DAKSHIN Workshop on Agriculture

17 January 2024

Report

DAKSHIN
Development and Knowledge Sharing Initiative
GLOBAL SOUTH CENTRE OF EXCELLENCE

RIS
Research and Information System for Developing Countries
विकासशील देशों की अनुसंधान एवं सूचना प्रणाली

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Concept Note

The Prime Minister of India inaugurated DAKSHIN – The Global South Centre of Excellence during the 2nd Voice of Global South Summit held virtually on 17th November 2023. Research and Information System for Developing Countries (RIS) hosts DAKSHIN and has been engaging with several think tanks across the Global South countries and formalising DAKSHIN's relationship with them through signing of Letter of Association (LoA). The Prime Minister also announced that DAKSHIN will coordinate an annual international conference of research partners and think tanks. It is proposed to have such a conference in February – March 2024. To initiate collective engagements of think tanks of the Global South in the run up to this conference, DAKSHIN is organising a virtual workshop on the agriculture sector on 17th January 2024.

The workshop aims to:

1. Discuss innovative solutions, best practices, successful flagship schemes of India & other countries of the Global South in the agriculture sector.
2. Promotingdevelopmentsolutionsadvocatedbythesecountriesfortheirpossible replication and adoption among peer countries of the developing world.
3. Involvethinktanks/universities/researchinstitutionsinpromotingmutuallearning, exchange of experiences and good practices among Global South countries.
4. Identifying areas of common interests and institutional collaboration.

Most of the countries of Global South face challenges related to food security of their population, improving farmers yield, manage groundwater level and maintaining nutrient value of the cultivated soil. The workshop will dwell upon these challenges, and would also deliberate upon farmer-centric solutions relevant for crop planning and health, improved access to farm inputs, credit ,and insurance. The role of technology in different aspects of farming cycle like weather forecasting, soil health indicators, irrigation techniques, seed sowing & harvesting would also be discussed.

In the spirit of 'One Earth, One Family, One Future', Global South cooperation in agriculture can fast-track food security and nutrition, sustainable agriculture with climate smart approach, inclusive agri-valuechains and food systems, all of which necessitate digitalization for agricultural transformation. DAKSHIN Workshop on Agriculture will

showcase Indian schemes and programmes, and experiences of other countries of the Global South in the following potential areas of cooperation:

1. Food security and nutrition
2. Sustainable, inclusive and climate resilient agriculture
3. Funding agriculture infrastructure
4. Digitization of agricultural markets

Agenda

Time	Event Details
5:00 pm – 5:05 pm	**Welcome Remarks** • Prof Sachin Chaturvedi, Director General, RIS
5:05 pm – 5:10 pm	**Introductory Remarks by Chair** • Dr Pramod Kumar Anand, Visiting Fellow, RIS
5:10 pm – 5:20 pm	**Keynote Address:** Overview of successful/innovative Indian Agriculture programmes Dr Smita Sirohi, Principal Scientist, ICAR, Ministry of Agriculture & Farmers Welfare, Govt of India
5:20 pm – 5:30 pm	**Discussants :** Discussion on Indian and global initiatives on agriculture in the context of immersive knowledge sharing among the countries of the Global South. • Dr S R Rao, Member of Governing Council, Society for Technology Management, India • Dr Kalpana Sastry, Managing Director, Ag-Hub Foundation, PJTSAJ, Hyderabad, India
5:30 pm – 5:50 pm	**Special Remarks:** • Challenges in the agriculture sector in the Global South countries; an overview of successful/innovative Agriculture programmes of respective countries • Discussants from selected Think Tanks
5:50 pm – 6:25 pm	**Open Discussion**
6:25 pm – 6:30 pm	**Vote of Thanks – DAKSHIN, RIS**

Proceedings and Outcomes

On Wednesday, January 17, 2024, DAKSHIN – the Global South Centre of Excellence at RIS, organized a workshop on Agriculture, bringing together experts, policymakers, and representatives from across the Global South to exchange experiences and best practices in sustainable and climate-resilient agriculture. The workshop aimed to strengthen South–South cooperation in promoting natural farming, regenerative agriculture, and innovative policy and institutional approaches to enhance food and nutritional security and ensure sustainable agricultural development in the Global South.

Mr. Atul Kaushik, GDC Fellow at the Research and Information System for Developing Countries (RIS), commenced the proceedings by extending a warm welcome to participants from various regions worldwide. Mr. Kaushik provided an overview of RIS, emphasizing its 4-decadelong commitment to working in 4 pillars; global economic governance, trade, investment and economic cooperation,trade facilitation and regional cooperation, and new technologies and development issues.

Mr. Kaushik talked about RIS's vertical on South -South cooperation and development cooperation since its existence and research work being available on the RIS's website relating to development cooperation.Additionally, he highlighted the pivotal role of the Global Development Centre (GDC) in sharing India's developmental experiences and best practices with other countries in the global South.The government has established the global South Centreof Excellence or DAKSHIN during second voice of global south summit, held on November 17, 2023. Dakshin is a Sanskrit or Hindi word, meaning'South' and when spelled in English, it is an acronym for development and knowledge sharing initiative.The Prime Minister had shared his vision about Dakshin back in the first voice of global South Summit held in January 2023 as a part of India's G20presidency.Mr. Kaushik outlined Dakshin's vision to foster knowledge exchange and mutual learningfor building capacities and developing sustainable affordable and locally relevant solutions by collating resources, experiences and strategies to address development challenges the global South faces and to promote globally inclusive partnerships.

In this exercise to promote globally inclusive partnerships,Mr. Kaushik introduced this first virtual workshop on Agriculture sector, aimed to facilitate discussions on agricultural development challenges and innovative solutions. He shared with the participants about Dakshin's plan of conducting more virtual workshops going forward. Besides the virtual event, He also informed the participants about upcoming annual in person International

Conference of the global South think tanks, details of which are yet to be finalised. In conclusion, Mr. Kaushik reiterated the importance of collaborative efforts in empowering the global South to address pressing issues in the agricultural sector, so that the global South canwork for itself through agencies that are from the global South and for the people of the global South. After expressing gratitude to the participants, he handed over the proceedings to Dr. PK Anand, anticipating insightful deliberations that would contribute to sustainable agricultural development in the global South.

Dr. Pramod Kumar Anand, gave his opening remarks, acknowledging the shared aspirations among countries of the Global South. Emphasizing the importance of sustainable and resilient agriculture, he highlighted the prevalent food deficits faced by 46 countries, necessitating external aid.

Dr. Anand acknowledged the necessity for significant interventions and initiatives, particularly in terms of investments and knowledge dissemination through platforms like Dakshin. He strongly emphasized the pivotal role of digitalization in agricultural development, citing successful implementations in various countries of the Global South, and encouraged collaborative efforts in this domain.Dr.Anand alsocommended the efforts of the Global South in ensuring food security amidst disruptions caused by the pandemic, underscoring the importance of sustained collaboration in this regard, while highlighting the importance of addressing nutritional challenges, with a special mention of the resilience and nutritional value of millets, presenting opportunities for small-scale farmers. He also talked about exploring the potential of leveraging advancements in Science and Technology, such as satellite imagery, for crop estimation and identifying water stress, to enhance agricultural practices.Dr.P.K.Anand then invited Dr. Smita Sirohi, a distinguished figure in agricultural circles, to share insights into India's initiatives, who had been India's face during G20 in agriculture.

Dr. Smita Sirohi, Principal Scientist, ICAR,Ministry of Agriculture & Farmers Welfare, Govt of India, underscored the significance of addressing these challenges collectively, highlighting the shared issues among countries, albeit with varying intensities.

Dr.Sirohi elaborated on the common challenges plaguing agricultural sectors across the Global South. These challenges include a disparity between structural changes and output, declining GDP contribution from agriculture despite a significant workforce reliance, limited access to resources coupled with water resource mismanagement, low efficiency levels, inadequate infrastructure, and restricted access to international markets. Climate change exacerbates these challenges, particularly in tropical regions, necessitating robust responses.

Amidst these challenges, Dr.Sirohi emphasized shared goals such as ensuring food security, promoting sustainable agricultural practices, and fostering inclusive and

equitable agricultural systems. She stressed the importance of concerted efforts to achieve these objectives, drawing attention to the workshop's platform for mutual learning and collaboration.

Dr.Sirohi provided insights into India's agricultural journey, noting substantial advancements despite persistent challenges. Notably, India has witnessed significant growth in food production and agricultural sector income, driven by diversified growth across various sectors, including fisheries.Dr.Sirohi outlined key initiatives that have contributed to India's agricultural progress. These initiatives include the National Mission for Sustainable Agriculture, focusing on rainfed area development, and the Soil Health Card scheme aimed at addressing soil productivity and nutrient imbalances. Additionally, emphasis on natural farming practices, diversification, climate-resilient agriculture, and risk management through crop insurance schemes have been pivotal.

Efforts to improve market access and infrastructure development were highlighted, including initiatives such as the e-NAM (National Agriculture Market) portal and support for agri-business consortia and farmer producer organizations. Significant investments have been made in post-harvest management infrastructure and digitalization to enhance efficiency and transparency in agricultural operations.Dr.Sirohi underscored the role of technology in agricultural transformation, citing examples such as the AgriStack initiative aimed at enhancing transparency and efficiency through digital platforms like mKisan for disseminating farm advisories and weather information.

In concluding remarks, Dr.Sirohi reiterated the importance of collaboration and knowledge exchange among nations in addressing shared agricultural challenges. She emphasized the workshop as a platform for sharing experiences and learning from each other's successes and failures.

Dr.P.K Anand expressed gratitude to Dr.Sirohi for her insightful presentation and highlighted the need for ongoing national reviews and initiatives to enhance agricultural productivity, resilience, and sustainability. He invited further contributions from Dr. S.R. Rao and encouraged continued dialogue and collaboration among participants.

Dr. S.R. Rao, Member of Governing Council, Society for Technology Management, India. He holds experience in genetic engineering, biotechnology, and crop genome editing lent invaluable insights into the technological facets of agricultural transformation.Dr. S.R. Rao expressed heartfelt gratitude to RIS and Dakshin for providing a platform to delve into critical agricultural issues. He commended Dr. Smita Sirohi for her insightful presentation, which provided a comprehensive overview of India's agricultural challenges and initiatives.Leveraging his 38 years of experience in governmental policy formulation and technological innovation, Dr. Rao assumed the mantle of a discussant, delving into

three distinct yet interwoven facets: local, regional, and global challenges in agricultural development. He emphasized the imperative of a nuanced understanding of technology equity and access in effectively addressing these challenges.

Dr. Rao underscored the significance of addressing grassroots challenges encountered by local farmers. Despite the plethora of government schemes and initiatives, he elucidated the persistent gap in awareness and adoption of technological innovations among farmers. Dr. Rao advocated for targeted awareness campaigns and enhanced communication channels to bridge this gap effectively.At the regional level, Dr. Rao highlighted the importance of leveraging communalities and regional advantages to tackle sustainability and climate change issues. He lauded the commendable efforts of agricultural universities in disseminating region-specific technologies tailored to suit local agricultural practices.

Dr. Rao stressed the imperative for heightened collaboration among institutions to expedite the adoption of innovative agricultural practices across the Global South.Drawing parallels with India's success in implementing national-level agricultural schemes, Dr. Rao showcased examples of effective technology transfer and adoption. He underscored the pivotal role of sharing India's lessons and success stories with other South countries to facilitate knowledge exchange and collaboration. Dr. Rao highlighted the transformative potential of digital initiatives in enhancing agricultural productivity and resilience, advocating for their replication in other developing nations.Identifying climate change and technology access as pressing global challenges transcending geographical boundaries, Dr. Rao emphasized the need for localized solutions to address region-specific challenges effectively. While acknowledging the efforts of international forums like the IPCC in addressing overarching issues, Dr. Rao called for collaborative efforts, including South-South and North-South partnerships, to facilitate technology transfer and address inequities in access.

In conclusion, Dr. Rao reiterated the imperative for concerted action at the local, regional, and global levels to address the multifaceted challenges facing agricultural development in the Global South. He underscored the pivotal role of technology equity, knowledge sharing, and collaborative partnerships in driving sustainable agricultural transformation. Dr. Rao's enriching insights provided valuable pathways for collective action towards achieving agricultural sustainability in the Global South.

Dr. Kalpana Sastry, Managing Director of Ag-Hub Foundation, delivered a thought-provoking address, highlighting key insights and opportunities for collaboration in the agricultural sector.

Dr. Sastry commenced her address by expressing gratitude to the organizers and attendees for their participation in this significant event. She underscored the importance of policy coherence in driving agricultural innovation, acknowledging the plethora of schemes and

initiatives at the policy level. Dr. Sastry emphasized the need for a comprehensive framework to streamline these initiatives, referencing the concept of South-South collaboration as a potential model for effective policy implementation.Acknowledging Dr. Smita Sirohi's informative presentation, Dr. Sastry noted the absence of a centralized platform for mapping agricultural schemes. She emphasized the necessity of consolidating information to facilitate informed decision-making and maximize the impact of agricultural policies.

Reflecting on recent developments in agricultural research and development, Dr. Sastry highlighted the emergence of innovative solutions, particularly in regenerative agriculture and digital agriculture. She emphasized the transformative potential of these innovations in realizing the concept of a bioeconomy, particularly in the context of the Global South.

Drawing parallels with successful initiatives in countries like Argentina, Dr. Sastry advocated for the adoption of public-private partnership models to promote bio-based inputs in agriculture. She cited the example of bio–Resource Centers in Indian villages as a promising avenue for training smallholder farmers in the production of bio input products. Dr. Sastry identified packaging and commercialization as key challenges to be addressed in leveraging these innovations effectively.Dr. Sastry also addressed the importance of preserving local and native varieties, Dr. Sastry stressed the need for collective action to promote these varieties to the global market without compromising their intrinsic value. She emphasized the role of collaborative projects in driving economic growth at the local, regional, and global levels, underscoring the significance of grassroots innovators and agri-tech startups in this endeavor.

In conclusion, Dr. Sastry reiterated her commitment to identifying actionable areas for collaboration and knowledge exchange. She emphasized the importance of leveraging lessons learned from diverse stakeholders to chart a path towards a more prosperous and sustainable agricultural future. Her address provided valuable insights into the challenges and opportunities facing agricultural innovation and policy coherence.

Dr. Lual A. Deng, PhD, Managing Director, Ebony Center for Strategic Studies (ECSS):Dr. Lual A. Deng, representing South Sudan, delivered a comprehensive address outlining the challenges and opportunities facing agricultural development in the region.Dr. Deng commenced his address by expressing gratitude to RIS for the invitation and emphasizing his eagerness to engage and learn from the discussions, despite not being an agriculturist. He underscored South Sudan's potential as a breadbasket, highlighting its vast uncultivated land and strategic location in the heart of Africa.Identifying key challenges, Dr. Deng highlighted the inadequacies in infrastructure and low productivity plaguing South Sudan's agricultural sector. With only 4% of the country's 30 million hectares under cultivation and a meagre yield of 1.1 metric tons per hectare, Dr. Deng underscored the urgent need to address these challenges to enhance food security and economic prosperity.

Dr. Deng shed light on the multifaceted challenges stemming from the country's history of conflict and ongoing climate variability, including flooding and drought. He emphasized the critical role of literacy in agricultural development, citing the low literacy rate of 34% among adults as a barrier to progress.Despite these challenges, Dr. Deng identified several opportunities for agricultural development in South Sudan. He emphasized the vast untapped potential of the country's arable land and highlighted the opportunity for investment, particularly through South-South collaboration. Dr. Deng also emphasized South Sudan's strategic location, positioning it as a potential hub for agricultural innovation and trade within Africa.

In conclusion, Dr. Deng articulated his vision for leveraging technology to drive economic transformation in South Sudan. He emphasized the importance of embracing digital solutions, such as artificial intelligence and digital financial transformation, to enhance government processes and improve efficiency in budget execution and monitoring.His thoughtful analysis underscored the urgent need for concerted efforts to address infrastructure gaps, enhance productivity, and leverage technology for economic transformation. Participants left the workshop inspired and motivated to explore collaborative solutions to advance agricultural development and economic growth in South Sudan and beyond.

Dr. Herrick Mpuku, Executive Director, Zambia Institute for Policy Analysis and Research (ZIPAR), Zambia,provided invaluable insights into the agricultural landscape and policy challenges faced by the country. Despite not being an agriculturist, his expertise in development economics brought a unique perspective to the discussion. This report aims to elaborate on Mr. Mpuku's key points and offer recommendations for addressing Zambia's agricultural challenges.

Zambia possesses approximately 42 million hectares of arable land, presenting a significant opportunity for agricultural development and economic growth. With its warm and agro-friendly climate, Zambia is conducive to cultivating a diverse range of crops, including maize, tobacco, wheat, soybean, cotton, millet, and exotic crops like apples, grapes, and strawberries. The country's diverse crop portfolio not only ensures food security but also offers opportunities for export and revenue generation.Despite the vast arable land available, only a fraction of it (1.5 million hectares) is currently utilized for farming, indicating significant untapped potential. Zambia's agricultural productivity is heavily reliant on rainfall, making it vulnerable to climate variability, including floods and droughts, which can adversely affect crop yields.

He also pointed out at the inadequate infrastructure, such as roads, bridges, and dams, hampers farmers' ability to access markets and transport agricultural produce efficiently.Challenges in accessing markets due to poor infrastructure and inadequate market information hinder farmers' ability to sell their produce at fair prices and maximize profits.The lack of specialized financial institutions and insufficient funding for extension services impede farmers' access to credit, technology, and information needed to improve productivity.

Zambia's maize production of 2 metric tons per hectare falls significantly below the expected yield of 10 metric tons per hectare, highlighting the need for interventions to enhance productivity. While Zambia has made strides in agricultural production, particularly in maize cultivation, progress has been gradual and falls short of the country's agricultural potential.Maize remains central to Zambia's agricultural economy, serving as a staple food crop and playing a vital role in ensuring food security for the population.

Encouraging private sector investment in agriculture can stimulate innovation, improve access to finance and technology, and enhance market linkages for smallholder farmers.Minimizing government interference in market dynamics can promote efficiency, competition, and price transparency, benefiting both producers and consumers.Prioritizing and adequately funding extension services to target viable farmers can provide tailored support, training, and technology transfer, boosting agricultural productivity and profitability.

Investing in infrastructure development, including roads, bridges, dams, and irrigation systems, is crucial for improving access to markets, facilitating transportation, and enabling irrigation for sustainable agriculture, leveraging regional cooperation and value chains can enhance market access, facilitate trade, and promote agricultural diversification, contributing to regional food security and economic integration.

He emphasised upon encouraging diversification beyond maize cultivation into high-value crops and alternative agricultural products can reduce reliance on a single commodity and enhance resilience to market fluctuations and climate change impacts.Mr. Mpuku's comprehensive analysis underscores the multifaceted nature of Zambia's agricultural challenges and emphasizes the importance of holistic and collaborative approaches to address them effectively. By embracing innovation, strengthening partnerships, and prioritizing investments in key areas, Zambia can harness its agricultural potential, overcome existing barriers, and unlock opportunities for sustainable development and economic growth.

Dr. P K Anand remarked on the presence of the Director-General, Professor Sachin Chaturvedi, and shared an anecdote regarding the G20 proceedings in India. He recalled Prof. Chaturvedi's advocacy for technology sharing among countries of the Global South, emphasizing the importance of South-South cooperation in technological exchange. Dr. Anand also noted Prof. Chaturvedi's promotion of millets during the proceedings, echoing sentiments expressed by other speakers regarding the potential of millet cultivation. Highlighting Gambia's underutilized land resources, Dr. Anand referenced interventions proposed by Dr. Deng aimed at addressing issues of collective capacity and institutional support, further emphasizing the significance of robust institutional frameworks.

Mr. Gregg C. E Rawlins, IICA Representative in the Eastern Caribbean States (ECS), IICA Delegation in Saint Lucia, Saint Lucia, informed about institution for agriculture within the Inter-American System, headquartered in Costa Rica. Its operations span across 33 countries in the Americas. With a primary objective of supporting member states, EA endeavours to foster competitive, sustainable, and inclusive agricultural sectors. Core to its mission is the production and strategic leveraging of actionable knowledge, targeting challenges at grassroots and policy levels alike.

Mr. Rawlins outlined significant challenges confronting the Eastern Caribbean States, including alarming rates of youth unemployment, peaking at 26%, and a concerning decline in the agricultural sector's contribution to GDP. Since 1999, the agricultural sector's contribution has decreased by 2.3% annually. Despite this, agriculture remains pivotal to economic growth in the region. Ry underscored the critical importance of smallholder sustainable agriculture in bolstering productivity, resilience to climate change, and household food security.

He talked about The Eastern Caribbean States' approach to addressing these challenges is multifaceted, centering on community involvement, capacity-building, and the strategic utilization of digital technologies. Emphasis is placed on fostering sustainable and inclusive development by actively engaging with community-based organizations and facilitating horizontal technical cooperation within the hemisphere. A shift from reliance on external interventions to empowering local stakeholders to generate solutions is prioritized.

Mr. Rawlins shared numerous initiatives and success stories, highlighting the effective deployment of digital technologies such as the Guru Marketplace platform and the Agri Extension app. These tools significantly enhance farmers' access to markets and extension services. The Guru Marketplace platform serves as an online platform where farmers can showcase their produce and connect with buyers such as hotels and supermarkets. This platform facilitates transparent and efficient communication between producers and buyers, enabling farmers to access larger markets and secure better prices for their products. Similarly, the Agri Extension app provides farmers with remote access to agricultural extension services, allowing them to seek guidance and support on farming practices, pest management, and crop selection conveniently through their smartphones. By leveraging these digital tools, the Eastern Caribbean States are empowering farmers with the knowledge and resources they need to thrive in today's competitive market environment.Moreover, initiatives aimed at bolstering food and nutrition security, such as the Hoops program, community composting, and commercial mushroom production, have yielded tangible benefits. Notably, these initiatives empower women and youth while promoting environmental sustainability.

The Hoops program, for instance, focuses on establishing gardens in primary and secondary schools, providing students with access to fresh and nutritious produce while promoting agricultural education and skills development. Additionally, community composting initiatives encourage the conversion of organic waste into nutrient-rich compost, which can then be used to enrich soil fertility and support sustainable agriculture practices. These initiatives not only contribute to food security by increasing access to healthy foods but also promote environmental sustainability by reducing waste and minimizing reliance on chemical fertilizers.

Commercial mushroom production emerges as another noteworthy practice highlighted in the report. Mushroom cultivation presents a promising opportunity for the Eastern Caribbean States due to its high nutritional value, low environmental impact, and growing demand in both domestic and regional markets. Moreover, initiatives focused on commercial mushroom production serve as catalysts for youth empowerment and entrepreneurship. By engaging young people in mushroom cultivation projects, the Eastern Caribbean States are not only providing them with valuable skills and income-generating opportunities but also fostering innovation and creativity within the agricultural sector. These projects empower youth to become active participants in sustainable agricultural development, contributing to both economic growth and social inclusion in the region.

Given the region's vulnerability to climate change, the report underscores the importance of implementing climate resilience and adaptation strategies within the agricultural sector. Initiatives such as the use of vetiver grass for conservation purposes and ecosystem-based adaptation approaches aim to mitigate the adverse impacts of climate change on agricultural productivity and rural livelihoods. By promoting the adoption of climate-smart agricultural practices and facilitating knowledge-sharing and collaboration through forums like the Caribbean Climate Responsive Agricultural Forum, the Eastern Caribbean States are working proactively to build a more resilient and sustainable agricultural sector capable of withstanding the challenges posed by climate change.

In conclusion, He reiterated IICA's unwavering commitment to leveraging knowledge as a pivotal development resource. He expressed gratitude for the opportunity to share insights and stressed the significance of collaboration with partners like RIS. The Eastern Caribbean States stand poised to contribute meaningfully to sustainable agricultural development efforts across the global south. Through detailed strategies and collaborative endeavours, they aim to forge a resilient and inclusive agricultural sector, poised to weather future challenges effectively.

Lady Fane Fakafanua, Chief Operations Officer, Royal Oceania Institute,Representative of the Kingdom of Tonga, greeted the audience and discussed about Tonga's agricultural sector, focusing on its challenges, benefits, and opportunities for development.Tonga, located in the South Pacific, boasts commendable achievements in education and healthcare, with a high rate of PhD holders. However, the economy, she highlighted, remains fragile, marked by limited employment opportunities and significant emigration to countries like New Zealand and

Australia. Agriculture is a vital sector in Tonga, with root crops such as cassava, taro, and squash being the mainstay. Ms. Fane emphasised upon the role of exports of these crops to various destinations, contributing significantly to Tonga's economy. She mentioned about Tonga's agriculture heavily depends on natural climate conditions, primarily rainfall, for irrigation. However, erratic weather patterns pose challenges, leading to unpredictable crop yields and vulnerability to droughts. The absence of a comprehensive irrigation system hampers agricultural productivity. Without adequate infrastructure, farmers struggle to maintain consistent water supply for their crops, limiting growth potential.The country faces water scarcity issues exacerbated by the lack of proper catchment systems. Inefficient rainwater capture and storage systems further compound the impact of droughts on crop production.

Ms. Fane discussed about the solutions being worked upon in Tonga to address these issues.Tonga is exploring desalination as a potential solution to address water scarcity in agriculture. While large-scale projects may face financial constraints, smaller-scale solutions could be viable for individual farmers. She said that Tonga could invest in developing irrigation infrastructure, including water catchment systems and distribution networks. Improved access to irrigation water would enhance agricultural resilience and productivity. She laid emphasis on the promotion of sustainable water management practices among farmers, including drip irrigation and soil moisture monitoring. Capacity-building programs can empower farmers to implement these practices effectively. There is a need for investment in research and innovation for driving advancements in agricultural technology and practices suited to Tonga's unique conditions. Collaboration with research institutions and international organizations can facilitate knowledge exchange and technology transfer.

In conclusion, Lady Fane called for addressing these challenges and seizing opportunities for development for enhancing Tonga's agricultural sector's resilience and sustainability. By investing in infrastructure, promoting sustainable practices, and fostering innovation, Tonga can ensure food security, economic growth, and livelihood improvement for its people.

Dr. P K Anand expressed gratitude towards lady Fane and underscored the critical importance of water resources for the region, referencing the global water stress map as evidence of its significance. He emphasized the interconnectedness between water availability and agricultural sustainability, stressing the urgency of addressing water-related challenges.

Mr. Karim M. Maredia, serving as the Director of International Programs in the College of Agriculture and Natural Resources at Michigan State University, shared valuable insights during the conference organized by RIS. Originally from North Gujarat State in India, Dr. Karim commended RIS and Dr. Sachin for their timely conference and the launch of the

Global South Center of Excellence. He expressed agreement with the issues highlighted by the panelists and emphasized the importance of collaboration and global partnerships in addressing pressing challenges in agriculture.

Michigan State University (MSU) is a land-grant university in the United States with a mission focused on research, education, and outreach. Dr. Karim highlighted MSU's extensive engagement with over 60 countries worldwide, including collaborative programs in Asia, Africa, Latin America, and the Middle East. The university's international programs extend beyond Michigan's borders, aiming to build global knowledge partnerships and address global challenges such as climate change and food security.

Dr. Karim noted a decline in the number of students pursuing agriculture in his village in India, indicating a broader trend of youth migration to urban areas. He emphasized the need to engage and empower youth in agriculture to ensure the sector's sustainability. MSU is committed to supporting initiatives that promote youth involvement in agriculture, aligning with India's National Education Policy's emphasis on global outreach and partnerships.As agriculture transitions from production-driven to market-driven, Dr. Karim underscored the importance of enhancing agricultural education to meet evolving market demands. MSU aims to collaborate with partners, including RIS, to develop relevant agricultural education programs that address the needs of a market-oriented agriculture sector, particularly with the increasing role of the private sector.Water scarcity remains a significant challenge in agriculture, leading to the abandonment of farming in many areas. Dr. Karim highlighted the importance of water resources and management in sustaining agricultural livelihoods. MSU is committed to collaborating with partners to address water management issues and develop sustainable solutions to ensure water availability for agriculture.

Dr. Karim emphasized the importance of agricultural extension services in disseminating knowledge and technologies to smallholder farmers. MSU is dedicated to addressing the "last mile" challenge by working with partners to improve extension services and ensure that farmers have access to the latest agricultural innovations and practices.

In conclusion, Dr. Karim reiterated MSU's commitment to collaborating with RIS and other global partners to address key challenges facing agriculture. By fostering global knowledge partnerships and leveraging expertise, MSU aims to contribute to sustainable agricultural development and livelihood improvement worldwide.

Dr. P K Anand while thanking Dr. Karim, addressed the issue of food security and proposed the adoption of multicropping systems as a viable solution, suggesting that other countries could emulate this approach. He emphasized the potential for expanding exports from the Global South, highlighting the prevalence of trade-related challenges within this sector. Dr. Anand stressed the importance of proactive planning to mitigate future risks, particularly in response to unforeseen circumstances such as the recent global crisis.

The workshop was joined by Prof. Sachin Chaturvedi, Director General, RIS. Prof. Chaturvedi expressed gratitude to all participants for joining the workshop and extended a warm welcome to share observations and insights. He emphasized the importance of engaging in discussions regarding the future roadmap of DAKSHIN, the Initiative for Global South Center of Excellence. Prof. Chaturvedi highlighted the potential development and knowledge-sharing opportunities within this initiative, mentioning the possibility of creating a handbook showcasing best practices in agriculture from various countries in the Global South. He encouraged participants to contribute their thoughts and ideas, emphasizing the significance of leveraging collective experiences to address common challenges, such as climate change, resource mobilization, and agricultural development. Prof. Chaturvedi reiterated India's commitment to the Global South Centre of Excellence as part of the G20 agenda, emphasizing the importance of collaborative solutions and South-South cooperation in achieving sustainable development goals. He invited participants to share their perspectives and engage in meaningful dialogue to advance the objectives of the initiative.

The Policy Studies Institute of Ethiopia raised a query regarding investing in roots and tubers for better productivity. They sought insights into effective strategies for investment in these crops.

Dr. Karim, responding to the query, emphasized the importance of addressing agricultural challenges through technological advancements. He specifically highlighted the development of water-efficient technologies and drought-tolerant crops as crucial areas for investment. Dr. Karim pointed out the significance of biotechnology in this regard, mentioning its potential in developing crops resilient to water stress. He underlined the necessity of integrating these advancements into agricultural practices to enhance productivity and ensure food security.

Ama Branford Arthur, representing IFAD, expressed appreciation for the initiative for Global South Centre of Excellence. She stressed the importance of fostering homegrown solutions and strategic partnerships in addressing agricultural challenges. Ms. Arthur shared insights from IFAD's work, highlighting their approach to scalability, replication, and learning from experiences in areas such as aquaculture. She emphasized the significance of leveraging partnerships to achieve sustainable agricultural development and food security goals.

Dr. Ravi Khetarpal, Executive Secretary, Asia Pacific Association of Agricultural Research Institutions, underscored the need to focus on income generation for farmers and small-scale enterprises alongside technological advancements. He emphasized the importance of building an agriculture innovation ecosystem to foster creativity and collaboration. Dr. Khetarpal highlighted the necessity of developing functional skills, such as collaboration and policy strengthening, to drive innovation and ensure sustainable agricultural practices. He emphasized the role of education in promoting entrepreneurship and enhancing agricultural productivity.

Mr. Apoorve Khandewal, the Council on Energy, Environment, and Waters (CEEW) conveyed their appreciation and greetings to all attendees. He outlined three key suggestions derived from the preceding discussions. Firstly, Mr. Khandelwal underscored the need for governments to exercise caution in their approaches to supporting agricultural prices and providing input subsidies, emphasizing the importance of coherent and recalibrated support mechanisms. They highlighted India's recent launch of innovative schemes like PM Pram and referenced Costa Rica's implementation of payment for ecosystem services as examples to draw lessons from.

Secondly, He observed that the conversation had predominantly focused on land-based agriculture and expressed hope for broader discussions encompassing allied sectors such as dairy, livestock rearing, and fisheries. They noted the potential for knowledge exchange in areas where India has demonstrated success stories, such as Amul, and expressed confidence in mutual learning opportunities.

Lastly, He stressed the importance of learning from subnational entities within India, particularly states like Odisha and Andhra Pradesh, where significant strides have been made in initiatives such as the Odisha Millet Mission and natural farming practices. They emphasized the value of incorporating state-level insights into the broader discourse and expressed satisfaction with the emergence of the platform under the leadership of the Research and Information System for Developing Countries (RIS).

Dr. Abdellatif Khattabi, representing the Royal Institute of Strategic Studies, Morocco, emphasized the interconnectedness of agriculture, climate change, ecosystems, and energy efficiency. He highlighted Morocco's initiatives in addressing climate change adaptation strategies, particularly in the agricultural sector. Dr.Kattabi sought experiences from other countries in managing the nexus between agriculture and the environment, including water scarcity, land degradation, and deforestation. He emphasized the importance of knowledge exchange and collaboration among Global South countries to develop effective solutions to common challenges in agriculture and environmental sustainability.

Dr. Tadesse Kuma Worako raised the issue of active private sector engagement in agricultural investment to address food security challenges. He sought insights into the role of governments in facilitating private sector involvement and the potential impact on agricultural transformation.The discussion centered on the importance of creating an enabling environment for private sector engagement in agriculture. Dr.Worako highlighted the necessity of supportive policies, access to finance, and infrastructure development to attract private investment in the sector. He emphasized the role of the government in creating conducive conditions for private sector involvement, including providing incentives and regulatory frameworks. The conversation also touched upon the significance of public-private partnerships in driving innovation and enhancing productivity in agriculture.

Prof Sachin Chaturvedi thanked all the participants for the queries and respective responses, highlighting its comprehensive coverage of pertinent issues concerning agriculture in the Global South. The discussion delved into various aspects, emphasizing the critical role of agricultural production, development initiatives, and knowledge sharing in addressing regional challenges. He commended Dr. Kalpana Sastry, Dr. Smita Sirohi, for their valuable insights into organic products, millet production, marketing strategies, and risk mitigation measures in crop cultivation. Additionally, Prof Chaturvedi complimentedDr.Worakounderscored the importance of risk management and engagement with information and communication technology in agriculture.

Prof. Chaturvedi emphasized the convergence of technological interventions, multi-stakeholder participation, and the role of institutions in ensuring the success of agricultural initiatives. He emphasized the need for a strategic approach to program implementation, highlighting the importance of aligning assistance with national priorities and fostering self-reliance.Furthermore, Prof. Chaturvedi commended the emphasis on education in agriculture, acknowledging the contributions of Prof. Karim Meridia, Dr. Smita Sirohi, and Dr. SR Rao in promoting educational initiatives. He expressed gratitude to all participants, including Lady Fane, for their valuable contributions, especially regarding water stress issues.Looking ahead, Prof Chaturvedi outlined plans for future workshops under the DAKSHIN initiative, covering various sectors such as health and digital solutions. He expressed optimism about the initiative's expansion and its potential to foster meaningful collaborations.

In conclusion, Prof. Chaturvedi thanked all participants for their engagement and assured follow-up on raised concerns and suggestions. He emphasized the importance of bilateral communication between DAKSHIN and partner institutions, fostering a collaborative approach to addressing regional challenges. Finally, he extended warm New Year greetings and wished everyone success in their endeavours for the year ahead.

Key Strategies and Recommendations

1. Strengthening South–South Cooperation and Knowledge Exchange
    - Promote mutual learning platforms for sharing agricultural best practices, innovations, and success stories across Global South countries.
    - Establish a repository or handbook of agricultural best practices to facilitate replication and scale-up of successful models.
    - Foster collaborative research networks among think tanks, universities, and agricultural research institutions to co-develop context-specific solutions.
2. Leveraging Digital and Technological Innovations
    - Enhance digitalization in agriculture through farmer-facing platforms, e-markets, and advisory apps to improve productivity and transparency.

- Promote digital extension tools such as the Agri Extension app and Guru Marketplace (as implemented in the Caribbean) to connect farmers with markets and advisory services.
- Invest in technology equity and access, ensuring marginalized and smallholder farmers benefit from digital solutions.
- Encourage AI, satellite imagery, and data analytics applications for crop estimation, soil health, and water resource management.

3. Promoting Climate-Resilient and Sustainable Agriculture
    - Encourage adoption of climate-smart agriculture, natural farming, and regenerative agricultural practices to enhance sustainability.
    - Strengthen initiatives like the National Mission for Sustainable Agriculture and promote rainfed area development across the Global South.
    - Scale up ecosystem-based adaptation measures and use of bio-based inputs to mitigate climate vulnerabilities.
    - Prioritize water management and irrigation infrastructure, especially in drought-prone and island nations like Tonga.
4. Enhancing Institutional and Policy Coherence
    - Develop a coordinated policy framework to align fragmented agricultural schemes and initiatives at national and regional levels.
    - Encourage public–private partnerships (PPP) for promoting bio-input enterprises and agri-startups, particularly at the village level.
    - Strengthen institutional capacities for implementation and monitoring of agricultural programmes.
5. Fostering Youth and Women Participation
    - Promote agri-entrepreneurship, innovation, and skill development among youth and women.
    - Support community-based agricultural models that empower local organizations, schools, and cooperatives to enhance food and nutrition security (e.g., Caribbean "Hoops" school gardens and community composting).
6. Facilitating Market Access and Value Chain Development
    - Improve market access infrastructure (roads, storage, logistics, e-platforms) for smallholders to ensure fair pricing and reduced post-harvest losses.
    - Encourage diversification beyond single crops (e.g., maize in Zambia) into high-value and export-oriented commodities.

- Strengthen regional and intra-South trade by reducing market barriers and enhancing value-chain linkages.

7. Investing in Research, Education, and Extension
   - Expand agricultural education reforms to make them market-oriented and innovation-driven.
   - Strengthen extension services and last-mile delivery mechanisms for effective transfer of technologies and practices to farmers.
   - Encourage joint training and academic collaborations between institutions like Michigan State University and Global South partners.
8. Mobilizing Finance and Investments
   - Facilitate targeted investments in rural infrastructure, irrigation, and mechanization through South–South partnerships.
   - Establish dedicated financing mechanisms for agri-tech innovations and start-ups.
   - Encourage international collaboration to attract climate and development finance for agriculture and food systems.
9. Building Climate and Food System Resilience
   - Focus on multi-cropping systems, millet-based nutrition security, and post-harvest management as strategic interventions for resilience.
   - Promote local seed systems and indigenous varieties to preserve biodiversity and reduce external dependency.

RIS

Research and Information System for Developing Countries

विकासशील देशों की अनुसंधान एवं सूचना प्रणाली

RIS specialises in issues related to international economic development, trade, investment and technology. It is envisioned as a forum for fostering effective policy dialogue and capacity-building among developing countries on global and regional economic issues. The focus of the work programme of RIS is to promote South-South Cooperation and collaborate with developing countries in multilateral negotiations in various forums. Through its following centres/forums, RIS promotes policy dialogue and coherence on regional and international economic issues.

DAKSHIN – Global South Centre of Excellence

The word "DAKSHIN" (दक्षिण) is of Sanskrit origin, meaning "South." The Hon'ble Prime Minister of India, Shri Narendra Modi, inaugurated DAKSHIN – Global South Centre of Excellence in November 2023. The initiative was inspired by the deliberations of Global South leaders during the Voice of the Global South Summits. DAKSHIN stands for Development and Knowledge Sharing Initiative. Hosted at the RIS, DAKSHIN has established linkages with leading think tanks and universities across the Global South and is building a dynamic network of scholars working on Global South issues.

AIC – ASEAN-India Centre at RIS

AIC at RIS has been working to strengthen India's strategic partnership with ASEAN in its realisation of the ASEAN Community. AIC at RIS undertakes research, policy advocacy and regular networking activities with relevant organisations and think-tanks in India and ASEAN countries, with the aim of providing policy inputs, up-to-date information, data resources and sustained interaction, for strengthening ASEAN-India partnership.

CMEC has been established at RIS under the aegis of the Ministry of Ports, Shipping and Waterways (MoPS&W), Government of India. CMEC is a collaboration between RIS and Indian Ports Association (IPA). It has been mandated to act as an advisory/technological arm of MoPSW to provide the analytical support on policies and their implementation.

FITM – Forum on Indian Traditional Medicine

FITM is a joint initiative by the Ministry of Ayush and RIS. It has been established with the objective of undertaking policy research on economy, intellectual property rights (IPRs) trade, sustainability and international cooperation in traditional medicines. FITM provides analytical support to the Ministry of Ayush on policy and strategy responses on emerging national and global developments.

BEF – Blue Economy Forum

BEF aims to serve as a dedicated platform for fostering dialogue on promoting the concept in the Indian Ocean and other regions. The forum focuses on conducting studies on the potential, prospects and challenges of blue economy; providing regular inputs to practitioners in the government and the private sectors; and promoting advocacy for its smooth adoption in national economic policies.

FIDC – Forum for Indian Development Cooperation

भारतीय विकास सहयोग मंच

FIDC, has been engaged in exploring nuances of India's development cooperation programme, keeping in view the wider perspective of South-South Cooperation in the backdrop of international development cooperation scenario. It is a tripartite initiative of the Development Partnership Administration (DPA) of the Ministry of External Affairs, Government of India, academia and civil society organisations.

FISD

FISD aims to harness the full potential and synergy between science and technology, diplomacy, foreign policy and development cooperation in order to meet India's development and security needs. It is also engaged in strengthening India's engagement with the international system and on key global issues involving science and technology.

SACEPS

As part of its work programme, RIS has been deeply involved in strengthening economic integration in the South Asia region. In this context, the role of the South Asia Centre for Policy Studies (SACEPS) is very important. SACEPS is a network organisation engaged in addressing regional issues of common concerns in South Asia.

NeST – Network of Southern Think-Tanks

Knowledge generated endogenously among the Southern partners can help in consolidation of stronger common issues at different global policy fora. The purpose of NeST is to provide a global platform for Southern Think-Tanks for collaboratively generating, systematising, consolidating and sharing knowledge on South South Cooperation approaches for international development.

DST SPR – Department of Science and Technology Satellite Centre for Policy Research at RIS – STI Diplomacy

DST-Satellite Centre for Policy Research on STI Diplomacy at RIS aims to advance policy research at the intersection of science, technology, innovation (STI) and diplomacy, in alignment with India's developmental priorities and foreign policy objectives.

— Policy research to shape the international development agenda —

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