

1st ANNUAL REPORT 2013



ADVANCING A NEXUS
APPROACH TO THE
SUSTAINABLE
MANAGEMENT OF
ENVIRONMENTAL
RESOURCES



UNITED NATIONS
UNIVERSITY

UNU-FLORES

Institute for Integrated Management
of Material Fluxes and of Resources

UNU-FLORES

Annual Report 2013

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Message from the Director

The year 2013 was the first year in the history of UNU-FLORES, the United Nations University's Institute for Integrated Management of Material Fluxes and of Resources. With the official opening ceremony of the institute taking place in Dresden, Germany, only in December 2012, the year's work was determined by setting the foundation for the future work of the institute.

Throughout the year, our initial team was occupied with assembling the full team and establishing contacts in the local, national and international scientific community.

UNU-FLORES aims to advance a nexus approach to the sustainable management of environmental resources. In order to do this, interrelated resources (water, soil and waste) are considered in a comprehensive manner using systems and flux analysis approaches. A strong focus is placed on the development of implementation concepts and management strategies, on governance of environmental resources and capacity development at the individual and institutional levels.

Among the highlights of 2013, the International Kick-off Workshop held in November surely shone the brightest. Created to serve as a starting point for a number of regional workshops and the bi-annual "Dresden Nexus Conference", the workshop, organized in cooperation with our partner university TU Dresden and a large number of co-conveners, gathered scientific leaders and policy makers from around the world to discuss current initiatives in research, education and capacity development advancing a nexus approach. The participants will also be involved in the planning of first Dresden Nexus Conference in March 2015, which will focus on Global Change considering Sustainable Development Goals and the Nexus approach. Another important event was the regional workshop in Maputo, Mozambique in May 2013, which paved the way to the establishment of an Operating Unit of UNU-FLORES in Maputo, envisioned to act as a hub for the region in the area of integrated management of water, soil and waste. A major outcome was the initiation of four joint research projects – one of various initiatives to establish the research programme of the institute.

This Annual Report is divided into several chapters that illustrate the nexus approach employed by our institute. Under "UNU-FLORES at a Glance" the concept of our institute and the way it is set up is explained. The chapter "Establishment" provides information on the road UNU-FLORES has taken towards establishing the institute in the world of academia and policy. Information on the highlights of the year 2013 is available in the chapter "Activities". The activities in this section are not assigned to a specific work area, as indeed the large majority of our activities in 2013 and future years transcends single subjects and integrates several perspectives and thematic areas in line with the nexus approach. The following chapters provide an overview over our "Publications" and our "Finance" for the contributions received in 2013, before we introduce "Our Team" and close this first Annual Report of UNU-FLORES with "The Way Forward".

I take this opportunity to express our gratitude to the Federal Ministry of Education and Research (BMBF) and the ministry of Higher Education, Research and the Arts (SMWK) of the Free State of Saxony, Germany, for their financial support.

I invite you to reach out to us with your ideas regarding the nexus approach in the management of water, soil and waste, with your suggestions or requests for research projects, academic curricula or the development of policy strategies. Only together we can advance the nexus approach and make sure that in the future, environmental resources are managed in a sustainable and responsible manner.

Reza Ardakanian

Director, UNU-FLORES



UNU-FLORES at a Glance

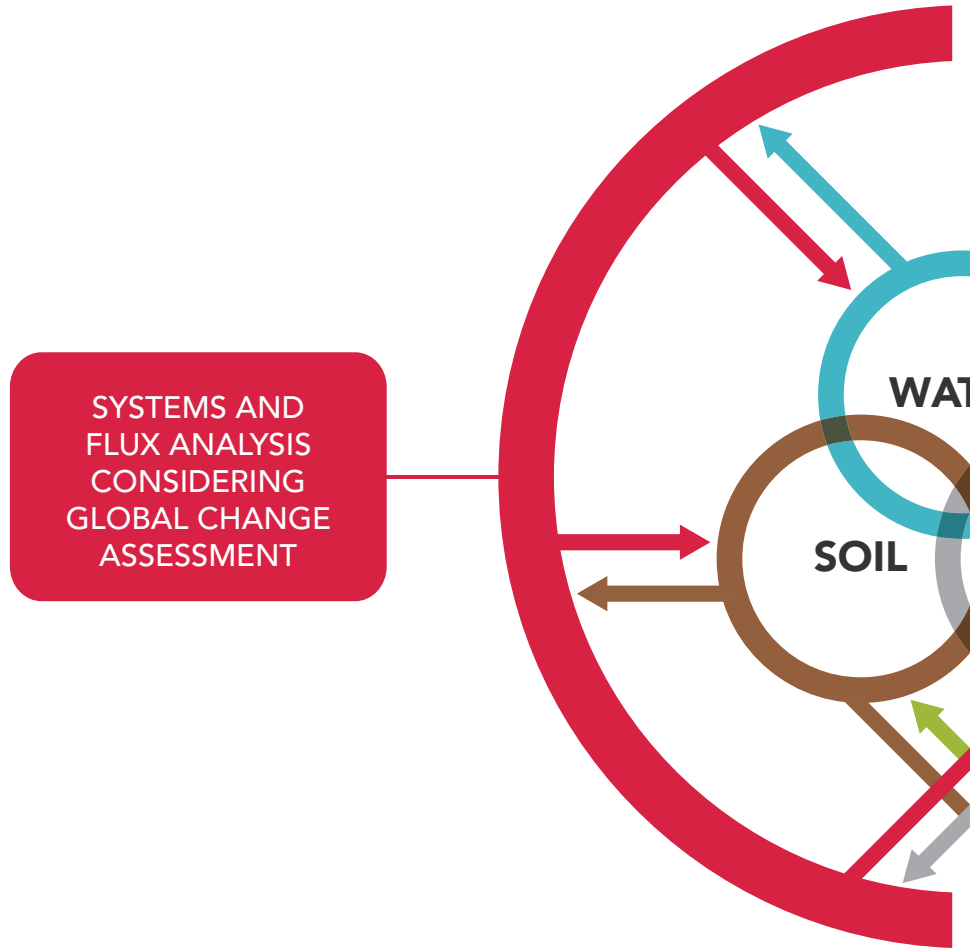


Mission and Vision of UNU-FLORES

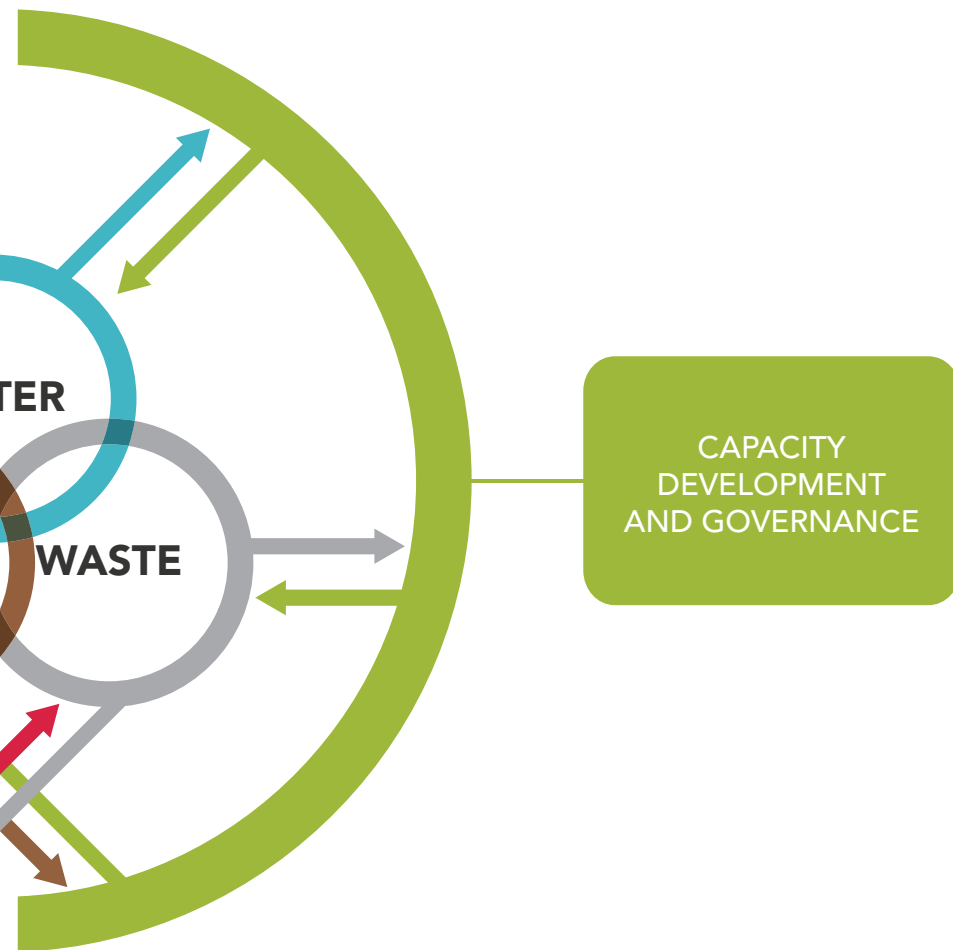
UNU-FLORES was established to contribute, through research, teaching, advanced training, capacity development and dissemination of knowledge, to the resolution of pressing challenges in the area of sustainable use and integrated management of the environmental resources water, soil and waste that are of concern to the United Nations and its Member States. In line with the general mission of UNU to foster sustainable development, UNU-FLORES advances the development of integrated management strategies for the sustainable use of the environmental resources water, soil and waste considering impacts of global change on resources management and its nexus to green economy.

UNU-FLORES aims at acting at the forefront of initiatives promoting a nexus approach to the sustainable management of environmental resources such as water, soil and waste. It serves within the UN as the think-tank on resources management and aims to be internationally recognized as major hub and intellectual focal point promoting integrated management strategies addressing in particular the needs of developing and emerging countries. UNU-FLORES' ambition is to attract high-caliber postgraduate students and to train the future leaders in the field via innovative concepts for target- and region-specific knowledge transfer as well as appropriate methodologies and approaches for postgraduate and professional education.

UNU-FLORES Academic Structure



UNU-FLORES aims at advancing a nexus approach to the sustainable management of environmental resources, focusing in particular on water, soil and waste. The nexus perspective emphasizes the inter-relatedness and interdependencies of these resources and their transitions and fluxes across spatial scales and between compartments.



Sustainable management strategies for water, soil and waste have to be based on consistent and comprehensive systems and flux analysis approaches taking into consideration the impacts of changes in demography, urbanization and climate. In addition, a nexus approach not only emphasizes the interrelations of resources, but needs to consider also the cycle from research to implementation, thus focusing on governance, the enabling environment and individual capacity development.



Systems and Flux Analysis considering Global Change Assessment

Under the Systems and Flux Analysis considering Global Change Assessment unit, UNU-FLORES promotes inter-disciplinary research on material fluxes and cycling of the environmental resources water, soil and waste in order to enable a nexus approach to the sustainable management of these resources. Within UNU-FLORES, SFA plays a central role as integrator, analyzer and initiator of integrative research on environmental resources management.



Capacity Development and Governance

The Capacity Development and Governance unit develops implementation concepts and management strategies, focuses on governance of environmental resources and capacity development at the individual and institutional levels. Given the acknowledged limitations of the conventional technology transfer model, capacity development approaches that aim to facilitate technology adaptation may offer a more durable basis for advancing the nexus approach.



Water Resources Management

The Water Resources Management unit at UNU-FLORES considers various linkages of water resources within themselves, with other environmental resources of UNU-FLORES' particular concern and with other natural resources. Based on a nexus approach that is sustainable and integrated with other environmental resources, Water Resources Management at UNU-FLORES fosters an interdisciplinary and integrative perspective, contributing to sustainable development.

Soil and Land-use Management

The Soil and Land-use Management unit at UNU-FLORES promotes interdisciplinary and transdisciplinary research to make sure that society can benefit from an improved understanding of the nexus of soil, water and waste. Advancing the nexus, the Soil and Land-use Management section develops site and region specific management options for developing and emerging countries.



Waste Management

The Waste Management unit at UNU-FLORES addresses issues of preventing losses and closing cycles of resources by developing and coordinating the research programme of UNU-FLORES on waste management, considering the close inter-linkage with other resources (water, soil). It develops management strategies for the collection, processing and recycling of waste; promotes strategies for rehabilitation of contaminated sites; and develops management strategies for safe waste water use and waste water processing.



ACADEMIC OFFICERS



Dr. Stephan Huelsmann

Academic Officer for Systems and Flux Analysis considering Global Change Assessment



Dr. Mathew Kurian

Academic Officer for Capacity Development and Governance



Dr. Mari Ito

Academic Officer for Water Resources Management



Dr. Kai Schwaerzel

Academic Officer for Soil and Land Use Management



Dr. Hiroshan Hettiarachchi

Academic Officer for Waste Management

The Nexus Approach to Environmental Resources Management

A definition from the perspective of UNU-FLORES

“The Nexus Approach to environmental resources management examines the inter-relatedness and interdependencies of environmental resources and their transitions and fluxes across spatial scales and between compartments. Instead of just looking at individual components, the functioning, productivity and management of a complex system is taken into consideration.”

Introduction

The term “Nexus” in Latin describes the act of tying together or something which binds. In connection with environmental resource management, the term nexus was introduced for the first time during the 1980s, notably in a project by the UN University (Food-Energy Nexus programme, (Sachs and Silk 1990)). Yet the Nexus Approach only gained prominence in international academia and policy circles in the lead-up to the Bonn2011 conference on the “Water, Energy and Food Security Nexus”. The conference argued that such an approach can result in improved water, energy and food security by integrating “management and governance across sectors and scales”, reducing trade-offs and building synergies, overall promoting sustainability and a transition to green economy (Hoff 2011). The inter-dependencies of water, energy and food can be visualized as follows:

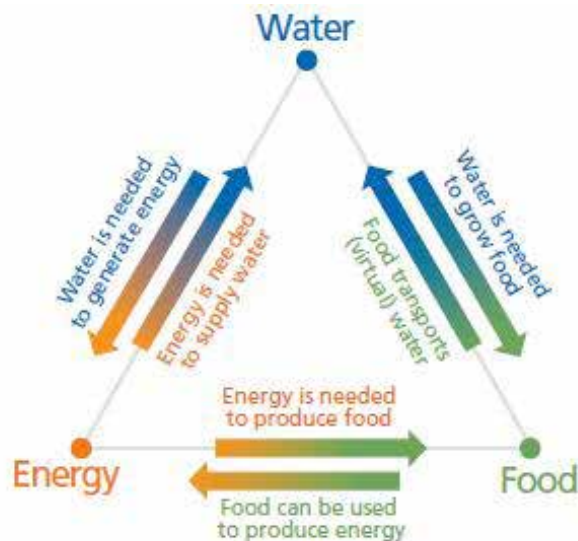


Fig. 1: The water, energy and food security nexus

While the term and concept of the nexus approach has been increasingly discussed since, there is no clear definition of the nexus approach in international academia to date. Instead, concurrent definitions are in usage, with partly overlapping, partly diverging foci. Below we provide a working definition from UNU-FLORES' perspective.

The Nexus of Environmental Resources

When looking at the before mentioned nexus of water, energy and food security, the question arises which environmental resources have to be managed in an integrated way to achieve the sought integrated and sustainable management. For UNU-FLORES, these environmental resources are: **Water, soil and waste.**

The production of food relies on water and soil, with waste being an important factor for the provision of nutrients and organic material. The same is true for the production of biofuel and energy from biomass. Additional links to energy exist for water (hydro power, conversion from heat to energy, cooling water) and waste (biogas, thermal energy from waste).

The nexus perspective emphasizes the inter-relatedness and interdependencies of these environmental resources and their transitions and fluxes across spatial scales and between compartments. Instead of just looking at individual components, the functioning, productivity and management of a complex system is taken into consideration. In such complex systems there are trade-offs as well as facilitation and amplification between the different components.

Even independently from the nexus of water, energy and food security, the nexus of water, soil and waste is evident (Lal 2013): One example is soil transferring run-off and percolation to the "blue" water (surface and groundwater). "Blue" water in turn is transformed by soil into "green" water that plants use for their growth. Soil also contributes to the transformation of waste from crops, animals and trees into humus and plant nutrients, and provides plants with these for growth. The application of sludge on soil is also an important source of nutrients and organic matter. Human use of water creates "grey" and "black" waters which can be recycled through purification and used as source of plant nutrients and converted into "blue" and "green" water by denaturing and filtration through soil.

Truly Integrated Management

Integrated management concepts have been used in the individual areas of water, soil, and waste for years. However, the close relationships, interactions, and interdependencies between these resources are usually not taken into consideration when integrated resource management concepts are developed. Yet fixing one challenge in managing one resource often creates challenges for other resources. A better solution can be achieved if these resources are managed collectively using a nexus approach.

The integrated and interconnected management of water, soil and waste can increase resource use efficiency while at the same time environmental risks and ecological degradation can be minimized. In addition, the nexus approach not only emphasizes the inter-relations of resources, but, given the focus on management, considers also the cycle from research to implementation, thus focusing on governance, the enabling environment as well as on individual capacity development.

The nexus approach to the sustainable management of water, soil and waste promoted by UNU-FLORES is thus closely related to the water, energy and food security nexus, looking at it from an environmental resources perspective. It is instrumental to meet the current challenges of growing resource demands, climate change, urbanization, and globalization.

UNU-FLORES and the Nexus approach

Advancing a nexus approach requires concerted action and cooperation on a global level and across sectors to address the knowledge gaps via well-defined nexus research programmes. Also, the nexus approach yet has to find its way into the curriculum of respective study programmes. For a sustained follow-up to the nexus initiative, a long-term commitment of leading institutions and thus an institutionalized support is indispensable.

Besides addressing knowledge gaps and the need for better scientific understanding, advancing a nexus approach requires special attention in regards to the requirements for the implementation of a nexus approach outside the academic circles. Examples of good and improved governance resulting from adopting a nexus perspective are rare. Knowledge issues and education (individual capacity development) must be addressed as well as the organizational level and the enabling environment and systems level (institutional capacity development). The upcoming Dresden Nexus Conference aims at providing a platform to comprehensively address these issues as laid out in the White Book on Advancing a Nexus Approach to the sustainable Management of Water, Soil and Waste (Hülsmann and Ardakanian 2014).

UNU-FLORES is a direct response to the nexus initiative, striving for an integrative approach to the management of water, soil and waste (closely related to the water, energy and food security nexus, see above). An asset of the institute is its integration into the research environment in Dresden and Saxony as well as its strategic positioning within the thematic areas of the UN University. UNU-FLORES will extend and upscale the concept of integrated resource management through adopting a truly integrative perspective by considering inter-related resources and emphasizing fluxes of resources between phases and compartments. Instead of following a traditional input-output model, UNU-FLORES explores whether the consistent tracing and management of resources as fluxes will result in sustainable management outcomes.

The Nexus approach and Policy

The complex relations between demand, resource availability and quality, and financial and physical constraints can be addressed by knowledge-based policies and reform of professional practice. The nexus approach recognizes the urgent need for this knowledge and its interpretation in a policy-relevant setting. This need derives from the understanding that there is a lack of blueprints for development based on integrated management of water, soil and waste resources both in developing and in developed countries. UNU-FLORES will pursue the achievement of sustainable environmental outcomes by serving as a think tank that promotes integrated resources management in all countries.

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**Institute for Integrated Management
of Material Fluxes and of Resources**

Following two international scoping workshops held in November 2010 in Dresden, Germany, and in October 2011 in Maputo, Mozambique, the Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES) was officially opened on December 10th, 2012. Since the opening ceremony, the institute has established networks locally and globally with its partner university, TU Dresden, as well as other institutions (see chapter "Networking"), recruited its full academic team, and begun with the process of setting up an operating unit of UNU-FLORES in Maputo.

Recruitment

With the beginning of 2013, the Founding Director of UNU-FLORES, with support of UNU headquarters as well as TU Dresden, set out to recruit high-caliber academics to lead the institute's efforts in its five academic work areas.

Additionally, several individuals with extensive background in working for the UN in various positions and organizations were recruited to support the institute in the fields of Administrative Management, Communications, Advocacy, Information and Communication Technology and Security.

To see the full team of UNU-FLORES, please visit the "Our team" chapter.

Networking

The nexus concept by nature requires to work within a network of partners, since it is virtually impossible that any single institution may cover all aspects of the nexus approach to managing water, soil and waste. Strategic partnerships are developed considering scientific expertise in specific areas, considering outreach, implementation and governance as well as international networking. Overall, partnerships are sought to strengthen the think-tank function of UNU-FLORES for the UN system and for member states. Clearly, this involves close cooperation with International Organizations, research communities as well as other UNU institutes, with UN agencies working on Nexus-relevant topics, such as FAO, UNESCO, UN-HABITAT etc. and with member states, particularly developing countries.

Technische Universität Dresden (TUD)



The TUD has its roots in the Royal Saxon Technical School that was founded in 1828. Today it is a university that unites the natural and engineering sciences with the humanities and social sciences, as well as medicine. This wide range of disciplines brings with it the obligation for the university to promote interdisciplinarity and to contribute to the integration of science and society. The TUD is one of eleven German universities that were identified as an "excellence university". TUD has about 37.000 students, 4.400 publicly funded staff members – among them over 500 professors – and approximately 3.500 externally funded staff members.

By cooperatively engaging in research, postgraduate education and capacity development, UNU-FLORES and TUD endeavor to create a hub for sustainable management strategies for environmental resources in Dresden. Following the signature of a **framework agreement between UNU and the TU Dresden** at the Opening Ceremony of UNU-FLORES in December 2012, both parties have actively implemented the partnership over the course of 2013:

- 15 working group meetings were held over the course of 2013 to develop and organize joint activities;
- Concepts for postgraduate programmes were developed;
- Two major workshops were organized jointly (see page 27 for the International Kick-off workshop on Advancing a Nexus Approach to the Sustainable Management of Water, Soil and Waste, and page 22 for the Regional Workshop for the partner institute in Maputo, Mozambique);
- Several joint research projects were initiated;
- UNU-FLORES and TUD involved each other mutually in eight events and seminars;
- UNU-FLORES was able to enlarge its network within TUD and with TUD partners, and likewise connected TUD to its international partners;
- Donors were approached jointly;
- UNU-FLORES became involved in teaching activities at TUD and trained the majority of its interns from TUD;

- Likewise, TUD was involved in the recruitment of the Academic Officers of UNU-FLORES; and
- The Rector of UNU, Dr. David Malone, met with the Rector of TUD, Prof. Hans Müller-Steinhagen, during his visit to Dresden in September to discuss the envisioned joint PhD programme and the cooperation in future research, events and capacity development activities.

The joint PhD programme will be established in 2014. Students will be co-supervised by UNU-FLORES and TU Dresden and benefit from the research infrastructure, expertise and scientific network of both institutions. After successful graduation, the students will receive a joint degree from UNU and TUD.

Leibniz Institute of Ecological Urban and Regional Development (IOER)

The Leibniz Institute of Ecological Urban and Regional Development (Leibniz-Institut für ökologische Raumentwicklung, IOER) is an establishment of the Leibniz Association, focusing on the sustainable development of cities and regions in the national and international context. The Institute investigates interactions between the natural environment and society and the options available for influencing them in order to supply advice to governments and societies. Contributing to the compatibility of human action and the development of the natural environment in order to ensure the sustainable basis of life, IOER places great value on promoting the younger generation of scientists.



In October, UNU-FLORES and IOER signed a **cooperation agreement**. The two Dresden-based institutes will conduct joint research projects, including case-based research in an international context, as well as produce joint publications and jointly organize and participate in academic meetings and conferences. Mutual activities for the benefit of young scientists are also planned, including joint teaching activities, primarily at UNU and TUD. Over the course of 2013, the following joint activities were initiated:

- The director of UNU-FLORES delivered a keynote speech in the International Conference "Climate Change and Regional Response" organized by IOER.
- UNU-FLORES contributed to IOER's Summer School;
- IOER contributed to UNU-FLORES' Nexus Observatory Workshop on "Life-cycle cost assessment of infrastructure projects"; and
- A Steering Committee was established in December to further coordinate the future cooperation between the two institutes.

Helmholtz Centre for Environmental Research (UFZ)

The Helmholtz Centre for Environmental Research (Helmholtz Zentrum für Umweltforschung, UFZ) was established in 1991 and is based in Leipzig, Halle an der Saale and Magdeburg. UFZ studies the complex interactions between humans and the environment in cultivated and damaged landscapes. The centre develops concepts and processes to help secure the natural foundations of human life for future generations.

Following up on a joint seminar in late 2012 UFZ contributed to events organized by UNU-FLORES (special session at SEFS 8, see page 31 and the kick-off workshop) and vice versa (Water Research Horizon Conference). A **cooperation agreement** was initiated in late 2013 as a basis for more intensive cooperation.



International Water Management Institute (IWMI)

The International Water Management Institute is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. It is headquartered in Colombo, Sri Lanka, with regional offices across Asia and Africa. IWMI works in partnership with governments, civil society and the private sector to develop scalable agricultural water management solutions that have a real impact on poverty reduction, food security and ecosystem health. IWMI is a member of CGIAR, an international consortium of agricultural research centers. IWMI's Mission is to improve the management of land and water resources for food, livelihoods and the environment.

In 2013, UNU-FLORES and IWMI started to elaborate a **cooperation agreement** to set up joint research projects, joint publications, joint trainings and workshops, mutual participation in meetings and conferences, the exchange of scientific information, the exchange of professionals, and joint outreach activities in developing countries.

International Hydropower Association (IHA)

IHA is a non-profit organization working with a network of members and partners throughout the world, its mission being to advance sustainable hydropower by building and sharing knowledge of its role in renewable energy systems, responsible freshwater management and climate change solutions.

Contacts with IHA were established in December 2013 and a potential cooperation was discussed. It was agreed to mutually contribute to events in 2014 and beyond and to initiate research on the management of multi-purpose reservoirs.



Visit of the Rector of UNU, Dr. David M. Malone, to UNU-FLORES

September 23-24, 2013

In September, Dr. David M. Malone, Rector of the United Nations University and Under-Secretary-General of the United Nations, visited UNU-FLORES (5) for the first time to examine the progress of the Dresden-based institute. During his visit, Dr. Malone also had several high-level meetings and conducted a press conference (4).

In a meeting with the Prime Minister of the Free State Saxony, Mr. Stanislaw Tillich, Dr. Malone and Mr Tillich (1) discussed the way forward for UNU-FLORES. The Prime Minister expressed his willingness to continue supporting UNU-FLORES in the future: "We are proud that the UNU has established an institute here in Dresden. This is the first institution of the UN in Saxony and we believe that this presents a great opportunity for scientists in Saxony."

Dr. Malone also met with the State Minister for Higher Education, Research and the Arts (SMWK) of the Free State of Saxony, Prof. Sabine von Schorlemer (2). As one of two donors of UNU-FLORES (along with the German Federal Ministry for Education and Research, BMBF), the Minister welcomed Dr. Malone to Dresden and discussed possible future interaction with the Rector.

Meeting the Rector of Technische Universität Dresden (TUD), Prof. Hans Müller-Steinhagen (3), Dr. Malone discussed the framework of cooperation between the two institutions and the plans for future joint PhD programmes.



(1)



(2)



(3)



(4)



(5)



Establishing an Operating Unit of UNU-FLORES in Maputo, Mozambique

Following the signing of an MoU between UNU, the Ministry of Science and Technology (MCT) of Mozambique and the Maputo-based University Eduardo Mondlane (UEM) on the occasion of the opening of UNU-FLORES in December 2012, a joint working group was established to oversee and organize the implementation of the MoU.

The most important milestones of the initiative in 2013 included:

- The working group completed a report to the parties including a **commitment letter by UEM** concerning the provision of premises, and a **commitment letter by MCT** concerning the annual in-cash contribution of the Republic of Mozambique.
- A **Regional Workshop** on the establishment of a network for partnership of UNU-FLORES was organized in Maputo in close cooperation with the University Eduardo Mondlane, Technische Universität Dresden and the Ministry of Science and Technology of Mozambique in May. Participating regional stakeholders represented 19 universities and organizations from 14 countries in Africa (Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Yemen, Zimbabwe).
- A working paper on drought and climate change assessment in Africa was released in cooperation with a visiting scholar of UNU-FLORES (Prof. T.Y. Gan, University of Alberta, Canada).
- Concerning **premises**, detailed planning has been initiated to allow the start of building/renovating according to the requirements of the regional office for the start-up phase.
- A **draft budget for the start-up phase** of three years (2014-2016) has been elaborated including a yearly contribution of MCT. It was agreed that during this period the status of the partnership will be an "Operating Unit" (OU) of UNU-FLORES.
- A proposal to establish an OU of UNU-FLORES in Maputo was presented at the 60th Council Meeting of the UN University, held in November 2013 at UN Headquarters in New York, the Council approved the establishment of an operating unit of UNUFLORES in Maputo, Mozambique.



Ministry for Science and Technology (MCT) of Mozambique



University Eduardo Mondlane (UEM)



Photo: Former Rector of UNU, Prof. Konrad Osterwalder, and His Excellency Prof. Louis Augusto Pelembe, Minister of Science and Technology (MCT) of Mozambique at the signing of the MoU.

Sharing the Results of UNU-FLORES' Activities

During 2013, the institute set up a variety of mechanisms to ensure that interested stakeholders around the world are able to follow the activities and results of UNU-FLORES. The homemade website flores.unu.edu is a clear and at the same time dynamic representation of UNU-FLORES. Developed to be responsive and accessible, the website is adaptable to all devices and the most common platforms. For those stakeholders interested to learn more, UNU-FLORES has also started three publication series for Working Papers, Proceedings and Lecture Series. Policy Briefs and other publication types will be added to UNU-FLORES' portfolio as the activities of the institute evolve in 2014. (Photo: - UNU-FLORES' website - flores.unu.edu)

The screenshot displays the UNU-FLORES website homepage. At the top, the United Nations University logo and the text 'Institute for Integrated Management of Material Fluxes and of Resources' are visible. A navigation menu includes 'ABOUT US', 'RESEARCH', 'CAPACITY DEVELOPMENT', 'EDUCATION', 'PUBLICATIONS', 'MEDIA', and 'CONTACTS'. The central focus is the 'UNU-FLORES ACADEMIC FUNCTIONAL STRUCTURE' diagram, which is a circular flow chart with 'WATER', 'SOIL', and 'WASTE' at its core. To the right, a 'UNU-FLORES IS HIRING' section advertises a 'Finance & Administrative Officer' position. Below this, a 'NEW INITIATIVE' section promotes the 'GRIEDEN NEXUS CONFERENCE 2015' on 'GLOBAL CHANGE SDGs'. The 'ACTIVITIES' section features a video player for 'UNU and UNU-FLORES at a glance' and a 'World Water Day 2014' banner with the text 'IN WATER WORLD WATER DAY 2014 water & energy'. A 'Publications' section highlights 'The Nexus of soil, water and waste' by Rattan Lal. A 'News' section titled 'UNU-FLORES and IOER embark on cooperation' reports on a partnership agreement signed in January 2014. At the bottom, there are social media icons for Facebook, Twitter, and YouTube under the heading 'FOLLOW US'.

Activities

UNU-FLORES is active in the fields of research, education and capacity development



RESEARCH



EDUCATION



CAPACITY DEVELOPMENT



RESEARCH



EDUCATION



CAPACITY
DEVELOPMENT

The Nexus Academy – A joint PhD programme of UNU-FLORES and TUD

The establishment of a PhD programme is a critical element in pursuing UNU-FLORES' mission, since it combines research activities on the nexus of environmental resources with education. The programme will attract candidates from developing regions and therefore also be effective in terms of individual capacity development. Students will be co-supervised by both institutes and benefit from the research infrastructure, expertise and scientific network of both UNU-FLORES and TU Dresden. The programme involves course work, offered by UNU-FLORES and TUD, but mainly focuses on research work, co-supervised by both institutions. Overall, the research conducted in the framework of the Nexus Academy will add value to the overall performance of UNU-FLORES as a think-tank for the integrated management of environmental resources.

In 2013, the following steps have been undertaken to establish a joint PhD by UNU-FLORES and TU Dresden in 2014:

- Development of a comprehensive proposal
- Development of admission criteria
- Development of a structure of the PhD programme
- Development of a curriculum/modules

Photo: TU Dresden premises



Joint Research Projects

At the regional workshop for establishing a partnership of UNU-FLORES in Mozambique in May 2013, four joint research projects have been defined among stakeholders from 19 universities and organizations from 14 countries (**Botswana, Burkina Faso, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Namibia, Nigeria, South Africa, Tanzania, Yemen, Zimbabwe**).

The projects investigate:

1. Productivity in Low-Fertility Areas and Climate Change;
2. Risk Management - Floods and Droughts;
3. Integrated Water and Waste Management; and
4. Soil Functioning and Food Production.

The projects are coordinated by UNU-FLORES in cooperation with regional focal points. TUD is also involved and assigned focal points for each project. Since the workshop, the following activities have been carried out:

- Mapping studies for all four joint research projects have been conducted.
- Based on the mapping exercise, a gap analysis has been performed.
- The development of project proposals for external donor support was started, to be finalized and submitted in the first half of 2014 after a regional consultation.

UNU-FLORES was involved in further initiatives to establish joint research projects with partners, which will result in research activities in 2014.



RESEARCH



EDUCATION



CAPACITY
DEVELOPMENT

International Kick-off Workshop on Advancing a Nexus Approach to the Sustainable Management of Water, Soil and Waste

*November 11-12, 2013
Dülfersaal, TU Dresden,
Germany*

In November, UNU-FLORES and TUD co-organized the International Kick-off Workshop on Advancing a Nexus Approach to the Sustainable Management of Water, Soil and Waste in Dresden/Germany. The workshop provided an update on current initiatives advancing a nexus approach and served as a starting point for the organization of a future regular Dresden Nexus Conference. Over 80 participants from UN agencies, Member States, German Ministries, Academia, NGOs as well as from several UNU institutes were assembled to discuss over 40 presentations and case studies.

Co-organizers:

UNU-FLORES, TU
Dresden

Participants:

FAO, UNESCO-IHE, UNCCD, UNEP, UN-HABITAT, UNW-DPC, UNU-INRA, UNU-INWEH, UNU-ISP, UNU-MERIT and UNU-EHS, Governments of India, Mongolia, the Republic of Korea, Tanzania and Uganda, BMBF, BMU, BMZ, SMWK, IPSWaT, IWMI, GWP, AfDB, EWI, CEDARE, CMASC, Imperial College London, Cyprus Institute, University of Arizona, University of Nairobi, University of Mauritius, University of the Free State, IOER, ZEF, UFZ, GIZ, DWA, BGR, DIE, and others.

The workshop was structured into four sessions addressing the following topics:

1. Opportunities for adopting a nexus approach to the management of environmental resources and its relevance to the envisaged sustainable development goals and the post-2015 development agenda;
2. Challenges for the nexus approach in managing water, soil and waste under conditions of global change;
3. Capacity Development for research and education programmes addressing the nexus, in particular teaching and training programmes; and
4. Institutional arrangements and governance structures to facilitate the implementation of a nexus approach and its integration in land use planning and management strategies.



For each session a list of key questions was worked out and participants were asked to address them in their presentations and during panel discussions. In addition, case studies were invited to provide practical examples of current practices of managing water, soil and waste and/or to showcase the benefits of integrated management approaches.

Besides research, issues of capacity development were considered, including education and training as well as institutional capacity development. The workshop was successful in providing a venue for exchange between researchers, policy makers and practitioners in the area of sustainable use of environmental resources, and shaped the debate around the practical implementation of a nexus approach

In March 2015, UNU-FLORES and TU Dresden will establish the first of a future series of biannual Dresden Nexus Conferences. Building upon the outcomes of the International Kick-off Workshop, the Conference will assemble stakeholders from around the world under the theme of "Global Change, Sustainable Development Goals and the Nexus".

Outcomes

The four chapters of the White Book reflect the topics of the four sessions of the kick-off workshop and shall serve as reference material for forthcoming Dresden Nexus Conference. The White Book is available under:

http://flores.unu.edu/wp-content/uploads/2014/03/White-Book_FINAL-web.pdf

In 2014, a collection of case studies presented at the Kick-off Workshop will be published, as well as the Proceedings of the Kick-off Workshop.

The presentations held at the Kick-off Workshop are available under **<http://flores.unu.edu/presentations-at-kick-off-workshop/>**

A summary from the Workshop is available under **<http://flores.unu.edu/international-kick-off-workshop-on-advancing-a-nexus-approach-concluded/>**



Budapest Water Summit – Budapest, Hungary

The Budapest Water Summit took place from 8-11 October 2013. The Summit brought together participants representing governments, international organizations, civil society, academia and the private sector to discuss the development of water-related goals for the post-2015 development agenda. Among the participants were UN Secretary General Ban Ki-moon, Irina Bokova, Director General of UNESCO, Margaret Chan, Director General of the World Health Organization, President János Áder of Hungary, Prime Minister Sok An of Cambodia, Djoko Kirmanto, Minister of Public Works of Indonesia, Veysel Eroğlu, Minister of Forestry and Water of Turkey, Sarah Reng Ocheke, Minister of Water Resources of Nigeria and Nurlan Kapparov, Minister of Environment Protection of Kazakhstan.

At the Summit, the Director of UNU-FLORES took part in a High-Level Panel on the “Water – Energy – Food Nexus”. Key points put forward by UNU-FLORES, such as the need of developing a nexus mindset both in science and in practice, and the need for institutional capacity development, were acknowledged and repeatedly supported by other panelists.

Outcomes

The participation of the Director in the special evening session on the “High-Level Water – Energy – Food Nexus Evening Panel” was a success in promoting the work of UNU-FLORES and the idea of the nexus of water, soil and waste among the water community. The booth at the expo enabled the institute to establish contacts and promote the work of UNU-FLORES in the international water community.

***8-11 October 2013
Millenáris Center,
Budapest, Hungary***

Organizer:

Government of
Hungary

Participants at the panel discussion:

Paul Oquist Kelly,
Minister and Private
Secretary of National
Policies of Nicaragua,
Mohammed Ibrahim
Al Saud, Deputy
Minister for Water
Affairs at the Ministry
of Water and Electricity
of the Kingdom of
Saudi Arabia, and
Alexander Verbeeck
from the Ministry of
Foreign Affairs of the
Netherlands, amongst
others.



18-19 December 2013
TERI University, New
Delhi, India

Organizer:
UNU-FLORES
and TERI University

Participants:

Ministry of Energy
of Iran, Kogakuin
University, Joint
Graduate School
of Energy and
Environment, Nanyang
Technological
University, Norwegian
University of Science
and Technology,
Environmental
Technology Research
Centre, Kasetsart
University, Indira
Gandhi Institute of
Development Research,
Central Leather
Research Institute,
National Council for
Cement and Building
Material, Livelihoods
and Natural Resource
Management Institute

Nexus Observatory Workshop on Life-cycle Cost Assessment of Infrastructure Projects

The Nexus Observatory addresses the gap between science and policy as well as related challenges. Its aim is to enhance coordination, communication and collaboration between sectors and stakeholders, thereby, facilitating and supporting integration and synergies. One of its purposes is to document methodologies and create interfaces between education, research, policy dialogue and consultation, with the objective of identifying capacity development opportunities. The Nexus Observatory encompasses four windows:

- harmonisation of data resources by linking databases;
- platform for e-learning;
- nexus repository, documenting and analysing consultations and pilot projects and
- nexus workshop, including a capacity development database and nexus indices.

The aim of the above framework is to aid the advancement of the nexus approach to the management of environmental resources. As part of the nexus repository, UNU-FLORES organises regional Nexus Observatory Workshops. These not only generate cross-fertilisation and pilot projects, but also produce policy relevant research questions, which engage with science-policy challenges and, thus, the overall objective of the Nexus Observatory.

Co-organized by UNU-FLORES and Teri University, the workshop was the first of a series of UNU-FLORES regional Nexus Observatory Workshops. Workshop participants came from a wide cross-section involving academia, donor agencies and governments from countries as diverse as India, Iran, Japan, Malaysia, Singapore and Thailand. From a nexus perspective, planners and decision makers benefit from adopting a life-cycle cost approach that considers costs of constructing, operating and maintaining water and sanitation infrastructure over the long-term. In 2014, additional UNU-FLORES nexus observatory workshops will be held in Africa and Latin America.



Special Session on “Freshwater Science and Capacity Development” at the Symposium for European Freshwater Science (SEFS 8)

*July 1, 2013
Münster, Germany*

The main theme of the 8th Symposium of European Freshwater Sciences (SEFS 8), sponsored by the European Foundation of Freshwater Sciences and hosted by the German Society of Limnology in collaboration with the University of Münster, was “Freshwater Science for Nature and Society”. SEFS 8 provided a trans-disciplinary platform for delegates from 36 countries, contributions ranging from fundamental to applied research and from genes to ecosystems, with a strong focus on anthropogenic pressures on freshwater systems and management options.

In line with this focus of SEFS 8, UNU-FLORES organized the special session on societal concerns and capacity development to provide a forum to raise awareness for global challenges for securing water resources in terms of quantity and quality; make a case for integrated approaches to manage freshwater resources to address these challenges; and in particular present and discuss tools, approaches and case studies on capacity development activities related to freshwater, focusing on developing or emerging countries.

Outcomes

The Proceedings of the special session are available under:
<http://flores.unu.edu/proceedings-special-session-sefs-8/>

During the symposium, UNU-FLORES was able to establish contacts and build networks among the assembled European freshwater community.

Organizer:
UNU-FLORES

Contributors:
University of Liverpool, Global Water System Project (GWSP), UN-Water Decade Programme on Capacity Development (UNW-DPC), TU Dresden, Helmholtz Centre for Environmental Research (UFZ) and others



25 June 2013
Berlin, Germany

Organizers:
UNU-FLORES,
TU Dresden

Open Space Workshop at 4th Water Research Horizon Conference

At the 4th Water Research Horizon Conference, UNU-FLORES and partners from TU Dresden organized an open space workshop on “Integrated Management of water, soil and waste - a question of capacities?” The Water Research Horizon Conference, organized by the Helmholtz Centre for Environmental Research (UFZ), acts as a platform for dialogue between the various disciplines of water research. The workshop invited the participants to take part in a lively discussion aimed at identifying appropriate approaches for capacity development. The participants, coming from different scientific institutions in Germany, the USA and China, provided extensive comments and ideas during the workshop on both individual and institutional capacity development.

UNU-FLORES also contributed to a session on “Water & soils for food & energy – a question of technological development?”, pointing out that waste needs to be considered in the context of water and soil management, emphasizing the need for a nexus approach to the sustainable management of water, soil and waste. While in water-scarce regions new and advanced technologies for desalination and for increasing water efficiency will be helpful to provide affordable water for various purposes, teaching and training the adequate use of these technologies needs to be taken into account.

Outcomes

During the conference, UNU-FLORES was able to establish contacts and build networks among the assembled water community.

Other activities

Title	Place	Date	Role of UNU-FLORES
Towards A Regional Collaboration – Regional Workshop Held on Establishment of a Partnering Institute of UNU-FLORES as a Hub for the RegionRegional Workshop on the Establishment of the Twin Institute of UNU-FLORES	Maputo, Mozambique	06– 08/05/2013	Organizer
Dresden Water Seminar	Dresden, Germany	14/05/2013	Lecturer
Climate Change and Regional Response 2013 (CCRR-2013)	Dresden, Germany	27 – 29/05/2013	Keynote speaker
Climate impact on Natural Heritage and on Environmental Resources: the need for an integrated management approachClimate Change as a Threat to Peace: Impacts on Cultural Heritage and Cultural Diversity	Dresden, Germany	31/05 - 01/06/2013	Panelist
Panel discussion on “Ethics in Research from an International Perspective” at Dresden Leibniz Graduate School	Dresden, Germany	1/10/2013	Panelist
Global Soil Week (GSW), Session on “Soil engineering – Enhancing the functioning of soils in the critical zone	Berlin, Germany	29/10/2013	Host of Roundtable discussion
Policy Forum Berlin 2013: Realising the Water, Energy and Food Security Nexus	Berlin, Germany	28 – 29/11/ 2013	Contributor
Lecture series in „Hydro Science and Engineering”, Post-graduate study programme at TUD	Dresden, Germany	12/2013 - 01/2014	Lecturer

Publications



Proceedings of the Opening Ceremony of UNU-FLORES

The proceedings of the opening ceremony on the 10th of December 2012 introduces the concept of UNU-FLORES, reproduces the scientific lecture and opening speeches given, and reports on the signing of the Framework of Cooperation with TU Dresden and the Signing of a MoU between UNU, the Ministry of Science and Technology of Mozambique and University Eduardo Mondlane.

<http://flores.unu.edu/?wpdmact=process&did=MTAuaG90bGluaw==>



Lecture Series No.1 - The Nexus of Soil, Water and Waste by Rattan Lal

The Lecture Series reproduces the presentation given at the Opening Ceremony of UNU-FLORES in December 2012 by Prof. Rattan Lal on the Nexus of Soil, Water and Waste. This lecture is also available on video under: <http://www.flores.unu.edu/lecture-1/>

<http://flores.unu.edu/the-nexus-of-soil-water-and-waste-rattan-lal-lecture-series-no-1/>



Working Paper No.1 - Drought, climate and hydrological conditions in Africa: an assessment based on the application of remotely sensed geospatial data and various models by Thian Yew Gan, Mari Ito and Stephan Huelsmann

Based on existing studies, the present paper provides an overview of climate and surface water conditions related to droughts in Africa, an assessment of droughts, climate and hydrological predictions with the application of remotely sensed geospatial data (satellite data) and various models, uncertainties associated with forecasting, the present status of drought preparedness, and recommendations for the preparation for, and management of, possible droughts.

<http://flores.unu.edu/drought-climate-and-hydrological-conditions-in-africa-an-assessment-based-on-the-application-of-remotely-sensed-geospatial-data-and-various-models-working-paper-no-1/>



Proceedings of the regional workshop on establishment of a network for partnership of UNU-FLORES based in Maputo, Mozambique

The proceedings of the workshop which took place in Maputo on 6-8 May 2013 offer a comprehensive documentation of the regional workshop as a reference for all involved stakeholders and as a source of information about the state of the art of the establishment of a partner institute of UNU-FLORES in Maputo and its regional network in research, education and capacity development.

<http://flores.unu.edu/proceedings-of-the-regional-workshop-on-establishment-of-a-network-for-partnership-of-unu-flores-based-in-maputo-mozambique/>



Draft White Book on "Advancing a nexus approach to the sustainable management of water, soil and waste"

The Draft White Book was prepared for the International Kick-off Workshop held in Dresden in November 2013 and reflected the views of four authors on opportunities for adopting a nexus approach, challenges for the nexus approach, capacity development as well as institutional arrangements and governance structures. The final White Book is now available under:

<http://flores.unu.edu/white-book-nexus-approach>

Finance

UNU-FLORES is jointly financed by the **Federal Republic of Germany** both on the Federal and State levels represented by the **Federal Ministry of Education and Research (BMBF)** and the **State Ministry for Higher Education, Research and the Arts (SMWK) of the Free State of Saxony**.

The BMBF has committed initial in-cash funding of EUR 1,051,000 per year for the start-up phase.

The SMWK committed the same amount for the start-up phase, of which EUR 743,000 were contributed in-cash and the rest as in-kind contribution.

The contributions received from the donors are fully utilized to fulfill the mandate of the institute, i.e. to advance a Nexus approach on sustainable management of environmental resources, water, soil and waste through policy relevant research, teaching and capacity development activities. This includes an effective usage of funds for both institutional administrative development (personnel, IT, communication etc.) and development of academic programmes. UNU-FLORES implements the highest standard on transparency and integrity and follows strictly the financial and procurement rules and regulations of the United Nations. UNU-FLORES is also striving to attract and welcome more external donors to support the implementation of research activities of the institute globally.



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The Way Forward

The work of UNU-FLORES has only just begun. In 2014, many of the activities that have been reported in this Annual Report will be continued and scaled up.

- 2014 will see the establishment of a **joint PhD programme** by UNU-FLORES and TU Dresden on the “Integrated Management of Water, Soil and Waste”. The programme will combine research activities on the nexus of environmental resources and advanced education. The research conducted in the framework of the PhD programme will strongly add value to the overall performance of UNU-FLORES as a think-tank for the integrated management of environmental resources.
- 2014 will also see the establishment of the **operating unit of UNU-FLORES in Maputo**. In cooperation with the Ministry of Science and Technology (MCT), the University Eduardo Mondlane (UEM) and with support of TU Dresden, the operating unit will be established in order to act as a hub for integrated management of material fluxes and of the resources water, soil and waste for Southern Africa and even beyond. After a workshop held in May 2013 in Maputo and the approval of the concept by the 60th Council Meeting of UNU in December 2013, the way is now clear towards the establishment of the operating unit.
- UNU-FLORES will establish a **Nexus Observatory** in 2014. This observatory will be instrumental in bridging the gap between science and policy circles by capturing and sharing data, policy briefs and lessons learned on the management of environmental resources through a nexus approach. The web-based observatory will use different tools for the analysis and the visualization of data and display the inter-connections between sectors and regions.
- The **Joint Research Projects** by UNU-FLORES and 19 African universities and research institutes will be further explored and lead to a series of research projects and publications concerning the nexus approach to the management of environmental resources in Africa.
- Another main project for 2014 will be the preparation of the “**Dresden Nexus Conference 2015**”. Building upon the outcomes of the International Kick-off Workshop on Advancing a Nexus Approach to the Sustainable Management of Water, Soil and Waste, the Conference will assemble stakeholders from around the world under the theme of “Global Change, Sustainable Development Goals and the Nexus” in March 2015.



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**UNITED NATIONS
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**Institute for Integrated Management
of Material Fluxes and of Resources**

The United Nations University Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES) was established in Dresden, Germany in 2012 with the support of the Federal Ministry of Education and Research (BMBF) and the Ministry for Higher Education, Research and the Arts (SMWK) of the Free State of Saxony, Germany. As part of the United Nations University (UNU), the Institute helps to build a bridge between the academic world and the United Nations. The UNU encompasses 16 research and training institutes and programmes in 12 countries around the world. UNU as a whole aims to develop sustainable solutions for pressing global problems of human survival and development.

UNU-FLORES develops strategies to resolve pressing challenges in the area of sustainable use and integrated management of environmental resources such as soil, water and waste. Focusing on the needs of the UN and its member states, particularly the developing and emerging countries, the institute engages in research, capacity development, advanced teaching and training as well as dissemination of knowledge. In all activities, UNU-FLORES advances a nexus approach to the sustainable management of environmental resources.

Find more information under: flores.unu.edu

ADVANCING A NEXUS APPROACH TO THE SUSTAINABLE MANAGEMENT OF ENVIRONMENTAL RESOURCES

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