DesertNet International

DesertNet International Newsletter n. 2/2015

This quarterly electronic newsletter is intended to inform the scientific community about dryland-relevant research matters. The **deadline** for receipt of material for the next issue is **10.09.2015.** Please send your contributions (1000 characters max, including spaces) to nrd@uniss.it and czanolla@uniss.it

Contents:

1. Information relevant to DesertNet members

Monique Barbut, Executive Secretary of UNCCD: degraded land restoration and climate negotiation

The 77th issue of 'Sciences au Sud', the IRD journal, presented an interview of M. Barbut, executive secretary of UNCCD about degraded land restoration and climate negotiations. M. Barbut underlines the need for a 50% increase in food production up to 2050 (while GIEC foresees a 2% decadal decrease) and highlights how the present destruction of forest and wetlands is unsustainable. Soil degradation leads to food security disruption and other severe societal hazards, including political extremism and land grabbing. Soil rehabilitation appears the faster and cheaper solution to face both these societal and climate change challenges. Rehabilitating some 12 million ha of degraded soil per year would allow storing 1 GT $C0_2$ per year for typical 100 $ cost per ha. Practical solutions exist and are at the top of the UNCCD agenda. Authoritative scientific structures as GIEC look to UNCCD to voice such paradigms. So, science is currently being better organized and strengthened. Another key link is civil society (NGOs and CBOs).

SOURCES: https://www.ird.fr/la-mediatheque/journal-sciences-au-sud

Information provided by: Gerard Begni, DNI – CSFD/CAC

IC-FAR - LInking Long Term Observatories with Crop Systems Modeling For a better understanding of Climate Change Impact and Adaptation StRategies for Italian Cropping Systems

The aim of ICFAR is to enhance knowledge about the expected climate change impacts on Italian cropping systems with particular attention to the assessment of uncertainties and to the development of adaptation strategies in different environmental conditions. ICFAR analyses the components of uncertainty by applying mathematical models calibrated with robust datasets from Long Term field Experiments (LTEs) to check the long term impacts of agronomic management practices on crop yield, water, C and N cycles. Special attention is being given to the dissemination of results and to the training and education of young researchers.

ICFAR is linked to international networks at the European and global level and will follow the protocols for intercomparison agreed in the context of AgMIP (www.agmip.com) and MACSUR (www.macsur.eu). **ICFAR Scientific Coordinator**: Pier Paolo Roggero – University of Sassari, Department of Agricultural Sciences. For more information visit http://www.icfar.it

Information provided by: Pier Paolo Roggero, University of Sassari, Italy

CIFOR is organizing the Global Landscapes Forum Paris "Launching the new climate and development agenda" 5-6 DECEMBER 2015

The call is now open for submitting applications for discussion forums:

http://www.landscapes.org/glf-2015/get-involved/

The year 2015 constitutes a major landmark for climate and development policy as countries are set to establish an agreement guiding climate action beyond 2020 as well as a set of Sustainable Development Goals (SDGs) replacing the MDGs. Four themes will guide discussions at the event. Climate change, food security and sustainable development will act as crosscutting topics. Sessions will be judged based on their relevance to these issues, diversity of speakers and methods they employ.

In an initial consultation, Forum organizers have identified the following potential themes:

Landscape restoration

Rights and tenure

Finance

Measuring success

Wild card topics to allow for sessions outside the main themes, based on exceptional relevance to science and policy

Information provided by: Christopher Martius, CIFOR, Indonesia

The CASCADE Project

Chania, Crete was the location of the recent plenary meeting of Partners in the CASCADE Project (on catastrophic shifts in drylands), to review results and progress, and exchange ideas about addressing the final project objectives. We also visited our study site in the Messara Valley (our other sites being in Portugal, Spain, Italy and Cyprus). At each site similar soil/water/ecology experiments are being carried out, some with clear plastic canopies to simulate drought, to establish the tipping points between a sustainable vegetation cover and land degradation. It is clear that overgrazing and fire are the most prominent drivers of degradation, but how far can ecological systems be stressed before the effects are irreversible? Project deliverables are now being put on the project website http://www.cascade-project.eu/ and the information system CASCADiS http://www.cascadis-project.eu/study-sites will present results in formats suitable for researchers, policy makers and land users.

Information provided by: Nichola Geeson, Osservatorio MEDES, Italy

The CADWAGO Project

The Cadwago project aims to address the global challenge of water security through enabling water governance innovations in the context of climate change. The 3-year project, conceptually and methodologically framed by a "learning together formula", brings together 10 partners from Europe, Australia and North America in a consortium led by the Stockholm Environment Institute. The last CADWAGO's international learning event (the first was held in Uppsala, Sweden in 2013, the second in London in 2014) will be held in Sassari (Italy) on 14-15-16th of October 2015. This final conference will involve a group of around 25 selected stakeholders related to water policy and governance issues under conditions of climate change. Showcasing and co-learning will be combined with a visit to the on-going Sardinian agricultural case study in Arborea. This context provides an opportunity both to meet and talk with local stakeholders and to reflect conceptually as well as in practice on recommendations and conclusions.

http://www.cadwago.net/

Information provided by: Pier Paolo Roggero, University of Sassari, Italy

The PROintensAfrica Project

Food security, sustainable development and farmers' social wellbeing in Africa are the basis of this project funded by Horizon 2020. PROintensAfrica involves 8 partners from Africa and 15 partners from Europe. Agriculture modernization and improvement of agricultural value chains will be addressed by consultation, case studies and stakeholder panel workshops. The kick-off meeting was held in Ghana in April 2015 and the project will run until 2017.

More information at: http://horizon2020projects.com/global-collaboration/african-nutrition-security-backed-by-h2020/

Information provided by the DNI bureau

2. Researchers Updates

Crop modelling for integrated assessment of risk to food production form climate change

The use of dynamic, process-based crop and cropping system simulation models for climate change impact and risk assessment studies has become increasingly important. The complexity of climate change impacts and adaptations for managing climate risks and improving food security calls for more integrated modelling and quantitative assessment approaches that go beyond the sole biophysical aspects of crop and cropping systems. By using a systems approach, IAM (Integrated Assessment and Modelling) can quantitatively assess various sustainability indicators that are used by decision makers in formulating policy responses. This is being addressed in the context of the MACSUR project (www.macsur.eu) run in 2012-15 and which is being extended for further two years. There has been considerable progress in modelling climate change impacts on crops, even if this largely refers to the improved responsiveness of crop models to climate change factors and efforts to improve model simulations of the effects of extreme events. However many other aspects relevant for climate change risk assessment are less well represented (e.g. number of crops and assessment variables modelled). For this reason progress is needed in different areas to address these challenges. A variety of generic issues were identified, such as the cross scale application of crop models and the uncertainty propagation and conceptual and methodological integration of crop models into IAM. The existence of long-term observation networks at a regional and global scale is necessary for model improvement and reliable model integration. Therefore international effort is clearly needed to guide the process of crop modelling improvement including data gathering for IAM. **Published in Ewert F., et al., Crop modelling for integrated assessment of risk to food production from climate change, Environmental Modelling & Software (2014), p. 1-17, ISSN: 1364-8152, doi: 10.1016/j.envsoft.2014.12.003**

Information provided by: Pier Paolo Roggero, University of Sassari, Italy

The relationships between aggregation and microbial activity in soils as indicators of soil C dynamics

Experimental results from an afforested semiarid degraded shrubland suggest that the correlations between basal respiration in soil macroaggregates and organic C associated to microaggregates within macroaggregates, and between basal respiration and percentage of microaggregates within macroaggregates, could be used as indicators of loss or sequestration of organic C in the soil. These indicators can be very useful to determine the impact of global change on soil health and functions and prevent desertification in semiarid ecosystems. The study, recently published in Soil Biology and Biochemistry (Garcia-Franco et al., 2015), was carried out at the CEBAS-CSIC (Murcia, Spain) by the Soil and Water Conservation Group. www.soilwaterconservation.es

Information provided by: Juan Albaladejo Montoro, CEBAS-CSIC institute , Spain

TerrAfrica, Learning Corner

Dissemination of sustainable land management practices is crucial for combating land degradation and desertification. TerrAfrica -funded by the Africa Region's World Bank- provides a visual space for community of practice to interact among each other and with experts from within and outside the continent. You are invited to learn from the e-courses, webinars and learning videos that can be found at http://www.terrafrica.org/sustainable-land-management-platform/learning-corner. There is also the possibility to make direct questions to experts at http://www.terrafrica.org/sustainable-land-management-platform/expertdata/1973

More information at: http://terrafrica.org/knowledge-management/knowledge-base/

Information provided by: Maria Jose Marqués, Univ. Autónoma de Madrid, Spain

4. Important upcoming events

List of links to next meetings regarding desertification, water conservation and land degradation.

2015		
10-14 Jul	Caux Dialogue on Land and Security http://www.caux.ch/en/Caux-Conferences-2015	Caux, Vaud, Switzerland
7-20 Aug	International Conference on Sustainable Uses of Soil in Harmony with Food Security http://www.ldd.go.th/WEB_ISC2015/Index.html	Phetchabun, Thailand
1-5 Sep	44th Conference of ESNA (European Society for New Methods in Agricultural Research) http://umbr.af.mendelu.cz/en/esna	Brno, Czech Republic
7-10 Sep	The 5th international symposium for farming systems design http://fsd5.european-agronomy.org/	Montpellier, France
20-24 Sep	5th International symposium on soil organic matter http://www.som2015.org/	Göttingen, Germany
23-26 Sep	Soil Functions and Climate Change - do we underestimate the consequences of new disequilibria in soil properties? . SUSTAIN http://www.soils.uni-kiel.de/de/sustain-2015	Kiel, Germany
11-14 Oct	2nd International Conference on Global Food Security http://www.globalfoodsecurityconference.com/	New York, USA
12-23 Oct	UNCCD COP 12 http://www.unccd.int/en/media-center/MediaNews/Pages/highlightdetail.aspx?HighlightID=357	Ankara, Turkey
5-6 Dec	Global Landscapes Forum 2015 http://www.landscapes.org/setting-stage-2015-global-landscapes-forum/	Paris, France

Information provided by: DNI Bureau

5. Publications and Special Issues

1. Barkemeyer, R, Stringer LC, Hollins J, Josephi F. 2015 Corporate Reporting on Solutions to Wicked Problems: Sustainable Land Management in the Mining Sector. Environmental Science and Policy 48, 196-209 http://dx.doi.org/10.1016/j.envsci.2014.12.021
2. Bestelmeyer, B. T., G. S. Okin, M. C. Duniway, S. R. Archer, N. F. Sayre, J. C. Williamson, and J. E. Herrick, 2015, Desertification, land use, and the transformation of global drylands: Frontiers in Ecology and the Environment, v. 13, p. 28-36.
3. Corrado, R., A. M. Cherubini, and C. Pennetta, 2015, Critical desertification transition in semi-arid ecosystems: The role of local facilitation and colonization rate: Communications in Nonlinear Science and Numerical Simulation, v. 22, p. 3-12.
4. Dixon JL, Stringer LC. 2015 Towards a theoretical grounding of resilience assessments for application in smallholder farming systems. Resources 4(1), 128-154 Available free online: http://www.mdpi.com/2079-9276/4/1/128

5. Jacobs, M., C. Schloeder, and P. Tanimoto, 2015, Dryland agriculture and rangeland restoration priorities in Afghanistan: Journal of Arid Land, v. 7, p. 391-402.

6. Magliocca, N. R., T. K. Rudel, P. H. Verburg, W. J. McConnell, O. Mertz, K. Gerstner, A. Heinimann, and E. Ellis, 2015, Synthesis in land change science: methodological patterns, challenges, and guidelines: Regional Environmental Change, v. 15, p. 211-226.

7. Marengo, J. A., and M. Bernasconi, 2015, Regional differences in aridity/drought conditions over Northeast Brazil: present state and future projections: Climatic Change, v. 129, p. 103-115.

8. Mura S, Greppi G, Roggero PP, Musu E, Pittalis D, Carletti A, Ghiglieri G, Irudayaraj J, (2015). Functionalized gold nanoparticles for the detection of nitrates. International Journal of Environmental Science and Technology, vol.12, Issue 3, pp. 1021 - 1028, ISSN: 1735-1472, doi: 10.1007/s13762-013-0494-7

9. Okin, G. S., M. Moreno-de las Heras, P. M. Saco, H. L. Throop, E. R. Vivoni, A. J. Parsons, J. Wainwright, and D. P. C. Peters, 2015, Connectivity in dryland landscapes: shifting concepts of spatial interactions: Frontiers in Ecology and the Environment, v. 13, p. 20-27.

10. Peters, D. P. C., K. M. Havstad, S. R. Archer, and O. E. Sala, 2015, Beyond desertification: new paradigms for dryland landscapes: Frontiers in Ecology and the Environment, v. 13, p. 4-12.

11. Reed MS, Stringer LC, Dougill AJ, Perkins JS, Atlhopheng JR, Mulale K, Favretto N 2015. Reorienting land degradation towards sustainable land management: linking sustainable livelihoods with ecosystem services in the Kalahari's rangelands. Journal of Environmental Management 151, 472–485 doi:10.1016/j.jenvman.2014.11.010 (Open access –available free online)

12. Rossetti I., Bagella S., Cappai C., Caria M.C., Lai R., Roggero PP., Martins da Silva P., Sousa J.P., Querner P., Seddaiu G. (2015). Isolated cork oak trees affect soil properties and biodiversity in a Mediterranean wooded grassland. Agriculture, Ecosystems & Environment, vol. 202, p. 203-216, ISSN: 0167-8809, doi: 10.1016/j.agee.2015.01.008

13. Spiekermann, R., M. Brandt, and C. Samimi, 2015, Woody vegetation and land cover changes in the Sahel of Mali (1967-2011): International Journal of Applied Earth Observation and Geoinformation, v. 34, p. 113-121.

14. Tan, M. H., and X. B. Li, 2015, Does the Green Great Wall effectively decrease dust storm intensity in China? A study based on NOAA NDVI and weather station data: Land Use Policy, v. 43, p. 42-47.

15. Wang F, Mu X, Li R, Fleskens L, Stringer LC, Ritsema C. 2015 Co-evolution of soil and water conservation policy and human-environment linkages in the Yellow River Basin since 1949. Science of the Total Environment 508(1): 166–177 doi:10.1016/j.scitotenv.2014.11.055 (Open access- available free online)

16. Whitfield S, Dougill AJ, Dyer JC, Kalaba FK, Leventon J, Stringer LC 2015 Critical Reflections on Knowledge and Narratives of Conservation Agriculture in Zambia. Geoforum 60, 133-142. doi:10.1016/j.geoforum.2015.01.016

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