3<sup>rd</sup> International Conference on Biodiversity and the UN Millennium Development Goals

Biodiversity and Food Security From Trade-offs to Synergies

Aix-en-Provence, FRANCE Aix-Marseille University October 29-31, 2014

## Organized by:

Institut Méditerranéen de Biodiversité et d'Ecologie

In partnership with Leibniz Association

& Centre National de la Recherche Scientifique

Local Partner Université aix-Marseille, Région PACA, CEREGE; Plan Bleu; OT-MED

























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

The first conference "Biodiversity and the UN Millennium Development Goals: Challenges for Research and Action" was held in Frankfurt/Main, Germany in December 2010. Its main goal was to review the state of concern for major components of biodiversity, and to discuss possible contributions of biodiversity conservation and management to achieve the new targets under development. Focus was on scientific reviewing current and future action in the field of the CBD and the MDGs. It addressed to scientists from basic as well as applied research concerned with various field of relevant CBD and MDGs related themes, also policy makers and other stakeholders were addressed and aimed at connecting researchers and other stakeholders from natural sciences, social science, economy, humanities, technology and related fields in an integrated way.

The Second Conference "Biodiversity and the UN Millennium Development Goals: Biodiversity and Health" was held in Berlin from 16 to 18 April 2013 and focused on the Nexus Biodiversity and Health. The goal of this conference was to discuss the interactions between biodiversity and human health under rapidly changing environmental conditions, to identify research gaps, and to develop novel, innovative approaches on how to manage ecosystems and biodiversity for the benefit of humans and nature. A Young Scientists Workshop preceded the conference. It was meant to enhance scientific exchange and networking among young scientists pursuing cross-disciplinary research in the areas of biodiversity and (human) health.

The goal of this Third Conference 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.

Across scales from genes to species, landscapes and biomes, biodiversity is an important resource for humanity. It is the key for a broad range of services provided by ecosystems. Biodiversity helps regulate the nutrient cycle, water (e.g. floods) and mitigates impacts of climate change. Biodiversity is also of direct importance for human well-being and for cultural and other values including recreation. The provisioning of clean water and diverse food supply makes it vital for all people.

Biodiversity at all levels, including the diversity of genes, species and ecosystems, is lost at alarming rates. Critical factors for these trends are habitat destruction, global warming and the uncontrolled spread of alien species. Pollution, nitrogen deposition and shifts in precipitation further affect biodiversity.

Food security faces significant challenges due to population growth, poverty, globalization, climate change and other factors. Supplying healthy food to all citizens is crucial for global development - to reach it, not only food production but also equitable access to food for all people must be improved substantially. Biodiversity loss and global food security are hence two major challenges of our time. Linking these two areas from a research perspective, and seeking synergies between them is likely to generate multiple benefits for social, ecological and economic development.

# **Program Overview**

	Wednesday, Oct. 29	Thursday, Oct. 30	Friday, Oct. 31
9:00- 10:30		Session 1 Environmental changes and food security: consequences and opportunities	Five parallel synergy workshops
10:30- 11:00		Coffee break	
11:00- 12:30		Session 2 Green economy, food security, and biodiversity	
12:30- 14:00		Lunch (with posters)	Lunch (with posters)
14:00- 15:30	Arrival / Registration Setting-up posters	Session 3 Sustainable use of biodiversity	Session 5 Science-based opportunities to reconcile food security biodiversity conservation and sustainable development
15:30- 16:00		Coffee break	Coffee break
16:00- 17:30	Opening Session with Keynote "Biodiversity and Food Security" (José Sarukhán, UNAM, Mexico)	Session 4 Overcoming conceptual pitfalls in the foodbiodiversity nexus	Closing Session with Keynote: Food Securit and Biodiversity Conservation for IPBES
19:00- 21:00	Welcome aperitif In Aix-en-Provence City Hall	Poster Session (with snacks & drinks)	Departure

The conference takes place at the

Faculté des Sciences Aix Marseille Université 6, Avenue du Pigonnet 13090 Aix en Provence

The building is marked

"Université de Droit d'Economie et des Sciences d'Aix-Marseille"

# Scientific Committee

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# How to get from the Conference Building to the Aix-en-Provence City Hall

The walk from the conference venue to the Aix-en-Provence City Hall is about 1.5 km – please follow the map:



# Plenary sessions

Oct 29, 14:00: Arrival, registration, setting-up posters

### Oct 29, 16:00: Opening Session

Keynote presentation "Biodiversity and Food Security" by José Sarukhán, UNAM, Mexico

Human populations have depended since their presence on this Planet on plants and animals for its sustenance and wellbeing. However most of the scientific global efforts to know, catalogue and conserve biodiversity in the last two or three decades and specially after the establishment of the CBD has focused on what may be termed the "wild biodiversity". The attention and systematic study placed on the components of biodiversity of which mankind depends to feed itself, take care of its health and other less tangible but important needs, have been scarce and very spotty at best, even from the agricultural, livestock and fisheries points of view. Confronted with the unpredictable effects of global change on the reliability of these sources of sustenance, it seems growingly imperative to know and understand in a more integral way the potentials and limitations of the human managed biodiversity and the form in which we produce them now and specially for the future generations.

Oct 29, 19:00: Welcome aperitif offered by Aix-en-Provence city hall in its buildings at 2, Place de l'Hotel de Ville, Aix-en-Provence.

# Oct 30, 9:00: Session 1 - Environmental changes and food security: consequences and opportunities

Coordinators: Sandrine Paillard (ANR, Paris) / Alexandra Lux (ISOE/BiK-F, Frankfurt)

The right to food is a fundamental human right. But, although some progress has been made during the last years, one in eight people go to bed hungry, says the recent MDG Report. With focus on food systems that rely on natural resources, the session aims at exploring the current findings on ensuring food security in the face of climate change, land degradation, globalization and other drivers of environmental changes. Which strategies are developed by households and societies in order to cope with the changing conditions for food production? Decisions on individual level may encompass diet changes, sale of belongings and strengthening local networks or (temporary) migration. Policy strategies may

range from support programs for agriculture and fishery and capacity building to international cooperation. We would like to concentrate on promising approaches that allow combining efforts in food security and human well-being with the sustainable use of biodiversity.

#### Keynote presentations by

- Biodiversity and food security: learning from smallholder farmers
   Doyle McKey; Centre d'Écologie Fonctionnelle et Évolutive (CEFE), UMR 5175
   CNRS, Université de Montpellier Université Paul-Valéry Montpellier Ecole
   Pratique des Hautes Etudes, Montpellier / Institut Universitaire de France
- Food and Nutrition Security and its interactions with Biodiversity and other aspects of Environmental Change
   Dr John Ingram; Food Systems Programme Leader, Environmental Change Institute, University of Oxford, UK
- Climate change, land degradation and food security in the Sahel the relevance of migration as adaptive strategy
   Diana Hummel; ISOE – Institute for Social-Ecological Research, Frankfurt/Main, Germany

#### Oct 30, 10:30: Coffee and refreshments

# Oct 30, 11:00: Session 2 - Green economy, food security, and biodiversity

Coordinators: Klement Tockner (IGB, Berlin) / Jean-Michel Salles (LAMETA, Montpellier)

The boom in green economy and the need to feed up to 9 billion people in the near future will stimulate the rapid development of new agricultural technologies and practices. Urban farming, multifunctional natural and technical systems, as well as increasing use of genetically modified and synthetic organisms will fundamentally transform terrestrial and aquatic landscapes. This will require a radical re-thinking of ecosystem management for maintaining biodiversity and ecosystem services; and it will pose a major challenge on the underpinning science too.

#### Keynote presentations

- Bioresource insects and biodiversity opportunities and challenges.

  Birgit Rumpold, Leibniz-Institut für Agrartechnik Potsdam-Bornim, Germany
- Land sparing vs land sharing: where do we stand?

  Jean-Michel Salles, CNRS, UMR5474 Lameta, Montpellier, France

• Incorporating Bio-diversity in cropping systems: consequences on productivity, local nutrition and management in tropical countries Eric Scopel (UR AÏDA), Eric Malézieux (UR HortSys), CIRAD, France

#### Oct 30, 12:30: Lunch and posters

#### Oct 30, 14:00: Session 3 - Sustainable use of biodiversity

Coordinators: Deborah Goffner (CNRS, Dakar) / Ulrich Stachow (ZALF, Müncheberg)

One of today's major land management challenges is to build resilient landscapes that are capable of providing both food security and sustainable livelihoods while minimizing negative impacts on the environment. Landscapes are comprised of mosaics of individual components, each providing a unique, yet often overlapping set of ecosystem services to respond to environmental and human needs. Progress in land use techniques enables choices for land use schemes to fulfil these needs. However, when biophysical land characteristics are not factored into the land management equation, this could ultimately result in ecologically undesirable effects. The question therefore arises: Why should land be made available for a certain use at all costs despite the fact that the environmental conditions make this unadvisable? Instead of decoupling land uses from its natural environment, site-specific, resource-preserving land use ought to be the rule. For a reliable indication of such complex systems with different scales, a social-ecological systems approach is indispensable. Hence, the integration of biodiversity within intensively used landscapes is a step in this direction. As a means to address the growing needs for agricultural production and environmental conservation, session 4 will focus on integrated, land management concepts and systems that address the nexus of agriculture, conservation and other competing land uses. From a social science perspective, the role of local communities, indigenous knowledge, and governance in building sustainable landscapes needs to be addressed. Finally, analyses of "lessons learned" from previous and ongoing integrated land management programs are also an important part of the equation for future win-win solutions.

#### Keynote presentations by

 Agroforestry systems: How to approach the potentialities and complexity of such integrated agricultural production systems.

Camille Béral; AGROOF, Anduze, France

- Biodiversity and Food Security linkages in South-East Asian rice landscapes

  Josef Settele & the LEGATO consortium; Department of Community Ecology,

  Helmholtz-Centre for Environmental Research UFZ Halle, Germany
- Tree agrodiversity, local knowledge and food systems across landscapes and through time in the Mediterranean region: examples from the Rif, northern Morocco.

Yildiz Aumeeruddy-Thomas; Centre d'Ecologie Fonctionelle et Evolutive, Montpellier, France

## Oct 30, 15:30: Coffee and refreshments

# Oct 30, 16:00: Session 4 - Conceptual pitfalls in the food-biodiversity nexus

Coordinators: Joern Fischer (Leuphana University, Lüneburg) / Muriel Tichit (INRA, Paris)

Both policy makers and scholars are increasingly interested in the nexus of food and biodiversity. However, despite a rapid increase of interest in this area, there is substantial controversy about the conceptual basis that should underpin analyses and policies on food and biodiversity. The premise of this session is that it is vital to get this conceptual basis right to avoid unwanted or perverse

outcomes (e.g. confusion in understanding scientific findings and their policy implications). In an effort to improve the conceptual basis of future analyses, in this session we draw attention to potential conceptual pitfalls of an ecological, socio-economic, and integrated nature. In addition to drawing attention to important pitfalls, we hope to stimulate discussion on how to improve research and governance on food and biodiversity in the future. The issues to be discussed include (i) the mutual dependence of food production and biodiversity conservation; (ii) the relationship between bundles of ecosystem services and biodiversity; (iii) the strengths and limitations of a land sparing/sharing framework; (iv) the conceptual foundation of "sustainable intensification"; and (v) the challenges of implementing policy in a context of multi-level governance.

#### Keynote presentations by

- The ecological economics perspective is not a simple juxtaposition of economic ans ecological elements.
  - Lauriane Mouysset; CNRS, France
- Potential and limitations for a sustainable use and maintenance of crop diversity in the fields.
  - Isabelle Goldringer; INRA, UMR de Génétique Végétale, France

• Models that are simple, elegant and wrong: conceptual framing of the biodiversity food security nexus.

David Abson; Leuphana University of Lüneburg, Germany

• Delivering food sovereignty in a world of interacting scales: Insights from governance research.

Julia Leventon; Leuphana University of Lüneburg, Germany

Trade-offs and synergies between biodiversity and ecosystem services
 Kristoffer Hylander, Dept. of Ecology, Environment and Plant Sciences,
 Stockholm University, Sweeden

#### Oct 31, 9:00: Parallel synergy workshops

The workshops are set to provide opportunities for all conference participants to enter the discussion, by revisiting the poster contributions and by contributing additional points to the conference theme. The workshops are organized around the themes of the main sessions. Detailed information, rapporteur and room assignments will be given at the end of Thursday, Oct 30. Refreshments will be made available. Please arrive on time such as to make the discussion productive!

#### Oct 31, 12:00: Lunch and posters

# Oct 31, 13:00: Session 5 - Science-based opportunities to reconcile food security, biodiversity conservation and sustainable development

Coordinators: Heribert Hofer (IZW, Berlin) / Wolfgang Cramer (CNRS, Aix-en-Provence)

This session includes cross-sectoral presentations as well as conclusions from the morning workshops

Keynote presentations by

 Approaches for synthesizing information on global patterns of land use and biodiversity.

Tomáš Václavík; Helmholtz Centre for Environmental Research, Germany

Conservation in the kitchen: domesticity and agrobiodiversity management.
 Patricia Howard, Wageningen University and the University of Kent's Centre for Biocultural Diversity

• Can we save agrobiodiversity by paying farmers? Insights from a field experiment in the Andes.

Unai Pascual, Basque Center for Climate Change, Bilbao, Spain

### Oct 31, 14:30: Closing Session

**14:30–15:00**: report back from Workshops (chair: Heribert Hofer)

4 rapporteurs + summing up of workshops

15:00–15:30: coffee break

15:30–16:30: Closing session

15:30-15:40: Poster award

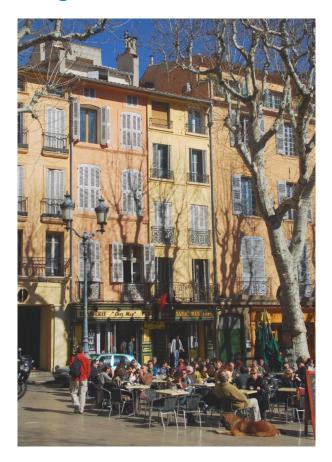
15:40 Keynote presentations by:

 Towards synergies between food security and biodiversity conservation: an outlook.

Joern Fischer, Leuphana University, Lüneburg

• Biodiversity and food security as part of global policymaking: IPBES. Wolfgang Cramer, CNRS, Aix-en-Provence

### Oct 31, 16:20: Closing statements



# **Contributed Abstracts**

Adongo C., Socio-ecological implications of a green economy on pastoral landscapes in central Rift valley, Kenya

Ahmad H., Biodiversity Scenario of Pakistan & Environmental Issues of Livestock Production Ahmed S., Multi-scale tradeoff analysis of future amazon deforestation

Akah N. [et al.], The Role of Elephant Grass (Pennisetum purpureum L. Schumach) in Global Food Security

Asogwa I. [et al.], Moringa leaf powder/soy bean flour blend alleviates the consequences of low protein feeding in rats

Bawa U., The illegal killings of African elephants

Berges R. [et al.], Urban agriculture and its links to biodiversity? the case of community gardens in Germany

Bonny S., Agricultural intensification: definition and controversies as regards biodiversity and food security

Bortolotto I. [et al.], Knowledge network to promote the use and valorization of wild plants along Paraguay River in the Brazilian Pantanal

Canelas J. [et al.], Land-Use Intensity and Ecosystems Stability

Dauber J., 'Land sparing vs. land sharing' and 'food vs. fuel'? Energy crops as a joining link for the dichotomies

Decock S., Modeling of agroecosystem functioning. An Opportunity to assess conservation agriculture in Mediterranean.

Eisner R. [et al.], Accelerating biodiversity loss and the energy, food, land nexus

Enjalbert J., WHEATAMIX: Increasing within-field wheat diversity to foster ecosystem services in the Parisian basin

Feniuk C. [et al.], Finding the balance: food production and biodiversity conservation in Europe García-nieto A. [et al.], Urbanisation as a driver of changes in ecosystem services demand and supply in the Mediterranean Region ? Demand side

García-nieto A. [et al.], Urbanisation as a driver of changes in ecosystem services demand and supply in the Mediterranean Region ? Supply side

Gerstner K. [et al.], Effects of land use on plant diversity? A global meta-analysis

Haddadi moghaddam K., The Study Change of Global Environmental and Human Changes on Sturgeons conservation with Emphasis on Food Security in Caspian Sea

Harrison E. [et al.], The Conflict Between Food Security and Wildlife Conservation in Rural Zimbabwe

Hazard B., Enduring biodiversity conservation and water/food security in pastoral landscapes of the Chalbi desert (Marsabit County, Northern Kenya).

Holzkämper A. [et al.], Trade-offs and synergies between agro-ecosystem functions in climate change adaptation planning

Hubatova M. [et al.], Ecosystem services within agricultural landscapes? trade-offs and synergies Jew E., Managing miombo woodland for biodiversity, ecosystem service provision and agricultural productivity in South-West Tanzania

Kehoe L. [et al.], Global patterns of agricultural land-use intensity and biodiversity

Khan A. [et al.], Genetic diversity and evolution of European wheat populations submitted to contrasting agro-climatic conditions

Koffi K. [et al.], Food security in Sudano-Sahelian landscapes: evidences from two contrasted village territories in Burkina Faso

Kohlmaier G., From Production to Consumption: On the Selection of Agricultural Plant Cultivars and Loss of Biodiversity by Export - Import Market Mechanisms? Focus tropical fruits

Langerwisch F. [et al.], Bundling ecosystems services from forests and rice fields in Southeast Asia under climate and land-use change

Loos J. [et al.], Using 'sustainable intensification' meaningfully to increase global food security Lu H. [et al.], Addressing the Challenge in the Post-2012 Climate Regime through REDD+: a Case Study in Southeast Asia

Martínez E., How new healthy food habits, like eating more quinoa, can increase social-economic and nature care responsibility in new agro-biodiversity scenarios.

Mccormack C. [et al.], Assessing and enhancing farmland biodiversity within the food industry: towards an evidence-based online tool

Meijer K., Can supply chain initiatives reduce deforestation? A comparative analysis of four private sector initiatives.

Nwaoha (nee mbaeyi) I., Production and Evaluation of Breakfast Cereals from Blends of Acha (Digitaria exilis) and Fermented Soybean (Glycine max) Paste (Okara)

Olowoyo J., Growth of Spinacea Olereacea from soil treated with urine compared with other soil amendments in Pretoria, South Africa

Ostermann O., The JRC research related to biodiversity and ecosystem services

Otero L., Alpha diversité des légumineuses dans les citrus organiques à Cuba

Pattison J. [et al.], Occupation and Asset Poverty Traps in Three Agrobiodiversity Hotspots in India: Determining the Distributional Impact of Policies

Pradhan P. [et al.], Changing dietary habits and potential regionalization: Implications for agrodiversity and future GHG emissions

Riddell M., The role of social institutions in determining peoples' access to meat from hunting in northern Republic of Congo and implications for food security

Root-bernstein M. [et al.], Restoration ecology, rewilding, pastoralism and food security: renewing old connections in central Chile

Sabatier R., Structural heterogeneity of landscapes as a way to overcome the production-biodiversity trade-off: a modelling approach

Schucknecht A. [et al.], Estimation of pasture biomass to support food security in Niger

Sereke F. [et al.], What farmers really think about agroforestry and ecosystem services

Sharma S., Save and grow? a new paradigm of food security and environmental challenges

Stachow U. [et al.], Impact of energy plant cropping and irrigation on farmland birds on a regional scale

Stepping K. [et al.], The effectiveness of biodiversity aid

Stollkleemann S. [et al.], Meat and dairy product consumption as a root cause for biodiversity loss and food insecurity

Tenerelli P. [et al.], Mainstreaming ecosystem services: which needs and opportunities for mountain areas?

Thierry de ville d'avray L. [et al.], How food security is linked to the ecological and economical status of coralligenous habitats of Marseille (France)

Toma L. [et al.], Education, knowledge and biodiversity behaviour in the European Union Van eerdt M. [et al.], Levers for mainstreaming biodiversity conservation into the food sector Van soesbergen A. [et al.], Agricultural development and biodiversity in the Great Lakes of Africa Villard P. [et al.], Study in mice of the transcriptional effects of PCB118 and PCB153 in liver, adipose tissue, muscle and colon: Highlighting of Glut4 and Lipin 1 as main target genes for PCB induced metabolic disorders

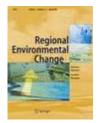
Virchow D. [et al.], Horticulture, biodiversity and poverty reduction: a positive feedback loop Williams D. [et al.], Biodiversity and food production in the Neotropics

Zabel F. [et al.], Quantifying trade-offs between food security and biodiversity under climate change conditions

Zupan L., The challenge of protecting biodiversity's multiple facets and ecosystem service supply: a case study on European Tetrapods.

# **Conference Publications**

The abstracts given of all conference contributions will be made available on a dedicated website online, shortly after the conference.



All contributors are invited to submit a manuscript to the Springer journal Regional Environmental Change (http://link.springer.com/journal/10113). Based on the submissions received by February 28, 2015, the conference conveners will produce a Special Feature in this journal.

All submissions will undergo regular peer review and will be evaluated on the basis of the established standards by the journal. Please note that all instructions for authors, given on the journal website, must be followed. When you submit your paper, you must indicate that it is a contribution to the "Special Issue Biodiversity and Food Security, Aix-en-Provence 2014"

The organizers look forward to receive your submissions!

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