


2nd Joint International Workshop on Bioenergy, Biodiversity Mapping and Degraded Lands

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A joint initiative by



Roundtable on 
Sustainable Biofuels



in collaboration with



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Report on the Workshop Outcomes

prepared by Oeko-Institut and UNEP

The following report on the outcome of the workshop draws from the notes taken by the session and working group chairs, and the respective rapporteurs.

All discussions were held under the Chatham House Rules.

The workshop report is a summary from the organizers' point of view, and does not necessarily express the views of each individual participant.

Presentations made during the plenary sessions of the workshop are available at the Bioenergy Wiki:

www.bioenergywiki.net/index.php/2nd_Joint_International_Workshop_Mapping

DAY 1 – 7th July 2009**Welcome and Overview of Workshop Objectives**

Martina Otto (UNEP), Jessica Loehndorf (BMU)

Martina Otto (UNEP) and Jessica Loehndorf (BMU) opened the workshop by welcoming the participants. Then they introduced the objectives of the workshop, i.e. to identify gaps and barriers in the work related to biodiversity mapping and the identification of degraded lands for the potential use for bioenergy production.

It aims at pushing the current debate forward while building on last year's workshop and the activities carried out since then.

Session 1: The Current Global Landscape**Biodiversity and Biofuels in the Convention on Biological Diversity (CBD) Process**

David Coates (CBD Secretariat)

David Coates explained the debate around the bioenergy issue has two main problems: lack of common terminology and understanding due to bioenergy being a mosaic of subjects, and variation of biofuel production on a local level with different national and regional policies.

- In the CBD, bioenergy is assigned under agriculture (Programme of Work for Agricultural Biodiversity). At the COP9 in Bonn in 2008, it was decided to have three regional workshops to get additional technical input, and to collect material¹ on bioenergy and biodiversity to prepare for a more detailed discussion at the 14th SBSTTA meeting (May 2010)², and the COP10 in November 2010 (Japan). Although the CBD parties agree that sustainable bioenergy production is directly related to biodiversity, it is still not clear how this should be defined.
- The largest threat to biodiversity is the intensification of the agricultural sector due to shifting diets in developing countries, which will cause increased and intensified land-use. Furthermore, the constraints of water resources will be a large contributor to biodiversity loss and will affect land availability for bioenergy as well. Degraded land use for bioenergy production is a problem because of direct competition with enhancing food production - in this sense, linkage with policies is important.

Biodiversity and Biofuels in UN Energy Activities³

Martina Otto (UNEP)

The current ongoing activities of the various UN-agencies in bioenergy were introduced by Martina Otto (UNEP). These activities include:

- Renewable Energy Cluster of UN-Energy, jointly lead by FAO and UNEP is developing a Decision Support Tool for governments to manage and assess risks in bioenergy development. It includes step-wise guidance to build national policies and strategies and

¹ See <https://www.cbd.int/agro/biofuels/> and <https://www.cbd.int/agro/biofuelresources/>

² See <http://www.cbd.int/doc/meetings/sbstta/sbstta-14/official/sbstta-14-01-en.doc>

³ See http://www.bioenergywiki.net/images/7/78/Intro_Otto.pdf

assess investments. It also highlights technical resources relevant to each of the critical risks and challenges;

- UNEP/FAO/UNIDO - GEF targeted research project on global assessments and guidelines for sustainable liquid biofuel production in developing countries which aims at identifying and assessing sustainable systems for the production of liquid biofuels both for transport and stationary applications worldwide to enable the GEF to set policies and priorities for future work and investments in biofuel related projects while providing guidance to countries that are keen to engage in this sector;
- UNEP International Panel for Sustainable Resource Management is issuing a report "Towards sustainable production and use of resources: Assessing Biofuels" which assesses existing reports to provide policy-relevant guidance from a resource efficiency perspective;
- Global Bioenergy Partnership (GBEP) sustainability task force, lead by the UK - aims at providing relevant, practical and science-based voluntary sustainability criteria and indicators to guide analysis and decision-making

Questions and Discussion

Moderated by Uwe R. Fritsche (OEKO)

The discussion reflected on the larger issues of land use and competition between different uses. A few highlights included in the discussion were:

- Identifying available land is dependent on local circumstances e.g. policies, preferences, trade, water availability (esp. in Africa and the Middle East).
- There is a need for sustainability criteria for agricultural production overall - not only for bioenergy production. Still, work on sustainability criteria for bioenergy is important as they receive government incentives, and the broad interest in bioenergy, and biofuels in particular, offers a "window" to open up the discussion to the agricultural sector.
- The CBD could help steer the process and guide other institutions in defining high conservation value, biodiversity-rich areas etc. Particularly, the planned workshops for regional perspectives on promoting positive and reducing negative aspects can help bring further clarity to the issues and involve a wide range of stakeholders. It was made clear that the CBD Secretariat is not doing the technical work, and that any outcome would be the result of consensus-based negotiation.

Session 2: Country and Case Studies

Biodiversity Mapping and Biofuels Development: The Brazilian Experience⁴

Suani T. Coelho (CENBIO)

Suani T. Coelho gave a presentation on the sustainability of Brazilian ethanol production, and in particular question 'where' and 'how' a necessary expansion of ethanol production would occur. The key points made were that:

- The production is economically sustainable. Ethanol is competitive with gasoline at current oil prices; there are increases in productivity, positive energy balance of sugarcane, and the utilization of the sugar cane bagasse for the processing of sugarcane to ethanol with a potential of increased surplus electricity generation.
- Social sustainability is achieved due to the existing federal and state labor laws, and better social conditions. Increased food prices are not due to biofuel production, as food production is growing faster than the ethanol production.

⁴ See http://www.bioenergywiki.net/images/e/e0/Brazil_Coelho.pdf

- The environmental sustainability of Brazilian ethanol production is ensured by strict environmental legislation on several levels, especially in the State of Sao Paulo. There is also less use of chemicals and fertilizers, avoidance of field burning, improvements in water efficiency, and little or no irrigation.
- Land currently used to grow sugar cane is far from the Amazon. Deforestation is mainly due to illegal logging for cattle and soy beans cultivation.
- Biodiversity is protected through legislation for legal biodiversity reserves (although some states need better enforcement).
- Agro-Ecological Zoning (AEZ) for future sugarcane expansion and a voluntary sustainability certification system are underway.

Results of Country Studies on Biodiversity Mapping/ Degraded Lands

Introduction: Results of Country Case Studies⁵

Klaus Hennenberg (OEKO)

Klaus Hennenberg introduced the session by asking whether or not indirect land-use change could be avoided by using degraded or abandoned land. Priority areas can be identified by a top-down analysis, areas worth protecting should be identified by mapping. Then a bottom-up analysis has to be done in the field and sustainable cultivation systems for the identified areas have to be selected.

As a part of the ongoing German “bio global” project of Oeko-Institut and IFEU (sponsored by the German Ministry for Environment and the Federal Environment Agency)⁶, there are four country case studies currently being carried out by partners in Brazil, China, India, and South Africa.

Country Study: China⁷

Heinz-Peter Mang (University of Science and Technology, Beijing)

The country study for China is carried out by a Chinese team lead by the University of Science and Technology, Beijing, and has developed and tested a decision tree for the usage of degraded land for biofuel feedstock production. China is the third-largest biofuel producer in the world of first and second generation biofuels. The biofuel production is mainly corn-based, but the use of non-food cellulose is being promoted. Some lessons learned from the project were:

- There were barriers to accessing GIS data in China: it was hard to find, insufficiently collected, not free and sometimes too old, and also data formats of GIS in China often differ from international formats.
- Many factors have to be taken into account for feedstock suitability for degraded land including: the integration of sustainable cropping systems, cost competitiveness and market demand, and competition with other land-uses.
- The “ground truthing” exercise carried out to compare findings from “top-down” mapping using global and national GIS data with those from “bottom-up” field trips revealed that there are situations in which the top-down approach leads to erroneous results. Using more recent data with higher resolution could help to reduce potential error, but “ground truthing” seems to be necessary to validate mapping based on remote sensing.

⁵ See http://www.bioenergywiki.net/images/9/98/Degraded_Land_OEKO.pdf

⁶ For a summary of recent results, see <http://www.umweltdaten.de/publikationen/fpdf-l/3741.pdf>

⁷ See http://www.bioenergywiki.net/images/8/89/China_Mang.pdf

Country Study: South Africa⁸

Arne Schufenhauer and Thomas Funke (Consultants, Pretoria)

The context of South African country study is myriad because it has a high degree of biodiversity, diverse climate conditions, social inequality and different agricultural practices. The bottleneck for biofuels is that productivity must increase for them to be profitable, as currently average yields are very low. Lessons learned from the project were:

- There is a lack of data on abandoned and unused land in the national datasets, and degraded land is difficult to define.
- Alternative crops should be considered for bioenergy production on degraded land, such as *Jatropha*. Also, from a country-wide perspective, land outside the homelands should be taken into consideration for energy crops as well.
- Degraded lands in the country are mostly former homelands which have been suffering from agricultural mismanagement. These areas as well as land reform areas have been selected as suitable for bioenergy crops cultivation by the South African legislation.

Question and Discussion

Moderated by Sebastian Hays (RSB)

In the discussion, the plenary raised some questions concerning whether or not GIS is an accurate tool for the mapping of degraded land. It was emphasized that GIS gives a good first indication but that the results of GIS data and analyses should be verified by field visits and ground truthing, and that in the future, more data with higher resolution will need to be collected for mapping.

Also, there were comments on how many of the case studies dealt with production potential and remote sensing without social contexts or assessments. It was noted that in the South Africa country study, social issues will be addressed, and that “social mapping” (in a non-GIS sense) should be a prerequisite for any bioenergy feedstock production scheme for “degraded” or abandoned land, as there is nearly no such things as “unused” land.

Case Studies on HCV Mapping/ Responsible Cultivation Areas

Introduction to RCA and Indonesia Case⁹

Bart Dehue (Ecofys)

Bart Dehue presented a project whose focus is to provide guidance for investors related to the selection of areas and production systems for bioenergy production in Indonesia. The project aims at developing a practical definition and methodology for ‘Responsible Cultivation Areas’ in order to help companies identify areas appropriate for bioenergy production.

These areas are subject to socio-economic and environmental assessments. One conclusion of the project was that direct land-use change can be controlled, but indirect land-use change is difficult to tackle.

Land-use change can impact greenhouse gas performance for better or worse.

⁸ See http://www.bioenergywiki.net/images/9/9f/South_Africa_BFAP.pdf

⁹ See http://www.bioenergywiki.net/images/5/50/RCA_Indonesia_Ecofys_WWF.pdf

Brazil Case¹⁰

Daan Wensing (IUCN)

Daan Wensing presented a project on HCV mapping. The High Conservation Value (HCV) framework includes biological and social aspects on local and global scales. The concept is that HVC areas can be used as long as their value can be maintained.

The methodology used by the project was the collection of existing data, field visits and public consultations. Aggregate mapping was used to determine appropriate areas for potential biomass cultivation; all HCV criteria were overlaid to project possible sites. The intermediate results of the project show that HCV is not too costly and the initial approach seems to show results, but it needs more consultation.

Session 3: Definitions and Databases**Biodiversity and Biofuels in the EU Renewable Energy Directive (EU-RES)¹¹**

Ron van Erck (EU DG TREN)

Ron van Erck gave an overview of the EU-RES as it relates to biodiversity and definitions. Key points made in the presentation were made were:

- The legislation defines a 10% mandatory target for renewable transport fuels by 2020 for all Member States, and a mandatory overall 20% renewable energy target by 2020 for the EU as a whole (with burden sharing between countries).
- National action plans describing how Member States will fulfill the targets are in the process of being developed and will be submitted for approval by the Commission next year.
- The directive defines sustainability criteria for liquid biofuels concerning a minimum greenhouse gas reduction threshold (35% compared to fossil fuels, rising to 50% by 2017), and biodiversity (“no-go areas”), including a bonus in the GHG calculation for feedstocks from degraded lands. The definition of degraded lands and the concrete meaning of some of the criteria (e.g., “high biodiverse grassland”) has yet to be established.
- The EU has work under way to substantiate these open issues, and will consult with Member States later this year to deliver definitions, and practical guidance.

Tools for Environmental and Social Assessments of Bioenergy¹²

Jorn Scharlemann (UNEP WCMC) and Christine Dragisic (IC)

The presenters gave an overview of the available tools to define and assess areas suitable for sustainable bioenergy production. Some of these tools included the Integrated Biodiversity Assessment Tool (IBAT), Initial Biodiversity Assessment and Planning (IBAP), Artificial Intelligence for Ecosystem Services (ARIES), Agro-Ecological Zoning (AEZ), and HCV Toolkits. The overview concluded that all of the tools have specific criteria and are globally applicable, but no single tool provides all the answers and contextual needs - they all have pros and cons. Therefore, a continued assessment of the different tools is needed.

¹⁰ See http://www.bioenergywiki.net/images/8/89/HCV_A_Wensing_IUCN.pdf

¹¹ See http://www.bioenergywiki.net/images/f/f5/Von_Erck_EU.pdf

¹² See http://www.bioenergywiki.net/images/e/e1/Scharlemann_Dragisic.pdf

Working Group 1: Biodiversity

Giulio Volpi (EU DG ENV) introduced biodiversity requirements from a holistic point of view. The subsequent discussion centered on how to define 'highly biodiverse areas'. While a global definition for "highly biodiverse areas" does not yet exist, primary forests, protected areas and highly biodiverse grasslands were mentioned by the participants. Key discussion points were:

- The EU policy defines 'no-go' areas for biofuel feedstock production based on biodiversity and carbon stocks. Some of these include: wetlands, primary forests, and peat lands. Biodiverse grasslands are a focus, but there is no definition yet.
- There is a focus on mapping tools and not on the underlying data, which might result in ignoring the current lack of data with adequate spatial resolution. Additional data and mapping is needed in many parts of the world. As a short term solution, the existing data and maps should be consolidated.
- Biodiversity could – to some extent - be mapped by remote sensing, but assessment of social values has to be done locally. It is important to have the support of the local community for anything to work.
- Communication on available tools for different levels is needed. A series of tools with different scales could be used starting at the top (global) level.
- Methods to be used to identify no-go areas should be objective, science based, internationally applicable, replicable, and locally relevant as well as applicable for companies on the ground. The question is how we should deal with different reference years and cut-off data.
- GMOs have not been addressed during the discussions, but there was a strong feeling that they should be addressed as well and the business sector needs to get on board.

Working Group 2: Degraded Land

Zhanguo Bai (ISRIC) introduced the topic of the working group by giving a short overview on degraded land mapping¹³. According to the GLADA project, land degradation is defined as a long-term decline in ecosystem functions and measured in terms of relative changes in net primary production. The results show that 24% of the global land is already degraded. After the presentation, the working group discussed several issues. The key discussion points were that:

- The soil-focused definition of degraded land is not comprehensive enough as it does not include socio-economic contexts or larger land-use issues.
- We should not develop a new definition but use the existing ones and available tools. The FAO mentioned that there are many definitions available and the definition of the term is ongoing and changing within the process. The identification of degraded land should be a relative process-oriented methodology with no fixed definition.
- The definition could be an umbrella concept with a holistic approach to include all aspects of land-use and degradation rather than a very simple one. Only in that context was the question of the potential usage of degraded land for bioenergy should be discussed.
- Much of the degraded land is already used and not automatically the best for biofuel production. It is necessary to go back to the goals of biofuels production and take other aspects into consideration as well (e.g. socio-cultural, biodiversity, user perspective).

¹³ See http://www.bioenergywiki.net/images/e/ed/Bai_GLADA.pdf

DAY 2 – 8th July 2009**Session 4: Mapping Practice and Data Needs****Bioenergy and Biodiversity in Central America¹⁴**

Abigail Fallot (CIRAD and CATIE)

Abigail Fallot gave a presentation on bioenergy production in Central America. Some activities in the region are: national mandates and tax subsidies for ethanol, palm oil expansion, cultivation of *Jatropha* and *Rinicius* for rural development, and mapping of bioclimatic conditions and eco-regions for biofuels production. In order to overcome negative side effects some pieces are required: the definition of no-go areas, sustainable agricultural practices, standards for small-scale production, and a more efficient land-use-planning.

Working Group 1: Biodiversity

The second part of the working group on biodiversity was kicked off by a presentation from Christopher Steward (HCV Resource Network)¹⁵ concerning mapping issues and data sources. He highlighted a number of needs and steps forward, including: coordination of existing conservation frameworks, national & regional interpretations of appropriate value definitions, support for appropriate regional mapping and capacity building with land-use planning agencies. The discussion that followed included the following key points:

- Protected Areas (PA) should not only be taken into consideration but also biodiversity considerations outside of PA – a monitoring plan of regions next to protected areas is needed.
- There is a need for an international set of criteria, considering traditional pressure on biodiversity (e.g. firewood collection) and commercial-scale bioenergy.
- For national stakeholders it is good to separate short- from long-term planning in order to provide concrete steps. A regional governmental land-use planning process is necessary in order to make sensible decisions about regional land-use - stakeholder participation/engagement is key.
- Mechanisms have to be put in place to improve the approaches over the time and bring forward best practices which go beyond minimum requirements and include different levels of requirement - maps do play an important role but there needs to be guidance on how to use them.

Working Group 2: Degraded Land

Bart Dehue gave short input on the use of degraded land for bioenergy production to prevent competition with food production and expressed that the remaining problem is the difficulty of identifying criteria to define areas as degraded land: Do we have to rely on existing datasets, or should we focus more on methodologies of how to identify the degraded areas?

This was followed by Zhanguo Bai (ISRIC) presenting the ISRIC report¹⁶ “Can soils carry the burden of bioenergy?” in a summary presentation¹⁷. A main finding of the report is that agro-

energy will increase the world food problem as meat consumption rises. Some discussion points were:

- Local data with a better resolution and data on the actual situation is often available in the countries, but is not incorporated in international datasets - this data should be used for further analysis
- Degraded land might also be in use for some livelihood activities, therefore we need to be aware of social implication of putting that land into production and displacing current activities.
- There's an urgent need of more science-based information on the natural resources (e.g. water availability and weather patterns).
- It might be better to focus on unused arable land instead of used degraded land (especially in Africa). The priority should be on the intensification of agricultural production, only as a second option the cultivation of additional land should be considered.
- For indicators, the degree of degradation and the soil fertility is important - not only the NPP.

Session 5: Further Issues

Working group 1: Gap Analysis for Biodiversity

During discussions there were twin foci: the first on gaps and how to fill them; the second upon the relevance of the EU process to identify “no-go” areas. Based on a brief input from Uwe Fritsche (OEKO) on preliminary findings from ongoing work to define land-related data for the sustainability scheme of the German bioelectricity feed-in law which underlined that currently, massive restrictions exist to define adequate “biodiverse-rich” grasslands, and problems of data resolution for other biodiversity-related issues, and that based on that, “no-go” areas should be defined using the precautionary principle (“grey” is “black”, i.e. if in doubt, an area should be classified as “no-go” unless proven otherwise), the discussion was furthered by various points:

- In order to be applicable on a global level, the scope of the work needs to be beyond Europe and the findings should be fed to regional bodies, UN-agencies and other economic and development fora. There is a need to communicate the available information and its limitations.
- Maps are useful decision making support tools, and therefore needed on the local level, where the decisions are made. Local data is often lacking, or too old.
- New data is needs to be collected at the local level. In order to make use of all available knowledge and to be implementable, maps should be developed from bottom-up in cooperation with all local stakeholders.
- A joint approach, taking into account many tools, might be helpful to shape the process. A way forward might be to use a combination of existing tools.
- A 4-step-process was proposed by IUCN.
- Benchmarks could be developed to help certifiers involved in voluntary certification schemes.

¹⁴ See http://www.bioenergywiki.net/images/3/33/Fallot_CentralAmerica.pdf

¹⁵ See http://www.bioenergywiki.net/images/7/76/Stewart_ws_day2.pdf

¹⁶ See www.pri.wur.nl/UK/newsagenda/news/biofuels150609.htm

¹⁷ See http://www.bioenergywiki.net/images/9/92/Bai_Gaps_for_biofuel.pdf

It was concluded that there are data gaps and there needs to be a clear prioritization of next steps to develop usable and time sensitive data to support decision making.

However, maps etc. can only be decision support tools, and beyond this there is a need for a process approach to identify appropriate sites and management practices based on clear benchmarks.

Working group 2: Gap analysis for degraded land

The session started with a short overview from Zhanguo Bai (ISRIC) on gaps in datasets and maps¹⁸. While national datasets may be more detailed, categories often do not converge with global datasets and in many countries, detailed datasets are not digitized. Since in most cases, global datasets have too low resolutions, a way forward could be to implement a hierarchy of steps to define “go areas” and to start with global data before going down to local data. Further points were:

- Local conditions should be taken into account. However, transparency and equality have to be ensured. Labor aspects, land-use, livelihood threats, carbon stocks, biodiversity and the whole life-cycle of the production system have to be considered. These criteria would need to be based on snapshot indicators describing the state of land at a fixed point in time.
- A clear process to identify ‘go-’ and ‘no-go’ areas is needed. ‘Degraded land’ would not be useful as a ‘proxy’ for areas that are especially desirable for bioenergy production as done in the context of the EU-RES Directive. Different categories for the level of degradation are important, with a focus on relative degradation in the last decades.

Working group 3: Potential Cultivation on Degraded Land

Astrid Agostini (FAO) gave a short input to the working group by stating that there is no “silver bullet” feedstock for bioenergy cultivation on degraded land, as each has pros and cons.

Discussion points are as follows:

- Existing knowledge on sustainable land management should be part of the decision making process and not only crop decision, AEZ mapping can help. The involvement of stakeholders is pertinent.
- One key barrier is that in developing countries there is often a lack of extension services, business models, finance and training for sustainable agriculture and industrial production.
- Possible measures towards a more sustainable bioenergy production are incorporating sustainable agricultural management like intercropping on existing land.
- The key is to work with how to optimize sustainably the land that already is in use, not automatically designate degraded land to bioenergy production.

Working group 4: Biomass Production in Protected Areas

The working group expressed that biomass can be produced and harvested in protected areas as long as the conservation aims of the areas are still safeguarded.

Harvesting of biomass can also help to protect certain areas and provide additional benefits.

¹⁸ See http://www.bioenergywiki.net/images/9/92/Bai_Gaps_for_biofuel.pdf

Some key discussion points from the working group are:

- Different categories of protected areas does exist: Areas protected by international conventions (e.g. RAMSAR), by the EU (e.g. NATURA 2000) and national protected areas (e.g. HNV 1-6).
- Cultivating bioenergy crops has positive or negative impacts, depending on the crops and the type of protected areas. Low-risk areas should be considered for bioenergy production first. Most of the worlds protected areas are already degraded.
- There is a danger that double standards might be put in place: international standards for export markets vs. local standards for the local needs.

Session 6: Summary and Next Steps

The overall outcomes of the working group session were that a common goal is needed in order to define further steps. A combination of tools and assessments is preferred to get answers, not just using “white and black“, “go and no-go“ areas.

Highly welcomed was a further discussion on the use of the proposed 4-step process for land use as it deals with the issue of scale by working on both the global and the local levels, as well as integrating good agricultural management practices.

Plenary Discussion and Joint Perspectives

The session included brief comments and perspectives concerning next steps following the workshop.

Short term:

- Create a common framework (discussion papers of the workshop, examples of tools/cases),;
- Increase communication within the group other organizations and processes;
- Continue development and discussion on the use of the 4-step process (screening, landscape-level assessment, site level mapping and responsible management) proposed by IUCN to assess land use as it deals with the issue of scale by working on both the global and the local levels, as well as integrating good agricultural management practices;
- Promote the use of a combination of tools and assessments rather than ‘black and white’ or ‘go/no go areas’.

Medium-term:

- Carry out more case studies
- Develop a more robust process where the different initiatives can be included.

Other comments on next steps and needs were identified by the participants:

Paul de Moudt (Shell): The company needs clarity on what counts for carbon credits and a methodology to define and identify degraded land with a global perspective. These would be future steps to look into.

Suani Coelho (CENBIO): Focusing on bioenergy production in developing countries and not only to produce feedstocks, but to the production capability as well. Extra minimum sustainability criteria for least developed countries are needed in terms of capacity building and production costs.

Giulio Volpi (EU DG ENV): Criteria have to be put in place to identify areas for bioenergy production, therefore working on key criteria and definitions is important to support the legislation building of the EU.

Bart Dehue (Ecofys): Ways of sustainable production for bioenergy first through increased productivity of land, better infrastructure and agricultural management. The proposed 4-step process seems to be common ground and needs to be it further developed in order to make it more concrete and objective.

Christine Dragisic (CI): To fill the existing gaps, more research and data is needed to underpin decisions as they cannot rely solely on tools. Moreover, assistance is needed for national governments to carry out integrated land-use planning.

Ignacio Gavilan (BP): Harmonization of all approaches and concepts is needed. A first step is the agreement on criteria then the development of indicators. National governments should have good mapping and suitability analysis (particularly with land tenure issues), law enforcement and incentives to go into degraded lands.

David Coates (CBD Secretariat): Look at how the product of the workshop can be linked to and included in CBD process. Particularly, more attention to water use and efficiency is needed.

Summary and Next Steps

Uwe R. Fritsche (OEKO) and Martina Otto (UNEP) summarized the outcome of the workshop and included some comments about potential next steps.

Although last year, degraded land seemed to be an option for bioenergy production, this year there the discussion made clear that this is not as straightforward and that alternatives and processes have to be taken into account in overall land-use planning.

Aspects of land management need to be integrated as this is not only a question of bioenergy, but agriculture in general. Moreover, guidance in informed decision making is needed, especially support for developing countries.

It is important to establish links between science and policy to foster informed decision making.

Efforts should rather be made to define criteria and processes to identify degraded land than to come up with a definition of the term itself. One of the major gaps still is the data availability and the combination of data and process for identification. Best practices in data collection should be used.

The workshop contributed to collecting information on existing tools, and to identify gaps and areas of further collaboration that could be taken up in a 'coalition of the willing'.

The group expressed the usefulness of preparing an output paper and to have a follow-up workshop to review the activities undertaken and to agree on further steps.

**Participants of the 2nd Joint International Workshop on Bioenergy,
Biodiversity Mapping and Degraded Lands**



Name	First Name	Organization	Email
Agostini	Astrid	FAO	astrid.agostini@fao.org
Bai	Zhanguo	ISRIC	zhanguo.bai@wur.nl
Benke	Dulce	UNF	dulce.benke@gmail.com
Berenguer	Paloma	Shell	Paloma.Berenguer@shell.com
Bertzky	Monika	UNEP-WCMC	Monika.Bertzky@unep-wcmc.org
Bowyer	Catherine	IEEP	c.bowyer@ieep.eu
Chalmers	Jessica	Winrock	jchalmers@winrock.org
Coates	David	SCBD	david.coates@cbd.int
Coelho	Suani	CENBIO	suani@iee.usp.br
Dallemand	Jean-Francois	JRC-Ispra	Jean-Francois.DALLEMAND@ec.europa.eu
Dehue	Bart	Ecofys	b.dehue@ecofys.nl
Desplechin	Emmanuel	UNICA	emmanueld@unica.com.br
Dickson	Barny	UNEP-WCMC	Barney.Dickson@unep-wcmc.org
Dixson-Declève	Sandrine	Hart Energy Cons.	sdixson@ifqc.org
Dornburg	Veronika	Shell	Veronika.Dornburg@shell.com
Dragisic	Christine	CI	c.dragisic@celb.org
Duchaine	Sandrine	EIFER	sandrine.duchaine@gmail.com
Eisentraut	Anselm	IEA	anselm.eisentraut@iea.org
Erck	Ron van	EU DG TREN	Ron.VAN-ERCK@ec.europa.eu
Fallot	Abigail	CATIE	fallot@cirad.fr
Fehrenbach	Horst	IFEU	horst.fehrenbach@ifeu.de
Ferraz	Silvio	Univ. Sao Paolo	sbferra@esalq.usp.br
Fritsche	Uwe	Oeko-Institut	u.fritsche@oeko.de
Funke	Thomas	Consultant	thomas.funke@up.ac.za
Gavilan	Ignacio	BP	Ignacio.Gavilan@uk.bp.com
Haye	Sebastian	RSB	sebastien.haye@epfl.ch
Hennenberg	Klaus	Oeko-Institut	k.hennenberg@oeko.de
Kimble	Melinda	UNF	mkimble@unfoundation.org
Leagnavar	Punjanit	UNEP	Punjanit.Leagnavar@unep.org
Löhndorf	Jessica	BMU	jessica.loehndorf@bmu.bund.de
Lübbecke	Imke	WWF	iluebbecke@wwfepo.org
Magnus	Jessica	JNCC	Jessica.Magnus@jncc.gov.uk

Name	First Name	Organization	Email
Malavelle	Jérôme	UNEP	jerome.malavelle@unep.org
Mang	Heinz-Peter	Beijing Univ.	mang@ecosan.net.cn ; hpmang@gmail.com
Máthé	László	WWF	Lmathe@wwfscotland.org.uk
McCormick	Nadine	IUCN	Nadine.McCormick@iucn.org
Metzler	Jasmin	UNEP	Jasmin.Metzler@unep.org
Miehe	Anne	UBA	anne.miehe@uba.de
Mortimer	Diana	JNCC	Diana.mortimer@jncc.gov.uk
Murti	Radhika	IUCN	Radhika.MURTI@iucn.org
Otto	Martina	UNEP	Martina.Otto@unep.org
Ramalho-Filho	Antonio	EMPRAPA	aramalhof@gmail.com ; ramalho@cnps.embrapa.br
Scharlemann	Jörn	UNEP-WCMC	jorn.scharlemann@unep-wcmc.org
Schuffenhauer	Arne	Consultant	agricon.za@gmail.com
Schukat	Philipp	GTZ	philipp.schukat@gtz.de
Schweers	Wilko	CAAS	w_schweers@caas.ac.cn
Smit	Hans	Utrecht Univ.	hh.smit@gmail.com
Stewart	Christopher	HCVNetwork	christopher@hcvnetwork.org
Sugue	Annie	CURES	annie@ecocity.org.za
Tawney	Letha	UNF	ltawney@emeraldarc.com
Volpi	Giulio	EU DG ENV	giulio.volpi@ec.europa.eu
Wenmei	Li	IIESS	wo-ai-meimei@hotmail.com
Wensing	Daan	IUCN	daan.wensing@iucn.nl
Wicke	Birka	Utrecht Univ.	B.Wicke@uu.nl

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