

(Newsletter of the project The Future Okavango, covering the period June and July 2014)

## What is coming up? TFO activities and deadlines, events of interest

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- **Biodiversity and Food Security – From Trade-offs to Synergies.** October 29-31, 2014, Aix-en-Provence, France. 3rd International Conference on Biodiversity and the UN Millennium Development Goals <http://biodiv2014.sciencesconf.org/>

Poster contributions are invited about all topics relevant to the conference theme. Please register and submit your abstract.

This conference is the third in a series, organized by the French CNRS Institut Ecologie et Environnement (InEE) and the German Leibniz Association (WGL).

The goal is to identify science-based solutions for global sustainability focusing on the issues of biodiversity and food security. Current ecological, economic and societal challenges for development require a holistic understanding of food security and environmental management: from this perspective, biodiversity can be seen as key to overcome trade-offs and to develop synergies between the food system and the conservation of landscapes, ecosystems, and species. The conference seeks to attract scientists from basic and applied research. It involves policy makers and other stakeholders concerned with biodiversity and food security themes who are interested in developing new solutions and strategies. It will connect researchers and stakeholders from natural sciences, social sciences, economics, humanities, technology and related fields.

**For more upcoming events, please have a look at our TFO website under the category “Events”.**

## Inside TFO: What has been done recently?

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- The 7th scenario workshop took place from June 4-5th, 2014 in Hamburg. Members of the scenario task force met to continue the work on the four preliminary storylines which were developed by interdisciplinary teams following the scenario logic established during the previous scenario task force meeting in Rundu, Namibia. Considerable progress has been achieved concerning the joint work on the further development of the storylines. Due to the maternity leave of Stephanie Domptail, the coordination of the scenario work was handed over to the newly formed scenario coordination team (Alex Groengroeft, Manfred Finckh and Michael Pröpper).



Impression from the Scenario Workshop in Hamburg, June 4-5, 2014 (© B. Kowalski)

## Inside TFO: News, communication & other information

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*(Topics: New TFO members, new uploads or features in MyTFO, OBIS or website, information by PT/BMBF/GLUES)*

- Botswana's Okavango Delta became UNESCO's 1.000th **World Heritage Site!** It was recognized as being one of the very few major interior delta systems with an almost intact wetland system. A special characteristic of the Okavango delta is its maximum flooding during the dry winter months supporting a unique ecosystem within the dry Kalahari basin. Native plants and animals have adapted to these seasonal rains and floods and several endangered species can be found here. With its inscription on the World Heritage List this ecosystem will be now placed under special protection (<http://whc.unesco.org/en/list/1432/>)
- Thomas Falk in cooperation with GLUES is elaborating the possibility to compare different cases from various Sustainable Land Management projects on the basis of the social-ecological systems framework developed by Ostrom 2007 & 2009. A comparative study could benefit from the work of the SESMAD group (Social-Ecological Systems Meta-Analysis Database) which has developed a database capable of capturing multidimensional data of social-ecological systems. The SESMAD database provides a coding format for a set of standardized variables, which have been relevant to the effectiveness and efficiency of governance systems in several case studies. The improved comparability based on these variables will help answering questions related to the socio-ecological context in which certain governance mechanisms contribute to the sustainable use of natural resources and whether certain governance mechanisms have advantages in the management of certain ESS.
- Copies of TFO films and flyers are available at the SASSCAL office in Windhoek.
- TFO **online calendar** available on OBIS: Please be so kind to take the time to **always add all events, deadlines, field-trips, conference dates** etc. that are of relevance for the TFO community and make use of the calendar as much as possible. You will need an OBIS account to get access to the calendar which is accessible for TFO members only. You can register on the

OBIS website, in case you don't have an account yet. Link to the calendar (link can also be found at the upper right corner on the TFO website):

<http://leutra.geogr.uni-jena.de/obis/metadata/login.php?url=%2Fobis%2Fmetadata%2Fcalendar.php>

- Please make use of the TFO webpages internal area called **MyTFO** which allows you to update your participant details, generate mailing lists and download internal documents such as reports, minutes, presentations etc. You will find the MyTFO link in the upper right corner. You can receive your personal MyTFO - login from the TFO - webmaster at [webmaster@future-okavango.org](mailto:webmaster@future-okavango.org)
- All SPs and Institutions please spend a minute to **update your participant details on the TFO Webpage in the MyTFO area** (see above) so that we get a clear picture who is participating at this stage. Please also provide information on your function and thematic and regional expertise within TFO. If you identify colleagues of your SP who have left the project please send an email to the TFO - webmaster at [webmaster@future-okavango.org](mailto:webmaster@future-okavango.org)

## Outside TFO: Reports from stakeholders' activities

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*(Topics: Feedback from stakeholder meetings TFO attended, TFO members on stakeholders contacts, stakeholder activities....)*

## New Publications by us and/or others

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*(Topics: new publications by TFO members or other publication being of interest; interesting websites, data etc.)*

- Baumberg, V., Helmschrot, J., Göhmann, H., Steudel, S., Fischer, C. & Flügel, W-A. (2014): Assessing basin heterogeneities for rainfall-runoff modelling of the Okavango River and its transboundary management. In: Castellarin, A., Ceola, S, Toth, E. and A. Montanari (eds.): Evolving Water Resources Systems: Understanding, Predicting and Managing Water–Society Interactions (Proceedings of ICWRS2014, Bologna, Italy, June 2014) IAHS Publ. 364, 320-325.
- De Cauwer, V., Muys, B., Revermann, R. & Trabucco, A. (2014): Potential, realised, future distribution and environmental suitability for *Pterocarpus angolensis* DC in southern Africa. *Forest Ecology & Management* 315, 211-226.
- Metzger, J. C., Landschreiber, L., Gröngröft, A., Eschenbach, A. (2014): A field and model approach to soil evaporation in southern African savanna ecosystems. *J. Plant Nutr. Soil Sci.* 2014, 177, 468–475.
- All articles published in the special volume “Biodiversity & Ecology 5 – Environmental Assessments in the Okavango Region” have been incorporated into the TFO database and are now individually available from the TFO website under the category “Publications”.

- Clever Mapaire has finalized his PhD-thesis **“A Critical Legal Analysis of the Law, Principles and Practice of Transboundary Water Equity in Southern Africa: the Case of the Okavango River Basin”**.

The dissertation centers around the question how nations relate to each other in the management of transboundary water resources in the face of a growing demand for water. In analysing state relations in so far as transboundary water management and allocation is concerned, the central concept of equity becomes very important to consider. The dissertation is based on research on the Okavango River Basin, but also considers international law and other relevant comparative jurisdictions and River basins in Southern Africa and elsewhere.

The research questions for this study moved from the general to the particular and were centred on the definition of equity and equitable water allocation. Also it considered the questions whether the inclusion of equitable language in transboundary water management and allocation agreements really makes a practical difference in transboundary water law at the basin level and in this light whether the signing of the water agreements on the use and management of Okavango waters has led to conflict or cooperation. The concluding question was focusing on how regime theory can help us understand interstate water co-operation and whether based on this understanding a typology or model for Okavango River Basin can be constructed.

The dissertation records some findings which include that the inclusion of equitable language does not in itself connote lack of conflict or cooperation. Further the signing of the water agreements on the use and management of Okavango waters has not been the sole cause of the apparent cooperation. The cooperation that exists is mainly out of political will or based on expectation of some economic benefit. It is emphasised in the dissertation that differences of opinion between the watercourse states are based not only on their legal views but also on their material political and economic interests. The dissertation highlights many instances which show conflict.

This study was mainly desk based and followed the mixed methodological approach. The analysis of data was based on some inductive strategy. The result of these methodologies and research paradigms was the development of a Five Pillar model out of the understanding from the regime theory. Based on this model, two Model Agreements applicable to the Okavango River basin were drafted and attached to the Dissertation as Annexures.

- Kira Kalinski has finalized her Master thesis **“Impact of land use on in situ soil respiration on savannah sites in northern Namibia”** at the University of Hamburg, Institute of Soil Science.

Understanding ecosystems in their functions is necessary to respond on the effects of climate change. Savannah regions are strongly affected by climate change which leads to land use and water conflicts. In the project “The Future Okavango (TFO)” a woodland savannah region under research is the Mashare region located at the Okavango River in northern Namibia. Within the subproject S03, one focus is on the soil carbon stocks and its microbial transformation. Within this topic, eight study sites in Mashare were investigated from March to May 2013 which were distributed on different landscape units (levee of old floodplain, depression of old floodplain, Kalahari Dune Area) and with varying land use types (dryland, conservation agriculture, irrigation agriculture, fallow , secondary bushveld). At each study site, the total soil respiration, the root respiration and the vertical CO<sub>2</sub> gradient were measured in three replicates and with about weekly time intervals. CO<sub>2</sub> emission rates were measured using the closed chamber

method with the infrared gas analyser “Licor LI 8100A”. Root respiration was calculated from the total soil respiration minus the heterotrophic respiration. The heterotrophic soil respiration was measured out of a root- free soil volume with a vertical root barrier. Aluminum pipes in different depths (10, 20, 40, 60, 80, 100 cm) were installed in the soil to measure the vertical CO<sub>2</sub> gradient. A volume of 5 ml is taken out of each lance with a syringe and determined by a direct injection into the gas analyser. In addition to the CO<sub>2</sub> measurements also in-situ topsoil moisture and soil temperature were recorded.

Over the whole measurement period a decrease in total soil respiration, root respiration, heterotrophic respiration and vertical CO<sub>2</sub> gradient was observed. Study sites with recent and former agricultural use showed a higher CO<sub>2</sub> Efflux rate than natural sites such as secondary bushveld. High dependencies were found between soil moisture and CO<sub>2</sub> Efflux rate and vertical CO<sub>2</sub> gradient, clearly visible on the irrigation agriculture site. With decreasing soil temperature also soil respiration decreased but the correlation was not that strong as for moisture. With higher organic carbon amount and C/N ratio also the CO<sub>2</sub> Efflux rate and CO<sub>2</sub> concentration increased except on secondary bushveld sites. The heterotrophic component showed the same correlations as soil respiration. A correlation between organic carbon, C/N ratio and root mass was not found. Root respiration could be calculated at five locations, on others the difference in soil moisture within the root-free collar and the unchanged soil was too large. The root respiration increased with increasing desiccation and is closely correlated with the root mass and therefore also with the organic carbon amount and the C/N ratio. On agricultural used study sites root respiration also showed higher values. A separation of the rhizomicrobial respiration from root respiration is a future step that needs to be tested in the field. For further work longer measurement period and the detection of more data could be helpful to analyse the controlling factors.

*All TFO participants who have completed MA, BA, PhD theses or other publications, please contact us if you would like to use the opportunity to have your work advertised here and please use the opportunity to contribute your work to the TFO publication-database on our webpage.*

Further recommended reading:

- Loomis, D.K., Ortner, P.B., Kelble, C.R., Paterson, S.K. (2014): Developing integrated ecosystem indices. *Ecological Indicators*. DOI: 10.1016/j.ecolind.2014.02.032
- Reyers, B., Biggs, R., Cumming, G.S., Elmqvist, T., Hejnowicz, A.P., Polasky, S. (2013): Getting the measure of ecosystem services: a social–ecological approach. *Frontiers in Ecology and the Environment* 11: 268–273.
- von Heland, J., Folke, C. (2014): A social contract with the ancestors—Culture and ecosystem services in southern Madagascar. *Global Environmental Change* 24, 251-264.

## News from the Okavango region

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*(Topics: new policies, happenings etc. relevant for resource management in the Okavango Basin)*

## Anything else...

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From now on, the TFO newsletter will appear regularly every two months. Therefore, the next deadline for submission of contributions will be September, 15<sup>th</sup>, 2014.

*(Here we offer space for all other information, which might be of interest for the TFO community)*

**\*\*\* Do you have any information for the TFO-community? \*\*\***

**Upcoming events, new SP-members, publications, research results, news from the basin or interesting events to share – please let us know:**

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