



# South - South Knowledge Exchange (SSKE) for Watershed Management, Infrastructure and Agriculture

CHINA—INDIA—NIGERIA

## Background

South-South Learning and Knowledge Sharing for watershed management, infrastructure and agriculture: World Bank task teams secured financing from the China-World Bank Group Trust Fund of USD 433,000 over 2.5 years to enhance South-South knowledge sharing between China, India, and Nigeria. The Trust Fund is supporting important knowledge sharing and learning between China, India and Nigeria, focusing on infrastructure development associated with major land and gully restoration, agricultural development and climate smart agriculture on restored lands, and applications of remote sensing, GIS, and Decision Support Systems (DSS) for more effective project management and M&E. These activities would primarily benefit the outcomes of the Nigerian Erosion and Watershed Management Project (NEWMAP), the new Neeranchal National Watershed Project in India and the FADAMA project in Nigeria.

Activities of the South-South knowledge sharing will inform critical activities including: a) gully restoration design, construction, physical works, and vegetative interventions; b) landscape restoration and agricultural and pastoral improvement in arid, rainfed areas; application of remote sensing, GIS, and DSS for more effective project management and M&E; and c) urban and peri-urban road design and management of surface water runoff (the main cause of gullies in southern Nigeria). The activities would also support the transfer of applied research and development results in key areas, for example on the economics of gully restoration and adopting innovative and climate friendly practices, drawing from Chinese and Indian experiences.

## Relevances of SSKE

There is a wealth of accumulated knowledge and experience in China (and India) on addressing similar issues. These include for example, World Bank-supported Loess Plateau Projects, the Ningxia Desertification Control and Ecological Protection Project, and a range of road improvement projects in China. In India, the Karnataka Watershed Development Project (2012-2018) in India is demonstrating cutting edge technology to help plan, prioritize, monitor and assess interventions in nine predominantly rainfed districts. Both China and India have a long history of successful Bank-supported sustainable land management programs, designed to improve water management, agricultural productivity, rural livelihoods, and build resiliency to climate change. At the same time, the NEWMAP project is piloting presented innovative examples to gully restoration and watershed management drawing on India and Chinese experiences and comparatively sharing knowledge with Nigerian Experts and other stakeholders on good approaches that can provide useful technical inputs.

## Objectives

The objective is to transfer and disseminate knowledge in the following areas:

- a. Watershed Management and Gully Restoration including the management of Surface Run-off in Urban areas;
- b. Climate Smart Agriculture (escalate the research of agricultural management practices within the landscape);
- c. d. Application of Geo-Spatial Technologies for Erosion Control, Watershed Planning and Management.

- e. Build Community of practice –bring together a wide range of experts from various government, academic, in the area of watershed management, infrastructure, climate smart agriculture, geospatial technology and producer groups.
- d. Leveraged resources –secure significant additional project resources by providing and provide a platform for partnerships.

### SSKE:NEWMAP, NEERANCHAL and FADAMA

The Neeranchal National Watershed Project in India (P132739), is supporting national watershed programs in nine states through technical and scientific inputs. In addition, there are numerous investment programs financed independently in China and India that have generated good results at scale. in Nigeria, the Ni-

geria Erosion and watershed management Project (NEWMAP) and the FADAMA III project are two World Bank sponsored Projects with positive impacts on the socio-economic status and livelihoods of the people. NEWMAP is primarily a concept to address Erosion land degradation, while FADAMA initiative seeks to support the government in the area of promoting new innovation in Agriculture and cash crop farming to address food shortage.

The NEWMAP and FADAMA projects are fondly referred as flag ship Projects by stakeholders in Nigeria as a result of positive impacts in the lives and livelihoods of the citizenry. The performance of these projects, considered as very satisfactory by the Bank, became very instrumental to the Task Teams further explorations into a South South Knowledge Exchange (SSKE) programme between China, India and Nigeria.



Participants to South- South Knowledge Exchange (SSKE) programme in China, at the World Bank office in Beijing, China.

Project Components	Expected Outputs
1. Knowledge sharing of field experiences <ul style="list-style-type: none"> <li>• South-South exposure visits between China, India and Nigeria on specific topics</li> </ul>	<ul style="list-style-type: none"> <li>• Improved knowledge base of field experiences to support piloting and scaling up of new approaches for gully restoration and prevention, climate smart agriculture, and landscape-scale management for agriculture and livestock development land use objectives</li> </ul>
2. Technology transfer of R&D results <ul style="list-style-type: none"> <li>• Collaborative transfer of R&amp;D results on specific topics between Chinese, Indian and Nigerian tertiary institutions/bureaus/research centers</li> <li>• Knowledge fairs/workshops</li> </ul>	<ul style="list-style-type: none"> <li>• Improved scientific knowledge on specific topics such as: the economics of gully restoration; comparative assessments of drones, satellites imagery and high resolution ortho-photos for M&amp;E; costs and benefits of improved surface water management in urban areas, etc.</li> </ul>
3. Dissemination <ul style="list-style-type: none"> <li>• Printing and distribution of reports</li> <li>• Production of training videos</li> <li>• Web site design and management</li> <li>• Dissemination workshops</li> </ul>	<ul style="list-style-type: none"> <li>• Tools and materials developed for dissemination to local stakeholders and wider global audience (simple “how to” brochures; field guides; short videos; etc.) translated into appropriate languages</li> </ul>
4. Management and coordination	<ul style="list-style-type: none"> <li>• Effective Trust Fund management and operation</li> </ul>



Drawing on the experiences of foreign countries and building on available realities, The South-South Knowledge Exchange (SSKE) platform with the help of the World Bank group brings wealth of knowledge from two giant developing economies to the doorstep of the two flagship projects in Nigeria; to work together and explore a pathway to sustainable development tapping on the available innovative ideas, cutting-edge paradigm, approaches and successful experience for these countries. In key areas of watershed management and climate smart agriculture, road infrastructure design; gully formation reduction and the application of satellite technologies. Key successes so far include:

**1. Scoping mission in March/April 2017** to identify opportunities for collaboration, particularly with Nigeria. This mission involved Bank project leaders from Nigeria, India and Washington, the Trust Fund Coordinator and key Nigerian officials. The team met with several Chinese technical institutes and experts, World Bank team leaders in Beijing, and visited relevant projects in the field. One key success was the subsequent signing of an agreement between Government of Nigeria and the China Irrigation and Drainage Development Centre (CIDDC) to coordinate study tours of Nigerian counterparts and other experts to China, and broader knowledge sharing.



*Participants at the Scoping Mission*

**2 Visit to World Bank Country office, Beijing.** Scoping Team met with Mr. Xiaoke Zhai, and Ms Huan Tian, Sr. Transportation Specialists, World Bank office in Beijing. Xiaoke presented China's experience on managing surface water runoff in urban areas, in particular the "Sponge" City Program in Sichuan Province; the permeable covering on side ditch slopes and permeable pavement and integrated water management plans. Mr. Liping Jiang, Sr. Water Resources Management Specialist introduced the Xinjiang Turpan Water Conservation Project; while Dr. Grant Milne, Dr. Amos Abu and Joy Agene from the mission team delivered a BBL on "Lessons Learned from Integrated Watershed management, Gully Rehabilitation Programs and Geospatial Applications in India and Nigeria". The BBL was chaired by Bekele Debele (Program Leader) with VC/webex connection to several country offices.



*Bekele Debele Program Leader, World Bank office in Beijing*



*Mr. Liping Jiang, Sr. Water Resources Management Specialist World Bank office in Beijing*

**3. International conference in October 2017** on geo-spatial applications to environmental and watershed management, organized by the Nigeria Ministry of Environment to coincide with the United Nations General Assembly declaration of October 4-10 as World Space Week. More than 300 officials and experts participated, including key speakers from the World Bank and leading scientific institutions in China, India, and Nigeria. According to Alhaji Ibrahim Usman Jibril, Honorable Minister of State for Environment – Nigeria, "this is a unique opportunity to leverage on space outreach and geospatial education to numerous stakeholders in the country." Participants expressed enthusiasm for the event and requested the Bank to provide support for scaling up of the conference as an annual event.



*Group Photo at the SSKE Knowledge fair*



#### 4. Study tour to China on Climate Smart Agriculture

in June 2018, with 27 senior officials and technical counterparts from two World Bank-supported projects in Nigeria dealing with watershed management and agriculture. The group visited China to learn about new approaches for climate smart agriculture within a watershed management approach. The team visited the World Bank office in Beijing, and with several leading government scientific agencies. The visitors also went to project sites to learn from field experience. Key outputs from the study tour will include a detailed technical report, training videos on important field practices, and possible development of an agreement between relevant Chinese agencies and Nigeria on climate smart agriculture activities.



#### 5. Other success stories include:

a) Agreement in principle between the Indian Space Research Organization (ISRO) and the counterpart agency in Nigeria for technical cooperation on geo-spatial technologies and technology transfer to Nigeria; b) presentation by a Chinese expert on water management for agriculture at a major conference in India; and c) initial web site developed and now being populated with data/information for dissemination of Trust Fund activities (see <http://www.sske.org>).



#### 6. Study tour to the United States:

A Team of Project Engineers, Coordinators and other high-level officials involved in the Nigeria Erosion and Watershed Management (NEWMAP) project implementation, went on a Technical Study Tour to Washington DC, November 11-17, 2018 under the auspices of the South-South Learning and Knowledge Sharing for watershed management, infrastructure and agriculture to exchange ideas on storm water management and reducing run-offs from the roads when it rains. The knowledge-sharing workshop at the World Bank headquarters in Washington, DC and Prince George's Councils in Washington DC, USA was to present to the Project Team the US experience and an overview of the operations and methodologies of managing surface water.



7. **Looking ahead.** The technical cooperation agreement between ISRO and government of Nigeria to be signed; and the development of cooperative initiatives between China and India on climate smart agriculture.



In less than two years the trust fund has recorded remarkable achievements. Testimonies from the Authorizing environments of the two Projects (FADAMA III and NEWMAP) and the generality of critical stakeholders points to the fact that the SSKE should not only be extended beyond the 2 years but expanded to other areas of benefits to greater outreach and necessary positive impact it sets to achieve.

According to **Ibrahim Usman Jibril**, “the provision of food security and conducive sustainable environment



**Ibrahim Usman Jibril**  
Former Minister of State,  
Federal Ministry of  
Environment

occupies the center focus of Government of the Federal Republic of Nigeria. This is why two major initiatives, often referred to as flagship projects on Agriculture and Environment: the FADAMA Programme (now FADAMA III AF) and the Nigeria Erosion and Watershed Management Project (NEWMAP) have continued to get the necessary support from the present administration to help achieve sustainable development; through their various project implementation activities which has impacted greatly on the social infrastructure and the livelihoods of the generality of Nigerians. Therefore NEWMAP is a great game changer in tackling erosion and the SSKE will further benefit the project immensely.”

Currently under its component 1 and 2 of its set objectives, the Trust Fund has been able to create a balance fusion of knowledge transfer and exchange by target specific activities which has not only improved scientific knowledge on specific topics such as: the economics of gully restoration; comparative assessments of drones, satellites imagery and high resolution ortho-photos for M&E; costs and benefits of improved surface water management in urban areas but has Improved knowledge base of field experiences to support piloting and scaling up of new approaches for gully restoration and prevention, climate smart agriculture.

On inception, the SSKE coordinating office effectively planned and coordinated the hosting of the first Geo spatial Knowledge fair in Nigeria.

The international conference Tagged “SSKE /World Bank /Newmap Knowledge Fair” held between 4-6 October 2017 in Abuja was a unique opportunity to leverage on space outreach and Geo spatial education to numerous stakeholders in the Country,” said **Senator (Prof.) Ajayi Boroffice** who also declared open the conference.



**Senator Prof Ajayi Boroffice** at the SSKE Knowledge fair

**Dr. Kofi Nouve**, Program Leader at the World Bank Nigeria country office applauded this initiative and agreed that “it was pleasing to work with Nigeria to convene such a meeting to share South-South experiences across China, India, and Nigeria, and also to help showcase other examples of global best practices. “This is part of our mission to support the improvement of the use of appropriate modern technology, given that the world around us is changing quickly and it is through activities such as this we stay abreast of new developments to be able to provide the most effective and efficient solutions to poverty alleviation.”



**Dr. Kofi Nouve**, Program Leader at the World Bank Nigeria country office

Speaking about the Knowledge fair, **Dr. Amos Abu** Senior Environmental Specialist (World Bank) and Task Team Leader NEWMAP agreed that “the fair did not only complement Global Space Week, but brought together in Nigeria, wealth of accumulated knowledge and experience from China (and India) as well from the United States (World Bank Headquarters). The pool of experts provided the best tools and materials disseminated to local stakeholders and wider global audience. The SSKE effectively provided the forum on knowledge and experiences in applying Geo spatial Technology.”



**Dr. Amos Abu**, NEWMAP's TTL

The first international conference at the instance of the SSKE to commemorate the 2017's Space Week drew Participants and resource persons from the Chinese Institute of Remote Sensing; India's National



Remote Sensing Centre and the Karnataka Watershed Program in Bangalore; Nigerian MDAs, higher learning institutions, students from secondary schools, and National Youth Service Core; NGOs, private sector, and World Bank colleagues from Washington and Nigeria. The fair addressed the following areas

- (i) Integrated Watershed and Erosion Management;
- (ii) Decision Support System (DSS) for Project Implementation, Monitoring & Policy Making;
- (iii) ET Management and Comparative Assessments of Drones, Satellites Imagery and High Resolution Ortho-photos for M&E;
- (iv) Monitoring Extreme weather event in Nigeria and Geodetic deformation monitoring for soil erosion.

## Effectiveness



*Dr Nagaraja Rao Harshadeep*

**Dr. Nagaraja Rao Harshadeep** believed “the SSKE international Conference on Geo –Spatial technology was able to present innovative examples to gully restoration and watershed management drawing on global experiences and comparatively sharing knowledge with Nigerian Experts and other stakeholders on good approaches that can provide useful technical inputs to managing the watershed and Smart Agricultural practices. This cooperation must be sustained”



*Dr. Essien Iniobong Ene*

The Commissioner environment Akwa Ibom State **Dr. Essien Iniobong Ene** noted that “the SSKE international Conference on Geo –Spatial technology and knowledge fair as well as the china exposure visit speaks volumes. It was very educative going by the array of presentations by credible resource persons that shared “experiences and research of agricultural management practices within the landscape.

**Alhaji Bello Sifawa** Commissioner for Environment Sokoto State agreed that SSKE in its short time has

done very well. It has provided a platform for partnerships, thus creating an increased capacity for high-quality applied research and appreciable successes.”

**Dr. Mruthyunjaya M. Reddy** of Indian Space Research organization (ISRO), Department of Space, Government of India agreed that the SSKE international Geo-spatial Knowledge fair created effective harmonization and sharing of geo-spatial information and Knowledge across all critical stakeholders through simplification of space technology for community and grassroots utilization.”

“I believe the SSKE should be sustained. It has evolved ample opportunity of cooperation between National Space Research Development Agency (NASRDA) of Nigeria and the Indian Space Research Organization (ISRO). Under the coordination of the SSKE an MoU was developed towards the establishment of central Bhuvan in Nigeria that will generate Geo Maps with scalable ratios. This will ensure the availability of information and Data, for use by MDAs’ who require information for Decision support in all socio-economic spheres.”

**Professor Ademola Omojola**, of the University of Lagos believes that the SSKE Platform is a veritable tool for Collaboration and Knowledge Transfer: It’s a platform for accelerated socio-economic development.”

**Salisu Dahiru** National Coordinator NEWMAP and Team Leader of the Exposure visit said, the objective of the study tour “is to provide training and exchange, learning and knowledge dissemination between China and Nigeria on climate smart agriculture in the context of integrated watershed management for sustainable development. At the end of the



*Alhaji Bello Sifawa  
Commissioner for  
Environment Sokoto*



*Dr. Mruthyunjaya  
M. Reddy*



*Professor Ademola  
Omojola*



*Salisu Dahiru  
NEWMAP National  
Project Coordinator*



exercise, participants gained knowledge and skills in relevant technical areas of climate smart agriculture; and we are going to incorporate the lessons learnt into implementation of the NEWMAP/FADAMA and climate smart agriculture activities in relevant MDAs in Nigeria. The SSKE has created an opportunity for collaborative action Plan with Chinese institutions.”



*Dr. Adetunji Oredipe  
TTL FADAMA III AF*

**Dr. Adetunji Oredipe** TTL FADAMA also a co-Team Leader of the Exposure visit to China acknowledged that “the SSKE Knowledge sharing and Transfer has conveniently piloted the two projects towards common grounds and cooperation and will further boost the activities of the projects, and improve the technical approach to watershed management.” He acknowledged that the principle behind the SSKE will support accelerated and sustainable development in the area of smart Agriculture, water conservation and environmental management as well.”



*Mrs Rosemary Oshikoya  
Hon Commissioner for  
Environment, Kogi State*

**Kogi state Commissioner** for environment noted that “the knowledge transfer and experiences of like Projects in China and India derivable from the platform of the SSKE, will surely impact positively on the various critical project beneficiaries. It could also be expanded to other areas”

Speaking in Beijing on the SSKE between China, India and Nigeria, **Mr. Harold Bedoya** World Bank acting country Director, China said “the World bank secured the trust fund to further support the two projects of FADAMA and NEWMAP, which are not only the two biggest Projects of the world Bank in Nigeria, but also two performing Projects and initiatives of the Nigerian government with great positive impacts on the people.

He said this support by the World Bank brings about a global wealth of experience to Nigeria because the SSKE will tap on the successful experiences of



*Harold L. Bedoya*

other World Bank funded projects in China and India, especially in the area of Agriculture and sustainable environment.”

### **Expected Success of the Exposure Visit and Field Knowledge Transfer:**

Honourable Minister of State Ibrahim Usman Jibril, concludes that the SSKE study visit supports a great deal, the process of Knowledge transfer and technology exchange. And the principles behind the SSKE will further support the two biggest Projects of the World Bank in Nigeria, FADAMA and NEWMAP.

**Dr. Halilu Ahmad Shaba** of National Space Research and Development Agency (NASRDA), summed up that SSKE has provided for inter-agency collaboration both at the national and international levels and encouraged good participation to build stronger knowledge sharing and professional networks. This we have seen and experienced as an Agency, especially with the planned cooperation with the Indian Space Research Organization (ISRO).”



*Dr. Haliru Shaba of the  
National Space Center*

**Wendao Cao**, World Bank’s Senior Agriculture Economist Beijing, noted that Intensive farming operations are a major and often under recognized source of water, soil, and air pollution. He applauded the SSKE as very pivotal to accelerated sustainable development in Smart Agriculture, water conservation and environmental Management. “I’m thus happy that the major national projects from Nigeria are here (in Beijing) to learn from the Chinese experience.”



*Mr. CAO Wendao,  
Senior Agriculture  
Specialist*

**Sitaramachandra Machiraju**, Senior Agribusiness Specialist, Beijing was very incisive: “I am thus confident that the SSKE has rightly piloted the two flagship projects in Nigeria to the right direction: a wealth of experience of other World Bank sustainable development Projects



*Sitaramachandra  
Machiraju,  
Senior Agribusiness  
Specialist*



here in China as well as in India. It is a great opportunity to learn global changing systems in Agriculture and food chains." There are three important changes in global agri-food systems: a. rising incomes resulting in shifting dietary preferences and eating habits; b. Rapid urbanization challenging food production and stretching supply chains; and the effects of climate change food production. Therefore very important is the fact that achieving sustainable agricultural regime can never be devoid of modern technology. That means best way is SMART agriculture that is why despite the trends affecting the food chain globally, Asian countries have achieved significant growth in their exports of higher value food products."



*Mr. HAN Zhenzhong,  
Chief Engineer (Vice  
Director General Level),  
CIDDC*

For China Irrigation and Drainage Development Center (CIDDC) and China Institute of Water Resources and hydro power Research (IWHR) the Training on Climate-Smart Agriculture, Integrated Watershed Management and exposure visit was a success. "We are happy to promote growth and international cooperation between China and Nigeria; the CIDDC is glad that the study visit was very successful and that it was very beneficial to both countries," said **Mr. HAN**

**Zhenzhong**, Chief Engineer (Vice Director General), CIDDC.

**Ms. PENG Jing**, Vice President China Institute of Water Resources and Hydropower Research (IWHR), expressed readiness and the willingness for partnerships: "SSKE provides opportunity for the Nigeria



*Ms. PENG Jing,  
Vice President China  
Institute of Water  
Resources and  
Hydropower  
Research (IWHR)*

Projects to benefit from the institutes' wealth of experience of over 50 years of evolution, since its establishment in 1958. Gains of this cooperation has been the window available through the China Institute of Water Resources and Hydropower Research (IWHR); this presents more opportunities under the SSKE with its extensive exchanges and cooperation with nearly one hundred foreign research institutions, prestigious universities, academic communities and international organizations.

**Dr. Joy Agene**, SSKE Coordinator said the SSKE has further enhanced the cooperation and collaboration of the two Nigerian Flagship Projects : (NEWMAP and FADAMA) and all accrued benefits derivable via knowledge transfer and experiences of like Projects in China and India will surely impact positively on the various critical project beneficiaries.

"More beneficial to the two projects is the experiences of the Chinese and Indian long history of successful World Bank-supported sustainable land management programs, designed to improve water management, agricultural productivity, rural livelihoods, and build resiliency to climate change."

The Trust Fund will support important activities under Window 2 – Knowledge sharing and South-South Learning, between China, India and Nigeria, focusing on infrastructure development associated with major land and gully restoration, and agricultural development on restored landscapes.

**Ms Li Qun**, Senior Agriculture Economist World Bank Country Office, Beijing China applauded the SSKE initiative between China, India and Nigeria. She agreed that the Cooperation will boost development and shared knowledge between participating countries and enhance agricultural transformation demands and the two projects' (NEWMAP/FADAM) economic benefits, and drive Nigeria's infrastructure.

**Ms. WANG Yue**, Program Officer, Engineer, GEF and The World Bank Project Management Office noted commend the initiative. She described the SSKE as a rare opportunity for the three countries to partner, share knowledge and provide improvements in the area of infrastructure and Watershed management



*Dr. Joy Agene  
SSKE Coordinator*



*Ms. LI Qun,  
Senior Agriculture  
Economist  
World Bank Country  
Office, Beijing China.*



*Ms. WANG Yue,  
Program Officer,  
Engineer, GEF and,  
World Bank Project Management Office  
(Beijing SSKE Desk Officer)*