

The 3rd COSIMENA Meta-Conference on “South-South and Triangular Cooperation”

24rd –26th November 2019, Cairo

Long Report

From 24 to 26 November 2019, the DAAD Regional Office in Cairo hosted its third COSIMENA Meta-Conference of the year, a three-day event highlighting “South-South and Triangular Cooperation” in the field of science, with a specific focus on its role in higher education in the MENA region and Africa.

The conference opened at the DAAD Regional Office in Cairo with a welcome address from Director Isabell Mering, who highlighted the importance South-South cooperation plays in today’s development landscape and how it represents a shared vision, shaped by close historical realities, similar development pathways, and shared challenges, among the countries of the Global South.

Cooperation between the states of the Global South hasn’t always been a successful story in the past, but over the last decade, the economic power of individual states has spurred a new wave of South-South cooperation, with increasing importance and attention given over the last two years on the political level in Egypt to establishing more cooperation in Tri-Africa. According to statistics provided by the Ministry of Investment and International Cooperation, several African countries have recently adopted economic reform programs aimed at increasing growth rates, which reached 3.5% in 2018 and are expected to rise to more than 4% over the coming years, despite the challenges of the global economy. President Abdel-Fattah el-Sisi and his government consider Egypt as the gateway to Africa, a claim supported through various academic African initiatives this year focused on making Africa a promising continent and incubator for major service projects. By bringing experts together from the MENA region and Germany to discuss their outstanding knowledge and experience, the DAAD aims to function as a mediator between higher education between the countries and to serve as a catalyst for South-South cooperation.

Through this three-day networking platform, which brought together regional experts to tackle the prospects for cooperation, encourage joint academic projects, and increase intermobility opportunities in the field of science, Mering concluded that the DAAD Regional Office Cairo, in cooperation with several other outlets across the continent, would allow the organization to continue advancing South-South and triangular cooperation as an accelerator and multiplier of sustainable development goals.

The head of the science department at the German Embassy in Egypt, Philippe Maupai, followed on by adding that, since its conceptualization in the 1950s, the idea of South-South has been moving more and more into the focus of international development cooperation, in particular since the 1990s. This increased cooperation is facilitating a new form of

development cooperation with countries like Germany, a phenomenon called triangular cooperation, where an industrialized country pairs up with emerging economies in developing nations, leading to international knowledge transfer and promoting joint learning for all partners. By engaging in such cooperation, Germany is also pursuing its goal of enhancing the effectiveness of development projects. Triangular cooperation also aims to provide a framework in which partners can work together as equals, jointly developing solutions for global development challenges. It also offers an opportunity for countries to develop a common understanding of development policy and its criteria and values. Triangular projects can now be found in all regions of the world and across a broad range of sectors, such as water, agriculture, sustainable economic development, the environment, education, and good governance. Maupai added that this conference, and its focus on science and research, would help further transnational cooperation in the MENA region and Sub-Saharan Africa and allow stakeholders to share knowledge, skills, expertise, and resources to meet development goals through concentrated efforts.

Day 1: Evening Panel and Experiences on South-South and Triangular Cooperation

Researchers from a pair of Egyptian universities, namely Cairo University and Heliopolis University, along with researchers from Sudan's University of Gezira, Germany's Julius-Maximilians-Universität Würzburg and Tunisia's Institut Pasteur de Tunis, participated in a panel on the first day, moderated by Dr. Alexander Niedermeier from Cairo University, on how academic exchange can foster innovative research in the MENA region and Sub-Saharan Africa.

Dr. Niedermeier introduced the panel, before highlighting that there is much more happening in the sphere of cooperation than just the traditional North-South model. Rather, there are two other forms currently growing in the region: South-South and Triangular. These models provide several opportunities, but also challenges to overcome. Over the last few years, the international community has become cognizant that South-South and triangular cooperation are imperative to promoting inclusive and sustainable development. The major question the panel needs to discuss, he mused, is how academic exchange can foster innovative research in the MENA region and Sub-Saharan Africa.

Dr. Abdel Meguid Kassem from Cairo University started the discussion with two anecdotes on the importance of seeking local insight into health systems in developing countries. In the first, he recalled a fact-finding mission by a German governmental organization into northern African countries focused on employability projects in the region and seeking industrial partners. In the first phase of the mission, the organization found no such potential projects. However, in the second phase of the fact-finding mission, Kassem was added to the team. Since he knew the problems facing Egypt, Sudan, Tunisia, and Morocco, he was able to identify two projects for the organization, which are still running successfully to this day, simply because he and his colleagues from the region had a more in-depth insight into developing countries. Kassem then turned to a health project between Germany and Tanzania where a tailored training program was needed. Such programs, he said, need to be conducted in countries of the Global South where the skills can be directly implemented

in the relevant context. States of the Global South have a better understanding of what is going on in the region and know the exact needs of the parties involved.

The next presentation came from Dr. Anmar Homeida from the University of Gezira in Sudan, who underscored the importance of bridging the gap between academic research and entrepreneurship. The current generation of doctors need to be able to think with an entrepreneurial mindset to build toward sustainable solutions in the cluster of communities in Sub-Saharan Africa and the Global South and to solve the healthcare and climate change problems facing the region.

Dr. Markus Engstler from the Julius-Maximilians Universität in Würzburg agreed with Dr. Homeida on the need to think in a more interactive way, adding that academia isn't everything when it comes to answering this question. Despite what the Western world often assumes, he said, finding knowledgeable people isn't the issue – gathering material resources is. A key to promoting sustainability in the region is safely bringing these resources and machines to the countries of the Global South where qualified local scientists and researchers can run the experiments themselves.

Following Dr. Engstler's comments, Dr. Sigward von Laue from Heliopolis University underscored the importance of friendship in making projects sustainable, saying that if that connection between people is there, the project will succeed. Even the best MoUs will not work if the people needed to execute the project do not want to live it. Promoting a social element, whether in the private or public sector, and allowing friendships to blossom, is the key to persevering through the inevitable difficult times that will arise. If you have this friendship, he concluded, you will pull through, and that's how you get sustainability.

Dr. Sonia Abdelhak from the Institut Pasteur de Tunis piggybacked on von Laue's comments by adding that trust is the most important element in these relationships. Mentors and colleagues become family and friends and help you see the way through problems. When working together, anything can happen. She added that it's imperative to remember the human component in research, stressing its importance over publications and "impact factors". Research needs to be applicable to local needs and to ultimately provide services for patients.

Day 2: Presentations and Field Visit to SEKEM Farm

On the second day of the meta-conference, which took place at the Steigenberger Hotel in Cairo, professors and researchers from Germany and the Global South gave presentations on transnational collaboration in the MENA region and Sub-Saharan Africa.

Dr. Engstler kicked off the morning with a look into fighting neglected tropical diseases through multisectoral triangular cooperation. Neglected tropical diseases are not just a medical problem, he mused, adding that South-South and triangular cooperation is essential in the fight against them. Through his work at the German Center for the Multisectoral Control of Neglected Tropical Diseases at the Julius Maximilians Universität Würzburg, he learned that academia alone isn't enough to solve the problems – civil society needs to guide it. Additionally, he concluded, multisectorality should not be equated with academic

interdisciplinarity and parity cooperation requires neither big consortia nor hypertrophic bureaucracy.

Dr. Mohammed El Azami El Idrissi from the University Sidi Mohammed Ben Abdellah of Fez in Morocco spoke next about how to organize good projects by highlighting his successful three-year-old twin training program called the “Morocco Clinical Trials Module” between Morocco and Tunisia, held in cooperation with the Karlsruhe Institute of Technology and financed by the German Federal Ministry of Education and Research. He led off his talk by underscoring Dr. Engstler’s argument that academia isn’t everything, adding that the curricula of universities are not enough to bring people to the job market. Therefore, his project aims to boost the employability of university graduates and their ability to adapt quickly to the fast-changing market. There is a gap between the knowledge and skills acquired in university and the true needs of society and the economy, he mused. University graduates need almost two to three years of on-the-job training to fulfill industry and employer expectations, while the classic medical curricula doesn’t offer opportunities for graduates to branch out into other disciplines, such as pharmaceuticals, medical technology, or clinical research—all fields where demand for qualified graduates who know how to design research and apply their findings, is increasing worldwide. To address these shortcomings, stakeholders from the University of Fez established an English-language, post-graduate module to train graduates to properly run clinical trials through practical workshops and a twin exchange summer program.

The next presentation, given by Dr. Abdelhak, focused primarily on transnational cooperation in the water sector across the MENA region and Sub-Saharan Africa. She presented five projects from the last decade that highlighted triangular cooperation from several international organizations, including the Japan international Cooperation Agency (JICA), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Agence Universitaire de la Francophonie (AUF), and the DAAD. The projects include the reuse of treated wastewater in the countries of the Maghreb, the enhancement of integrated water resource management in Sudan, and knowledge transfer. She highlighted some advantages of the projects—which included bridging cultures, the exchange of strategies between public water managers, and participation in case studies—as well as some disadvantages, which included limited South-South interaction and the limited sustainability of the exchanges.

Dr. Nikolaos Tzoupanos from the Technische Universität Berlin opened the next discussion on the decentralized treatment of wetlands for sustainable water management in rural and remote areas of semi-arid regions. The motivation for the project, which focuses on water management systems in Egypt, Tunisia, and Morocco, stemmed from the absence of effective existing systems in these areas. Giving Egypt as an example, he showed that only 0.1% of the rural population is served by proper sanitation systems, with only 29% of wastewater being used after treatment. He also highlighted issues in Tunisia, where only 55% of the population is served by sanitation systems and where more than 50% of the available water resources are saline. In Morocco, meanwhile, 43% of surface water resources face serious contamination problems. The project therefore aims to find sustainable solutions for polluted stream management, particularly in rural and remote areas under arid and semi-arid climate conditions, by using decentralized natural treatment systems. To that end, the university is running small-scale experiments in all three countries

on constructed wetlands, which aim to treat domestic wastewater and agricultural drains, while investigating different systems to determine optimum conditions. He added that the project also works to secure enough safe water for irrigation of crops, protect natural water resources from overexploitation, and improve quality of life in remote areas. The project is expected to turn arid areas into green areas as a potential solution to desertification, improve soil properties, and increase awareness about natural treatment systems, he concluded.

The final presentation of the day was given by Jürgen Scheffran from the Universität Hamburg on the sustainability of the water-food-energy nexus under climate change. As part of his university's Research Group for Climate and Security (CLISEC), he studied how climate change affects security, conflict, and stability in regional hot spots and the ensuing effects of human responses, cooperation, and institutional frameworks. The research team then mapped climate security hot spots and conflict indicators, including food, energy, and migration; integrated assessment and modeling of human responses and societal interactions; and created regional case studies in rural and urban areas in North Africa and East Asia. The research also included three interconnected models to show possible and plausible climate futures, including the physical plausibility of climate system dynamics, the social plausibility of social system dynamics, and the regional plausibility of sustainable adaptation.

Day three: Presentations

The final day of the meta-conference, which also took place at the Steigenberger Hotel in Cairo, focused on innovative research happening in the MENA region to tackle transnational challenges, with short presentations on current research topics in the fields of water, agriculture, and health. Speakers discussed common challenges and the variety of innovative approaches being adopted in Sub-Saharan Africa and MENA countries. The session also offered a space for networking and joint brainstorming on the opportunities of academic exchange to enhance South-South cooperation and achieve sustainable development.

The first presentation, given by Dr. Nisreen Lahham from the GIZ, looked at the Nexus Regional Dialogue (NRD) program in the MENA region, with a focus on the water-energy-food (WEF) nexus. The research program, funded by the EU and the German Ministry for Economic Cooperation and Development, seeks to build up regional resilience to problems that threaten WEF security, while ensuring the sustainable use of resources. The program is set up over two phases, with a theoretical first phase consisting of capacity building and policy advisement spanning from 2016 to 2019, and a second practical phase to be implemented from 2020 to 2023 that provides tangible benefits of the WEF nexus in the form of pilot projects. In the MENA region, the NRD will thus present a series of six policy briefs to the Arab League while working to bring together a compilation of nexus experts. The NRD also expects to carry out two country assessments to identify suitable nexus opportunities at national and sub-national levels in Tunisia and Sudan and develop a regional action plan for proposed nexus projects. Dr. Lahham also outlined the challenges the NRD faces in the region, which include "sector silos" where the different institutions in charge of water, energy and agriculture policies have diverging interests; limited experience and knowledge of nexus

implementation in the region (i.e. a holistic understanding of the way these forces interact); and lack a comprehensive database of nexus experts on which to call. Despite the challenges, she found that the nexus approach provides excellent opportunities for cross-country sharing of technical, economic, and institutional innovations, which in turn provides opportunities for regional cooperation and economic integration. Dr. Lahham concluded by sharing some of the lessons learnt in the process, highlighting that nexus mainstreaming can only be achieved through participatory approaches and that a limited focus on the water sector often makes the energy and agriculture sectors less interested in the process. She added that private business in the MENA region is very active in the energy sector and could be the entry point for implementing WEF nexus projects. Finally, demonstrating success stories and the financial gains a nexus approach can offer, strongly encourages policymakers to buy in.

Dr. Ahmed Abdel Aziz from the German University in Cairo spoke next on water treatment and electrochemical oxidation technique models. He began by highlighting previous examples of cooperation between Egypt and Germany, which included a project in 2008 on the development of anode for fuel cells in wastewater treatment and another in 2010 on the influence of natural sea water on the corrosion behavior of copper nickel alloys used in desalination equipment. Another project, slated for 2020, is expected to look at a new economical method for water treatment in rural areas through functionalized filters.

The next project, presented by Dr. Karima Attia from the National Water Research Center and the Nile Research Institute, focused on the role of science in facing flash floods, which she defined as a natural phenomenon that occurs when rainfall increases the soil's ability to absorb downwards, leading to high-velocity runoff to lower elevation areas that destroys everything in its path. She then talked about the importance of a Weather Research Forecast (WRF) monitoring network, where scientists can alert and aid local policy makers and authorities in a clear and concise way before, during, and after the event. Uncertainties should also be expressed clearly so officials can make better decisions and evaluate potential consequences. Of course, she added, such systems require some financial outlay, which is required to support research and the monitoring system itself. Thanks to the strong impact of climate change on flash floods, she concluded, the need for a WRF network and flash flood mitigation measures, which includes a system of storage and control dams, drainage channels, and artificial lakes, is at an all-time high. She also underscored the need of a flash flood atlas to define secured areas for development. The atlas, she explained, aims to help decision makers obtain quantitative and qualitative information in a clear and concise fashion, with scientific information and study results represented through specialized maps.

Dr. Sherine El Baradei from the Nile University spoke next on combating schistosomiasis in water through mechanical means and solar canals. Leading off, she presented her team's three-year research project on solar canals, which is receiving funding from the Misr El Kheir Foundation. The project, which is currently in its second year and is looking for phase 2 funding and partners from South-South and Triangular countries, aims to study the effect of covering irrigation canals with solar panels on both water quality and evaporation rates, along with the efficiency of energy production from the panels. She then discussed the project's research stages, which included the need to construct a mathematical model that

simulates the effect of canal coverage on evaporation rates and water quality, and the design and construction of a physical prototype as a way to calibrate the model through practical measurements. She also touched on a project focused on combating schistosomiasis through mechanical means, which has been completed on a laboratory scale, but requires more funding to implement a prototype stage. Schistosomiasis is one of the most dangerous waterborne diseases in the world, she explained, with over 200 million people infected and another 600 million believed to be at risk of infection. The project aims to combat the problem by focusing on snails, which are an intermediate host of the disease, through the use of “swirlers” that generate a vortex in the water that kills the snails. In laboratory tests of the method, which investigated different sizes and angles of the swirlers, she found that a kill rate of up to 98% could be achieved through the use of a 6 cm diameter swirler set at a 15-degree angle. She concluded that a good practical setup of this model could be placed between solar canals in order to prevent the snails from traveling between the irrigation canals.

Dr. Hayder Abdelgader from the Agricultural Research Corporation in Sudan then presented his efforts on implementing an alternative strategy to pesticides to control insect pests on agricultural crops. According to a report from Sudan’s Ministry of Agriculture, the country’s overreliance on pesticides has caused severe problems, including secondary pest outbreaks, pesticide resistance, greatly increased production costs, and most troublingly, human and environmental poisonings, which, according to government statistics, include over 500 poisonings and 46 deaths. Additionally, the increasing costs of pesticides and the decreasing effectiveness has decimated farmer’s profits and depleted the country’s limited foreign exchange. As such, a need for a sustainable agricultural production system that utilizes Integrated Pest Management (IPM) techniques in cooperation with the selective use of soft insecticides is apparent.

Opportunities and challenges for the innovative utilization of camel’s milk as a functional food was the subject of the next presentation, which was given by Dr. Ibtisam El Zubeir from the University of Khartoum. During her presentation, she reviewed current milk production systems in Sudan and identified production constraints, before highlighting that the camel, which represents the backbone of economic life in the country, is one of the best animal species that can be managed under marginal natural resources without endangering the environment. Currently, the concept of selling camel’s milk is generally not accepted among nomadic camel herders, but some recent studies suggest that some nomadic families in Kordofan were more flexible in accepting the concept of marketing their products. Camel milk can be a functional food because of the nutritional and functional values it possesses, she stated, but thanks in part to a dearth of studies investigating consumer acceptability of these products, camel populations are not yet developed enough to reach a commercial scale.

Dr. Mohamad Midani from the German University in Cairo gave the next presentation, which looked at an initiative focused on rediscovering uses for Arabian camel hair in the personal luxury goods market. Currently, the market is dominated by cashmere, alpaca, and Bactrian camel hair fibers, while Arabian camel hair represents an underutilized resource. The characteristics in determining a quality fiber include its diameter, length, and fleece weight, Dr. Midani stated, adding that the hair from the Arabian camel compares favorably to its

competitors, which would allow it to be used in high-priced fashion. He estimated that the use of the hair in the market could represent an estimated annual economic value of \$530 million once challenges inherent in the processing procedure are solved. To that end, his initiative focuses on defining the best practices in hair harvesting, collection, and shearing, fully characterizing the hair from different breeds and identifying the best breeds, and developing manual and semi-automated dehairing, carding, and spinning methods in order to develop new products with a high added value to bring income opportunities to rural communities in the MENA region and Sub-Saharan Africa.

Dr. Brima Mohammed from the University of Khartoum followed Dr. Midani's presentation with a look into preventative vaccines for visceral leishmaniasis. Leishmaniasis are a group of vector-borne diseases caused by leishmania parasites, with the visceral phenotype (VL) featuring a near-100% mortality rate if left untreated. Leishmaniasis is a disease of the poor and is considered to be one of the world's most deadly diseases, Dr. Mohammed stated, with more than 50,000 deaths recorded every year. There is hope though, he added, as studies have shown that leishmania infections induce lifelong immunity to the disease and patients who recover from VL have displayed a resistance to reinfection. Furthermore, there is extensive cross-reactivity between different species of leishmania and 80 to 90% of human infections are subclinical or asymptomatic. Therefore, he stated, a single vaccine can be potentially effective against many forms of the disease. Efforts to create a suitable vaccine have proven challenging, however, with a clear need for greater investment into research and development needed to create a promising cure.

The final presentation of the day came from Dr. Homeida, who highlighted entrepreneurship and healthcare startups as a new movement to find cures in Sudan and Sub-Saharan Africa. Today's challenges in health and medicine are rooted in a complex web of poorly understood interdependencies among social, commercial, economic, regulatory, and cultural issues, he said. Progress against the litany of challenges demands the best thinkers and doers from every discipline to learn how to connect the seemingly unconnected. The current business model is showing signs of exhaustion, he stated, adding that the need for doctor-entrepreneurs is extremely important and the mindset needs to be taught from the beginning of a student's medical education. At the University of Gezira, the focus is on the main healthcare challenges that currently play a major role in Sudan and the region, including chronic disease management, the caregiver crisis, and the elimination of medical errors. As part of the student's medical education, they will complete a capstone project in one of four categories, which include medical innovation and research, product development, health information technology and optimization, and health care operations and management. Through the program, students are expected to learn how to build partnerships and promote dialogue and negotiation skills, how to use critical thinking to examine environmental, economic, social, and cultural structures within the context of entrepreneurship, and how to use systemic thinking to look for links within and among systems when trying to find solutions to community health problems related to the full spectrum of health.

The meta-conference concluded with a panorama aimed at highlighting cooperation opportunities and synergies, while presenting potential future steps to foster South-South and triangular cooperation in the region.

(Report by Julian Redman)