerjog and Douda. These projects must demonstrate a robust market and a reliable supply chain.

- **The catalytic role of blended finance and public innovation:** Blended finance is identified as a key tool for reducing the risks perceived by private investors and attracting capital toward adaptation. At the same time, pioneering public investment is essential to kickstart innovative initiatives, as demonstrated by MENSUR's $2 million investment in space technology (nanosatellites, the future National Remote Sensing Center), thereby creating a public data infrastructure to reduce uncertainty and guide future investments.

- **Bridging the gap between innovation and investment:** Failure often stems from the missing link between solution providers (beneficiaries, researchers) and investors. Funds dedicated to disruptive innovation, such as the Innovation and Development Fund (FID), play a crucial role in financing high-impact proof-of-concept projects (e.g., early sex determination in date palms). This helps mitigate the risks associated with emerging technologies and prepares them for commercial-scale deployment.

- **Public action as the foundation of resilience and attractiveness:** The government has a fundamental role to play in creating the necessary framework conditions. This involves concrete sector-specific programs (increasing the number of wells for water access, supporting small-scale fisheries, and ensuring food security) that directly strengthen community resilience. This structural public action is a prerequisite for making a region attractive to broader and more sustainable private investment.

Key messages :

1. Closing the adaptation finance gap requires a shift from grants to market creation. This involves designing projects around resilient and profitable value chains (dates, livestock, fodder) capable of attracting private investors.

2. Public funds must play a strategic role as a catalyst and risk reducer, through blended finance, investment in data (remote sensing), and support for proof-of-concept innovation, to remove the barriers blocking the entry of private capital.

3. Impact measurement and high-quality project design are non-negotiable requirements for ensuring accountability, directing funding toward the most effective solutions, and building the trust of donors and investors.

Conclusion :

The panel emphasized that adaptation financing is less a matter of sheer volume than of quality, structure, and strategic alignment. The approach identified combines targeted public action

focused on the commons and basic resilience with agile financial engineering that transforms local climate challenges into investment opportunities with measurable impact.

Moderator :

- **Dr Jean-Luc Chotte**, Chair of the French Scientific Committee on Desertification (CSFD)

Speakers :

- **Ms. Clair Bernard,** Deputy Director General of the Fund for Innovation and Development (FID)
- **Dr. Elena Benedetti**, Head of Fundraising, Technology, and Innovation at the International Centre for Genetic Engineering and Biotechnology (ICGEB)
- **Mr. Aboubaker Hassan,** Secretary General of the Ministry of Higher Education and Research (MENSUR), Djibouti
- **Mr. Éric Guerpel,** Director of the French Development Agency (AFD) in Djibouti
- **Mr. Ibrahim Elmi Mohamed,** Secretary General of the Ministry of Agriculture, Water, Fisheries, Livestock, and Marine Resources, Djibouti
- **Mr. Kwami Dzifanu Nyarko-Badohu,** FAO Resident Representative in Djibouti.

Panel 3: Financing adaptation – scales of intervention, challenges and stakeholder

Panel 4 - Higher Education and Multi-Stakeholder Training for Adaptation

Key Points	
Title	Higher Education and Multi-Stakeholder Training for Adaptation
Moderator	Prof. Jeanick Brisswalter, President, Côte d'Azur University (UNICA), France
Objective	Strengthening scientific and operational skills capable of linking knowledge production, public decision-making, and on-the-ground action.
Expected results	Prioritizing critical skills, proposals for modernizing training programs, and concrete implementation methods through the Doctoral Alliance and the ZAPIs. The identification of mechanisms for joint training and knowledge transfer to government agencies and local regions is also expected.
Keywords	Skills, interdisciplinarity, doctoral and postdoctoral studies, research-based training, joint training, ZAPIs

Background :

This panel focused on the fundamental role of higher education and training in building the capacity needed for adaptation. The discussions clearly demonstrated that the climate response requires a profound transformation of education systems to train experts capable of linking scientific knowledge production, public policy development, and concrete action on the ground. The central challenge was to identify the critical skills and practical approaches needed to modernize training programs, while promoting interdisciplinarity and local relevance.

Key points covered:

- **Modernizing education through specialized master's programs and investment in infrastructure:** The University of Djibouti has established targeted master's programs in water science, risk management, and modeling/AI to meet national needs. A strategic investment in a regional-class supercomputer (HPC) is planned, which is essential for running detailed climate simulations, analyzing vast environmental datasets, and informing public policy with unprecedented precision.
- **The need for multidisciplinary profiles and a grounding in economic realities:** Education must produce hybrid professionals at the intersection of science, resource management, and policy. This approach must be grounded in national economic realities,

such as in Somalia, where 60% of the economy depends on livestock farming, an activity that is extremely vulnerable to climate change. Curricula must therefore directly support the protection of livelihoods and the resilience of communities.

- **Education on adaptation begins at a very young age and starts with behavior:** Awareness-raising and education must begin in elementary school to foster a culture of environmental responsibility. Adaptation is also presented as a matter of individual behavior (resource management) and collaborative development with affected communities, thereby ensuring that solutions are realistic, sustainable, and socially acceptable.

- **Rethinking doctoral training for engaged and interconnected science:** Research-based training, through programs such as ADAC, must evolve toward highly structured, transdisciplinary, and interdisciplinary theses. This also requires adapting the role of supervisors and transforming universities into actors that assume global responsibility, connected to global sustainability challenges.

- **Educational innovation, resource sharing, and community engagement:** To optimize resources and improve quality, it is essential for institutions and laboratories to share costs. Educational innovation involves developing micro-certifications (micro-credentials) for targeted skills and encouraging students to engage in community activities, creating a direct link between learning and contributing to local resilience..

Key messages:

1. Higher education must make a strategic shift toward tailored programs that are grounded in national challenges and equipped with state-of-the-art infrastructure (high-performance computing, laboratories) to produce the scientific and technical expertise essential for informed decision-making.

2. Adaptation training must be interdisciplinary, begin early, and extend beyond the university, integrating basic education, behavioral change, and the co-creation of solutions with communities to ensure sustainable ownership and effectiveness.

3. The pooling of resources, innovation in curricula (micro-certifications), and the realignment of doctoral training are critical levers for building an ecosystem of agile, interconnected skills capable of addressing the complexity of climate challenges.

Conclusion :

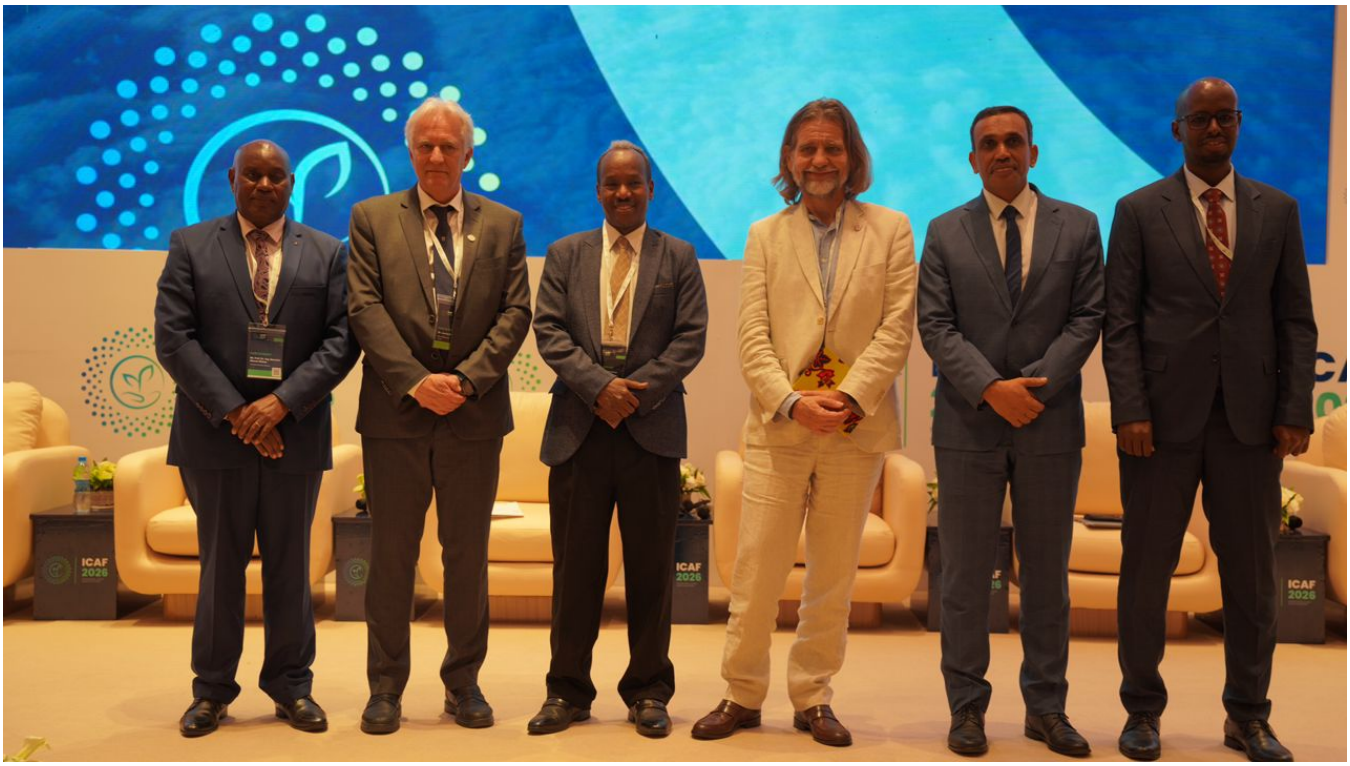
The panel established that training for adaptation means training high-level scientists, responsible citizens, and hybrid professionals. The outlined roadmap calls for a strengthened alliance between universities, governments, and local communities to co-design educational pathways that transform knowledge into effective and shared action.

Moderator :

- **Prof. Jeanick Brisswalter,** President of the Université Côte d'Azur, France

Speakers :

- **Mr. Djama Hassan,** President of the University of Djibouti
- **Prof. Dr.-Ing. Benedict M. Mutua,** Vice-Chancellor of the Technical University of Kenya (TUK)
- **Dr. Abdi Omar Shuriye,** Vice Chancellor of Hormuud University, Somalia
- **Dr. Mohamed Ahmed,** President of Jamhuriya University of Science and Technology, Somalia
- **Prof. Sébastien Velut,** Director of Training and Capacity Building, IRD, France



Panel 4: Higher education and multi-stakeholder training for adaptation

Day 2 – Tuesday, January 20th 2026

Session 2 : From Vulnerability to Sustainability: The Challenge of Priority Areas for Adaptation and Innovation (ZAPI) (Panels 5–9)

Introduction to the ZAPI concept by Dr. David Williamson (Expertise France/CERD)

Background :

Dr. David Williamson introduced the innovative framework of Zones of Major Innovation and Priority Adaptation (ZAPI), designed by the Doctoral Alliance for Climate Adaptation (ADAC) to bridge the critical gap between scientific research and development action on adaptation. This initiative stems from the observation that only 1% of scientific publications address concrete solutions, revealing an urgent need to intensify observation, analysis, and direct collaboration with local communities.

Objective and response to a structural need :

The central goal of ZAPI is to understand the impacts of climate change on social ecosystems and to translate this knowledge into opportunities for sustainable development. This approach addresses the complexity of the challenges at hand, which requires moving beyond siloed disciplinary approaches.

The ZAPI model is built around five fundamental pillars:

1. Target the most vulnerable social ecosystems
2. Adopt a transdisciplinary approach to link the social sciences with the physical sciences
3. Establish long-term monitoring of climate impacts
4. Build long-term partnerships with local communities for training and needs assessment
5. Engage young people in long-term climate action

Operational model :

The initiative is based on a participatory observatory where local observers—such as farmers and ranchers—work with scientists and students to monitor their ecosystem. The data generated is used for scientific analysis, model calibration, and the development of reliable adaptation strategies. This multi-component initiative aims to build a community through steering committees and doctoral training programs focused on adaptation.

The ZAPI initiative comprises two key components :

1. A collaborative research school that organizes doctoral and postdoctoral studies grounded in local adaptation priorities, with mandatory fieldwork within communities
2. An open scientific database that centralizes and freely shares data from the participatory observatory to inform research, innovation, and public decision-making

Transversal challenges:

- Funding for adaptation remains low and suffers from a lack of robust indicators to reassure investors, requiring rigorous evaluation

- Education and research must prioritize intersectorality, interdisciplinarity, and participatory methods, as knowledge sharing is essential

- Ethical data governance is crucial, requiring the acquisition and protection of data in accordance with the Nagoya Protocol and the development of indicators on the reliability of adaptation strategies

- The approach must ensure sustainability and inclusivity by addressing the needs of all generations and promoting long-term actions to attract investors

Geographic scope :

The initiative focuses primarily on East Africa due to its exceptional biodiversity and unique socio-ecological systems. Each partner country has selected a pilot ZAPI site to begin implementing this integrated approach.

Panel 5 - Tropical mountains and highlands (ZAPI in Tanzania and Ethiopia): What does the future hold for these biodiversity hotspots?

Key Points	
Title	Tropical Mountains and Highlands (ZAPI in Tanzania and Ethiopia): What Does the Future Hold for Water Towers and Biodiversity Hotspots?
Moderator	Prof. Amos Majule, Institute of Resource Assessment, University of Dar es Salaam, Tanzania
Objective	Share lessons learned from ZAPI in mountainous and high-altitude contexts, and identify the conditions for success and replication.
Expected Results	Concrete examples of tested solutions. Methodological lessons on local governance. Elements for scaling up and transferring the approach to other regions.
Keywords	Water, agriculture, ecosystems, risks, local governance, demonstration projects, replication

Background :

This panel presented the practical implementation of the ZAPI framework in two critical “water towers” in East Africa: the Ethiopian highlands and the Tanzanian mountains. Discussions focused on the urgent need to preserve these ecosystems—whose degradation threatens the water and food security of tens of millions of people downstream—and on the role of ZAPIs as an action-research tool to achieve this goal.

Key points covered :

- **Regional Emergency – Securing Water Reservoirs:** The Genale Dawa basin in Ethiopia (which supplies water to nearly 30 million people) and the mountains of southern Tanzania are under extreme climate stress. Their degradation poses a direct threat to the socioeconomic and food security of neighboring regions (Kenya, Somalia), making this a regional security priority.
- **Citizen science for grounded modeling:** ZAPI projects employ a citizen science approach. Communities participate in the installation and operation of

weather/hydrological stations and in social surveys. This collection of local data is vital for calibrating relevant scientific models.

- **Nature-based solutions as a priority:** To combat erosion and water variability, the preferred strategies are terracing, adjustments to agricultural practices, and drought-resistant crops, aimed at restoring the natural functions of watersheds.

- **Systemic impacts on livelihoods:** Climate and hydrological changes are driving migration (e.g., from forests to agricultural lands in Tanzania) and increasing the vulnerability of rain-fed agriculture, with repercussions for food security and health.

- **Structured research-policy pathway:** ZAPIs incorporate a solidarity-based research school to train researchers through applied doctoral projects. The objective is clear: to identify effective adaptation practices, produce policy briefs for decision-makers, and raise public awareness.

Key messages :

1. ZAPIs bridge the gap between science and policy by creating a continuum that spans from participatory observation to the formulation of policy recommendations grounded in local realities.
2. Protecting watersheds is a regional cooperation imperative, as their degradation upstream acts as a multiplier of crises (water, food, social) downstream, transcending national borders.
3. Adaptation research gains in effectiveness and legitimacy when co-developed with communities, thereby ensuring the relevance and ownership of solutions.

Conclusion :

The panel highlighted the added value of the ZAPI initiative in addressing critical environmental challenges. By making communities full partners in research, it outlines a model in which the resilience of ecosystems and societies reinforce one another.

Moderator :

- **Prof. Amos Majule**, Institute of Resource Assessment, University of Dar es Salaam, Tanzania Institute of Resource Assessment, University of Dar es Salaam, Tanzania

Speakers :

- **Mr. Ally Said Kiumwa,** Administrative Secretary of Rungwe District, Tanzania (online)
- **Dr. Kihara Kashimbi,** Institute of Resource Assessment (IRA), University of Dar es Salaam, Tanzania
- **Dr. Dessie Nedaw,** School of Earth Sciences, Addis Ababa University, Ethiopia

Panel 5: Mountains and Tropical Highlands (ZAPIs in Tanzania and Ethiopia): What Future for Water Towers and Biodiversity Refuges?

Panel 6 - Semi-arid and Arid Agro-Pastoral Zone (ZAPI Kenya & Djibouti) – Toward Sustainable and Innovative Territories.

Key Points	
Title	Semi-arid and Arid Agro-Pastoral Zones (ZAPI Kenya & Djibouti) – Toward Sustainable and Innovative Territories.
Moderator	Dr. Christine Omuombo, Department of Earth and Environmental Sciences, Kenya Technical University
Objective	Identifying operational priorities and high-impact solutions for the resilience of agro-pastoral systems in arid and semi-arid zones.
Expected results	A shared understanding of on-the-ground priorities. Examples of concrete solutions. A framework for monitoring results and ensuring accountability to local communities.
Keywords	Water, soils, pastoralism, mobility, climate services, risk management, resilience, ZAPI

Background :

This panel highlighted two operational ZAPIs located in critical agro-pastoral landscapes: the Grand Bara in Djibouti and the Amboseli Conservation Area in Kenya. These sites provide concrete examples of the implementation of the ZAPI approach in socio-ecosystems highly exposed to climate variability, where the impacts on the livelihoods of pastoralist and farming communities are direct. The discussions took place within the framework of the Water-Energy-Infrastructure nexus, presented as a central operational lever for strengthening territorial resilience.

Key points discussed during the panel :

- **The Amboseli ZAPI:** A multi-level governance model for a transboundary ecosystem: Located in a Kenya-Tanzania transboundary zone, this ZAPI is based on governance involving national authorities (National Drought Management Authority), local governments, research institutions, and communities. It promotes inclusive, long-term research, with protocols co-designed and active community participation in data collection and analysis (ecological and socio-environmental data since 1970). The use of tools such as artificial intelligence improves the linguistic accessibility of the results.

- **The Grand Bara ZAPI:** Integrating Hydrological Science with Pastoral and Agricultural Needs: This vast semi-arid plain in Djibouti, covering 700 km², faces major challenges related to pastoral vulnerability and a lack of hydrological data. The approach combines the installation of climate and hydrological monitoring stations with ongoing dialogue with nomadic communities. Data analyzed by CERD and the University of Djibouti directly inform the national risk management plan and operational recommendations for agriculture (soil analysis, water quality).

- **The complexity of ZAPIs as a challenge and opportunity for research:** The University of Nairobi highlighted the intrinsic geographic complexity of ZAPI sites, with significant local variations in soil and climate that influence migrations and complicate comparability. This requires in-depth interdisciplinary research to understand local processes, such as the dynamics of interaction between humans, livestock, and wildlife, and to avoid failures (e.g., reforestation unsuited to overgrazing).

- **School gardens as "micro-ZAPIs" for education and food security:** Djibouti's Ministry of Education has highlighted school gardens established in arid regions as practical educational laboratories. Managed by students, they supply school cafeterias and teach the scientific foundations of sustainable agriculture and water management, serving as a crucial first step in raising awareness and building practical resilience from an early age.

- **The importance of data harmonization and regional openness**: To maximize their impact, the data produced by the various ZAPIs must be harmonized and made accessible for robust secondary analyses. Discussions also called for expanding exchanges beyond East Africa, building on existing networks (e.g., with Burkina Faso) to share innovative solutions to common challenges such as soil degradation.

Key messages :

1. ZAPIs are "Living Labs" that bridge the gap between science, policy, and practice by grounding research in the resolution of concrete challenges faced by vulnerable regions.

2. Success depends on inclusive governance and systematic co-creation with communities, from defining research questions to interpreting and applying the results.

3. The integration of knowledge (scientific data, local knowledge, resource management) and multi-scale coordination (local, national, cross-border) are the keys to territorial resilience.

Conclusion :

Feedback from the Grand Bara and Amboseli projects demonstrates the relevance of the ZAPI model as an integrated framework for action. They provide fertile ground for doctoral research on adaptation and outline a path where resilience emerges from the synergy between scientific innovation, local capacity building, and alignment with national priorities.

Moderator :

- **Dr. Christine Omuombo,** Department of Earth and Environmental Sciences, Kenya Technical University

Speakers :

- **Dr. Sougueh Cheik,** Head of the Agroecology Laboratory, CERD, Djibouti
- **Dr. Golab Moussa,** Hydrology Researcher, Institute of Earth Sciences, Djibouti
- **Mr. Dabar Moussa Guedi,** Director, Center for the Training of Primary School Teachers (CFEEF), Djibouti
- **Prof. Pierre-Etienne Mathé,** CEREGE, Aix-Marseille University, France
- **Dr. Victor Mose,** Co-Director and Head of Biostatistics Services, African Conservation Centre (ACC), Kenya
- **Prof. Daniel Ochieng Olago,** Chair of the Department of Earth and Climate Sciences, University of Nairobi, Kenya.

Panel 6: Semi-arid and arid agropastoral zone (ZAPIs Kenya & Djibouti) – towards viable and innovative territories.

Panel 7 - Climate, Vulnerability, and Resilience: What Observations and Open Scientific Data Platforms?

Key points	
Title	Climate, Vulnerability, and Resilience: What Observations and Open Scientific Data Platforms?
Moderator	Dr. Celine Mari, Chair of the Department of Continental Internal and Surface Dynamics (DISCO), IRD, France
Objective	Strengthen the data and observation infrastructure needed for adaptation and improve the conversion of observations into actionable climate services.
Expected results	A concise list of priorities for observation and data, governance principles, and concrete steps toward operational climate services and early warning systems.
Keywords	Observation, open data, interoperability, climate services, early warning, governance, open science

Background :

This panel focused on the critical role of observation systems and open data platforms for climate adaptation within the ZAPI framework. The discussions highlighted the importance of producing, sharing, and using cross-cutting and interdisciplinary data—integrating instrumental observations, satellite data, socioeconomic data, and local knowledge—to effectively guide the actions of decision-makers and communities in addressing climate vulnerabilities.

Key points discussed during the panel :

- **The critical shortage of data infrastructure in Africa:** A lack of reliable local meteorological and environmental observation systems directly hinders the ability to anticipate and manage climate risks, making this a top priority that must be addressed.
- **The shift from data access to data utilization:** The major challenge is no longer accessing data (e.g., satellite data) but rather processing, managing, analyzing, and utilizing it to extract actionable insights.

- **The Foundational Technical Principles:** FAIR and Interoperability: It is crucial to structure data according to the FAIR principles (Findable, Accessible, Interoperable, Reusable) using open formats to ensure interoperability among diverse sources (climatic, biological, socioeconomic) and the sustainability of storage infrastructure.

- **Data sovereignty as a prerequisite:** The localization of infrastructure (data centers) and a clear policy strategy are essential for developing independent data systems, which are a prerequisite for autonomous decision-making and the development of useful artificial intelligence.

- **The indispensable link between space-based observation and field data:** Satellite data must be systematically validated and contextualized using field data to produce reliable interpretations and avoid analytical errors.

- **Data as the foundation for action and policy:** Reliable, scientifically analyzed data is the essential foundation for designing operational solutions (precision irrigation, early warning systems) and informing policy decisions regarding adaptation.

- **The importance of local ownership and co-production:** Platforms must be designed with and for local users. Training stakeholders and involving communities in the production and use of data are essential to their effective utility.

- **The need to broaden the scope of data:** To understand complex vulnerabilities, it is necessary to go beyond environmental data and incorporate socioeconomic and migration data, as human mobility can serve as an adaptation strategy or a consequence of a major crisis.

- **People at the center: training, skills, and engagement:** The practical solution to maintenance and connectivity challenges in the field lies in training and engaging researchers, students, teachers, and local communities, thereby creating a sustainable ecosystem for knowledge production.

  The conditional promise of Artificial Intelligence: AI is a powerful tool for modeling and early warning, but its effectiveness is strictly contingent upon the prior existence of a sovereign, reliable, and high-quality data infrastructure.

Key messages :

1. Addressing the data gap in Africa is a strategic priority for shifting from reacting to climate risks to anticipating them.

2. The main challenge has shifted from accessing data to managing and leveraging it, requiring massive investments in technical infrastructure and human capital.

3. Sovereignty and interoperability (FAIR standards) are the two inseparable pillars of an effective data system, enabling both decision-making autonomy and scientific sharing.

4. The value of data is realized through its use, which depends on its adoption by local stakeholders through co-production, training, and a direct link to concrete action and public policy.

5. A holistic approach to resilience requires breaking down data silos by integrating climate, environmental, socioeconomic, and human mobility data.

Conclusion :

The panel concluded that climate resilience is built on a robust and inclusive data value chain. This chain extends from reliable and sovereign data collection that incorporates all forms of knowledge, to open sharing via interoperable platforms, ultimately leading to effective use that informs action and transforms public policy.

Moderator :

- **Dr Céline Mari**, Scientific Department Director, IRD, France

Speakers :

- **Dr Mahdi Djama**, Director of the Information Systems Department, CERD, Djibouti
- **Pr Moustapha Ezziyani**, Faculty of Science and Technology, University of Tangier, Morocco
- **Pr Pierre-Étienne Mathé**, CEREGE, Aix-Marseille University, France
- **Pr Saloua Jemjami**, Faculty of Science and Technology, Hassan I University of Settat, Morocco
- **Mme Bianca Manacorda**, Program Officer, International Organization for Migration (IOM), Djibouti
- **Dr Arona Diedhiou**, Research Director, IRD/IGE, France (online)
- **Dr Éric Delaitre**, Researcher in Remote Sensing and GIS, IRD, France

Panel 7: Climate, vulnerability and resilience: What observations and open-science data platforms ?

Panel 8 - The Water-Energy-Infrastructure Nexus: Integrated Solutions for Regional Resilience

Key Points	
Title	Water-Energy-Infrastructure Nexus: Integrated Solutions for Regional Resilience
Moderator	Dr Jean Albergel (IRD)
Objective	Proposing integrated approaches, supported by science and data, to strengthen the resilience of essential services in arid environments.
Expected results	Operational guidelines for coordinating water, energy, and infrastructure; funding avenues; and proposed indicators to monitor the resilience and continuity of services. The panel must also identify demonstration projects that can be strengthened through ZAPIs.
Keywords	Integrated approaches, systems, planning, climate extremes, resilient infrastructure, energy, water

Background :

This panel focused on the Water-Energy-Infrastructure nexus as a central operational framework for strengthening the resilience of regions in the face of climate change, resource scarcity, and socioeconomic pressures. The discussions confirmed that this integrated approach has evolved from a theoretical concept into a concrete lever for action in public policy and investment, particularly in arid regions where essential services are interdependent and vulnerable.

Key points discussed during the panel:

- **Shared governance for rural water infrastructure:** In Djibouti, the strategy involves transitioning to 100% solar-powered wells to reduce costs and engaging communities through local management committees for minor maintenance, while the government retains responsibility for major repairs. This shared governance model ensures the sustainability of the infrastructure.
- **The hydrological impacts of climate change and the challenge of sizing:** IRD research shows that global warming is altering hydrological regimes (less infiltration, more surface runoff, accelerated depletion of aquifers), rendering dam design standards

obsolete. A coastal observatory is proposed in Djibouti to monitor the impact of the Amitié Dam, whose 14 million m³ of water infiltrates the ground in six weeks.

- **A portfolio of integrated technical innovations:** These innovations must balance resource efficiency, flexibility, and territorial integrity. They include wastewater reuse, IoT for networks, water-energy coupling (biogas), renewable energy microgrids, and digital twins to simulate and optimize systems.
- **Governance and cooperation as key success factors rather than technology:** The success of the nexus depends прежде all on governance frameworks capable of steering these innovations in a coherent manner. Regional cooperation is vital for managing transboundary resources (85% of Ethiopian resources fall into this category) and for harmonizing policies.
- **The central role of doctoral alliances and community engagement:** Regional doctoral alliances (such as the African Centers of Excellence) are a key lever for training a generation of "problem-solvers." The active involvement of communities in the co-creation of solutions is essential to ensure their relevance, ownership, and sustainability.

Key Messages :

1. The systemic integration of water, energy, and infrastructure is an urgent necessity for building resilient territories, moving beyond siloed sectoral approaches.
2. Transforming knowledge into action requires a strong interface between science, policy, and local practices—a missing link that must be strengthened so that innovations translate into concrete decisions and investments.
3. The sustainability of solutions depends as much on technologies as on institutional capacities, inclusive governance, and community engagement, making the human and organizational dimension a determining factor.

Conclusion :

The panel demonstrated that the path to territorial resilience lies in the integrated design and management of vital systems. By connecting technical knowledge with decision-making mechanisms and local realities, the nexus approach provides a powerful framework for building truly sustainable and adaptive development pathways.

Moderator :

- **Dr Jean Albergel**, Emeritus Researcher, IRD, France

Speakers :

- **M. Hassan Mohamed**, Director of Rural Water Supply, Ministry of Agriculture, Djibouti
- **Dr Jalludin Mohamed**, Director General, CERD, Djibouti
- **Prof. Razak Mumtaz**, University of Poitiers, France
- **Dr Gil Mahé**, Research Director, IRD / Hydrosciences Montpellier, France
- **Pr Joël Nobert**, Director of the Institute of Resource Assessment (IRA), University of Dar es Salaam, Tanzania
- **Prof. Feleke Zewge**, Director of the African Centre of Excellence for Water Management (ACEWM), Addis Ababa University, Ethiopia
- **Dr Niall O'Connor**, Director of the Africa Centre, Stockholm Environment Institute (SEI), Kenya (online)

Panel 8: Water–Energy–Infrastructure nexus: integrated solutions for territorial resilience

CS4RRA Initiative: Co-construction of Research and Innovation in Climate Services between Africa and Europe

Presentation of the Initiative by Dr. Arona Diedhiou, Research Director at IRD and member of the UNCCD Science-Policy Interface

Context of the Initiative:

Alongside the panel discussions, a special session was dedicated to the CS4RRA initiative (Climate Services for Risk Reduction in West Africa), presented by Dr. Arona Diedhiou. This initiative embodies a new approach to scientific cooperation between Africa and Europe, focused on the co-construction of climate services for risk reduction. Dr. Diedhiou, a key figure at the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), outlined a vision in which African priorities shape the research and innovation agenda.

Core Principles and Objectives:

- **Primacy of African needs:** Placing the challenges and demands of African stakeholders at the heart of climate service design.
- **Equitable co-construction:** Establishing balanced scientific and institutional partnerships between Africa and Europe, moving beyond the traditional knowledge transfer model.
- **Science–policy–practice interface:** Systematically strengthening the link between scientific production, end users (farmers, urban planners), and policymakers to ensure effective translation of knowledge into action.
- **Sustainability through capacity building:** Ensuring long-term viability of services by investing in training and skills development within leading African institutions such as WASCAL.

Impact and Vision:

The presentation highlighted the strategic role of climate services as practical levers for resilience. By providing reliable and context-specific information on risks (such as droughts and floods), these services directly inform decision-making in critical sectors including agriculture, water management, and spatial planning. The CS4RRA initiative thus positions itself as a structuring framework to align research, innovation, and public policy, making climate services a central pillar of adaptation strategies in West Africa.

Conclusion :

This presentation demonstrated the maturity and relevance of a new model of international

scientific cooperation. By making co-construction an operational principle and relying on strong African institutions, CS4RRA paves a promising path for climate science to directly address the continent's resilience challenges.

Panel 9 - Biodiversity – Food Security – Health Link: Nature-Based Solutions and Resilient Food Systems

Key Points	
Title	Biodiversity – Food Security – Health Link: Nature-Based Solutions and Resilient Food Systems
Moderator	Dr Frédérique Aberlenc (IRD)
Objective	Highlight nature-based and "One Health" approaches to strengthen resilience in the areas of biodiversity, food systems, and health. A set of priority solutions and follow-up recommendations, as well as key research and assessment needs to document effectiveness and prevent inappropriate adaptation.
Expected results	A set of priority solutions and follow-up recommendations, along with the main research and assessment needs to document effectiveness and prevent any inappropriate adaptation.
Keywords	Nature-based solutions, agroecology, nutrition, heat and health, One Health, and associated benefits

Context :

This panel focused on the crucial and interconnected link between biodiversity, food security, and human health in the context of climate change. Its aim was to explore and promote adaptation strategies based on two integrative approaches: Nature-Based Solutions (NBS) and the "One Health" concept. Emphasis was placed on seeking solutions that are scientific, innovative, integrated, and participatory, capable of building resilient food systems in vulnerable contexts.

Key points addressed during the panel:

- **Integrated water management and water-energy coupling in arid environments:** In Djibouti, addressing absolute water scarcity combines desalination, reuse of treated wastewater, and large-scale deployment of solar energy to power wells and irrigation

systems. This coupling is presented as a fundamental technical pillar for agricultural resilience.

- **Scientific innovation to save threatened agro-systems:** Facing the degradation of oases (salinity, aging), a scientific approach to varietal selection using genetic markers enables the identification of resistant and productive date palm cultivars. This strategy is complemented by the creation of local seed farms to ensure autonomy and adaptation to climate stresses.

- **Shifting approaches to agricultural technology adoption:** In Africa, the challenge is not the lack of technologies (agroforestry, biochar, hydrogels) but the methods to promote them. Systemic approaches such as “Living Labs” and research networks involving farmers, researchers, and policymakers are essential to make technologies understandable and practical on the ground.

- **Valorization of endemic heritage and lessons from large projects:** The Moroccan experience warns against the adverse effects of large dams (overexploitation of aquifers) and advocates for ecosystem-specific solutions. The resilience strategy relies on identifying and developing “flagship” endemic products (argan, saffron) as levers for socio-economic and ecological sustainability.

- **Youth engagement and community co-construction:** Djibouti’s policy relies on Community Development Centers (CDCs) as local platforms for environmental volunteering, training in green and blue jobs, and ecological restoration. This inclusive governance consistently involves youth, community leaders, and women’s associations.

  Holistic conservation and root-cause analysis: The approach of a conservation NGO demonstrates the need to link active biodiversity protection (combatting invasive species) with the creation of economic activities (eco-tourism) and social development. It underscores the importance of systemic diagnostics, identifying, for example, overgrazing as a threat connected to broader cultural and economic transformations.

Key Messages:

1. **Resilience requires a systemic approach** that recognizes and strengthens the vital interconnections between ecosystem health, food security, and human health.

2. **The success of technical innovations depends primarily on the adoption of sound approaches:** co-construction with communities, participatory methods such as “Living Labs,” and careful adaptation to local contexts.

3. **Sustainable solutions arise from the hybridization of knowledge**, combining cutting-edge science (genetics, renewable energy) with traditional knowledge and the expertise of local practitioners.

4. **Youth engagement and inclusive community governance** are essential drivers for the implementation and long-term sustainability of adaptation and conservation actions.

Conclusion :

The panel concluded that adopting an integrated governance paradigm is imperative to address climate challenges. This approach requires agricultural, biodiversity conservation, and public health policies to be designed in synergy. It places science at the service of strengthening natural systems and local capacities, and makes community participation and youth engagement the foundation of territorial resilience, fully embodying the “One Health” vision.

Moderator :

- **Dr Frédérique Aberlenc**, Research Director; Head of the Genops Team, DIADE Unit, IRD (France)

Speakers :

- **Mr. Mouktar Mahamoud**, **Mouktar Mahamoud,** Director of Agriculture, Ministry of Agriculture, Fisheries, Livestock, and Marine Resources (Djibouti)
- **Dr Abdourhaman Daher**, Director of the Life Sciences Institute (ISV), CERD, Djibouti
- **Dr Mariagrazia Di Luca**, ICGEB, Trieste, Italy
- **Dr Ben Fungo**, National Agricultural Research Organization (NAFORRI), Uganda
- **Pr Aïcha Rochdi**, Professor at Hassan 1 University (FST of Settat), Department of Applied Geology. Her work focuses on environmental geosciences, with an interest in natural resources, risks, and vulnerability dynamics.
- **Mrs Roukya Hassan Cheik**, Director of Social Integration and Youth Volunteering, Djibouti
- **Dr Bertrand Lafrance**, Founder of Association Décan, Djibouti

Panel 9: Biodiversity – Food Security – Health nexus : nature-based solutions, resilient food systems

Day 3 – Wednesday, 21 January 2026

Session 3 : Innovating and Creating Businesses for Climate Change Adaptation (Panels 10–11)

Panel 10 - Innovation for Adaptation: Young Innovators at the Forefront

Key Points	
Title	**Innovation for Adaptation: Young Innovators at the Forefront**
Moderator	Prof. Oumarou Malam Issa (IRD, France)
Objective	Highlight evidence-based innovations and create concrete pathways for experimentation, evaluation, and scaling up..
Expected results	An identified portfolio of innovations clarified support needs, and avenues for collaboration. A proposed timeline for experimentation or demonstration, as well as simple indicators to monitor outcomes, is expected.
Keywords	Innovation, demonstration, experimentation, impact evidence, incubation, business models, youth

Context :

This panel highlighted the central and proactive role of young innovators in designing concrete adaptation solutions to environmental and climate challenges. Based on the understanding that sustainable innovation requires an evidence-based approach, the objective was to explore the pathways connecting scientific research, entrepreneurship, education, and public policy to facilitate experimentation, evaluation, and scaling up of these solutions.

Key points addressed during the panel:

- **The imperative to translate research into action:** The innovations presented (biofertilizers, remote irrigation, smart waste management) are all grounded in rigorous scientific diagnostics. The panel emphasized that the ultimate value of research lies in its practical application to solve real-world problems.

- **Circular economy as a pillar of adaptation:** Several initiatives illustrated how challenges (waste management) can be transformed into opportunities (compost production, optimized collection). This circular approach generates both environmental benefits (soil regeneration) and economic benefits (job creation and new value chains).

- **Technology as a lever for inclusion and efficiency:** Digital technologies (sensors, connected devices) are used to democratize access to complex solutions, such as precision irrigation at a distance. By relying on familiar tools (mobile phones), they make sectors like agriculture more attractive and accessible to youth.

- **Multi-stakeholder collaboration as a key to success:** Contributions consistently highlighted the importance of partnerships between researchers and entrepreneurs (to validate innovations), between the public sector and innovators (to provide framework and data), and between education and civil society (to anchor solutions in communities).

- **Education and capacity-building as sustainable foundations:** Beyond tools, the panel stressed the need to change mindsets and skills through systemic education and strengthening young entrepreneurs' capacities, supported by dedicated public policies (incubators, awards).

- **Youth: a driving force to support:** The young demographic is seen as a huge innovation opportunity. The main barrier identified is not the lack of ideas, but access to financing and a comprehensive support ecosystem (training, incubation, market connections).

Keywords :

- **Effective adaptation innovation emerges at the intersection of science, entrepreneurship, and on-the-ground needs**, requiring an integrated and practical approach.
- **African youth are a major reservoir of solutions**; their potential must be unlocked through targeted investments in empowerment, access to finance, and robust support ecosystems.
- **Appropriate technologies and circular economy models** are powerful accelerators for a resilient ecological transition that also creates sustainable jobs.
- **Scaling up requires systematically strengthening synergies between research, the private sector, education, and governments**, as no single actor holds all the keys.

Conclusion :

The panel demonstrated that young innovators are at the forefront of proposing integrated, smart, and locally anchored solutions. The challenge now is to structure and amplify this momentum. This requires establishing permanent collaboration frameworks between research and entrepreneurship, creating financial instruments adapted to the risks of experimentation, and systematically integrating innovation into educational and development policies. The future of adaptation depends on the ability to transform youth ingenuity into resilient innovation ecosystems.

Moderator :

- **Prof. Oumarou Malam Issa**, IRD, France

Speakers :

- **Dr Adèle Ouédraogo**, Institute of Applied Sciences and Technologies (IRSAT), Burkina Faso
- **M. Abdou Maman**, Founder of Tech-Innov, Niger
- **Dr Dabar Moussa**, Deputy Director, National Education Training Center (CFEN), Djibouti
- **Mr. Osman Ali Soubaneh**, Trainer, National Education Training Center (CFEN), Djibouti
- **Dr Odile Rauzy**, Paul Sabatier University, France (online)
- **Dr Gouled Miganeh**, Deputy Director, Center of Excellence in Logistics and Transport (CEALT), University of Djibout
- **Mrs Nimo Warsama Abrar**, Head of Youth Support Services Unit, Ministry of Youth and Culture, Djibouti

Panel 10: RoundTable : Innovation for adaptation : young innovators at the forefront

Panel 11 - New Technologies for Adaptation (Digital Tools, AI, and Early Warning Systems)

Key Points	
Title	New Technologies for Adaptation (Digital Tools, AI, and Early Warning Systems)
Moderator	Prof. Hacène Djellout (University Clermont Auvergne)
Objective	Explore how digital tools and early warning systems can strengthen climate adaptation by connecting innovation, applied research, and operational needs, with responsible governance.
Expected results	Identify pathways for reliable, inclusive, and context-appropriate technology deployment, highlighting the importance of high-quality data, physics-based models, and algorithmic transparency.
Keywords	Early warning systems, interdisciplinarity, data, governance, field laboratories (ZAPI), physical modeling

Context :

In response to the urgency of climate change and environmental risks, this panel explored the role of advanced technologies - artificial intelligence, digital tools, and early warning systems - in building resilient adaptation capacities. Discussions focused on the intersection of technological innovation, applied research, and operational needs, with an emphasis on responsible governance and real-world impact, particularly in Africa and the Mediterranean.

Key points addressed during the panel :

- **Doctoral research as a pillar of field innovation:** The multidisciplinary doctoral school at the University of Djibouti trains “hybrid” researchers by immersing them in real-world issues (climate, environment, data). This approach breaks academic silos and prepares researchers capable of engaging with diverse stakeholders to tackle complex challenges.

- **Multi-risk early warning systems: an operational priority:** Deploying reliable systems relies on multi-source observation (satellites, stations), AI processing, and robust dissemination channels down to the “last mile.” Major challenges include data access and quality, infrastructure maintenance, and the shortage of hybrid expertise. ZAPIs are proposed as spaces for accelerated experimentation.

- **Science serving policy: the JRC approach:** Producing data-driven tools to inform policies (food security, risk management) requires sustainable, comprehensive, and interoperable datasets. A central issue is accountability and trust in AI-driven models, necessitating governance frameworks with external audits, algorithm transparency, and validation by field experts.

- **The foundational role of mathematical and physical models:** Advanced technologies (AI, digital tools) must rely on rigorous mathematical and physical modeling of phenomena. This fundamental understanding is essential to ensure the reliability and robustness of predictions and decision-support tools.

Key Messages :

1. **Interdisciplinarity is essential:** Addressing climate challenges requires combining skills in data science, physical sciences, social sciences, and sectoral expertise—a hybrid approach to integrate into researcher training.

2. **Data is a strategic yet fragile common good:** Access to high-quality, interoperable, and sustainable data is a sine qua non for deploying reliable technologies. Governance and data sharing among public actors, researchers, and the private sector must be strengthened.

3. **Technology must be responsible and transparent:** Using AI in decision-making requires ethical frameworks, independent audits, rigorous algorithm documentation, and clear accountability to build and maintain trust.

4. **The “last mile” is as important as the first:** Sophisticated technology only has impact if it reaches and is adopted by end users (farmers, communities). Dissemination channels, interfaces, and local appropriation are critical points in the value chain.

Conclusion :

The panel demonstrated that emerging technologies offer immense potential to strengthen adaptation, provided they are grounded in a responsible, inclusive, and physically-based approach. Territorial innovation laboratories (ZAPI) emerge as key spaces to test, validate, and accelerate the maturation of these solutions under real conditions before scaling up.

Moderator :

- **Prof. Hacène Djellout**, Université Clermont Auvergne, France

Speakers :

- **Prof. Jacques Piazzola**, MEDD Cluster, University of Toulon, France (online)
- **Prof. Mehmet Ersoy**, University of Toulon, France (online)
- **Dr. Houssein Ahmed,** Director of the Center for Research in Mathematics and Digital Technologies, University of Djibouti
- **Dr. Hassan Ali,** Director of the Multidisciplinary Doctoral School, University of Djibouti
- **Dr. Melissande Machefer**, Joint Research Centre (JRC), European Commission
- **Prof. Moustapha Ezziyani,** Faculty of Science and Technology of Tangier, Morocco

Panel 11: New technologies for adaptation (digital tools, AI and early warning systems)

RECOMMENDATIONS

Panel 2 - Research for Adaptation: Current State and Challenges

1. Immediately Actionable Scientific Priorities

1.1. Conduct research in the social sciences (sociology, socio-economics, anthropology) to ground the identification of needs and challenges in the realities of communities, within a sustainability science perspective.

1.2. Place soil management, land restoration, and water management at the core of applied research agendas (diagnostics, mapping, soil health monitoring protocols).

1.3. Develop and test directly transferable adaptation solutions (agroecology, crop improvement, sustainable resource management, erosion and salinization control) with a view to replication across comparable territories.

1.4. Strengthen interdisciplinary research programs on critical resources (water, soils, coastal areas), bringing together life sciences, Earth sciences, data sciences, and social and economic sciences.

1.5. Document the co-benefits and economic models of solutions (productivity, loss reduction, ecosystem services, jobs, additional income) to facilitate their adoption and financing.

2. Science–Decision–Field Interfaces

2.1. Institutionalize a science–policy interface: regular policy briefs, concise formats for decision-makers, and a structured dialogue calendar (ministries, local authorities, researchers, private sector actors, civil society).

2.2. Establish co-construction mechanisms (living labs, pilot sites, demonstration projects) involving local communities, technical services, and researchers from the early stages of research design.

2.3. Strengthen South–South and North–South mobility and knowledge sharing (exchange of protocols, feedback, joint training) to accelerate the dissemination of proven innovations.

2.4. Position universities and research centers as platforms supporting public policies: technical assistance, expertise, continuous training for administrations, and support for innovation.

3. Data, Platforms, and Governance

3.1. Deploy open and interoperable data platforms (common formats, metadata) to facilitate data reuse and multidisciplinary analysis.

3.2. Systematically combine field observations with satellite data, using validation protocols, to improve the reliability of analyses and models.

3.3. Invest in skills (data management, modeling, AI, visualization) to transform data access into actionable information for anticipation and decision-making.

3.4. Clarify data governance: sharing rules, responsibilities, security, ethics, and access modalities for end users.

4. Monitoring, Evaluation, and Evidence of Effectiveness

4.1. Define a common monitoring and evaluation framework for adaptation solutions: objectives, theory of change, simple and measurable indicators, and baselines.

4.2. Establish long-term monitoring on pilot sites to assess the actual effectiveness of solutions (including social, economic, and environmental impacts).

4.3. Document success and failure factors (transferability conditions, limitations, risks of maladaptation) to guide scaling-up efforts.

4.4. Ensure regular feedback to stakeholders (communities, administrations, funders) and integrate field feedback into the continuous improvement of solutions.

Panel 3 - Financing Adaptation: Scales of Intervention, Challenges, and Stakeholders

1. Establish a Robust Measurement and Monitoring Framework

1.1. Define and implement standardized adaptation indicators, from local to national levels, to rigorously document the impacts and co-benefits of measures.

1.2. Co-develop these indicators with local stakeholders from the project design phase, drawing on their knowledge and priorities to ensure relevance and ownership.

2. Develop Innovative and Tailored Financial Instruments

2.1. Design hybrid financing tools combining public, private, and philanthropic capital to reduce perceived risks and attract private investment in adaptation.

2.2. Create dedicated mechanisms to scale up proven adaptation solutions, providing them with sustainable funding aligned with investment cycles.

2.3. Adapt financial instruments (concessional loans, guarantees, dedicated funds) to countries' repayment capacities and macroeconomic contexts, avoiding the buildup of unsustainable debt.

3. Establish Multi-Stakeholder Governance and a Trust Framework

3.1. Strengthen the pivotal role of states in setting a clear and stable strategic framework, ensuring a long-term vision and coordination among all stakeholders (public, private, and civil society).

3.2. Establish regular and transparent dialogue platforms to align objectives, share risks and responsibilities, and build trusted partnerships that facilitate co-investment.

3.3. Rebalance climate finance flows in favor of adaptation by using this trust framework to strategically direct international and domestic funding toward identified adaptation priorities.

Panel 4 - Higher Education and Multi-Stakeholder Training for Adaptation

1. Reform Curricula to Train Hybrid Adaptation Profiles

1.1. Massively develop interdisciplinary and tailored programs (at bachelor's and master's levels) that break down academic silos and systematically integrate the scientific, policy, socio-economic, and technical dimensions of adaptation.

1.2. Anchor learning in practice through field case studies, living labs, and mandatory internships in partnership with local authorities, technical services, and communities, to expose students to operational realities.

1.3. Establish continuous training programs and flexible micro-certifications accessible to working professionals (technicians, decision-makers, entrepreneurs), to continuously update skills within administrations and key sectors.

2. Strengthen University Ecosystems through Strategic and Open Alliances

2.1. Strongly promote a multilateral, network-based cooperation model among universities at regional and international levels, to pool expertise, educational resources, and critical infrastructure, moving beyond traditional bilateral frameworks.

2.2. Position higher education institutions as open platforms for dialogue and co-creation, facilitating systematic exchange between global scientific knowledge, local knowledge, and indigenous knowledge to enrich solutions.

2.3. Encourage and fund student and early-career researcher initiatives engaged in community-based climate action, recognizing this engagement as a valued component of training.

3. Move Toward a Model of Engaged and Responsible Science

3.1. Rethink doctoral training models to promote applied, transdisciplinary research projects directly aligned with territorial adaptation priorities, while also adapting supervision and evaluation methods.

3.2. Recognize and strengthen the societal and planetary responsibility of universities by enabling them to act as key players in resilient development, beyond their traditional role of knowledge production and dissemination.

3.3. Establish permanent institutional mechanisms (chairs, observatories, legal and policy clinics) dedicated to the science–policy interface, to formalize academic support for the design, monitoring, and evaluation of public adaptation policies.

Panel 5 - Mountains and Tropical Highlands (ZAPI in Tanzania and Ethiopia): What Future for Water Towers and Biodiversity Refuges?

1. Consolidate the ZAPI Model of Action Research and Citizen Science

1.1. Scale up the ZAPI approach as a structural framework for studying and protecting water towers, operationalizing the science–policy interface from participatory observation to policy recommendations.

1.2. Institutionalize citizen science by systematically involving communities in the installation and operation of monitoring stations and in social surveys, to ground modeling in local realities.

1.3. Strengthen the research–policy nexus through the ZAPI solidarity research school, which trains researchers through applied doctoral projects to produce policy briefs for decision-makers.

2. Prioritize Nature-Based Solutions to Combat Land Degradation

2.1. Develop and prioritize the testing of nature-based solutions to address erosion and water variability, such as terracing, adjusted agricultural practices, and drought-resistant crops.

2.2. Design research and training programs on water management and climate-smart agriculture (improved practices, adapted seeds) to address the specific challenges of these highland areas.

2.3. Assess the systemic impacts of these solutions on livelihoods (food security, migration, health) to guide their implementation.

3. Establish Regional Cooperation and Partnerships for Governance

3.1. Establish transboundary cooperation frameworks to secure shared water towers, making their protection a regional stability imperative in the face of water and food security risks.

3.2. Promote Public-Private Partnerships (PPPs) as a potential model to finance and implement identified adaptation strategies.

3.3. Improve policies to support adaptation options, taking into account livelihoods and demographic dynamics as key factors in resource management.

4. Document and Guide the Replication of Effective Solutions

4.1. Document success factors, limitations, and conditions for transferability of solutions tested within ZAPI to guide their scaling up to other vulnerable territories.

4.2. Establish long-term monitoring on pilot sites to assess the actual effectiveness of adaptation solutions, particularly their socio-economic and environmental impacts.

5. Establish Regional Cooperation and Partnerships for Governance

5.1. Establish cross-border cooperation frameworks to secure shared water towers, making their protection a regional stability imperative in the face of water and food security risks.

5.2. Promote Public-Private Partnerships (PPPs) as a potential model to finance and implement identified adaptation strategies.

5.3. Strengthen policies to support adaptation options, taking into account livelihoods and demographic dynamics as key factors in resource management..

Panel 6 - Semi-Arid and Arid Agropastoral Zones (ZAPI Kenya & Djibouti): Towards Viable and Innovative Territories

1. Structurer une gouvernance inclusive et transfrontalière

1.1. Formalize and sustain multi-stakeholder governance platforms (states, local authorities, researchers, communities, private sector) for each ZAPI, clarifying roles, decision-making processes, and mutual accountability mechanisms.

1.2. Establish transboundary coordination protocols for ZAPIs located in shared ecosystems, building on the Amboseli experience, to facilitate joint management of resources and climate risks.

1.3. Create local monitoring committees representing communities (including women and youth), with a clear mandate to participate in research prioritization and solution evaluation.

2. Anchor Action Research in Co-Construction and Training

2.1. Systematically ensure the paid and recognized involvement of “community researchers” in all phases of ZAPI projects, from data collection to dissemination, and structurally integrate local and indigenous knowledge into scientific protocols.

2.2. Use ZAPI sites as training grounds for students (master's and doctoral levels) and as action-research spaces for early-career researchers, with dedicated funding for student projects designed in response to local challenges.

2.3. Develop adapted communication and dissemination tools (multilingual, visual) to ensure that knowledge produced is understood, owned, and usable by all stakeholders, including pastoral communities.

3. Build a Regional Infrastructure of Open and Harmonized Data

3.1. Develop and adopt a common data harmonization framework across ZAPIs to enable robust comparative and regional analyses.

3.2. Create a regional open data platform on agropastoral zones, fed by ZAPIs, to centralize access to long-term climatic, hydrological, soil, and socio-economic data.

3.3. Address baseline data gaps through targeted scientific campaigns, using appropriate technologies (low-cost sensors, remote sensing) calibrated with community-based field observations.

4. Sustain Impact through Exchanges, Advocacy, and Local Opportunities

4.1. Develop South–South and intra-African (West–East) exchange and mentorship programs among researchers, ZAPI managers, and pastoral organizations to capitalize on innovations and lessons learned in addressing shared challenges.

4.2. Leverage international frameworks, such as the International Year of Rangelands and Pastoralists (2026) proclaimed by the United Nations, to advocate for dedicated policies and funding, using strong evidence generated by ZAPIs.

4.3. Create concrete pathways to local employment for young graduates (within cooperatives, technical services, eco-tourism, green startups) to retain skills within territories and sustainably anchor innovation.

Panel 7 - Climate, Vulnerability, and Resilience: What Observations and What Open Scientific Data Platforms?

1. Make ZAPIs Pilot Territories for Integrated Observation

1.1. Deploy in each ZAPI sustainable observation systems that systematically combine in situ data, satellite data, and socio-economic data.
1.2. Ensure long-term funding for these systems to guarantee maintenance, technical evolution, and continuity of data series.

1.3. Establish intercomparison and cross-validation protocols between different ZAPI sites to assess data reliability, document uncertainties, and ensure interoperability

2. Structure Open Data Platforms Adapted to Local Uses

2.1. Develop platforms that comply with FAIR principles, with particular attention to metadata quality, the use of open formats, and comprehensive documentation.

2.2. Establish clear data governance (ownership, responsibilities, access conditions) from the outset of ZAPI development, co-constructed with national institutions and aligned with digital sovereignty

2.3. Design accessible interfaces and tools, taking into account local languages and usage contexts, so that these platforms are perceived as legitimate and useful by communities and territorial

2.4. Promote the emergence and pooling of sovereign data centers at the regional level to host and process these data.

3. Invest Massively in Skills and Training

3.1. Integrate ZAPIs as central learning platforms in university curricula (bachelor's, master's, doctoral levels) and in continuing professional training, including technical skills in data management and computing.

3.2. Develop specific training programs on the analysis, interpretation, and operational use of climate and environmental data for public, technical, and civil society actors.

3.3. Encourage and train researchers to publish "data papers" to enhance, credit, and sustain the datasets produced.

4. Strengthen Mediation between Science, Citizens, and Decision-Makers

4.1. Create or support scientific mediator roles ("data ambassadors") whose function is to bridge territorial needs, research questions, and scientific outputs.

4.2. Develop decision-support tools and interactive dashboards co-designed with end users (as illustrated by the CS4RRA initiative in West Africa) to transform raw data into actionable information.

4.3. Support participatory science approaches, including citizen-operated sensors and the integration of local knowledge, to strengthen ownership and legitimacy of the data produced.

5. Make Data a Direct Lever for Adaptation Policies

5.1. Explicitly align ZAPI systems with national and sectoral policies on risk management, spatial planning, water, energy, and migration.

5.2. Use climate scenarios and locally produced ZAPI data to strengthen anticipation and medium- to long-term strategic planning.

5.3. Embed ZAPIs within institutional frameworks that promote co-construction between research, the state, and civil society across all stages of the data lifecycle, from collection to policy use.

Panel 8 – Water-Energy-Infrastructure Nexus: Integrated Solutions for Territorial Resilience

1. Adopt integrated governance and innovative financing models

1.1. Establish shared governance for rural water infrastructure, where the State finances major repairs and communities manage maintenance through local committees.

1.2. Develop financing models and public-private partnerships dedicated to integrated nexus projects to attract investment.

1.3. Establish binding regional cooperation frameworks for the joint management of transboundary resources and infrastructure.

2. Integrate climate data and deploy a portfolio of technical innovations

2.1. Systematically incorporate hydrological knowledge and climate projections into the design and sizing of new infrastructure to ensure resilience.

2.2. Deploy integrated technical solutions such as wastewater reuse, water-energy coupling (biogas), renewable energy microgrids, and digital twins for system optimization.

2.3. Create environmental observatories (e.g., coastal areas) to continuously monitor the impacts of major infrastructure on resources.

3. Strengthen capacities through training and the science-policy interface

3.1. Support regional doctoral alliances and centers of excellence to train a new generation of specialists capable of addressing nexus-related challenges.

3.2. Reinforce the science-policy interface by translating scientific knowledge into operational guidelines and public investment plans.

3.3. Use reliable data and environmental monitoring to base public policies on evidence.

4. Ensure sustainability through community engagement and monitoring

4.1. Actively involve communities in co-creating solutions to ensure relevance, ownership, and sustainability.

4.2. Establish long-term monitoring mechanisms to assess the performance and impact of deployed solutions.

Panel 9 - Biodiversity – Food Security – Health Nexus: Nature-Based Solutions and Resilient Food Systems

1. Establish integrated governance and collaborative frameworks

1.1. Operationalize the "One Health" framework by creating permanent intersectoral governance bodies linking the ministries of agriculture, environment, and health.

1.2. Develop formal multi-stakeholder strategies to systematically involve researchers, practitioners, local communities, and policymakers in co-designing and monitoring adaptation programs.

1.3. Structure interdisciplinary collaboration by funding research consortia that combine agronomy, ecology, hydrology, social sciences, and health in joint projects.

2. Deploy and finance a portfolio of proven technical solutions

2.1. Scale up nature-based and agroecological solutions through dedicated grants and calls for proposals, prioritizing oasis systems, agroforestry, and biological control (bacteriophages).

2.2. Optimize sustainable water management by mandating water-energy coupling (solar) for new irrigation projects and establishing national standards for the safe reuse of treated wastewater in agriculture.

2.3. Fund scientific innovation for ecosystem restoration via national programs supporting assisted varietal selection, soil regeneration techniques (biochar, hydrogels), and local seed banks.

3. Anchor action at the territorial level through participation and training

3.1. Create a network of "Living Labs" in each vulnerable territory as a permanent mechanism for co-creation, demonstration, and adaptation of innovations.

3.2. Launch national agricultural training and advisory programs to scale up resilient practices and develop "green and blue" job pathways.

3.3. Economically valorize key endemic products through geographical indications, marketing support, and integration into territorial development programs.

4. Capitalize on knowledge and engage younger generations

4.1. Develop an open digital knowledge-sharing platform to archive and disseminate protocols, data, and lessons learned among all stakeholders.

4.2. Integrate environmental engagement and green entrepreneurship into school and university curricula, and support youth volunteering projects for ecosystem restoration.

4.3. Implement territorial observatories tasked with conducting systemic diagnostics of pressures (e.g., overgrazing) and assessing the impact of solutions on biodiversity, food security, and health.

Panel 10 - Innovation for Adaptation: Youth Innovators at the Forefront

1. Create a structured support ecosystem for young innovators

1.1. Establish dedicated financing mechanisms, through partnerships with donors, to support experimentation, scientific validation, and prototyping of youth-led solutions.

1.2. Create and strengthen incubators and accelerators specialized in climate adaptation within universities and ZAPIs, providing technical, entrepreneurial support and network access.

1.3. Set up permanent collaboration frameworks between young entrepreneurs, researchers, and the public sector to co-design solutions, validate their scientific effectiveness, and facilitate integration into policies.

2. Integrate innovation and green entrepreneurship into education and training

2.1. Systematically “green” secondary and higher education curricula by incorporating education on sustainable development, green entrepreneurship, and circular economy principles as core subjects.

2.2. Develop practical training and mentoring programs in innovation and project management to strengthen the entrepreneurial capacities of youth, drawing on local success stories.

2.3. Transform ZAPIs into learning and experimentation hubs for students and recent graduates, embedding concrete research-action and innovation projects.

3. Promote sustainable and circular business models

3.1. Design projects and ZAPIs with economically viable components from the outset, aiming for partial or full self-financing through the valorization of services or products (e.g., compost, data, digital services).

3.2. Support and scale circular economy models (waste recycling, reuse) that turn environmental challenges into economic opportunities and local job creation.

3.3. Leverage appropriate digital technologies (sensors, mobile apps) to develop inclusive, efficient, and revenue-generating services, particularly in agriculture and resource management.

4. Strengthen networks and transdisciplinarity for scaling up

4.1. Establish active networking platforms to connect young innovators with each other, scientific mentors, investors, and policymakers, within ZAPIs and beyond.

4.2. Encourage and fund transdisciplinary approaches and projects that combine science, engineering, social sciences, and design to develop holistic, context-specific innovative solutions.

4.3. Create mechanisms for capitalizing on and sharing successful innovations (protocols, business models) to facilitate replication and scaling in other vulnerable territories.

Panel 11 - New Technologies for Adaptation (Digital Tools, AI, and Early Warning Systems)

1. Train hybrid experts in data science and physical phenomena

1.1. Strengthen doctoral schools and multidisciplinary programs to create hybrid researcher profiles proficient in mathematical/physical modeling, artificial intelligence, and the field realities of climate and environmental challenges.

1.2. Integrate interdisciplinarity as a core principle in curricula, systematically combining data science, physical sciences, social sciences, and sectoral expertise.

2. Establish robust governance of data and algorithms

2.1. Implement data governance frameworks ensuring data quality, interoperability, sustainability, and responsible sharing among public actors, researchers, and the private sector as a strategic common good.

2.2. Introduce transparency and audit procedures for AI models and algorithms used in decision support, including thorough documentation, validation by field experts, and clear accountability mechanisms.

3. Develop and validate tools within ZAPIs before deployment

3.1. Use ZAPIs as experimental laboratories to test, calibrate, and validate advanced tools (digital twins, early warning systems) under real conditions, assessing robustness against imperfect data and extreme events.

3.2. Address the major challenge of data quality and heterogeneity by using ZAPIs to improve data collection, calibration, model validation, and to study solution transferability across territories.

3.3. Focus efforts on coupling mathematics-data-AI to develop territorial digital twins, where physical models ensure fundamental consistency and AI accelerates computation and leverages complex data.

4. Integrate technological tools into decision-making mechanisms

4.1. Establish permanent interfaces between tool producers (research centers, JRC) and decision-makers so that scientific knowledge and forecasts directly inform food security and risk management policies.

4.2. Make ZAPIs a lever for co-creation, ensuring that scientific results and complex tools are understandable and usable by local authorities and government services, thereby bridging the gap between research and operational action.

CLOSING REMARKS

In his closing speech, H.E. Dr. Nabil Mohamed Ahmed, Minister of Higher Education and Research, framed the event around the tangible urgency of climate change for arid and coastal regions. He laid the foundation for future action: an inseparable alliance between science, innovation, and international cooperation, grounded in strong human connections and a collective capacity to reinvent development models.

Key messages from the Minister:

1. **Adaptation as a strategic priority:** It must be placed on the same level as economic growth, food security, and social stability in both national and international agendas.
2. **Science at the heart of action:** Research and higher education are essential pillars. Strengthening the synergy between scientific production, public decision-makers, and local communities is imperative.
3. **A societal project grounded in sovereignty:** Climate adaptation is presented as a profound societal choice, anchored in intergenerational solidarity, and as a lever to build sustainable scientific sovereignty.

The Minister emphasized the foundational character of this first ICAF Forum. The event does not mark an end but rather the starting point for strengthened partnerships and concrete actions

to sustainably mobilize science in service of communities. His closing words, *"This is not a farewell, only a see you again,"* symbolized the collective commitment to continue and amplify the momentum launched in Djibouti.

ACKNOWLEDGEMENTS:

Based at the Ministry of Higher Education and Research (MENSUR) of Djibouti, the ICAF 2026 organizing team extends its sincere thanks to the Steering Committee of the FEF-ADAC project and to the CERD, who have supported the Forum initiative from its inception. Gratitude is also expressed for the ongoing support of the IRD representation in East Africa and its office in Djibouti. Finally, this event would not have been possible without the mobilization of the French Embassy in Djibouti, particularly its Cooperation and Cultural Action Service, supported by Expertise France. They are all warmly thanked here.

ANNEX I – Biographies of Panelists and Moderators

Panel 2 – Research for Adaptation: Status and Challenges

Moderator :

- **Dr Jalludin Mohamed** – Ph.D. in Hydrogeology, graduated in 1993 from the University of Poitiers (France). Recruited in 1986 at ISERST as a hydrogeologist in the Earth Sciences section, he became Head of the Hydrogeology and Hydrology Department in 1994. Since 2002, he has served as Director General of CERD (Centre for Studies and Research of Djibouti, formerly ISERST), under the supervision of the Ministry of Higher Education and Research. Since 2014, he has also been appointed geothermal expert for the Asal Rift Geothermal Project, funded by multiple donors and led by Électricité de Djibouti (EDD).

Keynote Speaker :

- **Dr Rattan Lal** – Ph.D., Distinguished Professor Emeritus and Director of the Lal Carbon Center at Ohio State University. A specialist in soil carbon sequestration and regenerative agriculture, he has an h-index of 209 and over 180,000 citations. Author of nearly 1,200 scientific articles and numerous books, he has received several major international awards, including the World Food Prize (2020) and the Gulbenkian Prize for Humanity (2024).

Speakers :

- **Dr Anne Kuria** – Scientist in transdisciplinary systems at CIFOR-ICRAF, specializing in scaling up agroecological and regenerative food systems. She evaluates agronomic, environmental, socio-economic, and resilience indicators of agroecological transitions, focusing on climate adaptation, soil health, livelihoods, and policy relevance. Her work leverages participatory research, policy analysis, and systems-based evidence to connect local innovation to national decision-making.

- **Prof. Leonidah Kerubo Omosa** – Professor and Deputy Vice-Chancellor for Research, Innovation, and Entrepreneurship at the University of Nairobi. She leads scientific strategy, innovation, partnerships, and the valorization of research outputs.

- **Dr Valerie Verdier** – French biologist and CEO of the Institut de Recherche pour le Développement (IRD) since 2020, re-elected in 2024. A specialist in plant pathophysiology, her research focuses on food security and plant-microbe interactions. Committed to sustainability science, she promotes equitable partnerships with countries of the Global South.

- **Prof. Yassine Zaghloul** – President of Mohammed Premier University in Oujda, he drives the institution's academic and scientific strategy and its international outreach.

Panel 3 - Financing Adaptation: Scales of Intervention, Challenges, and Stakeholders

Moderator :

- **Dr Jean-Luc Chotte** – Research Director at IRD, France, specializing in agroecology to support the SDGs, soil degradation neutrality, and climate action in the AFOLU sector. Former member of the SPI of the UNCCD (2015–2019), he chairs the French Scientific Committee on Desertification and represents research in the 4P1000 initiative.

Speakers :

- **Ms. Clair Bernard** – Deputy Director General of the Innovation Fund for Development (FID). (online)
- **Dr. Elena Benedetti** – Head of Fundraising, Technology, and Innovation at ICGEB.
- **Mr. Aboubaker Hassan** – Secretary General of the Ministry of Higher Education and Research of Djibouti.
- **Mr. Éric Guerpel** – Director of the French Development Agency (AFD) in Djibouti.
- **Mr. Ibrahim Elmi Mohamed** – Secretary General of the Ministry of Agriculture of Djibouti.
- **Mr. Kwami Dzifanu Nyarko-Badohu** – FAO Resident Representative in Djibouti since August 2024. He holds degrees in agronomic sciences, biological engineering, livestock, and animal nutrition, obtained notably at the University of Liège (Belgium) and the National Agronomic Institute of Tunisia. He supports national efforts in food security, sustainable agriculture, and resilience of production systems.

Panel 4 - Higher Education and Multi-Stakeholder Training for Adaptation

Moderator :

- **Prof. Jeanick Brisswalter** – Professor at Côte d'Azur University since 2010. His research focuses on energy metabolism during exercise and its links to brain function, applied to high-level sports and aging. Former Vice-President in charge of research (2016–2020), he has been President of Côte d'Azur University since 2020, an institution labeled University of Excellence.

Speakers :

- **Mr. Djama Hassan** – President of the University of Djibouti.
- **Prof. Dr.-Ing. Benedict M. Mutua** – Vice-Chancellor at the Technical University of Kenya (TUK) and Professor of Water Resources, Environmental Engineering, and Hydraulics, teaching at several international universities. He holds a BSc and a degree in Agricultural and Hydraulic Engineering (Egerton University) and an MEng in Civil and Environmental Engineering, specializing in fluid dynamics and hydraulics (University of Melbourne, Australia).

- **Dr. Abdi Omar Shuriye** – Professor at the University of Somalia and Vice-Chancellor of Hormuud University in Mogadishu, teaching politics, international relations, and Islamic studies. With 29 years of experience in research, teaching, and institutional development, he specializes in networking, resource mobilization, and institutional transformation.

- **Dr. Mohamed Ahmed** – President of Jamhuriya University of Science and Technology in Mogadishu, Banaadir region, Somalia. With over 13 years of leadership experience in higher education, he has strong skills in leadership, administration, and communication. He is particularly interested in educational technologies, AI applied to education, and technological innovation in the university sector.

- **Prof. Sébastien Velut** – Director of Training and Capacity Building at IRD, France. He is a geographer and expert in regional development, energy, and environment, with international experience, particularly in Latin America. He has published numerous articles and books on these topics and has held several positions at Sorbonne Nouvelle, including Director of the Institute of Advanced Latin American Studies, Director of CREDA (UMR 7227), Vice-President for International Affairs, and Director of Doctoral School 122. He also served as Deputy Director for International Relations at Sorbonne-Paris Cité. In 2025, he joined IRD as Director of Training and Capacity Building.

Panel 5 - Tropical Mountains and Highlands (ZAPI in Tanzania and Ethiopia): What Future for Water Towers and Biodiversity Refuges?

Moderator :

- **Prof. Amos Majule** – Institute of Resource Assessment, University of Dar es Salaam, Tanzania. He is an academic researcher at the University of Dar es Salaam, specializing in agriculture and climate change. He is co-author of 44 publications and has an h-index of 17, reflecting his scientific impact in the field.

Speakers :

- **Mr. Ally Said Kiumwa** (online) – Administrative Secretary of Rungwe District, Tanzania.
- **Dr. Kihara Kashimbi** – Lecturer at the Institute of Resource Assessment (IRA), University of Dar es Salaam, Tanzania. He holds a Ph.D. His research focuses on agriculture, environment, and sustainable development, contributing to both research and academic training.
- **Dr. Dessie Nedaw** – Associate Professor of Hydrogeology at Addis Ababa University and Director of the Academic Support Office. He specializes in groundwater supply, irrigation, aquifer recharge under land use and climate change, as well as groundwater modeling. He has authored over 50 scientific publications in hydrology, hydrogeology, and climate change.
- **David Williamson** – Technical Coordinator of the Doctoral Alliance for Climate Adaptation (ADAC) at CERD and International Technical Expert (Expertise France). Specialist in climate-socio-ecosystem interactions in East Africa, and pioneer in localized, participatory environmental and climate monitoring. He supports the structuring of scientific activities, regional coordination, and the science-policy interface within the Alliance.

Panel 6 - Semi-Arid and Arid Agropastoral Zones (ZAPI Kenya & Djibouti): Towards Viable and Innovative Territories

Moderator :

- **Dr. Christine Omuombo** – Geology for Global Development, Research and Analysis Coordinator.

Speakers :

- **Dr. Sougueh Cheik** – Specialist in tropical soils. His work focuses on the functional characterization of soil engineers, soil dynamics, and water functioning in different pedoclimatic environments. He currently leads the Agroecology Laboratory at the Centre for Study and Research of Djibouti (CERD). His research addresses the description, characterization, and prioritization of edaphic constraints in arid tropical ecosystems, particularly in Djibouti, resulting in several high-impact publications in soil science.
- **Dr. Golab Moussa** – Hydrology Laboratory, Institute of Earth Sciences, CERD.
- **Dabar Moussa Guedi** – Director at the Teacher Training Center for Primary Education (CFEEF) in Djibouti.
- **Prof. Pierre-Etienne Mathé** – Ph.D. in Environmental Geosciences (1996, University of Aix-Marseille, France). Researcher and lecturer at CEREGE/OSU Institut Pythéas since

1999. Member and co-founder of the Rungwe Environmental Sciences Observatory Network (Mbeya, Tanzania) and member of COSDOC ADAC.

- **Dr. Victor Mose** – Co-Director and Head of Biostatistics Services at the Amboseli Conservation Program of the African Conservation Centre (ACC), Nairobi, Kenya. He holds a Ph.D. in biomathematics from University Paris VI and specializes in population dynamics, modeling large mammal migrations, GIS, and the application of open-source artificial intelligence and machine learning to biodiversity conservation and natural resource management in East Africa.
- **Daniel Ochieng Olago** – Professor of Geology (Environmental Geosciences) at the University of Nairobi, where he directs the Department of Earth and Climate Sciences and the Institute for Climate Change and Adaptation. His research covers water, climate, environment, and their interactions with humans. He participates in global environmental change training for various stakeholders and was a lead author of the IPCC Sixth Assessment Report and the Fourth Report recognized with the 2007 Nobel Peace Prize.

Panel 7 - Climate, Vulnerability, and Resilience: Observations and Open Scientific Data Platforms

Moderator :

- **Céline Mari** – Department Director of Science at IRD. She oversees scientific orientations in solid Earth, atmosphere, surfaces, and continental interfaces, addressing environmental and societal challenges in the Global South. She contributes to structuring international partnerships and developing interdisciplinary research to inform public policy. As a CNRS research director and atmospheric science specialist, her work focuses on atmospheric chemistry and pollution processes, their sources, transport, and impacts on the environment and health.

Speakers :

- **Dr. Mahdi Djama** – Director of the Information Systems Department, CERD.
- **Prof. Moustapha Ezziyani** – Full Professor in the Computer Science Department since 2017, member of the Mathematics and Applications Laboratory (MAL), and head of the research axis "Data Science and Digital Transformation." His work focuses on integrating heterogeneous systems, data science, artificial intelligence, decision-support systems, and new communication technologies.
- **Prof. Pierre-Étienne Mathé** – Ph.D. in Environmental Geosciences (1996, University of Aix-Marseille, France). Lecturer and researcher at CEREGE/OSU Institut Pythéas since 1999. Member and co-founder of the Rungwe Environmental Sciences Observatory Network (Mbeya, Tanzania) and member of COSDOC ADAC.
- **Prof. Saloua Jemjami** – Professor at the Faculty of Science and Technology of Settat, Hassan I University, Morocco.
- **Ms. Bianca Manacorda** – Program Officer, IOM – United Nations Migration, Djibouti.
- **Dr. Arona Dhiedou (online)** – Research Director at the Institut de Recherche pour le Développement (IRD; Institute of Environmental Geosciences, IGE – University Grenoble Alpes, France), based at the Félix Houphouët-Boigny University in Côte d'Ivoire (National High-Performance Computing Center, CNCCI). Founder of the International Associated

Laboratory NEXUS, focused on interactions between climate, water, agriculture, and energy. Specialist in the African climate system and tropical climate change, he leads or participates in several international programs on climate impacts, land use and cover in Africa, climate nexus, and climate information services. Contributor to IPCC and SPI/UNCCD reports.

- **Dr. Éric Delaitre** – Researcher, IRD, France; research engineer and Ph.D. in geology/geophysics at UMR ESPACE-DEV. Specializes in remote sensing and GIS applied to continental surfaces in tropical regions (Brazil, Madagascar, Tunisia), focusing on desertification, deforestation, biodiversity, oases, and mangroves. Also works on time series processing at multiple spatial and temporal scales.

Panel 8 - Water-Energy-Infrastructure Nexus: Integrated Solutions for Territorial Resilience

Moderator :

- **Dr Jean Albergel** – Emeritus Researcher at IRD (France) with a Ph.D. in Hydrology. His work focuses on climate impacts on water resources, land management, and the water-energy-food nexus in Africa. He serves as a special advisor at the French Ministry of Higher Education, Research and Sports (MESRE), is a member of the French Academy of Agriculture (AAF), and an honorary member of the African Academy of Sciences (AAS).

Speakers :

- **Mr. Hassan Mohamed** – Director of Rural Hydraulics, Ministry of Agriculture, Djibouti. Oversees the implementation and maintenance of boreholes and water points in rural areas.
- **Dr. Jalludin Mohamed** – Ph.D. in Hydrogeology (University of Poitiers, France, 1993). Joined ISERST in 1986 as a hydrogeologist, became Head of the Hydrogeology and Hydrology Department in 1994, and has served as Director General of CERD (Centre for Studies and Research of Djibouti, formerly ISERST) since 2002. Since 2014, designated geothermal expert for the Asal Rift geothermal project, funded by multiple donors and led by Électricité de Djibouti (EDD).
- **Prof. Razak Mumtaz** – Professor at the University of Poitiers (France). University researcher involved in international scientific cooperation, covering higher education, research supervision, and capacity building, including collaborations with partners in Africa and the Middle East.
- **Dr. Gil Mahé** – Research Director at the French Institute for Research for Development (IRD) and member of the Hydrosciences Montpellier laboratory. With around 40 years of experience, he studies hydrology and climatology in Africa, focusing on climate change and human impacts on water resources, sediment transport, dam effects, and the atmosphere–sea surface temperature–precipitation relationship. Former head of UNESCO's FRIEND-Water program and president of the International Surface Water Commission.
- **Prof. Joël Nobert** – Director of the Institute of Resource Assessment (IRA), University of Dar es Salaam, Tanzania. Specialist in natural resource management, land use, and environmental assessment, with emphasis on soil, water, and climate issues. Actively

participates in development-oriented research, policy-relevant studies, and graduate training in East Africa, often in collaboration with international partners.

- **Prof. Feleke Zewge** – Director of the African Centre of Excellence in Water Management (ACEWM), Addis Ababa University, Ethiopia. Renowned expert in water resources management, hydrology, and water governance. Extensive experience in capacity building and regional research programs in Africa. Plays a key role in graduate training, applied research, and policy initiatives at national and continental levels.
- **Dr. Niall O'Connor (online)** – Director, Africa Centre, Stockholm Environment Institute (SEI), Nairobi, Sweden. Senior academic and policy expert working at the interface of energy, climate policy, and sustainable development, with a focus on evidence-based policy support and capacity building in Africa. Engages in regional and international research initiatives, supporting governments and institutions in climate-resilient energy transitions and development pathways.

Panel 9 - Biodiversity – Food Security – Health Link: Nature-Based Solutions and Resilient Food Systems

Moderator :

- **Dr. Frédérique Aberlenc (IRD)** – Research Director at IRD. Specialist in plant genetics, genomics, and reproduction, particularly of palms. Her work focuses on developing innovative solutions to strengthen the sustainability and resilience of agroecosystems in the Global South.

Speakers :

- **Mr. Mouktar Mahamoud** – Director of Agriculture since 2019, committed to sustainable agricultural development and climate resilience in arid environments. National focal point for the United Nations Convention to Combat Desertification (UNCCD). Leads programs on soil health, climate change adaptation, and the reuse of treated wastewater for agriculture. His work bridges public policy, regional cooperation, and operational implementation in Djibouti.
- **Dr. Abdourahman Daher Meraneh** – Researcher at the Centre for Studies and Research of Djibouti (CERD). Holds a Ph.D. in integrative biology of tropical plants from University of Montpellier 2 (2010). Research focuses on the physiology and reproductive biology of date palms and agroecosystem restoration under climate change. Since 2013, serves as Director of CERD's Life Sciences Institute, coordinating interdisciplinary research teams, and currently scientific coordinator of an international project funded by the Development Innovation Fund.
- **Dr. Mariagrazia Di Luca** – Associate Professor of Microbiology, Department of Biology, University of Pisa, Italy. Principal investigator at the International Center for Genetic Engineering and Biotechnology (ICGEB) in Trieste, leading a research group on antimicrobial resistance.

- **Dr. Ben Fungo – NAFORRI, Uganda** – Researcher at the National Agricultural Research Organization. Focuses on soil science, particularly soil fertility improvement and greenhouse gas reduction from agricultural lands.
- **Prof. Aïcha Rochdi** – Professor, Department of Applied Geology, Hassan I University, Settat, Morocco. Researches sustainable soil and water management, including (i) agroecology and innovative approaches for soil restoration and agricultural resilience, and (ii) hydrology and watershed erosion studies.

- **Ms. Roukya Hassan Cheik** – Director of Social Integration and Youth Volunteering, Ministry of Youth and Culture, Djibouti. Develops programs on civic engagement, inclusion, and community mobilization.

- **Dr. Bertrand Lafrance** – Veterinarian based in Djibouti since 1995, founder of the country's first private veterinary clinic, where he discovered previously undocumented wildlife. President of the Décan Association since 2001, dedicated to the protection of nature and wildlife.

Panel 10 - Innovation for Adaptation: Young Innovators at the Forefront

Moderator :

Prof. Oumarou Malam Issa (IRD, France) – Researcher at the French Research Institute for Development (IRD). His work focuses on soil structure and fertility, degradation of tropical and Sahelian soils, and the use of microorganisms such as cyanobacteria to restore degraded soils.

Speakers :

- **Dr. Adèle Ouédraogo, IRSAT, Burkina Faso** – Agro-pedologist at the Institute of Applied Science and Technology Research (IRSAT/CNRST), Burkina Faso. Her work focuses on converting household and agro-industrial waste into organic fertilizers to promote sustainable and resilient agriculture.

- **Mr. Abdou Maman, Tech-Innov, Niger** – Entrepreneur, inventor, and innovator specializing in Digital Farming. With over 15 years of experience in smart agriculture, he revolutionized farming with his invention Télé-Irrigation (3 patents granted by OAPI).

- **Dr. Dabar Moussa, Deputy Director of the National Education Training Center (CFEN), Djibouti** – Ph.D. candidate in Education Sciences at the University of Normandy (Caen, France) and member of the CIRNEF research lab. Holds a Master 2 in Social Sciences from the University of Southern Brittany, specialized in Education and Training Professions, with a focus on Institutional Responsibility. Currently serves as Deputy Director of the National Education Training Center (CFEN), Djibouti.

- **Mr. Osman Ali Soubaneh, CFEN, Djibouti** – Trainer at the National Education Training Center (CFEN), Djibouti. Works on strengthening pedagogical skills and supporting educational teams.

- **Dr. Odile Rauzy, Université Paul Sabatier, France (online)** – Professor of Internal Medicine. Former Vice-Dean and Director of the Department of Medicine, Midwifery, and Paramedical Sciences at the University's Faculty of Health. She earned her doctorate in 2006 and was appointed PU-PH in September 2008.

- **Dr. Gouled Miganeh, CEALT, University of Djibouti** – Deputy Director of CEALT. Contributes to the development of higher education programs, academic coordination, and strengthening scientific cooperation.

- **Ms. Nimo Warsama Abrar** – Head of the Youth Support Services Unit at the Ministry of Youth and Culture, Djibouti. Oversees programs for guidance, support, and mentorship of youth-led initiatives.

Panel 11 - New Technologies for Adaptation (Digital Tools, AI, and Early Warning Systems)

Moderator :

Prof. Hacène Djellout (Université Clermont Auvergne, France) – Works at the Blaise Pascal Mathematics Laboratory, Université Clermont Auvergne. His research focuses on probability theory, statistics, and applied mathematics. His recent work includes the publication *"Modeling Experimental Data with Polynomial Chaos."*

Speakers :

- **Prof. Jacques Piazzola (online)** – Professor at the University of Toulon, France. He leads the MEDD Hub (Sea, Environment, and Sustainable Development), an interdisciplinary institute comprising 10 laboratories dedicated to sustainable development in marine environments. He coordinates an international collaboration with the University of Djibouti and CERD to develop a technological platform that serves as an early warning system, risk prevention tool, and decision support system for coastal areas. His work aims to overcome the limitations of physical modeling for small coastal sites using AI and deep learning methods, in collaboration with Prof. Mehmet Ersoy.

- **Prof. Mehmet Ersoy (online), University of Toulon, France** – Professor of Applied Mathematics at the University of Toulon and SeaTech. His research focuses on numerical modeling of geophysical flows, environmental hydrodynamics, and the mathematics–data–AI interface. He coordinates several national and European projects and plays a key role in research structuring and ethics.

- **Dr. Houssein Ahmed** – Lecturer-Researcher at the University of Djibouti, involved in climate services and risk management. He focuses on developing multi-hazard early warning systems and generating actionable information for decision-makers.

- **Dr. Hassan Ali** – Associate Professor in Electrical Engineering at the University of Djibouti. Specialist in X-UV photodetectors, optical characterization, and energy

management systems. He is Director of the Multidisciplinary Doctoral School and former Dean of the Industrial Technology Institute.

- **Dr. Melissande Machefer** – Scientific Officer at the EU Joint Research Centre (European Commission, JRC EC), developing data-driven tools and models to improve food insecurity estimates and performing technical reviews of EC service provider projects. Previously, she was a research scientist in the private sector, building models to assess and forecast climate-related vulnerabilities, risks, and opportunities.

- **Prof. Moustapha Ezziyani** – Full Professor in the Department of Computer Science since 2017, member of the Mathematics and Applications Laboratory (MAL), and head of the "Data Science and Digital Transformation" research axis. His work focuses on integrating heterogeneous systems, data science, artificial intelligence, decision support systems, and new communication technologies.

ANNEX II – EXHIBITOR PROFILES (INNOVATION STANDS)

Stand 1 – Tele-Irrigation 3.0

EXHIBITOR	TECH-INNOV

Contact person / Stand manager	Mr. Abdou Maman
Country	Niger
Project title	Télé-Irrigation 3.0
Description	**Télé-Irrigation 3.0** is a digital system (hardware and software) that enables remote management, monitoring, and tracking of agroecological practices, particularly water management and soil health, via mobile phones, sensors, and solar energy. Designed for arid and semi-arid regions, the solution creates real-time interaction between the farmer, the soil, the crop, and the environment. It aims to reduce water usage by up to 60%, save up to 80% of time, and provide real-time monitoring of indicators such as CO_2, N_2O, CH_4, temperature, humidity, and evapotranspiration, while also estimating the farm's carbon footprint.

Stand 2 – Converting Household, Agricultural, and Agro-Industrial Organic Waste into Compost

EXHIBITOR	**IRSAT / CNRST (Faso Compost)**
Contact person / Stand manager	Dr Adèle Ouédraogo
Country	Burkina Faso
c	Converting Household, Agricultural, and Agro-Industrial Organic Waste into Compost
Description	In Burkina Faso, declining soil fertility requires increased production and use of organic fertilizers to restore soil organic matter. At the same time, large amounts of household and agro-industrial organic waste remain underutilized, causing health and environmental impacts. This innovation

	transforms such organic waste into compost, producing useful organic fertilizers that enhance productivity and strengthen the resilience of agricultural systems against climate change.

Stand 3 – New Varieties of Vegetable Seeds

EXHIBITOR	AGROECOLOGY LABORATORY
Contact person / Stand manager	CERD - Institut des Sciences de la Vie
Country	Djibouti
Project title	New Vegetable Seed Varieties Adapted to Local Climate
Description	Development and dissemination of vegetable seed varieties better suited to climatic constraints (heat, water stress, seasonal variability) to secure yields and maintain production quality in arid and semi-arid contexts. The project aims to support farmers' adaptation, strengthen food security, and promote more sustainable farming practices through more resilient plant material.

Stand 4 – Remote Sensing for Climate Adaptation: Real-Time Monitoring of Mangroves

EXHIBITOR	IRD (France) / DSI-CERD (Djibouti)
Contact person / Stand manager	Dr Eric Delaitre
Country	France / Djibouti

Project title	Remote Sensing for Climate Adaptation: Real-Time Mangrove Monitoring
Description	Implementation of mangrove monitoring using remote sensing and Geographic Information Systems (GIS) to rapidly track the evolution of these coastal ecosystems, including vegetation status, spatial dynamics, and areas of degradation or restoration. The objective is to provide actionable information to guide management, protection, and restoration efforts, thereby strengthening climate adaptation in coastal territories.

Stand 5 – Early Sex Determination of Date Palms for Sustainable Agriculture

EXHIBITOR	PLANT BIOTECHNOLOGY LABORATORY
Contact person / Stand manager	CERD - Institut des Sciences de la Vie
Country	Djibouti
Project title	Early Sex Determination of Date Palms for Sustainable Agriculture
Description	A plant biotechnology innovation enabling the early identification of date palm sex. This allows for optimized orchard planning, reduced costs associated with waiting for plants to mature, and improved productivity. By supporting more efficient planning and better allocation of planting material, this approach enhances the sustainability of agricultural systems and helps date palm farming adapt to climate constraints.

Stand 7 – Valorization of Seaweeds into Food and Cosmetic Products

EXHIBITOR	MARINE BIOLOGY LABORATORY
Contact person / Stand manager	CERD - Institut des Sciences de la Vie
Country	Djibouti
Project title	Valorization of Seaweeds for Food and Cosmetic Products
Description	This initiative focuses on transforming seaweed biomass into ingredients or products for food and cosmetic uses. It aims to create new value chains from biological resources, support economic activities that are compatible with ecosystem protection, and diversify income sources, all within a framework of sustainable development and adaptation to climate constraints.

ANNEX III – LIST OF PARTICIPANTS

	Name	Country	Institution
1	**Abdillahi Issack Mohamed**	Djibouti	Civil society
2	**Abdallah Hared Omar**	Djibouti	Civil society
3	**Abdallah Solma Abdallah**	Djibouti	Civil society
4	**Abdek Yacin Moussa**	Djibouti	Civil society

5	**Abderrezzak Cherifi**	Djibouti	Université Paris Saclay
6	**Abdi Bouraleh Darar**	Djibouti	Civil society
7	**Abdi Dirir**	Djibouti	Civil society
8	**Abdi Omar Obsieh**	Djibouti	Wingu Africa
9	**Abdillahi Ahmed Aden**	Djibouti	Association for the Protection of Trees in the Ali Region
10	**Abdillahi Mohamed Abdillahi**	Djibouti	Djiboutian Spatial Agency
11	**Abdimalik Ali Warsame**	Somalie	Hormuud University
12	**Abdirahman Abdillahi Affasseh**	Djibouti	Civil society
13	**Abdo Aboubaker Ali**	Djibouti	Civil society
14	**Abdo Mohamed Amine**	Djibouti	Climate Action Committee : organization
15	**Abdorachid Nouh Ibrahim**	Djibouti	National Gendarmerie
16	**Abdoulkader Houssein Mohamed**	Djibouti	CERD
17	**Abdoulkader Ibrahim Idriss**	Djibouti	Université de Djibouti
18	**Abdoulrazack Aref Abdillahi**	Djibouti	IEPS/CERD
19	**Abdourahman Daher Meraneh**	Djibouti	CERD
20	**Abdourahman Houssein**	Djibouti	Université de Djibouti
21	**Abdourahman Yacin Ahmed**	Djibouti	Université de Djibouti
22	**Abdulrahman M A Gh S Alqadiri**	Djibouti	Civil society
23	**Aberlenc Frederique**	France	IRD
24	**Aboubaker Abdi Robleh**	Djibouti	Civil society

25	**Aboubaker Ahmed**	Djibouti	Civil society
26	**Aboubaker Ali Moussa**	Djibouti	Électricité de Djibouti
27	**Aboubaker Houssein Mohamed**	Djibouti	Civil society
28	**Adeleh Souleiman**	Djibouti	MENFOP
29	**Adeoti AdéOla Zouri-Kifouli**	Bénin	Université d'Abomey-Calavi
30	**Adou Abdallah Kadiri**	Djibouti	Climate Action Committee : organization
31	**Adwa Abdou Ali**	Djibouti	ISV/CERD
32	**Afnan Abdokarime**	Djibouti	MENFOP
33	**Afnan Ahmed**	Djibouti	MENFOP
34	**Ahadi Ali Mohamed**	Djibouti	Civil society
35	**Ahmed Dini Ali**	Djibouti	CRIPEN
36	**Ahmed Houssein Said**	Djibouti	Civil society
37	**Ahmed Mohamed Ahmed**	Djibouti	Civil society
38	**Ahmed Yassin Mahamoud**	Djibouti	Civil society
39	**Aicha**	Djibouti	Civil society
40	**Aicha Abdi Hadi**	Djibouti	Civil society
41	**Aïcha Ahmed**	Djibouti	MENFOP
42	**Aicha Ahmed Ali**	Djibouti	FAO
43	**AïCha Sougal Hassan**	Djibouti	Civil society
44	**Akram Kalid Ahmed**	Djibouti	CERD

45	**Al-Djazouli Ouchar Mahamat**	UAE	Essaâdi University
46	**Ali Merito Ali**	Djibouti	Civil society
47	**Ali Miganeh**	Djibouti	Université de Djibouti
48	**Ali Mohamed Houmed**	Djibouti	Civil society
49	**Ally Said Kiumwa**	Tanzanie	RUNGWE DISTRICT COUNCIL TANZANIA
50	**Amer Abdorachid Omar**	Djibouti	REDA – Network of Ambitious Djiboutian Entrepreneurs
51	**Amin Youssouf Mohamed**	Djibouti	Civil society
52	**Amina Is Ibrahim**	Djibouti	Civil society
53	**Amina SaïD Chire**	Djibouti	Research
54	**Amos Enock Majule**	Tanzanie	University of dar es Salaam
55	**Amoun Youssouf Abdillahi**	Djibouti	Entrepreneur
56	**Amran Awale**	Djibouti	Civil society
57	**Andrei Shanin**	Djibouti	Russian embassy
58	**Anissa Mohamed**	Djibouti	MENFOP
59	**Arona Diedhiou**	France	IRD
60	**Arwa Fouad Ali**	Djibouti	CCD
62	**Asma Abdi Robleh**	Djibouti	Civil society
63	**Asma Djama Araleh**	Djibouti	Civil society
61	**Asma Houssein Kawalie**	Djibouti	Civil society
64	**Asma Outte**	Djibouti	MENFOP

65	**Assia Abdou Ali**	Djibouti	MENFOP
66	**Assia Mohamed Hassan**	Djibouti	CERD
67	**Awaleh Abdi Ibrahim**	Djibouti	Green Bag
68	**Awaleh Abdoulkader**	Djibouti	MENFOP
69	**Ayan Omar**	Djibouti	MENFOP
70	**Ayan Omar Ibrahim**	Djibouti	ISV/CERD
71	**Ayanle Omar Kayad**	Djibouti	ISV/CERD
72	**Ayanleh Abdo Abdillahi**	Djibouti	Civil society
73	**Ayoub Ahmed Hersi**	Djibouti	Civil society
74	**Bachar Aboud Moubarak**	Djibouti	Civil society
75	**Bahdon Elmi Ragueh**	Djibouti	CERD
76	**Ballarin**	France	IRD / UniCA
77	**Benedict Mwavu Mutua**	Kenya	Technical University of Kenya
78	**Bernard Fungo**	Ouganda	NAFORRI
363	**Bertrand Lafrance**	Djibouti	DECAN Organization
79	**Bianca Manacorda**	Djibouti	ICGEB Group Leader
80	**Calatayud Paul-Andre**	Kenya	IRD
81	**Captain Patrick Kikwaya**	Tanzanie	University of Dar es Salaam
82	**Cécile Sabourault**	France	Université Côte d'Azur
83	**Chaker Ibrahim**	Djibouti	Université de Djibouti

84	**Chayma Nidar Said**	Djibouti	CERD/IRM
85	**Chewa Donald**	Cameroun	Research
86	**Chifa Mohamed**	Djibouti	MENFOP
87	**Chotte**	France	IRD
88	**Christine Omuombo**	Kenya	Technical University of Kenya
89	**Coustilliere**	Djibouti	French embassy in Djibouti
90	**Dabar Moussa**	Djibouti	MENFOP
91	**Dagan Abdoulkader Mohamed**	Djibouti	Civil society
92	**Daher Mohamed**	Djibouti	MENFOP
93	**Daniel Ochieng Olago**	Kenya	University of Nairobi
94	**Dato Gaas Ali**	Djibouti	Amoyta
95	**David Jan Alexander Meissner**	Kenya	PNUE
96	**David Marques**	Djibouti	Civil society
97	**David Williamson**	Djibouti	CERD
98	**Dayib Osman Samireh**	Djibouti	CERD
99	**Dayibo Mahamoud Farah**	Djibouti	Civil society
100	**Dek Mouhoumed**	Djibouti	CERD
101	**Deka Mahamoud Guirreh**	Djibouti	E-health Digital Djibouti
102	**Delaitre Eric**	France	IRD
103	**Desconnets Jean-Christophe**	France	IRD

104	**Dessie Nedaw Habtemariam**	Ethiopie	Addis Ababa University
105	**Djaltou Aboubaker Osman**	Djibouti	CERD
106	**Djellout**	France	Université Clermont Auvergne
107	**Dominique Dumet**	France	IRD
108	**Doris Aline Barboni**	France	CEREGE
109	**Dr Abdirahman Elmi Fourreh**	Djibouti	CERD/IRM
110	**Dr Mohamed Abdi Khaireh**	Djibouti	Université de Djibouti
110	**Dr. Anne Kuria**	Kenya	CIFOR-ICRAF
112	**Dr. Daha Hassan Daher**	Djibouti	CERD
114	**Ekaterina Kashirina**	Russie	The A.O. Kovalevsky Institute of Biology of the Southern Seas
115	**Elena Bendetti**	Italie	ICGEB Group Leader
116	**Eliane Ilias**	Djibouti	Student
117	**Eltson Eteckji Fonkeng**	Autre	Civil society
360	**Eric Deguerpel**	Djibouti	French Development Agency in Djibouti
118	**Fabio Maria Montagnino**	Italie	Climate KIC European Institute of Innovation and Technology
119	**Faiza Awaleh Ibrahim**	Djibouti	faizailhan1234@gmail.com
120	**Farah Abdillahi Ali**	Djibouti	Central Procurement of Medicines and Essential Supplies
121	**Fathia Farah Mo**	Djibouti	Civil society
122	**Fathia Mohamed Ali**	Djibouti	Civil society
123	**Fatoum Said Ismaël**	Djibouti	Ministry of Labour in charge of Formalization and Social Protection

124	**Fatouma Ahmed Ali**	Djibouti	Civil society
125	**Fatouma Mohamed Abdoul-Latif**	Djibouti	CERD
126	**Feleke Zewge**	Ethiopie	Dir ACEWM
127	**Fouad Houssein Hassan**	Djibouti	Civil society
128	**Fouad Nouh Sougal**	Djibouti	Djibouti University Hospital (CHU)
129	**Fozia Abdillahi SaïD**	Djibouti	Civil society
130	**Girma Sahilu Bedane**	Ethiopie	Addis Ababa University
131	**Golab Moussa Omar**	Djibouti	CERD
132	**Gouled Said Abdi**	Djibouti	Civil society
133	**Goumane Said Yassin**	Djibouti	EDD
134	**Guyot**	France	IRD
135	**Hafsa Robleh Isman**	Djibouti	Civil society
136	**Haibado Abdoulkader Yacin**	Djibouti	Civil society
137	**Hajara Hassan Youssouf**	Djibouti	Société civile
138	**Hakan Ates**	Türkiye	Cankiri Karatekin University
139	**Halimo Mohamed Abdi**	Djibouti	Civil society
140	**Haloum Abdallah Mohamed**	Djibouti	CERD
141	**Hamda Mohamed Chideh**	Djibouti	Ministry of National Education
142	**Hamda Osman Guedi**	Djibouti	Civil society
143	**Hamdi Abdo Doubad**	Djibouti	Civil society

144	**Hamza Dirieh**	Djibouti	Civil society
145	**Hamza Elmi Yonis**	Djibouti	Civil society
146	**Hamza Osman Waberi**	Djibouti	Senior Consultant
147	**Hamze Mohamed Hassan**	Djibouti	Civil society
148	**Hanan Mahamoud Mohamed**	Djibouti	Civil society
149	**Hasna Hassan**	Djibouti	MENFOP
150	**Hassan Ahmed Mohamed**	Djibouti	Civil society
151	**Hassan Ali BARKAD**	Djibouti	Université de Djibouti
152	**Hassan Ali Chansan**	Djibouti	Climate Action Committee : organization
153	**Hassan Miguil**	Djibouti	MENFOP
154	**Hassan Mohamed Hassan**	Djibouti	Directorate of Rural Water
155	**Hassan Mohammed**	Djibouti	MENFOP
156	**Hayad Robleh Bahdon**	Djibouti	Civil society
157	**Hazard**	Kenya	CNRS
158	**Hikmat Riad Saleh**	Djibouti	participant
159	**Hoda Souleiman Bouraleh**	Djibouti	Civil society
160	**Hodan Mohamed Abdi**	Djibouti	Civil society
161	**Houda Abdallah Isman**	Djibouti	Directorate of Rural Water / MAEPERH
162	**Houssein Ahmed**	Djibouti	Université de Djibouti
163	**Houssein Hamad Badoul**	Djibouti	Civil society

164	**Houssein Mohamed Gass**	Djibouti	Doraleh multi-purpose port
165	**Ibrahim Adaweh Ahmed**	Djibouti	Civil society
166	**Ibrahim Aden Mohamed**	Djibouti	Chartered Accounting Firm ZIA
167	**Ibrahim Mohamed**	Djibouti	Civil society
168	**Ibrahim Mohamed Ibrahim**	Djibouti	Civil society
169	**Ibrahim SaïD Ali**	Djibouti	Civil society
170	**Idil Abdi Mohamed**	Djibouti	MENFOP
171	**Idil Mouhoumed**	Djibouti	Université de Djibouti
172	**Idris Ahmed Souleiman**	Djibouti	Civil society
173	**Idriss Miganeh Waiss**	Djibouti	CERD
174	**Ikram Hassan Hoch**	Djibouti	Survey Officer and Secretary of the Dynamic Youth Alliance Association
175	**Isaac Tom Okurut**	Ouganda	Makerere University
176	**Iskandar Mahamoud Hassan**	Djibouti	CERD
177	**Ismael Said Ismael**	Djibouti	CERD
178	**James Kairo**	Kenya	Kenya Marine and Fisheries Research Institute
179	**Jangorzo Salifou Nouhou**	Niger	Université Dan Dicko Dankoulodo de Maradi
180	**Jean Albergel**	France	IRD
361	**Jean-françois Arnal**	France	French Development Agency in Djibouti
181	**Jeanick Brisswalter**	France	Université Côte d'Azur
182	**Jihan Abdoulkaher Hassan**	Djibouti	Civil society

183	**Joel Nobert Kirway**	Tanzanie	University of Dar es Salaam
184	**Kader Youssouf Elmi**	Djibouti	Civil society
185	**Kadidja Djama Ilmi**	Djibouti	Civil society
186	**Kadidja Houssein Hared**	Djibouti	Civil society
187	**Kadiga Omar Mohamed**	Djibouti	MENFOP
188	**Kaltoum Ali**	Djibouti	Civil society
189	**Kaltoum Bouh Osman**	Djibouti	MENFOP
190	**Kashimbi Juma Kihara**	Tanzanie	IRA
191	**Kwami Dzifanu Nyarko-Badohu**	Djibouti	FAO
192	**Ladan Mohammed Hassan**	Djibouti	Civil society
193	**Ladan Moussa Ahmed**	Djibouti	Civil society
359	**Laurence Amigues**	Djibouti	French Embassy in Djibouti
194	**Lea Meltz**	Djibouti	Civil society
195	**Leonidah Kerubo**	Kenya	University of Nairobi
196	**Liban Ismail Abdillahi**	Djibouti	Université de Djibouti
197	**Liban Said Mohamed**	Djibouti	DJIB INNOVA CONSULTING
198	**Lineva Nastasia**	Russie	Institute of Biology of the Southern Seas of RAS
199	**Lorene Ladan Fofana**	Sénégal	A Better Life/ SOS SAHEL
200	**Loula Ali Elabe**	Djibouti	Civil society
201	**Madina Ismael Absieh**	Djibouti	Civil society

202	**Madina Moussa Darar**	Djibouti	National Education
203	**Madina Youssouf Ismail**	Djibouti	Sud Analytics
204	**Mahad Ahmed Abdallah**	Djibouti	MENSUR
205	**Mahamoud Osman Abdillahi**	Djibouti	MENSUR
206	**Mahdi Abdi Rayaleh**	Djibouti	Djibouti pavé plastique
207	**Mahdi Atteyeh Bouh**	Djibouti	Civil society
208	**Mahdi Djama Rayaleh**	Djibouti	CERD
209	**Mahé Gil**	France	IRD
210	**Mahmoud Mourad Mahmoud**	Djibouti	CEALT
211	**MaïMouna Mohamed Chehem**	Djibouti	Civil society
212	**Malala Lictevoet**	Djibouti	Sos Environnment Djibouti
213	**Malam Issa**	Djibouti	IRD
113	**Malika Ed Dahbi**	Djibouti	French Embassy in Djibouti
214	**Malyoun Mahamoud**	Djibouti	MENFOP
215	**Maman Abdou**	Niger	Tech Innov
216	**Mari Celine**	France	IRD
217	**Mariagrazia Di Luca**	Italie	ICGEB Group Leader
218	**Mariam Mohamed**	Djibouti	Civil society
219	**Mathé Pierre-Etienne**	France	Civil society
220	**Maydoub Ilyas**	Djibouti	MENFOP

221	**Medinasolutions**	Kenya	Civil society
222	**Melissande MACHEFER**	France	JRC EC
223	**Mevlut Karatas**	Türkiye	Cankiri Karatekin University
224	**Mirane Isse Mohamed**	Djibouti	Civil society
225	**Mohamed**	Djibouti	Civil society
226	**Mohamed Abdi Hassan**	Djibouti	Civil society
227	**Mohamed Ahmed Daoud**	Djibouti	CERD
228	**Mohamed Ahmed Mohamud**	Somalie	Jamuriya University of Science and Technology
229	**Mohamed Ahmed Robleh**	Djibouti	Civil society
230	**Mohamed Ahmed Said**	Djibouti	IRM-CERD
231	**Mohamed Dato Seik**	Djibouti	MENSUR
232	**Mohamed Egueh Walieh**	Djibouti	CERD/ISV/Lab Pédologie
233	**Mohamed Eleyeh**	Djibouti	MENFOP
234	**Mohamed Fathi Mahamoud**	Djibouti	Djiboutian Spatial Program
235	**Mohamed Hamad Bililis**	Djibouti	Civil society
236	**Mohamed Hassan**	Djibouti	MENFOP
237	**Mohamed Hassan Ali**	Djibouti	Civil society
238	**Mohamed Ibrahim**	Djibouti	Université de Djibouti
239	**Mohamed Ladieh**	Djibouti	CERD
240	**Mohamed M. Rayaleh**	Djibouti	LARAY STRATEGIC ADVISORY

241	**Mohamed Omar Hassan**	Djibouti	GOGORI S.A.S
242	**Mohamed Sahal Ahmed**	Djibouti	Civil society
243	**Mohamed Souleiman Moussa**	Djibouti	Civil society
244	**MohamedEleyeh**		Civil society
245	**Momina Mahamed Moussa**	Djibouti	Civil society
246	**momo**	Djibouti	Civil society
247	**Mostafa Ezziyyani**	Maroc	Abdelmalek Essaadi University
248	**Mouad Abdillahi**	Djibouti	Civil society
249	**Mouaromba Wavel**	Tchad	Institut Tchadien de Recherche Agronomique pour le Développement (ITRAD)
250	**Moubarak Ahmed Mohamoud**	Djibouti	CERD
251	**Moumin Douhour**	Djibouti	MENFOP
252	**Moumin Yacin Abdillahi**	Djibouti	Civil society
253	**Moumtaz Mahmoud Abdoul Razack**	France	Université de Poitiers
254	**Mounawara Mohamed Djama**	Djibouti	MENFOP
255	**Moune Youssouf Ismael**	Djibouti	Djiboutian Agency for Social Development (ADDS)
256	**Moursal Ibrahim Moussa**	Djibouti	Civil society
257	**Mouss-Ab Moussa Dirieh**	Djibouti	Next step
258	**Moussa Abdallah Mohamed**	Djibouti	Sales Representative
259	**Moussa Ahmed Mohamed**	Djibouti	VINCI Construction – Major Projects

260	**Moussa Mohamed Waberi**	Djibouti	CERD
261	**Moustapha Mohamed Abdo**	Djibouti	7 Dabali OBOCK S.A.R.L
262	**Moustapha Nour Ibrahim**	Djibouti	CERD
263	**Moustapha Omar Mahamoud**	Djibouti	Université de Djibouti
264	**Nabugasha Diana**	Ouganda	Samuel Wegoye Advocates
265	**Nadra Mahamoud-Moktar Omar**	Djibouti	Civil society
266	**Nancy Waringa Wanjiru**	Kenya	IRD
267	**Nasir Mohamed Doualeh**	Djibouti	Université de Djibouti
268	**Nasir Mohamud Ibrahim**	Djibouti	Civil society
269	**Nasri Hassan Ibrahim**	Djibouti	CERD
270	**Nassim Ali Mohamed**	Djibouti	CERD
271	**Nasteho Mahamed Ahmed**	Djibouti	Civil society
272	**Nasteho Mohamed Warsama**	Djibouti	Novatez
273	**Necdem Donfack Vanique Patherson**	Cameroun	Université de Douala
274	**Neima Abdillahi Houssein**	Djibouti	Civil society
275	**Neima Hassan**	Djibouti	Civil society
276	**Neima Hassan Ismael**	Djibouti	MENFOP
277	**Neima Said Houssein**	Djibouti	Civil Society
278	**Nima Moussa**	Djibouti	Civil society
279	**Noura Siyaad Barreh**	Djibouti	Civil society

280	**Nur Rashid Ahmed**	Somalie	Jamuriya University of Science and Technology
281	**Omar Abdi Abdillahi**	Djibouti	Civil society
282	**Omar Hassan Ali**	Djibouti	Civil society
283	**Omar Mahmoud Mohamed Ahmed**	Djibouti	Civil society
284	**Omar Osman**	Djibouti	Civil society
285	**Omar Osman Abdi**	Djibouti	Université de Djibouti
286	**Omar Youssouf Houssein**	Djibouti	Civil society
287	**Oscar Eschenbrenner**	Djibouti	French Embassy in Djibouti
288	**Osman Ali Soubaneh**	Djibouti	MENFOP
289	**OUEDRAOGO Rayangnéwendé Adèle**	Burkina Faso	IRSAT-CNRST
290	**Oumahani IsmaëL Hassan**	Djibouti	Civil society
291	**Oumalkaire Abdi Ibrahim**	Djibouti	Civil society
292	**Oumalker Moustapha Emi**	Djibouti	Climate Action Committee Organization
293	**Perla Farhat**	France	IRD
294	**Prof Dr Abdi Omar Shuriye**	Somalie	Jamhuriyah university, Somalia
295	**Rachid Bouh Robleh**	Djibouti	Civil society
296	**Rachid Mohamed**	Djibouti	Université de Djibouti
297	**Rachid Robleh Ragueh**	Djibouti	CERD
298	**Ragueh Abdi Ragueh**	Djibouti	National Technical Committee for Energy, Electronics, Electrotechnics, and Renewable Energy

299	**Rahima Nasir Omar**	Djibouti	Civil society
300	**Rahma Abdi**	Djibouti	MENFOP
301	**Rahma Hassan**	Djibouti	Civil society
302	**Raisso Houssein Mahamoud**	Djibouti	Civil society
303	**Ramadan Ali Ahmed**	Djibouti	Université de Djibouti
304	**Rochdi Aicha**	Maroc	Université Hassan 1er
305	**Roho-Loule Guedid Abdon**	Djibouti	Civil society
306	**Rokiatou Traore**	Mali	Herou Alliance
307	**Roueda Ziad Taher**	Djibouti	Civil society
308	**Ruweida Mohamed Obo**	Kenya	NATIONAL ASSEMBLY
309	**Saad Houssein Hassan**	Djibouti	Private Solar System Installer
310	**Sadat Saleh**	Djibouti	Université de Djibouti
311	**Safa Ismael Doualeh**	Djibouti	Civil society
312	**Safia Abdillahi Ali**	Djibouti	Civil society
313	**Safia Ahmed Ibrahim**	Djibouti	Civil society
314	**Safia Ahmed Mahamoud**	Djibouti	Civil society
315	**Sagal Mohamed**	Djibouti	Université de Djibouti
316	**Said Hassan Mahamad**	Djibouti	Entrepreneur
317	**Said Okieh Kamil**	Djibouti	CERD/DSI
318	**Saida Barkat Daoud**	Djibouti	IRM-CERD

319	**Saida Chideh Soliman**	Djibouti	Université de Djibouti
320	**Saleh Mohamed Houssein**	Djibouti	Civil society
321	**Saliha Ahmed Cheiko**	Djibouti	MENFOP
322	**Sallam Mokhtar Sallam Dhafer Alhakimi**	Djibouti	Civil society
323	**Salman Hassan Darar**	Djibouti	Civil society
324	**Saloua Jemjami**	Maroc	Université Hassan 1er
325	**Salsabila Saleh Awaleh**	Djibouti	CERD
326	**Samatar Kayad Guelleh**	Djibouti	National Malaria Control Program
327	**Samatar Omar Djama**	Djibouti	CERD /ISV
328	**Samia Abdoulkader Youssouf**	Djibouti	Civil society
329	**Saredo Ahmed Yonis**	Djibouti	Civil society
358	**SE Jérôme Bresson**	Djibouti	French Ambassador in Djibouti
330	**Sebastien Velut**	France	IRD
331	**Semhal Simon**	Canada	UQAM
332	**Sikie Abdillahi Elmi**	Djibouti	Civil society
334	**Souad Elmi Houssein**	Djibouti	Civil society
335	**Sougueh Cheik**	Djibouti	CERD
336	**Souleikha Mouhamed**	Djibouti	Civil society
337	**Souleiman Ismael Hassan**	Djibouti	Civil society
338	**Souleiman Isman**	Djibouti	Université de Djibouti

339	**Souleiman Omar Hoch**	Djibouti	CEALT
340	**Soumaya Ahmed Mahamoud**	Djibouti	Civil society
341	**Sozanne Said Ismail**	Djibouti	CFEN
342	**Sylvie Lewicki**	France	CIRAD
343	**Tasnim Omar Abdillahu**	Djibouti	Civil society
344	**Tawfik Ibrahim Gaber**	Djibouti	Civil society
345	**THEAU Benoit**	France	IGAPURA
346	**Verdier Valérie Marie**	France	IRD
347	**Veronica Faith Kemunto**	Kenya	IRD
362	**Victor Bernard**	Djibouti	French Institute of Djibouti
348	**Victor MOSE**	Kenya	African Conservation Centre
349	**Yahyeh Souleiman Isman**	Djibouti	Université de Djibouti
350	**Yasser Awaleh Elmi**	Djibouti	French Institute of Djibouti
351	**Ye SiéDouba Georges**	Burkina Faso	IRSAT/CNRST
352	**Youssouf Abdi Arreh**	Djibouti	Civil society
353	**Zahra Hassan**	Djibouti	MENFOP
354	**Zakaria Mouhoumed Ahmed**	Djibouti	Civil society
355	**Zeinab Abdi**	Djibouti	MENFOP
356	**Zeinalabidine Souleiman Said**	Djibouti	Ministry of Higher Education and Research (MENSUR)
357	**Zouhour Hassan Youssouf**	Djibouti	Civil society