Biofuels and Food Security

*A consultation by the HLPE to set the track of its study.*

Collection of contributions received

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Introduction to the topic

In October 2011, the CFS has recommended that appropriate parties and stakeholders "review biofuels policies - where applicable and if necessary - according to balanced science-based assessments of the opportunities and challenges they may present for food security so that biofuels can be produced where it is socially, economically and environmentally feasible to do so". In line with this, the CFS requested the HLPE to "conduct a science-based comparative literature analysis, taking into consideration the work produced by the FAO and Global Bioenergy Partnership (GBEP), of the positive and negative effects of biofuels on food security".

As part of its report elaboration process, the HLPE is now launching an e-consultation to seek views, public feedback and comments, on the pertinence and relative importance of some key questions that the report proposes to address, in line with the request from the CFS, and that could form the building blocks of the report. The feedback received will be used by the HLPE Steering Committee to finalize the terms of reference of the Study and HLPE Project Team that will be appointed to prepare the study and policy recommendations.

The HLPE proposes, in line with the request from the CFS, to consider biofuels with the prism of food security (positive and negative effects).

Biofuels holds a special place in the renewable energy sources. As one of the few alternative fuels to fossil fuels in the transport sector, biofuels are seen as important for energy security and a resource for the diversification of energy sources, as well as in certain cases promoting better access to transport fuels in remote areas. Biofuels are also considered to contribute to agricultural and rural development, with employment opportunities in associated sectors i.e. agriculture, industry, infrastructure and research. For oil-importing countries, they are a mean to reduce the oil importation bill. For key biofuel producing countries, they bring new investment and trade opportunities going along with the development of international markets. Biofuels are also often perceived as a way to contribute to the mitigation of climate change by reducing greenhouse gas emissions of transportation, bringing less atmospheric pollutants locally. They are perceived as a mean to increase the efficiency of food systems by increasing productivity, for example through the use of agricultural residues and waste, while bringing additional revenues to farmers in case of better market access.

Biofuel policies, in the USA, in the EU, in Brazil and elsewhere are often benefiting of substantial public support, be in terms of tariffs, of blending mandates with gasoline or diesel, or of public subsidies.

Current trends in growth of global market for biofuels (a 400% increase from 2000 to 2008) have however triggered a development of controversies at different levels and across many stakeholders (from groups of states to individual business entities and consumers), with the economic, environmental and social effects being widely debated.

Considering biofuels in a life cycle analysis, "from well-to-wheel" GHG emissions linked to the production of biofuels are in some cases as important as the reduction linked to the substitution to fossil fuels. This is due to high direct and indirect use of energy in irrigation, inputs, transportation, process, especially nitrogen for the first-generation biofuels, as well as the induced loss of land carbon stocks in case of conversion of forests, wetland, carbon-rich lands in order to grow biofuel crops. Concerns have also been raised on the impact of biofuels on the other environmental challenges including biodiversity, often due to associated conversion to
mono-cropping, to the increase of deforestation, threats to natural reserves, and to increase pressures on water supply and water quality problems.

Importantly for this report, concerns have also been raised on the impact of biofuels on food security. First, because of a suspected role of biofuel policies to upward pressures on food prices (HLPE 2011, FAO SOFA 2008). Second, because of the suspicion that the development of biofuels has triggered large scale investments at the expense of food production, in some places associated with land acquisitions (HLPE 2011).

This has raised considerable doubts on the food security risks which biofuels might raise, in a context where there is currently 1 billion undernourished people on the planet, and where, as estimated by FAO without taking into account biofuels, food demand is likely to increase by 60-70% by 2050 due to population dynamics and the effect of economic growth. There is also the concern, that there is currently a considerable amount of food losses and waste, estimated by FAO (2011) to about one third of the food produced in the world for human consumption every year, approximately 1.3 billion tonnes (much more than the amount of corn that is currently used for ethanol).

There is also the concern, on the longer term, that fuel prices, if growing faster than agricultural commodities, will trigger an increase of interest to devote land to biofuels in the long term, with potential risk on the food prices and biomass quantities remaining available for food and feed. Are biofuels not adding too much to the – already unmet - challenge to feeding the world? As food security is a complex issue, many facets need to be considered when looking at the interactions between biofuels and food security.

The main question is: are biofuels compatible with food security concerns at different levels, global to local? What could be done to ensure their development does not go against (and even favours) food security?
To address this question, the HLPE proposes to look at several issues:

1. What do we know about the extent of current and forecasted biofuel policies, and what is the current state and the prospects for the production, technologies and use of liquid biofuels in the world? How do this compare to agricultural production and food demand?

2. What is the extent of the competition for biomass feedstock: food versus feed versus traditional bioenergy like fuelwood, versus bioenergy and biofuels in different parts of the world, in local and international markets? If biofuels are produced by other parts of the plant than the grain, which would otherwise go to the soil, does the production of biofuels pose a risk in weakening the return of organic matter from the plant to the soil, therefore posing a risk to longer term food security?

3. Given the world’s limited arable land resources, what is the extent of the competition for land because of biofuel? Is there evidence for indirect effects on land-use change, even remotely, or biofuel policies, which could have an effect on food security? For countries with large land resources, like Russia for example, biofuel production can offer perspectives for diversification of the agricultural production and for job creation for farms which cannot rely on the production of high quality agricultural products. Is there a real prospect for the mobilization of marginal or degraded lands not suitable for growing food, and where biofuels feedstock, particularly of second generation, could be grown under sustainable practices? Could the use of abandoned

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1 Some scenarios predict an increase in the share of biofuels in transport fuel from about 1.5 percent on average today to 8 percent in the developed countries and 6 percent in the developing countries in 2020. The corresponding shares in 2030 are respectively 12 percent and 8 percent.

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agricultural land or extensively used grasslands cause relatively lower impacts than the use of other lands?

4. As the production of biofuels is linked to agriculture, are investments in biofuels and the biofuel production chains benefiting upstream agriculture? How are economic benefits shared along the biofuel production chain? Under which circumstances and conditions could biofuel play an important role in increasing farm income and enhancing agricultural development? What can be done so that the current development model for biofuels is turned profitable for farmers? Farmers have to get access to the market and to credit facilities for fertilizers and other agricultural inputs. Can effective and balanced partnerships between farmers and agro-industrial biofuel companies be found?

5. Can biofuel production be compatible with small-farming and smallholders, which form the majority of the agricultural systems in many parts of the world, and who are key to the wealth of livelihoods and food security? Income raising activities could in many cases improve the situation of the poor - like production of cane, sorghum, or other crops, whether for the food, fuel or feed, domestic or export markets. Is it possible to engage family farmers, smallholders, based on which adequate crops, into biofuels, with which effect on their own food security, on local food security and on global food security? How do the structure of the supply market and the sharing of the benefits from biofuels production determine the impacts on food security? What are the effects on the poor net food-buyers farming households, urban consumers and landless workers? Are biofuels meant to help developing countries transition from subsistence farming?

6. By causing land concentration for plantation-type production, due to considerations of economy of scale, biofuels have been accused to cause evictions or marginalization of vulnerable groups and individuals, including women in the developing countries, particularly in Africa, and indigenous peoples and other groups with insecure land titles. Can a range of social issues be addressed, including poor working conditions for labourers and loss of land rights for indigenous peoples where new plantations for feedstock are established?

7. Non-commercial small scale production of first-generation biofuels in rural settings, e.g. for household purposes in tropical developing countries has been cited as an asset for rural development and access to energy in remote areas, avoiding expensive imports and difficult provision of fossil fuels? Aren't at the contrary careful planning and comprehensive policies required as biomass feedstocks that will be used for industrial biofuels will compete with traditional biomass used for local household energy, important for for rural populations in many developing countries?

8. Not all biofuel feedstocks are equal. Feedstock vary in the amount of energy yielded per acre of land; the amount of inputs needed such as fertilizer, pesticides and water for production; and the extent to which they compete with traditional agriculture for land. By all of these criteria, the second generation of biofuels (from high-yield ligno-cellulosic biomass such as perennial grasses and tree species) is expected to fare better than existing biofuels. The nitrogen fixing legumes, new oil crops like *Camelina sativa* (L.), *Eruca sativa* Mill. and others, GMO plants with reduced amount of lignin are promising feedstock in that regard. Is it possible, and on which basis, to distinguish the first and second generation of biofuels in terms of food security? To reach these goals, can more suitable crops, be grown, which ones, perennial versus annual, and how? What is the prospect to use biomass residues from agriculture, and forestry and also related waste, as a feedstock source as well?

9. Can new technologies overcome the food security and resource issues? Third generation biofuels, currently in the research and development (R&D) stage comprise integrated bio refineries for producing biofuels, electricity generation and bioproducts (such as petrochemical
replacements). In advanced technologies, like algae-based biodiesel or micro-organism based “solar-to-fuel” methods, the use of natural resources such as land and water are expected to be reduced resulting in lower concerns with on food security. What can we expect from these new technologies, in terms of price and production potential? As these technologies mature, how far are they from being commercially viable, and what kind of multidisciplinary research programmes are needed? What are the policy options for future commercial and R&D investment? Should we step up scientific research efforts, in which one of those technologies, as a way to overcome the current negative effects of large scale biofuel production? It is worthwhile to investigating multipurpose feedstock making use of the bio-refinery concept (Bio-based Economy)?

In assessing the positive and negative impacts of biofuels on world food security, the HLPE proposes to try to disentangle the nature and relative weight of this problem as compared to other factors affecting food security.

Biofuels are a promising source of energy with major implications for global competitiveness, energy security and uncertain social and environmental impacts. Therefore, formulating policy and regulatory frameworks for biofuels nationally and internationally is likely to require intense debate, negotiations and compromise. There is a need to consider the evolving policy landscape for biofuels, including policy measures used by major producing countries to support their industries, and their impact on food security.

The HLPE proposes to look at what can be done at different levels, multilateral, regional or national level, for food-security biofuels, given that current legislation in major producing and consuming countries, will frame the development of biofuels in the years to come.

Professor Igor Tikhonovich, on behalf of the Steering Committee of the HLPE
Contributions received

1. Muhammad Suleman Hasher, Ghazi Brothers, Pakistan

As we, the developing nations are facing a constant energy crisis, so it is very much imperative to seek out non-conventional ways to meet the gap between demand and supply. It is common observation that energy produced through conventional ways is not only costly but also it does not meet the needs. The concept of biofuel can help a lot in reducing the level of these issues. In rural areas of Pakistan concept of bio gas is getting popular. Bio gas produced by animal dung is being effectively used not only to meet agricultural and dairy farm requirements, but also to run the kitchen gas supplies. Even one of the government owned livestock farms at Kheri Moorat, distt Attock is fully operative on Bio Gas, so people who own a good number of farm animals are adopting the concept of Bio Gas very rapidly. The Bio gas plants are usually installed near the water drainages or tube wells, so that the waste of bio gas plant may be drifted to the fields as fertilizer. Further the usage of the bio gas is not being obstructed, socially, legally and from an environmental point of view.

The second biggest crisis is in the transportation industry where the public is facing high cost fuels and shortage of CNG as there is great competition between industry and transport industry. In this case, if alternatives are available in the shape of bio fuel, it will be a great milestone and shall be acknowledged and welcomed by public in general.

2. Dominique Bordet, FAO, Italy

Thank you for launching this very interesting debate. The proposed HLPE analytical study is very timely and important. Though, while all questions posed are, as presented, relevant, it may be useful that some more fundamental questions be also asked. These questions relate to the functioning and future prospects of energy markets, of which biofuels are part, and to the relation between food and energy markets. The economy of biofuel being directly linked to the economy of fossil fuels, any rise in fossil fuels prices will: i) make biofuel production more attractive and more profitable; ii) pull the prices of food up, for a number of reasons that may be well known, but that the study should discuss, based on best analytical sources.

Fossil resources being limited, supply of fossil fuels will at some stage decrease, while the demand for energy grows steadily and fast – global growth rate is currently higher than 4%. My assumption, as a non-specialist, is that the price of fossil energies, hence biofuels, hence food is bound to increase. I would invite the study to look at, and eventually contradict this assumption and analyse the consequences of energy price rise on global food security, and food security in LIFDC countries, depending on whether or not LIFDC countries dispose of petrol reserves, and land reserves for biofuel production.

The current land rush and competition for natural resources may be due the fact that investors anticipate the rise of energy and food costs. As nothing currently prevents farmers from shifting their production from food for human consumption to biofuel to feed engines – this shift is even being subsidized in some countries – nothing prevents well informed and market-connected producers - predominantly, large-scale, mechanized farms but also small-scale farmers - to produce less food and more biofuels. Should this happen, global food prices may rise very fast, even faster than energy prices. The impact on global food security could be dramatic, particularly in LIFDC countries with no fossil fuel reserves and no land reserves to produce biofuels.
In which proportion will energy prices rise? The response is complex and should mobilize the best specialists. It requires a good knowledge of the prospective development of different types (fossil and renewable) of energies, to be analysed in light of models global growth for the future. The study could review existing scenarios. For instance, the International Energy Agency (IEA, see slide 4 at: http://www.eia.gov/conference/2009/session3/Sweetnam.pdf) proposed in 2009 three different possible evolutions of future oil markets. In the most drastic scenario, the price of petrol could jump to about USD180/barrel in 2020. To be compared, in 2012, to crude oil prices oscillating above USD120/bbl, after a peak of USD100/bbl in 2008 and a dip down to USD60/bbl in 2009. This suggests that the current evolution may follow the worst case scenario. As said above, the land rush may indicate that major investors bet on higher food and energy prices in a close future – these investors would be able to shift from food to biofuel production, whichever is more rewarding – this contribute to explaining why food price will follow energy prices, unless global food markets are regulated. The experience of 2008 would demonstrate that food price hikes accompanied - if not were driven by - an important surge of petrol prices.

Current forecasts for future fossil fuel production and prices are however the object of animated debates reflecting the interests of stakeholders. Oil production forecasts vary, depending on who speaks. The oil extracting industry tends to consider that oil production is at a plateau that could be sustained in the coming decades, thanks maybe to the discovery of new oil and gas fields. The IEA (see graph on slide 8 copied below, extracted from above presentation) seems to recognize that our civilization reached in 2012 the “peak oil”, or historical moment from which the world production of petrol would engage into an irreversible decline 2.

It would be useful that the study bring these debates into full light, so that FAO and its Membership become fully cognizant of the issues at stake, participate in the debates and monitor the impact of energy prices on food prices. The introduction of biofuels in the agricultural landscape establishes a direct link between energy and food markets. Indeed, markets may tend to consider food as a commodity like any other and in particular as a source of energy. The study should describe how food and energy and food markets are intrinsically connected, hence how food policy and energy policy should be linked. I would expect that this should have major consequences on FAO’s food security policy work and advice to the membership.

Biofuel is also at the heart of climate change, land tenure and natural resource conservation issues. When energy prices rise, the agricultural sector, if not the whole society, may find an interest in producing biofuels. Some types of biofuels have a positive impact on climate and environment – e.g. methanisation of animal by-products for biogas, reduces methane emissions and mitigates the negative impacts of animal husbandry. More generally, the contribution of biofuel to the reduction of green house gas emissions is controversial. Some studies indicate that biofuel enhances GHG emissions when production systems are not “energy-smart”, i.e. use high levels of mechanization and fertilizers. Do the energetic yield (ratio: energy used for producing / energy produced) and cost of biofuel production justify policies in support to biofuel expansion? The HLPE should take stock of and inform on comparative analyses of the environmental and social impacts of different types of biofuels.

2 Some research groups and websites on “peak oil” debate these issues. For instance some experts reckon that tensions on oil markets will arise between 2013 and 2015. See http://petrole.blog.lemonde.fr/2011/12/30/oi-will-decline-2015-according-to-a-former-expert-of-the-international-energy-agency/; “the production of oil having been on a plateau since 2005 at around 82 million barrels per day (88 mb/d for all liquid fuels, including biofuels and coal-to-liquid fuels) it appears impossible to go much higher”.

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The current rush for land and for biofuel also entails risks of accelerated degradation of natural resources and social exclusion, that the study should discuss. Is it worth producing biofuel if the cost of production integrates the cost of fair compensations to displaced populations and the cost of restoring the environment degraded by careless exploitation? Can all Governments establish and enforce rules to avoid environmental degradation and minimize negative social impact?

More generally, should FAO support the emergence of national and global governance about biofuel? The study should provide a conceptual framework for addressing all these questions.

Many Member Governments already consider energy security and food security as core, linked priorities. FAO needs to develop policy advice to help Governments making provisions to adapt to future energy and food price hikes. Some countries that are endowed with abundant land resources have encouraged biofuel, some since long (e.g. Brazil' sugar cane for ethanol). The study should review their experience and see in particular how they balance food security and energy security. But the study should focus essentially on the type of policy advice that FAO should give to LIFDCs, particularly those with high population density and limited land reserves, that have limited margins of manoeuvre to adapt to future food/energy price shocks.

In my view, if our institutions wants to ensure permanent access to food for poor segments of population, food and agricultural products cannot be traded like any other commodity. Food is a strategic commodity for peace and human development, calling for regulated food and land markets. Food security is about human dignity, and unless a strong, national and global governance of land use, food and biofuel is established, producing biofuel with no safeguards may directly oppose the Right to Food, the basic principles of Human Rights and equitable development. At a time when FAO raise the issue of food waste, should we not also raise the issue of energy wasted to sustain unsustainable and inequitable lifestyles? What would be the interest of producing biofuel, if this allow to continue wasting energy?

Table 1: Source International Energy Agency
3. David Nowell, IPPC Secretariat, Italy

Dear colleagues

A point that I believe has not been given appropriate airtime in FAO processes is that of the possible pest risks associated with some biofuel crops in certain environments. It is an important threat identified by a number of people in various fora over the past few years – and examples are beginning to emerge. This issues needs to be raised as part of being aware about balancing benefits and challenges, and ensuring FAO provide balanced and objective advice. It would be useful if this topic was included in any review process.

Regards

David

Information Exchange Officer
IPPC Secretariat
AGPMI-AGP
4. Christian Häberli, World Trade Institute, Switzerland

Biofuels vs Food security in a nutshell:

1. The case for biofuels: Renewable source of tradable and local-use energy (subject to availability of adequate and fallow or under-utilised agricultural land, environmental sustainability, and water). Floor price for producers of cane and other commodities, depending on hydrocarbon prices and world economy. Vertically-added value. Rural, infrastructural and technological development and other FDI-induced advantages.

2. The problem with biofuels: Apart from Brazil mostly developed with different non-Green Box subsidies. WTO problems, also for import regulations (e.g. EU). Many developing countries cannot compete on those levels – or with Brazil. Implications: (national) food security can be impaired where the increased productivity fails to reach the land owners (household f.s.) or (at least) to increase GDP. Tax incentives and hidden subsidies as a particularly problematic competition tool.

3. A framework conducive to biofuels and to national food security: International standards (e.g. EITI) and national and international investment protection, without fiscal incentives. Comprehensive and independent impact assessment made public, including for national and household food security. Investment contracts published for and accepted establishing economic, environmental and social sustainability over the project lifespan, plus end-of-cycle expectations. Stakeholder consultations. Land tenure rights. Adequate international and national trade and investment rules yet to be developed, and allow for a public interest clause with a specific national food security provision.

5. FAO’s energy group, Italy

Through this contribution, the energy group of FAO would like to share its comprehensive experience related to the links between biofuels and food security. The rapid development of bioenergy, and in particular liquid biofuels, has generated considerable debate regarding their sustainability, and in particular the so-called “food versus fuel” competition. The links between bioenergy and food security are complex and multi-faceted. Making bioenergy development sustainable becomes even more challenging when one tries to capture its potential for rural development, climate and energy security benefits. A sound and integrated approach is required in order to address these links and promote both “food and fuel”, and ensure that bioenergy contributes to sustainable development in both developed and developing countries.

This approach requires:

- An in-depth understanding of the situation of the bioenergy potential, and of the related opportunities and risks, including synergies and trade-offs. In that respect, three FAO tools can be used:
  - The web-based UN-Energy Decision Support Tool for Sustainable Bioenergy (DST), developed by FAO and UNEP - [http://www.bioenergydecisontool.org/](http://www.bioenergydecisontool.org/)
The Woodfuel Integrated Supply-Demand Overview Mapping (WISDOM) - http://www.fao.org/docrep/009/j8027e/j8027e00.htm

- **Implementation of good environmental and socio-economic practices** by investors and producers in order to reduce risks and increase opportunities; and **appropriate policy instruments and legal and institutional frameworks to promote these good practices**.
  - The Bioenergy and Food Security Criteria and Indicators Project (BEFSCI) has made such products available at http://www.fao.org/bioenergy/foodsecurity/befsci.

- **Proper impact monitoring and evaluation and policy response mechanisms.** The following tools can be used for this purpose:
  - The bioenergy sustainability indicators developed by the Global Bioenergy Partnership (GBEP) - http://www.globalbioenergy.org;
  - The common methodological framework for GHG Lifecycle Analysis of Bioenergy developed by GBEP; and
  - The Project level evaluation tool, jointly developed as a GEF-funded project by UNEP, FAO and UNIDO.

Additional FAO documents relevant to the debate include:

One major conclusion from this comprehensive work on bioenergy, and in particular its links with food security, is that biofuels are neither good nor bad per se. If a thorough and participatory **assessment** of the sustainable bioenergy potential is conducted, and mechanisms to **prevent and manage risks** and to **monitor, evaluate and respond to impacts** are established, biofuels can foster both food and energy security and contribute to agricultural and rural development, and to climate change mitigation and adaptation.
Given its significant and internationally respected work on the topic under debate, the FAO energy group considers it important to be adequately consulted regarding the HLPE study on Biofuels and Food Security.

The contact person within the FAO energy group is Olivier Dubois (olivier.dubois@fao.org) and, in his absence, Irini Maltoglou (irini.maltoglou@fao.org).

6. Abdul Razíq, Saves, Pakistan

This is really a very important debate. Food security is a challenge. There are many hurdles and obstacles. The most important ones are the misuse of land, like golf clubs bio-fuels, climate change, loss of biodiversity and other stupid and man-made things. But the question is, either our suggestions will work or not? Those who makes global policies, do not care about the general masses and hunger, but luxuries and cheap consumable commodities.

7. Kevin Gallagher, FAO, Pakistan

During my time in Sierra Leone (2008-2010), the issue of biofuels was, and continues to be, a difficult topic. The biofuel requirements of EU offer incredible opportunities for Sierra Leone to develop some biofuel from sugarcane and cassava production on land that is very productive otherwise. On the one hand, biofuel production will bring new technology and investment to Sierra Leone, will offer a long term capacity for Sierra Leone to have its own biofuels to replace imported oils, and provide an alternative market for cassava farmers – giving them more money for their crop and allowing them to buy rice finally. The critics say that biofuels should come after the country is self-sufficient in basic food crops and therefore should be avoided. If you suggest that it is better to stop cocoa or coffee production (export crops to EU) in favor of planting rice or maize, they say this is ridiculous – which it is, but no more ridiculous than arguments that would ask farmers to opt out of good income in favor of remaining poor subsistent upland rice farmers rather than biofuel farmers.

Analysis needs to look at the wider global production and trade environment. Malaysia considers 60% of national rice consumption produced in country (percentage may have changed since I checked last) as “food secure”, preferring instead to export high value oils, rubber, cocoa, etc and import the rest. In a small country like Sierra Leone, importation of some rice may also make sense. In a large country like China, the policy would be foolish as the internationally traded rice would never suffice.

The big question that needs to be answered would seem to be “can any country avoid NOT moving to biofuels for liquid transport fuels given current peak oil and lack of alternatives?”. Is FUEL SECURITY of equal or higher importance than self-sufficiency in a particular food crop, which is sometimes called FOOD SECURITY although many people cannot afford to actually buy the food?

Kevin Gallagher
FAO Pakistan
8. Chenco Norbu, Department of Agriculture, Buthan

Thank you for giving this opportunity again. My views are as follows:

Small farmers use very little fossil fuel energy to produce their food requirements. For example, the source of plant nutrients mostly comes from the recycling of agriculture waste, and land preparation is mostly done by animals or human labor. This is because land holding is small and in many places physical environment is difficult to use machines. It is also not economical to use these farm machineries at household level even if it permits so. I believe for these reasons, small farmers provide solutions to climate change through mitigation measures such as carbon sequestration in cultivated plant biomass above and below grounds. This should be a good reason for the developed countries to support the development of agriculture in the countries dominated by small landholders.

Biofuel production is going to have a negative effect on food security and as well on local environment of these farms, particularly on forest and water resources. The available arable land is shrinking in many developing countries, and if biofuel crops are promoted, there will be a limited land left to produce food crops. This may encourage farmers to bring in more forest land under cultivation resulting into emissions of GHG, drying of water sources, and less carbon sequestration. There is also an option to produce biofuel from agriculture waste, but this is not also advisable for small farmers since these wastes are good sources of animal feeds, plant nutrients and protects fertile top soils from wind and water erosions. If food crisis like in 2008 erupts again, small farmers will suffer most if their farms are used for biofuel production. It is also known that energy requirement is very high for biofuel production, and the question is who is going to supply this energy and at what cost? I am not supporting the idea of promoting food crops and agriculture wastes for biofuel production for food security reasons.

Many thanks.
Chencho Norbu,
Department of Agriculture,
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9. Ernest L. Molua, Centre for Independent Development Research, Cameroon
[first contribution]

Debates on biofuel and food security are generally skewed towards the competing resource use (land, labour, capital, etc...) which biofuel brings to bear on food crop production.

However, most often ignored is the potentials that capable farmers may exploit to diversify their income base, and take advantage of the new demand and market opportunities which biofuel exploitation brings.

The policy imperative should attempt to promote the development of guidelines to support entrepreneurial farmers and communities wishing to exploit biofuel and optimize resource use.

Rather than mourn on the diversion of resources into biofuel production, efforts should be geared on improving farmer productivity and efficiency, farm expansion and diversification and providing mechanisms that could assist farmers exploit new products and emerging markets being ushered by biofuel production.

Therefore a study on biofuels and food security should attempt to capture the opportunities in biofuel production, and the potential synergy in farm enterprise combinations between biofuel
and food which will allow farmers optimize their incomes and resource use, whilst protecting the environment.

Ernest L. Molua  
Centre for Independent Development Research [CIDR]  
Southwest Region  
Republic of Cameroon

**10. Ernest L. Molua, Centre for Independent Development Research, Cameroon**  
[second contribution]

While developing countries attempt to exploit the opportunities within biofuel subsector, they must guard against colonial style adventurism enshrined in contemporary land grabs across Asia, Latin America and Africa.

The effort must be on supporting African producers to take advantage of the new and emerging markets.

To guard against land grabs for biofuel production, developing countries in Africa in particular where land institutions, land policy and land laws are weak, should make use of the recent FAO’s "Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security;"

The Voluntary Guidelines will guide and support better land governance, ensure secure land tenure, promote better land valuation and provide transparency in land acquisitions for biofuel crop development.

This will allow for a win-win situation in which domestic producers and local communities too, benefit from the emerging opportunities in the biofuel subsector.

Ernest L. Molua  
Centre for Independent Development Research [CIDR]  
Southwest Region  
Republic of Cameroon

**11. Bertrand Vincent, UNCCD-Secretariat, Germany**

Dear colleagues,

Thanks very much for this new opportunity to comment on HLPE work. This will be a small contribution this time.

I guess the major aspects of biofuel issue are covered. I would like however to emphasise a bit on a 2 things:

- the scale effects: negative aspects of biofuels on wide scale production could turn positive at a small scale, and vice versa... success stories about jatropha used to fuel small electricity generator can be explored and analysed.

- the role on land degradation (which can be covered in the first point): do biofuel production model contribute to land degradation? could biofuel production have more
added value on less fertile land? Could biofuel production be used on land restoration in order to avoid competition on fertile land?

Thanks

Bertrand VINCENT
Programme Officer
PAGI unit
UNCCD-Secretariat
Bonn, Germany

12. Patrick Chatenay, ProSunergy, UK

In the main, the following remarks address question n°3.

Given there remain vast amounts of arable land available\(^3\) and, up to now at least, 80% of additional supply came from yield improvements, there truly is no risk of the humanity starving structurally if appropriate policies encourage production. Also, the probable evolution of the world’s demography is not continuous growth but, more likely, an asymptote. (9 billion inhabitants seem to be the current consensus “target”).

If one wishes to raise the amount of food produced, one must raise the economic return of farming. This was amply demonstrated by the original European Union Common Agricultural Policy which aimed to increase agricultural output and succeeded all too well. Unfortunately, such a (relatively) simple fact is often lost to the thrill of providing both frightening news and the attendant amount of consultancy work. The “food vs. fuel” debate is a case in point.

A little common sense goes a long way: let us take the world’s second-largest bio-fuel program, Brazilian ethanol from sugarcane, as an example. Assume, for a moment, that the 55% of Brazilian sugarcane going to ethanol is switched to sugar, and think about the consequences. Short-term, the world sugar supply would surge by some 25% and, if Brazilians do not dramatically alter their diet, the 50 million-tonne world market would have to absorb some 40 million tonnes more; sugar prices, of course, would come crashing down. As a result, sugarcane production costs would not be covered and sugar supply would shrink: there would be no additional supply of food.

What if the 4.5 million hectares involved shift to foods other than sugar? If they do, they just will crash other markets. Indeed, the problem is not the amount of land available; the problem is the financial returns earned producing food on it. When sugarcane is planted to produce ethanol, it is because the expected returns are judged reasonable. If food returns are insufficient, food will not be forthcoming.

An additional twist to this story is that the economies of scale obtained by co-producing ethanol and sugar benefit sugar by lowering its cost-of-production. Doing away with ethanol would raise the average cost of this particular food. And, most likely, the sudden availability of this land will result in mothballing of other, less productive, areas: total food supply will largely be unaffected.

\(^3\) For the FAO, based on a map of our planet made from 10,000 Km\(^2\) squares, in 2008 out of 2.7 billion arable hectares, “only” 1.4 billion were farmed (Dr. Josef Schmidhuber, October 2008 presentation at the 2008 annual Datagro Conference, São Paulo, Brazil).
If one prefers to apply this reasoning to the largest bio-fuel program, the US one, largely based on corn (maize), the results will be similar. To increase the amount of food available to our planet it is largely useless to oppose food and renewable fuels. There is enough land for both.

Food security is attainable. The problem is that it requires that food prices be high enough to encourage production but that level may be too high for poorer populations.

Patrick Chatenay
ProSunergy (UK) Ltd

13. Adewale Adeleke, Van Hall Larenstein University of Applied Sciences, the Netherlands

My view about the above mentioned issue will focus on Nigeria. Many biodegradable waste generated day by day in many household are constituting nuisance in many cities. This waste disposal if well managed can contribute cheap source of bio fuel while at the same time controlling pollution. Many abbatior are located in major cities like Lagos and Ibadan with high volume of rumen waste posing a high disposal problem. Cow dung are also produced in addition to rumen waste. Many houses in small towns and villages also use pit latrine. I believe that Nigeria is not the only country in Sub-Saharan Africa with the problem of waste disposal. It is my view that bio-fuel policy can be focus in this area to generate cheap energy fuel or bio-gas without causing problem to food security. The final residue from biogas or bio-fuel produce from this source will also generate cheap manure for crop production.

14. Alois Leidwein, Austrian Agency for Health and Food Safety, Austria

From a farmers point of view, it makes no difference producing crops for food or fuel. Farmers need high prices and high yields. 75% of the poor are living in rural areas and are dependent on agriculture (IFAD, rural poverty report 2001). Higher prices for crops can help rural poor to overcome poverty. In this sense stimulation of markets by demand for biofuels will reduce poverty and enhance investments in agriculture. In a medium term rising prices will help small and subsistence farmers too. How long this takes is a question of national agricultural policy. I do not know any farmer who did not profit from higher prices. Higher farm incomes will increase demand of rural people for goods and services. Demand for biofuels therefore will have a positive effect on the overall economy particularly in developing countries in a long term.
The real problem are the urban poor, as rising prices affect them in a short term: urban poor are better organized as rural poor or farmers. Some NGOs fight against biofuels because of ideological reasons. So there is the risk that politics does not recognize the benefits of higher prices and impedes production for biofuels and prohibits investments in agriculture in this way.

15. Maïmouna Soma, FIAN, Burkina Faso

[Original contribution in French]

Je remercie l’équipe du forum de nous avoir donné l’occasion de parler des biocarburants et la sécurité alimentaire qui sont au cœur des débats actuels.

Je pense que la sécurité énergétique au tant que la sécurité alimentaire sont aussi importantes. Cependant une rivalité semble s'installer entre ces deux. Dans la pratique, on se rend compte que le développement des biocarburants se fait au détriment des cultures vivrières. Pensez vous qu'il est prioritaire de faire fonctionner des machines en assistant impuissamment à un nombre
I thank the forum team for the opportunity to talk about biofuels and food security, which are at the heart of the present debates.

I think that energy security is just as important as food security. However, it seems that some rivalry has appeared between the two. In practice, it is seen that the development of biofuels is to the detriment of growing food crops. Do you think that it is a priority to make machines run while looking helplessly as a growing number of men, women and children die each year of hunger or of illnesses caused by malnutrition? For anyone sensitive and aware, the answer is surely no. And in my view, there is no doubt that priority should be given to the right to food and food security, using arable land for the production of foodstuffs. The growth in biofuels increases land grabbing, which exposes the small rural producers to hunger and malnutrition. Energy security could be ensured by exploring other possibilities. I am referring for instance to solar energy which is abundant in Africa, hydraulic energy taking into account that water covers 70% of the world's surface.

Best wishes to all members.

Mme SOULAMA/ SOMA Maïmouna
Responsible for the Program and Development of FIAN (Food first Information and Action Network) in Burkina Faso

16. Bhubaneswor Dhakal, Nepal

Dear Moderator and members of the FSN Forum,

I have two main points on this biofuel discussion issue. The points are related to the success of biofuel programme in general and communal land based communities.

1. I agree with the concept note that the benefits of the biofuel production varies with places due different on opportunity benefit of the resources. However I doubt that farmers benefit more from biofuel than food products particularly in food security problem areas. It may be a flash success. Some members of the forum presented the example of Jatropha. I would like to know the method of its cost benefit analysis. Whether the study considered the economic wise (spell over) effect, opportunity benefit, risk and other impacts. The history of use of Jatropha for commercial biofuel is not long. Development agencies have given many indirect incentives and supports which might have been making it profitable. Due to new programmes it was easy for
development agencies to convince various resource agencies funding in this field. Similar level of advice and support are not available to alternative businesses particularly on food production sectors. In some cases development agencies over exaggerate the success of new programme otherwise they will be proven failure on their jobs. Mostly development organizations select those people in the programme evaluation team who write positive report of their work. They make the visit of the project evaluation team where the programme has seen most impressive. There are many methodological weaknesses of most of the academic studies which proved the success of the biofuel crop.

2. Community pastureland is an important resource to sustain livestock in critical feed deficit season for forest based and indigenous ethnic communities in many developing countries. The animals are an important source of farm power, soil fertility and food security in the communities but the development and support agencies have influenced at national policy and local communities and used the lands for biofuel production. Looking at global resource scarcity trends the higher opportunity benefit of the biofuel crop relative to the food and livestock business is less likely to last long in food deficit areas. But the lands are less likely to be reused for pasture production once trees with biofuel crop are grown. The poor people ultimately lost their local livelihood opportunity. This problem is well evidenced in community forestry and protected area programmes in developing countries such as in Nepal, India and China. The development agencies provided some flash incentives, and assurance of long term benefit while using community pasturelands forestry development and biodiversity conservation. The agencies often mobilized influential people of the community to convince the people who protested against the regressive actions of the development agencies. Now neither the people get the benefit which was assured at the time of starting the programmes, nor are these lands available to use for pasture production and animal grazing. Legal and other institutional barriers are evolved and become blocking use the lands for pasture production. The local people are oppressed by the action of the development agencies. Despite understanding of marginalization of the poor people the development and support agencies (national, bilateral and multilateral) have not shown their interest to help the poor people and trapped communities and resolve the problems. For example FAO played crucial role to introduce the forestry policy and programme which was designed to control and reduce livestock of poor Nepali farmers and do plantation in the pasturelands. The role of FAO is well documented in the preface section of the Forestry Sector Master Plan of Nepal 1988. Now the poor people and more in remote areas are bearing the cost of the bad polices. Due to evolving of new institutions associated with the environment conservation programme and policy, the change in land use is very costly. Has the FAO helped the poor people and communities to escape from that problem?

To escape from growing criticisms on their actions, many of the agencies are still working actively from background and continued further regressive environment conservation activities or in other areas. For example, the World Bank also played an instrumental role to introduce and implement the Nepal's forestry programme which is well documented in books and journal articles. Now the World Bank has advised and funded to implement REDD forestry programme which, by explicit objective, reduces use of the forest for livestock management purpose. Following the programme the Ministry of Forestry, Wildlife and Soil Conservation has introduced further conservative laws recently. Similarly, the WWF and IUCN has worked from background and advised the Ministry to expand protected areas in many remote communities of indigenous people (e.g. Gaurishankar conservation area). The global environmental conservation hegemony and provided resources and incentives to work on have made the forestry and conservation officials further powerful and influential in forestry decision making. Leasehold forestry programme was introduced to afforest the communal lands areas which were not covered by community forestry programme particularly the land surrounding the residences. IFAD had helped to implement the programme. I had got opportunity to see economic and agricultural changes after implementing the IFAD programme while working in other programme of one of the leasehold programme districts. The programme has impacted
highly on local food security and household income and employment in community though a few household might be better off. Similar cases can be found in other countries too.

If the development agencies continue to promote the biofuel crops, we will see the community land locked and the poor people’s and indigenous communities’ oppressed situation in biofuel case too within another 10 years as it has happened by the forestry based environment conservation programmes. The investment of the biofuel promotion programme may give return to the funding source countries when the resource locked communities increase their food purchased from the countries.

You might feel uneasy to read these bad consequences of the high profile international agencies which are suppose to help poor people and disadvantaged communities. Those are the outcomes of not being serious on analysing local context and making decisions. May poor people and communities escape from such bad consequences of the biofuel promotion programmes and policies.

Thank you for patiently reading my critical views.
B. Dhakal

17. Michael O'Donohue, Institut National de la Recherche Agronomique, France

Regarding the position of biofuels in a complex global scheme, many issues need to examined. However, here I would just like to briefly underline a few points:

(1) The supposed food versus fuels problem needs to be carefully examined, taking into account all local and global parameters. Biofuels also need to be placed into the framework of a global debate on human needs, which must necessarily address both food and energy requirements in an integrated way.

(2) In Europe, public opinion is already turning against biofuels, even though most people are little aware of how European agriculture participates to global food production. Paradoxically, other developments, such as organic farming in the developed world (which is likely to lower crop yields to some extent), are not suffering from a similar unfavorable public opinion.

(3) The prospect of using dedicated crops for biofuel production should be carefully considered and the need for GMO plants weighted against potential disadvantages. For example, reducing lignin in crops for biofuel production appears to be a good solution, but making better use of lignin as a raw material for biobased chemicals and materials might well be preferable.

(4) Fundamentally, the development and maintenance (in already developed countries) of efficient agricultural industries should be an over-arching priority for governments. Without this, the food versus fuel debate is vain.

(5) Probably more attention should be given to the prospect of using marginal and contaminated lands for non-food production. Of course, one of the prerequisites is the creation of a consensus inventory of such lands.

(6) Even in the context of a FAO consultation, one must keep in mind the enormous potential of forestry. Forestry and agriculture will either drive biofuels hand in hand, or else biofuels will probably not develop at all.

Michael O'Donohue
Institut National de la Recherche Agronomique
Hi all,

My contribution is that food insecurity existing in many developing countries today is not a result of productive land being used for bio-fuel production. What is critically required is comprehensive agricultural policies that are linked to other key sectors which impact on the development of the agricultural sector in order to unleash the underutilized huge potential of agriculture in many of these countries. Within the agricultural sector in many such countries there are gaps in critical areas such as farmer handling methodology, research and development agenda, land use plans. Agricultural sector needs other key sectors to work concurrently with in order to ensure efficiency in the areas of irrigation, transport, communication, marketing and finance etc.

Bio-fuel production does not necessarily posse threat to food security given the argument above. Where land is appropriately utilized bio-fuel production can be a blessing. Let me share an example where bio-fuel in northern Tanzania, Arusha is not a threat to food security.

Livestock keepers plant jatropha plants to fence off livestock protecting crops from being eaten by livestock. Women harvest the seeds and sell them to a non-governmental organization (NGO) in the area that promotes the use of bio-fuel from this plant. In this instance no productive land has been solely used for bio-fuel production. Rather, benefits such as income generation by rural women, contribution to carbon offsetting and crop protection are a plus. Clearly in this case, food security is not compromised instead it is enhanced. Careful informed choices have to be made before bio-fuel production. However, comprehensive policies and collaborative engagement of the agricultural sector with other sectors that impact on agriculture are imperative.

Thank you,

Mrs. Eutropia Mwasha,
St. Georges
Grenada West Indies

19. Orlando Vega, Inter-American Institute for Cooperation on Agriculture, Costa Rica

Indications for the twenty-first century point towards an increase in the global demand for food, fiber and energy. Tropical countries that are rich in land, water and solar energy will thus have a unique opportunity to play an essential role. At the same time, due to a new environmental awareness that focuses on the sustainability of production systems, there is a call to shift production patterns by adopting measures aimed at slowing down the depletion of natural resources and reducing greenhouse gases in order to decrease their effects on climate change.

Among the different measures possible to achieve this, the use of renewable energy instead of fossil fuels (oil and coal) shows great potential for the utilization of renewable energy, particularly what is produced from biomass. Raw materials used for the production of biofuels may be obtained by growing high energy density specimens, or through the exploitation of organic refuse and waste.
Most countries in Latin America and the Caribbean have been, or are currently, implementing policies or programs that provide incentives for producing biofuels. However, although they represent an important opportunity for agriculture in the region, biofuels can only be optimized if progress is made towards the achievement of the regulatory goals that will allow their insertion in the countries’ energy matrixes. The importance of clear regulatory goals stems mainly from the fact that, in their absence, a market cannot be created. Without a market, there are no investments and without investors the region may lose all comparative advantages it currently has over others with regard to biofuel production.

Another positive impact of renewable energy production is the redistribution of the income generated, since it requires a large raw material production base prior to processing and transportation. Employment and income supply are thus expanded, thereby helping to strengthen economic development in those countries.

There are currently mounting concerns about the actual sustainability of biofuel production. Discussions on this subject focus principally on maintaining the available land fit for cultivation for growing high energy density specimens, or for the organic waste and residue exploitation necessary for biofuels, in such a way so as not to compete with food production and security.

The production of biofuels may indeed have an adverse effect on agricultural markets. Much has been said about how the increase in the demand for biofuels could result in a greater concentration of production and land ownership. Although this is not out of the question, a good biofuel policy can serve to guide agricultural and social development in regions where agriculture is no longer a competitive activity.

There are no clear-cut rules to be followed for biofuel policies, namely because each country must define its goals based on its own geographical, social and environmental realities. Nor is it necessary to reinvent the wheel, as a number of country profiles are readily available, including their experiences on the subject.

A great deal of information can also be found in the literature on the conflicts that biofuel production may cause with regard to food security, although analyses on the subject are often unilateral. From the point of view of land competition, any agricultural activity that does not directly target food generation is competing with food security. Likewise, other agricultural activities such as silviculture, or flower or tobacco growing, currently practiced for income diversification in rural areas, would be equally condemned, just like the production of biofuels.

A thorough study of land-use potential prior to creating regulatory goals, and the use of techniques such as crop rotation or no-till systems, would make the production of raw materials possible, both for biofuel or food, minimizing food security risks while increasing energy security.

Orlando Vega
Renewable Energies, Specialist
Innovation Program for Productivity and Competitive Inter-American Institute for Cooperation on Agriculture

20. Alexandre Meybeck, FAO, Italy
Dear Coordinator,

Please find hereunder some personal comments on the consultation launched by the HLPE to set the track of the study on Biofuels and Food Security

The issues proposed by the HLPE very rightly point to the risk of increased competition for biomass feedstock and for land.

1) To better understand these, especially in a medium term perspective, and especially to consider 2nd generation biofuels, there is a need to enlarge consideration of current and forecasted biofuel policies (seemingly restricted to liquid biofuels) to all bioenergy policies; and also to renewable energy policies as they most often rely on the development of the use of biomass for energy purposes.

With first generation biofuels the competition is mainly between food and biofuels. With 2nd generation, the scope of the potential competition for biomass and land will get broader, including other energy uses, feed and return of organic matter to the soil. Biofuel policies and targets cannot be seen in isolation from either other agriculture issues nor other bioenergy policies. This calls for better coordination of policies between ministries in charge of agriculture, forestry, environment and energy.

2) To keep priorities right, competition for biomass and land should be considered in terms of resource efficiency, output or outcome per resource used, at every scale. If the objective here is to produce energy and reduce GHG emissions, other different solutions, including biogas, thermal,… should be compared in terms of energy yield/ha and GHG emissions reductions per ha, including inputs and transformation.

3) The proposed issues also point out the competition for biomass feedstock between biofuels and animal feed. This is particularly welcome given the predicted growth of the livestock sector. Production of first generation biofuels have contrasting effects on availability and price of feed for livestock. On the one hand it directly competes for grain and oil. On the other it drives an increase of production and creates coproducts of use as feed. 2nd generation will radically change the terms of the competition both in terms of biomass and in terms of land. Effects on feed availability should be taken into account.

4) The proposed issues give great importance to social issues and the impact of biofuel policies on small holders and local populations. Here also elements of comparison in terms of jobs and livelihoods (both direct and indirect) per hectare, generated by biofuel production as compared to other types of land use for other agriculture (including forestry) uses would be of interest.

5) Another essential issue should be considered: the versatility of the biofuel production systems. Extending production of cereals by creating an additional market for surpluses would not have the impact it has on food security if the mechanisms to encourage biofuel production were not establishing as a de facto priority (mandatory incorporation, cost of investments, difference in reaction to price between rich and poor countries...).

Therefore policies on biofuels (first generation) could also organize prioritization of the competition between food and other uses. The report could consider mechanisms which instead of encouraging transformation in biofuels at any time, encourage reduction of transformation when there is a temporary shortage.

This question of versatility is even more important considering 2nd generation biofuels as there is a risk of freezing land on a long term with perennial cultures which would be difficult to revert quickly to food production. There is also a risk that the high cost of investments freeze feed in...
long term constraints (either by contract or mandates and according effect on price). Finally the report could consider what type of feedstock would be at the same time, for a determined land, the most efficient in terms of energy yield, (linked to global biomass production and needed input) and still versatile (either for food or livestock feed). There are for instance studies advocating for perennial mixed (or “natural”) grasslands as potentially extremely efficient for 2nd generation biofuels, instead of dedicated monocultures.

Best regards
Alexandre Meybeck

21. Ignatius Onimawo, Nutrition Society of Nigeria

Dear FSN-Moderator,

I have been following some of the arguments for and against biofuel as it relates to food security. The issue is not so simple depending on the program being embarked upon by the government.

First it is generally agreed that if food crops are converted to biofuel it will negatively impact on food security. The example of using maize for biofuel is definitely at variance with efforts to ensure food security in a world where over one billion people are hungry. Secondly, the argument that if jatropha is used, that it will not affect productive land is also not so simple if we understand the human psychology. If for example jatropha becomes so valuable and it commands good prices because of its use for biofuel, many farmers will not only cultivate it in waste lands or just used it as fence, many will soon convert their arable lands to jatropha production. The eventual impact will be the migration from food production to jatropha production with the concomitant impact on food prices. In the final analysis food security will be adversely affected.

In my opinion all these facets must be put in a matrix and carefully analyzed before we conclude on biofuel.

Prof Ignatius Onimawo
President Nutrition Society of Nigeria

22. Federal Ministry of Agriculture, Forestry, Environment and Water Management, Austria

Dear Sir,
Dear Madam,

Regarding your e-consultation on biofuels and food security the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management takes the liberty to comment as follows:

In general, key questions regarding the production of biofuels will be addressed by the proposed study.

The production of energy crops is closely associated with the traditional agricultural production. In Austria – as well as globally – the same crops and production methods predominate as for the production of food and feed. The impact of increased mobilisation of biomass for energy purposes on agricultural commodity prices is seen to be very low in Austria. Positive effects
are given mainly due to the inclusion of previously set-aside land, yield increases as well as the utilization of co-products (e.g. Distillers Dried Grains with Solubles, DDGS). Moreover, an increase of demand for agricultural biomass has a positive effect on the farm income. In the European Union, sustainability criteria are set, which guarantee that raw materials used for the production of biofuels (also imports) are produced in compliance of environmental and social standards.

For the Federal Minister:

Dr. Hedwig Wögerbauer

23. Paul Hagerman, Canadian Foodgrains Bank, Canada

My numbering relates to the issues identified in the HLPE paper.

#1 - biofuel policies - The ethanol and biodiesel industries have benefitted from large subsidies and mandates which have guaranteed that feedstocks went to production of fuel rather than food. It is time to end those subsidies and mandates, a fact which is recognized now even by many industry actors who supported these policies as necessary for a new industry to get established. (It may be pointed out that biofuels need subsidies in order to compete with the subsidized fossil fuel industry, but the more sensible solution is to reduce or eliminate subsidies to both industries.)

It is generally agreed that second generation biofuels will deliver more environmental benefits, and have less impact on food security than first generation. However, their commercialization continues to be very slow. There may be a role for government policies to promote this aspect of the industry, but governments should not be able to apply these policies to first generation biofuels if second generation fuels fail to meet targets.

#3 - land pressures - Land (and water) for production of biofuel feedstocks is one of the driving factors behind the current surge in land investment in developing countries. In some cases, this is to fulfill biofuel mandates of foreign countries. While all foreign land investment should be subject to the recently passed FAO Voluntary Guidelines on Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security, this is especially important where land investment is intended to fulfill policies of other governments.

Paul Hagerman
Director of Public Policy
Canadian Foodgrains Bank

24. CIDSE, International alliance of Catholic development agencies, Belgium

The CFS has requested the High Level Panel of Experts for Food Security and Nutrition (HLPE) to "conduct a science-based comparative literature analysis, taking into consideration the work produced by the FAO and Global Bioenergy Partnership (GBEP), of the positive and negative effects of biofuels on food security". This input aims to address both the pertinence and importance of the proposed questions to be tackled in the study as well as to note some important missing considerations.

We welcome the CFS' willingness to commission a study by the HLPE on biofuels. In recent years, biofuels have become increasingly prominent as an alternative to fossil fuel energy sources. Given the contribution of the transport sector to GHG emissions and the
unsustainability of continued dependence on petroleum-based energy, it is important that we begin to look for alternatives and biofuels are being propagated as a "solution". Yet evidence suggests that the pursuit of this so called "solution" is causing significant detrimental impacts to global and local food security, land rights and labour rights with low or even negative impacts on climate change.

As a body of the CFS, the HLPE has as its primary function to provide robust analysis on issues related to food security; hence it is imperative that any investigation on biofuels be grounded first and foremost in how it relates to the realisation of the right to food. The FAO itself has reported a major "concern, particularly in bioenergy products involving cultivation of energy crops or access to bioresources" (FAO 2009 pg 31). It is thus fitting to this report to explore how biofuel policies are being incoherent with CFS objectives. It must not be forgotten that the HLPE has already produced reports, particularly on price volatility (2011) which identify some of the impacts of biofuels on food prices, as well as, the impact of subsidies for biofuels on the market; these findings must not be ignored. Recommendations of the upcoming report must therefore integrate the findings of previous HLPE reports relating to the relevant areas where there is overlap and/or influence.

In general terms, we caution the report from employing a fragmented analysis of biofuels. It is critical that we do not only stay at the technological level, but rather take a critical look at the social implications at stake. The ToR as it stands gives a lot of importance to technocratic matters, as if by gaining ground on these aspects such policies would be worth pursuing.

The ToR does not look critically enough at the reality of how biofuel production is actually manifesting in many countries and the challenges between theory and practice. There is no link made to rights-based concerns and the commitments that have been made by governments in this regard. Moreover, it largely ignores the political, institutional and legal frameworks which are the main determinants of the varying impacts that such policies could have. This is an opportunity for the analysis to particularly explore the following key areas:

- How biofuels are impacting the realisation of the right to food
- What is the impact of industrial biofuel production on GHG emissions? How does this contribute to or contradict adaptation efforts
- A discussion on sustainability criteria for biofuels which is currently lacking. Rigorous and stringent environmental and social criteria for the production of biofuels should be assessed and further analysed within the report.
- How could the right to food, land rights and labour rights be included in social criteria?4
- What has been the impact of biofuels on land access, management and tenure?
- The link between biofuels and increased food prices. The indexation of food raw material on the price of oil should also be looked at
- The relationship between resource degradation (soil, water sources) and biofuel production
- How are women in particular impacted by biofuels production?
- How are indigenous people, pastoralists, forest people and other marginalised groups being impacted by biofuels?
- Impact on habitats and biodiversity

We will address our concerns reflecting the questions noted in the ToR

4 See CIFOR working paper "Social sustainability of EU approved voluntary schemes for biofuels. Implications for livelihoods http://www.cifor.org/nc/online-library/browse/view-publication/publication/3551.html
1. What do we know about the extent of current and forecasted biofuel policies, and what is the current state and the prospects for the production, technologies and use of liquid biofuels in the world? How does this compare to agricultural production and food demand?

Biofuel policies and targets set by national governments hungry for alternative energy sources or FDI are biased towards these ends and fail to protect local small scale food producers. In the absence of provisions that protect these people, who are largely excluded from the political processes that affected them, biofuels are actually having a deleterious impact on food security.

- It is important to consider the impact that subsidies have had on the propagation and increase of biofuel production and how these could be artificially incentivising production and distorting demand.
- In which ways are these subsidies indirectly supporting unexpected and undesired social and environmental side effects? What are some of these side effects?
- Who are the main actors involved? Foreign and national investors and large companies are benefiting to the detriment of those who are most affected by hunger. What mechanisms, trade or investment, are being employed? How are these being sanctioned or enabled?
- How are trade policies related to biofuel production in developing countries? The role of trade, through EPAs and other agreements, is largely missing from the analysis.
- Could improved efficiency and decreased consumption be part of an effective set of policies to reach energy objectives currently pursued by biofuel policies?

2. What is the extent of the competition for biomass feedstock: food versus feed versus traditional bioenergy like fuelwood, versus bioenergy and biofuels in different parts of the world, in local and international markets? If biofuels are produced by other parts of the plant than the grain, which would otherwise go to the soil, does the production of biofuels pose a risk in weakening the return of organic matter from the plant to the soil, therefore posing a risk to longer term food security?

- Evidence suggests that there have been significant shifts in land use and production patterns with the introduction of biofuels. These production models have in some cases re-defined the use of land and land rights. Large-scale plantation models are among the most prominent being propagated. In these, biofuel companies control all aspects of production and processing, rendering those who are working on the land to mere servitude. How have biofuels changed land use and models of production?
- The production models propagated by biofuels projects tend to emphasize monocropping, which has detrimental impacts on soil health. How are biofuels contributing to soil degradation and resource depletion?
- The claim that biofuels can be primarily growth on marginal lands is largely misleading. A critical look the reality behind this claim is needed, see IIED study in Mozambique (Nhantumbo and Salomao 2010)

3. Given the world’s limited arable land resources, what is the extent of the competition for land because of biofuel? Is there evidence for indirect effects on land use change, even remotely, or biofuel policies, which could have an effect on food security? For countries with large land resources, such as Russia for example, biofuel production can offer perspectives for diversification of the agricultural production and for job creation for farms which cannot rely on the production of high quality agricultural products. Is there a real prospect for the mobilisation of marginal or degraded lands not suitable for growing food, and where biofuels feedstock, particularly of second generation, could be grown under sustainable practices? Could the use of abandoned agricultural land or extensively used grasslands cause relatively lower impacts than the use of other lands?
Evidence from the ground suggests that biofuels production is fueling land grabbing and compromising the food security of millions of the world’s poorest people. The rapid spread of commercial biofuels production "may result – and is resulting – in poorer groups losing access to the land on which they depend (IIED publication, Cotula et al). This aspect is central to any investigation of biofuels and food security, see HLPE report on land (2011)

Contract arrangements being made with biofuel companies are in fact resulting in small-scale food producers losing control over their lands and what they choose to grow on it. How are labour arrangements being shaped and reshaped by biofuels production?

Possible prospects for job creating must be balanced with the realities that have actually materialised. In many cases we are seeing a trail of broken promises rather than the manifestation of the possibilities pledged by biofuel companies. Industrial biofuel production often requires large tracts of land and very little local manual labour. What exactly has been the contribution of biofuels to the generation of decent employment?

Lands often termed as "marginal" and "unproductive" are being given to biofuel companies for production. In many cases these lands are being used for various means including pastoralism, in the absence of which the livestock which communities depend on for their livelihoods would have nowhere to graze. Where is the actual biofuel production taking place? What is the use of the land before its introduction?

There is overwhelming evidence to illustrate an increase in conflict between biofuel companies and local communities. How has biofuel production contributed to land conflicts around the world?

4. As the production of biofuels is linked to agriculture, are investments in biofuels and the biofuel production chains benefiting upstream agriculture? How are economic benefits shared along the biofuel production chain? Under which circumstances and conditions could biofuel play an important role in increasing farm income and enhancing agricultural development? What can be done so that the current development model for biofuels is rendered profitable for farmers? Farmers have to gain access to the market and to credit facilities for fertilizers and other agricultural inputs. Can effective and balanced partnerships between farmers and agro industrial biofuel companies be found?

The report must take a critical look at production considerations. In many cases small holders do not have the skills and experience necessary to commercially produce biofuels. In the sambas district of Kalimantan, smallholders have had to hand over 80% of their land to the concession holding company in return to participate in a biofuel producing program. These farmers were forced into debt in order to buy high quality seeds, fertilizers, nursery materials and technical assistance which will enable them to partake in the new agro industrial program.

What are some of the institutional arrangements between small farmers and biofuel companies, cooperatives and governments? What do these different arrangements have to tell us about biofuel production and the impact on food security?

What does the market chain look like for biofuels? Where are they going? What are the differences between prices at the farm gate and the market? Who are the intermediaries?

What are the differences in production costs and profit between biofuels and food crops?

5. Can biofuel production be compatible with small-farming and smallholders, which form the majority of the agricultural systems in many parts of the world, and who are key to the

5 GRAIN dataset http://www.grain.org/e/4479 http://landportal.info/landmatrix

6 http://www.forestpeoples.org/topics/palm-oil-rspo/publication/2012/cordaid-partners-new-publication-biofuel-partnerships-battlegr
wealth of livelihoods and food security? Income-raising activities could, in many cases, improve the situation of the poor like, whether for the food, fuel or feed, domestic or export markets. Is it possible to engage family farmers, smallholders, based on which adequate crops, into biofuels, with which effect on their own food security, on local food security and on global food security? How do the structure of the supply market and the sharing of the benefits from biofuels production determine the impacts on food security? What are the effects on the poor net food buyers’ farming households, urban consumers and landless workers? Are biofuels meant to help developing countries transition from subsistence farming?

- How are biofuels actually impacting the realisation of the right to food? What kind of impact assessments are made, if any to track this?
- Biofuel production is changing the planting culture of many farming communities. Food crops are making way for palm oil and jatropha the world over. What is the impact of these changing cultures?
- The costs associated with biofuel production, seeds, inputs and machinery are largely out of reach for most small producers. Pursuing such a pathway will only **in debt farmers**. How are biofuels contributing to debt for small farmers? What strategies do farmers have to employ to meet their debt obligations? And what are the implications of this for household food security?
- In many communities around the world, small producers are actually the main suppliers of food consumed locally. What is the impact on the local food web with the introduction of biofuels? Where will food for local consumption come from? How will increased dependence on trade and market price fluctuations impact food security? Raising the income of the poor will not automatically improve their food security if they have to pay more for food.
- What is the opportunity cost of labor from small scale food producers who engage with biofuel production? What activities become displaced?
- Are there any biofuel initiatives which have successfully integrated small scale producers into value chains, increasing incomes and enhancing access to local energy? If so what were the enabling conditions?

6. **By causing land concentration** for plantation type production, due to considerations of economy of scale, biofuels have been accused to cause evictions or marginalisation of vulnerable groups and individuals, including women in the developing countries, particularly in Africa, and indigenous peoples and other groups with insecure land titles. Can a range of **social issues** be addressed, including poor working conditions for labourers and loss of land rights for indigenous peoples where new plantations for feedstock are established?

- Instead of asking whether social issues could be addressed, there is a need to take a critical look at the state of affairs and to understand how biofuel policies **are actually** exacerbating social problems.
- As situations differ across the world, it is important that the HLPE study be as evidence-based as possible. It must be stressed that what interests us in this report is the impact that biofuel production is having on food security. Conclusions should not be drawn based on the **possibility** of employment generation of FDI which could come into the country, but rather on the **realities** we are seeing as a result of these policies.

7. **Non-commercial small-scale production** of first generation biofuels in rural settings, e.g. for household purposes in tropical developing countries, has been cited as an asset for rural development and access to energy in remote areas, avoiding expensive imports and difficult provision of fossil fuels? Aren’t at the contrary careful planning and comprehensive policies required as biomass feedstocks that will be used for industrial biofuels will compete with traditional biomass used for local household energy, important for rural populations in many developing countries?

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7 http://www.search4dev.nl/document/175530
• Claiming that it will make renewable energy available for the poor and reduce use on non-renewable needs to be investigated. What does the current body of evidence tell us in this regard?
• How much of biofuel production is actually being used to meet the needs of the rural poor? In places where this is taking place what factors are contributing to its success?
• What other alternatives, such as biogas, can be used to really meet the needs of the rural poor in a way that does not compromise their food security?

8. Not all biofuel feedstocks are equal. Feedstock vary in the amount of energy yielded per acre of land; the amount of inputs needed such as fertilizer, pesticides and water for production; and the extent to which they compete with traditional agriculture for land. By all of these criteria, the second generation of biofuels (from highyield lignocellulosic biomass such as perennial grasses and tree species) is expected to fare better than existing biofuels. The nitrogen-fixing legumes, new oil crops like Camelina sativa (L.), Eruca sativa Mill and others, including GMO plants with reduced amount of lignin are promising feedstock in that regard. Is it possible, and on which basis, to distinguish the first and second generation of biofuels in terms of food security? To reach these goals, can more suitable crops be grown, which ones, perennial versus annual, and how? What is the prospect to use biomass residues from agriculture, and forestry and also related waste, as a feedstock source as well?
  • Evidence suggests we are still a ways away from use of second generation biofuels. Looking that far into the future while ignoring the problems that are currently bring faced can lead to a continuation down a dangerous path
  • The use of GMOs is extremely contentious. It is disturbing that given the controversy behind this issue it is featured even as a possibility to be explored in this report

9. Can new technologies overcome the food security and resource issues? Third generation biofuineries, currently in the research and development (R&D) stage, comprise integrated biorefineries for producing biofuels, electricity generation and bioproducts (such as petrochemical replacements). In advanced technologies, like algae-based biodiesel or microorganism-based "solartofuel" methods, the use of natural resources such as land and water are expected to be reduced resulting in lower concerns with on food security. What can we expect from these new technologies, in terms of price and production potential? As these technologies mature, how far are they from being commercially viable, and what kind of multidisciplinary research programmes are needed? What are the policy options for future commercial and R&D investment? Should we step up scientific research efforts, in which one of those technologies, as a way to overcome the current negative effects of large scale biofuel production? It is worthwhile to investigating multipurpose feedstock making use of the biorefinery concept (Biobased Economy)?
  • Evidence suggest that new technologies alone will not overcome food insecurity, as these can be out of reach to the majority of those most affected by food insecurity. What technologies are indeed adaptable?

25. France, received through the Ministry of agriculture and agrifood

The outline proposed is a good starting point. However, the structure and content could be improved as follows.

Globally the introduction gives a good overview of the context concerning liquid biofuels for transportation. However, the "biofuels" term is larger and covers other kinds of fuels from biomass origin (solid, liquid, gazeous fuels coming from vegetal, animal or waste biomass). It is important to take into account the different kind of biofuels. Besides, when the concern of losses of food and waste is mentioned, the energy losses should also be taken into account as it is a real issue to tackle.
The **main question** should be more **precise**. When it is said “are biofuels compatible with food security concerns...” Are we talking about the production and/or the use of biofuels?

The **9 issues proposed** to look at should be **re-organized around the following questions/areas**:

1. **State of the art and prospects of the development of biofuels** (as regards food prospects but also energy challenges) **and biofuels policies - including sustainability certification schemes** (**currently question 1**)

2. **Competition on biomass feedstocks** for different uses and consequences (**currently questions 2 and 8**).
   - Waste and residues feedstocks should not be forgotten.
   - The different kind of biofuels should be treated.
   - It could be useful to establish a “priority ranking” in biomass use (1/ food 2/ bio-based materials or chemicals 3/ biofuels).

3. **Biofuels and land use** (**currently questions 3**). It is important in this part to take into account:
   - the uncertainties when monitoring land use;
   - the by-products coming from biofuels production that are used in the feed sector;
   - the biofuels needs compared to other needs (urban development, ...);
   - the yield improvement hypotesis;
   - the contaminated or degraded land use possibilities.

4. **Biofuels and rural development** (**currently questions 4, 5, 6 and 7**). This part should deal with:
   - The different kind of investments (large to small-scale) and their impacts on producers and the production chain;
   - Impacts on job creation, job quality and other social issues;
   - Conditions to respect in order for biofuels development to be favourable to rural development, poverty reduction and sustainability.

5. Impacts on **food prices and interactions (current situation and prospects) with energy prices**, from local to global levels. In this part, besides what was already presented in the HLPE report on food price volatility, it is important to consider that biofuels can be a way to mitigate price shocks under several conditions (including policy conditions). When considering “food security”, the HLPE team should bear in mind both long term and structural aspects but should also take into account crisis situations especially regarding policy recommandations.

6. What can we expect from **new technologies**? (**currently question 9**). In this part the impact on land use should be also carefully taken into account some biomass feedstock used for second generation biofuels can give less “flexibility” for reconversion.

7. **Recommendations for policy makers**, including on policy coherence for development and food security, on sustainability schemes and on what can be called the “nexus” between food and energy policies.

Finally, the report should be **as neutral as possible** when presenting the facts and controversies and not present any personal opinion or views of the HLPE team when not duly justified. In this

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Global Forum on Food Security and Nutrition

http://km.fao.org/fsn
outline, it seems to us that it is not the case with the current wording of question 6.

26. Babasola Olajide, Wageningen University, the Netherlands

@ FSN Moderator,

Interesting to read diverse opinions, arguments and some counter-arguments to this very relevant and interesting topic.

My submission is not going to be laced with so much words, therefore, I would make it simple. I have read the opening argument tendered by Prof. Igor Tikhonovich, and related it back to the HLPE report of 2011 on Land Grabbing. In my honest submission, I think the 9 issues raised are valid, but however, a bit muddled up or misplaced. The first question, I would have loved to see is: "what are we doing wrong towards not ensuring food security?" The world has not yet attained a food secured status for all and sundry, where every citizen of this world has adequate and sustainable food supply; but here we are clamouring for the growth of biofuels! I strongly think this is misplaced priority.

Until we go back to the basics, finding out where and how did we go wrong towards ensuring food security for all, the glorious ambition of achieving biofuels towards favoring food security is nothing but a mirage.

To buttress my point, I would give a practical example. My example lies with Nigeria. Nigeria is the highest producer of cassava globally (FAO 2004). This has been achieved based on small scale level of farming. Cassava has been found to be a high energy crop and equally a cash crop. The Government in Nigeria having realized the enormous financial potential in cassava farming towards producing biofuels, have been calling upon investors to invest in large-scale farming of cassava to this regards. This would put enormous pressure on resources such as land itself (mono-cropping, human displacement, etc), water, local food security, infrastructure, etc. Nigeria is not yet a food secured nation, to invest into large-scale farming either for the intention of food security or the hidden intention of biofuel through cassava or other high energy crops is not in itself sustainable. Until we get the basics right, have the proper policies and structure in place to ensure that every human being and animal on this planet has the right to food availability, food accessibility and food utilization; biofuel production is simply and only making matters worse for the upcoming generation.

Babasola Olajide.
PhD Candidate on Large-scale land acquisition and its impact on local food security.
Wageningen University

27. Actionaid

Preamble

ActionAid welcomes this opportunity to input into the HLPE consultation on 'Biofuels and Food Security'.

ActionAid is an international development NGO whose aim is to fight poverty worldwide. Formed in 1972, we work with local partners to fight poverty and injustice in over 40 countries worldwide. We help the most vulnerable people fight for and gain their rights to food, land, water, shelter, work, education, healthcare and a voice in the decisions that affect their lives.
Thirty-five years of experience in child sponsorship has rooted ActionAid firmly in the world’s poorest communities. Over 80% of our staff are from developing countries and we are the only international development organisation to be run from one - our head office is in Johannesburg.

ActionAid believes that food, water, shelter and education are not just basic needs; they are human rights. We also know that poverty affects women disproportionately. Women also have the greatest potential to end it. The lack of control that women have over their own lives is a huge global injustice, and keeps whole communities locked into poverty. This and the lack of rights to food, land, water, shelter and education are fundamental barriers to ending poverty. We therefore work with people in poor communities and decision-makers at all levels to make sure their rights are met.

Introduction
In recent years, communities supported by ActionAid and its partners from around the world have suffered the negative impacts of industrial biofuel policies. While ActionAid has been working with these communities on the ground, we have also conducted research on the global impacts of biofuel production and consumption on the human rights of poor and marginalised communities.

Globally, it is estimated that crop production for biofuels has been involved in at least 37 million hectares being removed from the control and use of rural communities. As several studies have shown, this phenomenon was a substantial factor in the 2007-2008 food crisis. Many nations have adopted mandates whereby transport fuels must contain a certain percentage of biofuels. For example, the European Union (EU) adopted the Renewable Energy Directive (RED) in 2009 with the aim of reducing European greenhouse gas (GHG) emissions. The RED requires renewable energy sources to constitute 10% of the final consumption of energy for transport in each EU member state by 2020. In 2010, member states submitted action plans outlining how they would meet this 10% target. It became clear that over 88% of the 10% target is to be met through "first generation" biofuels – manufactured from food crops or crops grown on land that could produce food. This means that the 10% target for renewable energy in transport by 2020 is for all intents and purposes a first generation biofuels target.

It is timely that this consultation will examine the effects of biofuels policies on global and local food security and food rights; but to do so requires a comprehensive review of the impacts of biofuel production on food prices, land rights, climate change, labour rights, women’s rights and other developmental and environmental issues that have an impact on food security, such as water. In this respect greater attention needs to be given in the HLPE’s questions to the impact of biofuel policies on food prices, both local and global. According to a report written by 10 intergovernmental organisations, including the World Bank and the Food and Agriculture Organisation (FAO), “projections encompass a broad range of possible effects but all suggest that biofuel production will exert considerable upward pressure on [food] prices in the future". At a local level, little research has been done on the transmission of global price effects onto local markets and the direct impacts of biofuels plantations on local food prices. This is an area of research that the HLPE might want to prioritise.

In light of the negative impacts of biofuel policies, 10 intergovernmental organisations including the FAO and the World Bank called for: “G20 governments [to] remove provisions of current national policies that subsidize (or mandate) biofuels production or consumption.” ActionAid has been advocating such recommendations for some time and would urge the HLPE to endorse and support it.

9 Ibid
1. “What do we know about the extent of current and forecasted biofuel policies?”

According to the International Energy Agency (IEA), current biofuel demand (2010) is about 2 EJ (EJ = 10^18 joules) or roughly equivalent to 100 billion litres; this will rise to about 10 EJ by 2030 and over 30 EJ by 2050 with most demand coming from OECD Europe, OECD North America, India, China and Latin America. Meeting the biofuel demand in this roadmap would require around 65 exajoules (EJ) of biofuel feedstock, occupying around 100 million hectares (Mha) in 2050.¹⁰

Demand is created through a combination of policy instruments:

- Binding mandates and/or indicative targets – over 50 countries have adopted mandates or targets for biofuels. Current and future mandates/targets for selected countries are given in the table below.
- Exempting biofuels from CO2 emission trading scheme – ie in EU
- Subsidies for biofuels – these may be given when land (and water) is purchased or leased; at the feedstock production stage (eg EU agricultural subsidies); or at sale (tax reductions, etc). The Global Subsidies Initiative is currently producing a report on global subsidies to biofuels, drawing on a series of country level analyses.

<table>
<thead>
<tr>
<th>Country</th>
<th>Current target/mandate</th>
<th>Future target/mandate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Ethanol blend 20-25% (E20-25); Biodiesel blend 5% (B5)</td>
<td>Na</td>
</tr>
<tr>
<td>Canada</td>
<td>E5 (up to E8.5 in 4 provinces), B2-B3 (in 3 provinces)</td>
<td>B2 (nationwide) (2012)</td>
</tr>
<tr>
<td>China</td>
<td>E10 (9 provinces)</td>
<td>Na</td>
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<tr>
<td>EU</td>
<td></td>
<td>10% renewable transport energy by 2020 (binding)</td>
</tr>
<tr>
<td>India</td>
<td>E5</td>
<td>E20, B20 (2017)</td>
</tr>
<tr>
<td>US</td>
<td>48 billion litres of which 0.02 bln. cellulosic-ethanol</td>
<td>136 billion litres, of which 60 billion cellulosic-ethanol (2022)</td>
</tr>
</tbody>
</table>

Ethanol and biodiesel from food crops are now widely commercialized. Ethanol has the disadvantage that without engine and component modifications, ethanol blends above 10% can cause corrosion. Advanced ‘second generation’ biofuels from lingo-cellulosic feedstocks are only now becoming available although commercial production is still many years away and will not have a significant role to play in meeting 2020 targets.

2a. “What is the extent of the competition for biomass feedstock; food versus feed versus traditional bioenergy like fuel wood versus bioenergy and biofuels in different parts of the world?”

ActionAid has mainly looked at the local aspects of competition between uses, particularly in Africa. On one plantation in Tanzania, a large part of the land that was taken for jatropha plantation was reserved village forestry lands. The land supported a wide range of forest-dependent livelihood activities and also provided forest-related food products to the communities. According to the villagers, land use was as follows: firewood collection was the dominant previous land use followed by crop production, fetching water, then charcoal

production and timber and pole harvesting. Over half of the study population in the focus groups now expressed difficulty in terms of access to fuelwood collection, increased distance to water sources, reduced availability of natural resource products and limited wildlife catching. One firewood and charcoal collector said he had lost an income of about 350,000 Tanzanian Shillings (TSH) per month (£144 per month). He now has to rely solely on income from cassava.¹¹

2b. "If biofuels are produced by other parts of the plant than the grain, which would otherwise go into the soil, does the production of biofuels pose a risk in weakening the return of organic matter from the plant to the soil, thereby posing a risk to longer term food security?"

Many issues arise with agricultural and forestry residues for future generation biofuels. At a general level in many developing countries, many of these residues are already used in one form or another – to generate heat and power, cooking fuel, roofing and fencing, fertilizer, as animal fodder and so on.¹² In developed nations, forestry residues are also used extensively in the panel industry while crop residues are often left to increase soil fertility, used as animal bedding, and as roughage in livestock diets.¹³ In a study by Kansas State University, it was found that removing agricultural residues such as stalks and leaves for cellulosic ethanol had negative impacts on soils, the environment and future crops because the residues sequester carbon, keep soils healthy and improve crops yields. "Only a small fraction (about 25%) of residues might be available for removal depending on soil type and climate .... This small amount of crop residues is not economically feasible nor logistically possible."¹⁴

3. "What is the extent of the competition for land because of biofuel [and biomass]?"]

There is already considerable competition for land. Biofuels represent a large part of global agriculture production. During the period 2007-2009, biofuels accounted for 20% of sugarcane production, 9% of vegetable oil and coarse grains and 4% of sugarbeet.¹⁵ In the US, some 40% of maize currently goes to biofuel production. In the EU, 66% of vegetable oils are used for biofuels.¹⁶ To get a sense of scale involved, the calorific value of the energy sector is 20 times that of the food sector.

As the IEA conclude, just meeting the biofuel demand until 2050 poses a considerable challenge given competition for land and feedstocks as a result of the rapidly growing demand for food, feed, fibres, forest products and other non-food crops. This is in addition to the extra 80 EJ of biomass required for generating heat and power by the same date. There is little agreement on the supply of land that would be suitable for agriculture. Studies have variously suggested between 50 million and 1,600 million hectares of land is suitable for agricultural expansion.¹⁷ However the UK Foresight Report stated that whilst food production may have to increase by

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¹³ Kretschmer B et al, 2011, Securing Biomass for Energy – Developing an environmentally responsible industry for the UK now and into the future, Institute for European Environmental Policy, August 2011
¹⁵ OECD / FAO (2010), Agricultural Outlook 2010-2019, OECD , Paris
about 70 per cent, the area of land given over to agriculture may have to remain static, or even decrease as a result of soil degradation and climate change.18

The amounts of net land required for food and bioenergy will clearly depend on yields going forward and the use of by-products; most of the growth in agricultural production in the twentieth century has come from increases in yields rather than an increase in agricultural area. It is expected that this will remain true for the 21st century. But yield growth has certainly slowed in the last decade for many crops and regions, and climate change will only exacerbate this in many areas. Increased yield is also associated with intensification of cultivation and all the associated impacts on climate change, water scarcity, pollution and biodiversity loss that this entails.19

The biofuel industry places great store on the use of by-products from the industry, such as distiller's dried grain with solubles (DDGS). This, they say, will reduce the net land requirement globally as DDGS can replace soy imports for animal feed. ActionAid believes that this has been overstated. Analysis for the pig and poultry sectors in the UK has shown limitations on the ability to utilise DDGS from wheat, rapemeal and glycerine. Significant differences in terms of the nutrient content of DDGS have been noted in terms of the extent, quality and digestibility of the amino acids present. In addition, DDGS from wheat contains high levels of fibre, which may limit an animal’s ability to take on sufficient quantities of feed. Only limited proportions of DDGS are, therefore, recommended within the feed mix. In the case of rapemeal, high levels of glucosinolates can be present. These compounds are known to have negative health consequences for animals consuming it at high volumes; the same holds for residues of methanol and salts (sodium or potassium chloride), likely to be present in biodiesel by-products. In addition, the metabolism of glycerol requires the activation of a specific enzyme and above certain thresholds of intake it is simply excreted rather than utilised by the animal.20

It is also important to consider competition for water which arises from land use. Reaching a 5% level of biofuels in global road transport could consume between 20 and 100% of all water currently used in world agriculture.21 At the local level, this will likely have devastating impacts for poorer communities whose access to water will be affected, contributing to displacement and even conflict.

3b. "Is there a real prospect for the mobilisation of marginal or degraded lands not suitable for growing food?"

It is sometimes argued that biofuels production is not in competition with food production as there is plenty of available land that is currently unused that could be used for biofuels production. Much of this is what some would refer to as ‘marginal’ or ‘degraded’ land. This narrative is however seriously flawed and has serious consequences for food security, not least at local level. It has been proven repeatedly that much of the land considered as ‘idle’ frequently constitutes a vital source of food and livelihood for poor people by providing fruits, herbs, wood for example for heating or grazing area. Additionally, production on what is classified as ‘marginal land’ has often proven to not be economically viable, due to the low yields that it produces; more fertile land (needed for food production) is often used for biofuels production.

since reliable field data is lacking on current land-use through smallholders and rural communities. Complex land tenure structures and lack of infrastructure in rural areas are additional challenges for the expansion of biofuels production in many African countries.”  

Similarly, the Committee on World Food Security’s HLPE has stated that: “It is often asserted that there is much ‘available’ land in Africa and Latin America. This suggests abundant unused land. However, there is rarely any valuable land that is neither already being used in some way, nor providing an important environmental service.”

5. “Can biofuels production be compatible with small-scale farming and smallholders?”

Economies of scale for biofuel production dictate a size of plantation that usually exceeds 5,000 hectares. This is not compatible with small scale farming and smallholders as ActionAid has found in many countries in Africa. Even in northeast India, where companies enticed small holders to experiment with jatropha, this has not proven to be beneficial to small holders; the promise of high yields never materialized and there was no market for the jatropha seeds.

6. “By causing land concentration for plantation-type production, due to considerations of economy of scale, biofuels have been accused to cause evictions or marginalization of vulnerable groups and individuals, including women in the developing countries, particularly in Africa, and indigenous peoples and other groups with insecure land titles. Can a range of social issues be addressed, including poor working conditions for labourers and loss of land rights for indigenous peoples where new plantations for feedstock are established?”

ActionAid believes that land concentration is one of the most relevant issues that the report should address in terms of food security. A lot of sound documentation proves that land grabs happen, and ActionAid can document several cases of biofuel driven land grabs. The International Land Coalition recently published its findings on ‘land grabs’ in developing nations between 2000 and 2010. Of verified data, 71 million hectares had been acquired, of which at least 37 million was for biofuels, more than all the other agricultural land deals combined.

Most of the deals were in Africa, not least because of the perception of cheap and abundant land but also because of trade preferences granted by developed nations. The main investor countries have been China, Saudia Arabia, South Korea, India, USA, UK, Brazil and the UAE (although many of the deals in the latter two have not been verified). The top target countries are Sudan, Mozambique, the Philippines, Tanzania, Ethiopia, Madagascar, Zambia, DRC, Brazil, Pakistan and Indonesia.

It is an absolute necessity to address a wide range of social issues related to the impact of biofuel production on food security, as land is one of the most important assets to achieve food security. Biofuel production patterns encourage large scale land acquisitions, which have proved to negatively affect the poor. We agree that the report should address social issues very carefully, with regard to poor working conditions for labourers, loss of land rights for indigenous peoples and affected communities, especially women. Women are particularly affected because of their systematic discrimination with regard to recognition of their land rights, discrimination in

22 IEA, 2011. Op cit
public discourse and decision making, and their dependence on common land and resources that become attractive for biofuel investments with the result being deprivation of basic sources for their livelihoods (such as water, grazing land, and fruits).

One of the main reasons for land grabs is weak governance and insecure land titles, so better land tenure governance systems should be designed and applied. The HLPE should recommend in its report the adequate implementation of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests (VGs), recently endorsed at the CFS, at national level as a way to strengthen land rights of indigenous peoples and affected communities in all countries. The VGs offer a set of principles and practices that governments and other actors can refer to when administering land, fisheries and forests rights in order to serve the best interests of their populations and to promote food security and rural development.

At the same time, the VGs offer some key principles to northern governments which host companies and big investors, in order to guide them in monitoring and supporting these companies towards more sustainable investments. Section 12 of the VGs makes explicit recommendations to governments on which investments to support most, additional safeguards in case of large scale transfers of land rights, and on prior impact assessment on the potential positive and negative impacts that investments could have on tenure rights, food security and the right to food, livelihood and the environment.

While emphasis is generally on plantation owners and or foreign companies to strike deals with local governments or communities, there are questions about the extent to which foreign companies in particular are paying taxes on their revenues. Where taxes are avoided through transfers to tax havens, local communities and the country as a whole will not reap the benefits of the investment. This is an area that requires further exploration.

8a. “Not all biofuels feedstocks are equal”.

All biofuel feedstocks need to be assessed by thorough life cycle analysis (LCA or ‘well-to-wheel’) including greenhouse gas emissions. Those originating from genuine wastes, for example, offer some of the greatest benefits as they do not compete with land, food and have large GHG savings.

That said, biofuels around the world currently fail to properly account for all GHG emissions associated with their production and use. This is mainly because methodologies fail to address Indirect Land Use Change (ILUC). Several studies have showed that ILUC has a significant effect on the carbon footprint of biofuels and means that several feedstocks used for biofuels are actually worse for climate change than fossil fuels.

In terms of land conversion alone, the ILUC impacts attributable to additional conventional biofuels usage by 2020 in all 27 Member States of the EU are between 4.7 and 7.9 million hectares. As much of this land conversion will, if current trends continue, be likely to happen in carbon sensitive areas, the additional carbon emissions in the period up to 2020 as a result of European biofuels usage when including ILUC effects is anticipated to range from 313 to 646 MtCO2e or between 2.9 and 6 gCO2e/kgoe. Effectively, this would be the equivalent of placing between 14.2 and 29.2 million additional cars on the roads across Europe in 2020.26

Considering the concrete and serious effects of climate change on development, including food security and access to arable land, it is paramount that nations factor in the full effects of their

26 IEEP, 2011. Anticipated Indirect Land Use Change Associated with Expanded Use of Biofuels and Bioliquids in the EU – An Analysis of the National Renewable Energy Action Plans
http://www.ieep.eu/assets/786/Analysis_of_ILUC_Based_on_the_National_Renewable_Energy_Action_Plan.pdf
biofuels policies on climate change when considering wider development and environmental issues. One key way of doing this is to introduce honest carbon accounting through robust, binding, feedstock differentiated ILUC factors for all biofuels.

**8b. 2G biofuels are expected to fare better than existing biofuels** [in terms of land, chemical and water use].

ActionAid would argue that it is too early to make such an assertion. With regard to future generation biofuels, the same issues - such as land use change, impacts and indirect effects - will apply.

In terms of production, cellulosic ethanol contains a third less starch and sugars compared to corn and more fossil energy inputs are required to release these tightly bound starches and sugars: "About 170% more energy (oil and gas) is required to produce ethanol from cellulosic biomass than the ethanol produced." All these issues need to be analysed through an LCA.

If land is required to grow any biofuel, issues to do with land use will probably arise. Much of the growing of future generation biofuels in developed nations (ie dedicated energy crops such as grasses and trees) may need to be established either on existing cropland (with indirect land use change implications) or on other habitats such as grasslands (with direct land use change implications). Scientists are forecasting that: "An expanded global cellulosic bioenergy program ... predicts that indirect land use will be responsible for substantially more carbon loss (up to twice as much) than direct land use."  

As with current biofuel production, land in developing countries will be sought for future generation crops. Direct land use change could have significant impacts on carbon rich habitats or on land that is currently growing food or could be used to grow food. These are the same countries where most population growth will take place. The debate surrounding ‘land for food’ versus ‘land for fuel’ will be most relevant in these areas. ActionAid is already seeing this with the growing of jatropha (which some people classify as a 2nd generation biofuel because it is non-edible).

Jatropha has been sold as a miracle biofuel. One of its supposed advantages is that it can be grown on “marginal land” (see answer to question 3b), would not compete with food and not be grown in carbon rich habitats. Jatropha, it is claimed, can also be grown in semi-arid areas, on poor soils with limited water use. It will therefore provide livelihoods and promote development in rural areas.

Most of the evidence to date suggests that this is overly optimistic. For a start, companies would like the crop to be grown on fertile land with the requisite amounts of water to bring higher yields and returns. But this would put it into direct competition with land that could, and often is, used to grow food. In Tanzania, jatropha is being targeted at areas with good rainfall and fertile soils. In Sahel areas of Senegal, jatropha will only survive with irrigation; it’s a similar story in Swaziland, which is suffering from persistent drought.

Indirect land use displacement (ie the displacement of arable crops due to an expanded future biofuel programme) may also mean expanded crop production in developing countries.

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9. Can new technologies overcome the food security and resource issues?

As with all new technologies, all environmental, social and economic issues need to be subject to comprehensive life cycle analysis, and this must be conducted ‘feedstock-by-feedstock’ or ‘product-by-product’. Only then should some approaches be encouraged -- but not through targets and mandates. In this way, we might avoid some of the pitfalls of the use of first generation biofuels where policy has got ahead of the science.

ActionAid isn’t against science or technology, and we firmly believe that investment in appropriate agricultural knowledge, science, technology and plant breeding is one of the best and most cost-effective ways to tackle rural poverty, hunger and social and gender inequalities.

Like many groups worldwide ActionAid takes a precautionary approach to new crop technologies and we contribute to and rely on high-level peer-reviewed UN/World Bank global assessments on whether these new technologies are positive for poor rural communities – over the short, medium and longer terms.

ActionAid endorses IAASTD’s conclusions and we highlight increasing high-level evidence that shows that a shift towards women and smallholder-based low-input 'sustainable agriculture' approaches is highly productive and has wider social, gender and environmental benefits.

For example, the largest study examining smallholder-based sustainable agriculture in poor countries analysed 286 projects covering 37 million hectares in 57 countries. The 2006 study found that when low-input sustainable agriculture was adopted, that average crop yields increased by 79%.30

The UN Conference on Trade and Development (UNCTAD) and the UN Environment Programme (UNEP) has since looked in detail at 114 of these 286 projects throughout Africa, and it found:

- crop yields increased by an average of 116% for all African projects and by an average of 128% for projects in East Africa
- A focus on 15 of these projects found multiple benefits for smallholders, including increased food availability, increased household incomes, and education, skills and health, and social benefits for the wider community, plus benefits to the environment, such as better soil fertility, water supply, flood control and enhanced biodiversity.31

28. Global Renewable Fuels Alliance (GRFA), Canada

Main Question of the HLPE Study

Are biofuels compatible with food security concerns at different levels, global to local? What could be done to ensure their development does not go against (and even favours) food security?

Comments on the terms of reference in the discussion paper

We have provided some broad comments below in response to some of the questions and issues the HLPE have raised. However, our primary comments refer to the overall terms of reference of

the discussion. The discussion is silent on three fundamental points that must be part of any discussion on biofuels production.

1. This discussion must be held in the context of an unsustainable fossil energy future. The context for this discussion must be biofuels production is the only viable alternative today to an ever-growing addiction to crude oil. The International Energy Agency has clearly pointed out that we are on an unsustainable path of energy consumption and biofuels MUST be part of the future energy mix. In 2010 the global biofuels industry produced over 110 billion litres of biofuels, supported over 1.4 million jobs in all sectors and contributed $277.3 billion to the global economy. The numbers are to grow by 2020 to producing over 196 billion litres of biofuels and supporting over 2.2 million jobs in all sectors (Cardno Entrix, Contribution of Biofuels to the Global Economy – Prepared for the Global Renewable Fuels Alliance, 2012). This positive economic effect biofuels are having on the global economy, especially during these difficult financial times MUST be part of the discussion.

2. What is the impact of energy prices on food inflation? Energy is the only input cost that touches ALL food. It is understood that the UN Food Price Index is directly correlated to the price of crude oil. See the GRFA chart below.

[Image of chart showing oil price and food price index]

Establishing this link between global energy prices and food security (prices) is critical to understanding the impact that biofuels production can have on all countries, particularly those that import their energy. Biofuels production can reduce a country’s reliance on crude oil, improve their balance of payments and drive down energy prices. This in turn can have a tremendous impact on food prices in a local economy. This linkage is not raised in terms of this discussion, but remains a critical part of the debate. According to a 2010 World Bank report, financial speculation in commodities markets is another a key factor that is driving food prices (World Bank, Placing the 2006/08 Commodity Price Boom into Perspective, 2010).

3. The feed market is a critical part of any agricultural sector. Biofuels production, particularly from corn and wheat, produces a valuable high protein feed that is returned to the livestock market. In fact, a third of all grains used to make ethanol are co-produced as animal feed. The creation of this feed market is a valuable contribution to the food sector, reduces the amount of land needed for global feed
production and assists in the development of dairy and beef cattle industries. This too must be part of the discussion.

In short, we must examine the individual issues raised by the HLPE but in the context of an uncertain energy future. This energy future is based on unsustainable fossil energy where biofuels today are the only viable alternative to crude oil. Biofuels, which contribute hugely to the global economy, improve global energy security, cushion the effect of oil prices on food costs and contribute significant amounts of animal feed to the livestock market.

Please find below the GRFA’s comments on some of the points raised by the HLPE:

**What do we know about the extent of current and forecasted biofuel policies, and what is the current state and the prospects for the production, technologies and use of liquid biofuels in the world? How does this compare to agricultural production and food demand?**

These two questions should not be looked at in isolation from each other but rather in a holistic approach. It has been proven that biofuels production can encourage investment in agriculture thus further expanding domestic food production. The UN FAO has identified *under-investment in agriculture* and one of the most important challenges facing the world today. Finding ways to encourage investment in agriculture must be a priority. The FAO has stated that agriculture investment needs to rise 50% to meet future food demand. David Nabarro, coordinator of Secretary-General Ban Ki-moon’s High-Level Task Force on Global Food Security said “a point that we’ve been maintaining now for the last 30 years [is] that there is systematic and serious under-investment in agriculture and food security and that’s a problem now, but it’ll be a much greater problem as we move towards 2015,”

World ethanol production is to grow from 93 billion liters in 2010 to 154 billion liters in 2020. In 2011 the IEA stated that biofuels by 2050 could supply “27% of the worlds transport fuel” and “avoid 2.1 gigatonnes of CO2 emissions” while “not compromising food security” (International Energy Agency, *Technology Roadmap – Biofuels for Transport*, 2011). Currently ethanol production only utilizes 3% of global grain use, with 1/3 of these grains being co-produced as animal feed.

It is well understood, that global food production far exceeds our needs today; however hunger is still a global challenge but there are ways to combat this problem. The scale of food waste worldwide is unacceptably high. According to a report for the UN by the Swedish Institute for Food and Biotechnology, around 1.3 billion tonnes of food is either lost, or wasted, globally each year. The figure represents 33% of the world’s total food production; and the study says that reducing losses in developing countries could have an "immediate and significant" impact on livelihoods and food security.

For thousands of years, farmers have been using breeding techniques to improve the quality and yield of crops. Modern technology allows plant breeders to produce crops with increased yields. These methods have been adopted by farmers worldwide at rates never before seen by any other advances in the history of agriculture. In 2011, 16.7 million farmers on 160 million hectares in 29 countries grew improved crops. The reason for such impressive adoption rates is simple – modern crop technology delivers significant and tangible benefits, such as increased yields, all the way from the farm to the fork. Modern techniques have enabled improved farming methods and crop production around the world by increasing plants’ resistance to diseases and pests; reducing pesticide applications; and improving crop yields.

Evidence of this improvement in crop yields can be seen this year when corn farmers will produce a record 14.79 billion bushels in the 2012 – 2013 season. This according to the US Agriculture Department is its first forecast for the coming year’s crop production. This amount is
11 percent higher than the previous record of 13.09 billion bushels in 2009, and 65 percent higher than what corn farmers were producing a decade ago.

**What is the extent of the competition for biomass feedstock: food versus feed versus traditional bioenergy like fuelwood, versus bioenergy and biofuels in different parts of the world, in local and international markets?**

As mentioned in our opening comments, this discussion omits a reference to the fact that the ethanol industry creates a valuable high protein feed product that has become and important part of the feed complex in North America and others parts of the world. In essence the biofuels market is really only competing for the starch in the kernel of corn. Despite this competition for the “starch”, corn production in North America has grown consistently and this year will produce yet again the largest corn harvest in U.S. history.

While the competition for commodities obviously has an impact on price, there are two other factors that have been proven to have a very real impact on price spikes and long-term food inflation. These two factors are speculation in the commodities markets and oil prices.

It has now been shown that the proprietary trading of food commodities on open markets such as the Chicago Board of Trade and other markets has had a direct impact on the price escalation of these commodities. A 2010 World Bank study and an earlier study done by the United Kingdom’s Department of Environment, Food and Rural Affairs came to similar conclusions and found that speculation in food commodities have contributed directly to the food price spikes of 2008. In fact, the reports also found that the impact of biofuels production on food price spikes was found to have been significantly over – stated.

The GRFA chart shown previously clearly shows that the global price for food is directly impacted by the rising price of oil. Moreover, there is little relief on sight for oil prices because the growing competition for oil has driven prices to record levels. There is almost universal agreement that the competition for oil coupled with dwindling supplies will drive all commodity prices higher in the future unless we can reduce our reliance on crude oil through the development of alternatives like ethanol and biodiesel.

**Given the world’s limited arable land resources, what is the extent of the competition for land because of biofuel? Is there evidence for indirect effects on land-use change, even remotely, or biofuel policies, which could have an effect on food security?**

In December 2010 the World Bank released a report that said, “African countries are well placed to benefit from the increased demand for biofuels because many have large areas of land suitable for producing biofuels as well as abundant labour. Sub-Saharan Africa has more than 1 billion hectares of land with potential for rain-fed crop production according to the Food and Agriculture Organization of the United Nations, of which less than one-quarter is being cultivated,” ([World Bank, Biofuels in Africa – Opportunities, Prospects and Challenges, 2010](http://km.fao.org/fsn)).

Current global land use for biofuels is minimal, using about 3% of total arable land area. There are currently massive amounts of unused, underproductive or marginal land available for biofuel production without compromising food production. A 2011 study by the University of Illinois found that there is an additional 320 – 702 million hectares of global land available for sustainable biofuels production. This is “an area that would produce 26% to 56% of the world’s current liquid fuel consumption,” ([University of Illinois at Urbana–Champaign, Department of Civil and Environmental Engineering, Land Availability for Biofuel Production, 2011](http://km.fao.org/fsn)).

A 2012 report by the United Kingdom’s National Non-Food Crops Centre found that “We can minimize competition for land by increasing its productivity. Improved breeding and management techniques will increase the productivity of crops. An annual yield increase of just 2% would double biofuels production volumes by 2050 without any land expansion,” ([National Non-Food Crops Centre, The changing face of the planet: The role of bioenergy, biofuels and bio-based products in global land use change, 2012](http://km.fao.org/fsn)).
Once again, a primary challenge is not how much food we grow but how efficiently we grow and distribute it. Related to this challenge, of course, is the issue of poverty. Access to food is irrelevant if prices are at levels where people are unable to afford it.

In May 2011 the UNFAO said that investment in biofuels could actually help to improve food security in rural economies by creating jobs and boosting incomes. Heiner Thofern, head of the FAO Bioenergy and Food Security project, said that if "done properly and when appropriate, bioenergy development offers a chance to drive investment and jobs into areas that are literally starving for them."

The indirect land use change impacts of biofuels, or ILUC, remain a controversial subject in large part because the science is flawed, immature and there are massive disparities in the final data. ILUC is an untested and heavily disputed theory that assumes that crops used for biofuels will displace other crops used for food. ILUC estimates vary drastically depending on the input data assumptions of the researchers and some are based on false or out-of-date assumptions. Often key inputs, such as co-products, are not included in the scientific models that seek to measure ILUC. While even some recent studies such as a report from the US Department of Energy (DOE) that looked at historical data, determined that indirect land use change (ILUC) resulting from corn ethanol expansion over the past decade has likely been "minimal to zero." Other reports have shown that corn-based ethanol production is far better for the environment than oil.

More proof of ILUC flaws come from the National Institute of Space Research, which found that deforestation in the Amazon has declined sharply just as biofuels production in the United States quadrupled. It found that in 2004, 10,588 square miles of the Amazon was cut down but in 2009/10, that number dropped to 2,490.7 square miles. In the meantime, U.S. ethanol production had gone from approximately 3 billion gallons in 2004 to approximately 13.23 billion gallons in 2010. In Brazil the tropical protection program, Amazon Region Protected Area, resulted in a 75 percent reduction in tropical forest clearing since 2004, even as ethanol production doubled.

While the indirect land effects of biofuels production have not been proven, the environmental impact of oil production is widely known and getting worse. Oil exploration is now venturing into extremely sensitive environments as conventional supplies disappear. Oil companies today must undertake risky exploration in areas such as arctic, offshore in some of the deepest oceans in the world and large parts of the Canadian boreal forest in the Canadian tar sands.

**As the production of biofuels is linked to agriculture, are investments in biofuels and the biofuel production chains benefiting upstream agriculture?**

Biofuels production has been shown to have both a direct economic impact on the local economy and on the larger macro economy. Biofuels provide farmers with income allowing them to reinvest in their farms, which can have the secondary effect of improving investment in global food production. A 2008 study sponsored by the Farm Foundation and USDA showed that in the EU alone biofuels would add an estimated 3.2 billion Euro in farm income and create an additional 55,000 direct farm jobs. The biofuels sector also contributes to other indirect jobs in and around the agriculture industry, such as seed suppliers and companies that provide agricultural technology (Farm Foundation and USDA, *Impacts of the European bio-fuel policy on the farm sector: a general equilibrium assessment*, 2007).

A recent economic study commissioned by the Global Renewable Fuels Alliance has shown that in 2010 the global biofuels industry produced over 110 billion litres of biofuels, supported over 1.4 million jobs in all sectors and contributed $277.3 billion to the global economy. The numbers are to grow by 2020 to producing over 196 billion litres of biofuels and supporting over 2.2 million jobs in all sectors. This positive economic effect biofuels are having on the global economy, especially during these difficult financial times MUST be part of the discussion (Cardno Entrix, *Contribution of Biofuels to the Global Economy – Prepared for the Global Renewable Fuels Alliance*, 2012).
Can biofuel production be compatible with small farming and smallholders, which form the majority of the agricultural systems in many parts of the world, and who are key to the wealth of livelihoods and food security?

In May 2011 the FAO released a report that said “investment in bioenergy could spark much-needed investment in agricultural and transport infrastructure in rural areas and, by creating jobs and boosting household incomes, could alleviate poverty and food security,” (Food and Agriculture Organization, Making Integrated Food-Energy Systems work for People and Climate, 2011)

This same report suggested that producing food and energy side-by-side might offer one of the best formulas for boosting countries’ food and energy security while simultaneously reducing poverty.

By causing land concentration for plantation-type production, due to considerations of economy of scale, biofuels have been accused to cause evictions or marginalization of vulnerable groups and individuals.

The Global Renewable Fuels Alliance has repeatedly called for transparency in land deals associated with investments in agriculture for food and biofuels production. It is extremely short sighted and counter productive to discourage investment in agriculture and biofuels feedstock production because some land deals are suspicious and may not benefit local citizens. We should be encouraging this investment but insisting on transparency in these deals. If the terms of these deals are transparent then actions can be taken to mitigate against deals that are not in the public interest. We support the broader search for transparent data on agricultural land use across the globe.

Issues such as land grabs are symptomatic of wider societal and systemic problems such as bad governance. Western countries should develop ethical guidelines and codes of conduct for those companies wishing to invest in biofuels production abroad.

Non-commercial small scale production of first-generation biofuels in rural settings, e.g. for household purposes in tropical developing countries has been cited as an asset for rural development and access to energy in remote areas, avoiding expensive imports and difficult provision of fossil fuels?

2012 is the international year for “Sustainable Energy For All”, as today, one in five people throughout the world does not have access to modern energy sources. 2.7 billion people use wood, coal, charcoal or animal waste to cook their meals and heat their homes, thereby exposing themselves to health dangers and causing deforestation. According to the European Commission, cooking with wood, for example, contributes, through smoke and fumes, to the deaths of 1.5 to 2 million people each year, due to respiratory illnesses (European Commission, http://europa.eu/rapid/pressReleasesAction.do?reference=IP/12/363, 2012). The CleanStar Mozambique project is an excellent example of a small-scale ethanol production that is bringing environmental, energy and health benefits to rural dwellers. The project provides ethanol fuel for clean cooking stoves that improves access to energy for rural people and reduces deforestation at the same time (CleanStar Mozambique, http://www.cleanstarmozambique.com/, 2012). As previously mentioned the 2011 UN FAO study “Making Integrated Food-Energy Systems work for People and Climate” found that integrating food and energy crops can have massive benefits for poor farmers in developing nations by improving food security, access to clean energy and reducing fossil energy bills – the GRFA supports this conclusion.

Not all biofuel feedstocks are equal. Feedstock vary in the amount of energy yielded per acre of land; the amount of inputs needed such as fertilizer, pesticides and water for production; and the extent to which they compete with traditional agriculture for land. Is it possible,
and on which basis, to distinguish the first and second generation of biofuels in terms of food security? To reach these goals, can more suitable crops, be grown, which ones, perennial versus annual, and how? What is the prospect to use biomass residues from agriculture, and forestry and also related waste, as a feedstock source as well?

Next generation technologies that utilize "other feedstocks" are extremely complicated and expensive to develop. In many cases "scale" of production is critical to reducing the cost of production. Early commercial scale operations will focus on very specific feedstocks such as switch grasses and corn stover. Branching out to other feedstocks will happen over time and costs will come down so that many countries can adopt this technology but it will take many years for this to occur. That being said, the potential for developing countries with significant land mass and under investment in agriculture is tremendous.

It is critical to understand that the first generation of biofuels will be the foundation on which the next generation will be built. Biofuels from corn, sugar cane, sugar beet and oil seed are still today the most efficient and cost competitive fuels. Developing production in first generation biofuels will create a solid platform on which the next generation can be developed and built. This platform will promote investment in agriculture, establish a market and develop skills in the business, which are critical to growing and industry. The GRFA supports the general shift to a bioeconomy, and the introduction of biorefineries that produce multiple end products.

29. EcoNexus, United Kingdom

We believe that the HLPE report on biofuels and food security needs to carefully consider the claims made for biofuels against the emerging evidence of deleterious impacts, both direct and, perhaps more important, indirect, on food security.

Below, we have briefly set out some of the most serious problems to date.

We begin with an extract from one of the most recent pieces of research to be published that reiterates the basic message:

Biofuels goals 'may lead to food shortages', Bernard Appiah, 21 May 2012

from article:
"More than 40 countries have made commitments to meet at least ten per cent of their transportation fuel needs with biofuel by 2020."

From abstract of paper:
"Significant land re-allocation would take place with notable decreases in forest and pasture lands in a few countries. The expansion of biofuels would cause a moderate decrease in world food supply and more significant decreases in developing countries like India and Sub-Saharan Africa."

Biofuels play a key role in land-grabbing
According to a report published by the International Land Coalition, land 'transactions' involving at least 71 million and possibly as much as 203 million hectares worldwide were concluded between 2000 and 2010, particularly in Africa. Two-thirds of land transactions (for which details were available) were for biofuels.
This will surely have a major impact on local food production:

- Land leased or sold for biofuels is often cleared of people early on – but where do these people go, and how do they feed themselves?
- Projects may fail: due to fundamental flaws, eg: wrong crops (jatropha in Ethiopia, where land was cleared before it was decided the area was unsuitable for this plant)
- But it is hard to reverse impacts if projects fail
  - People once divided from their land, lose local varieties, knowledge etc
  - They may not be allowed back to their land, even if the project fails (see below)
  - People also frequently lose customary access to land where they gathered food for emergencies or to raised a little cash
- Women often worst affected:
  - limited land rights anyway
  - but crucial to food provision, household food security and children

So-called marginal and degraded land targeted for biofuels
Land described as "Marginal, idle, degraded, unused" is often used by communities, sometimes seasonally, or on a long cycle that enables it to recover in between:
- people may depend on collecting food and materials from, eg: forests, during droughts or to supplement income
- It is frequently managed collectively, sometimes according to well-defined rules. eg: pastoralists
- Such people often have no recognised title to their land, especially if it is collectively used
- But under EU law, the production of biofuels on "degraded" or contaminated land actually attracts a bonus
  - the EC would like to extend this to "idle" land
  - those proposing biomass criteria wish to see the degraded land bonus for liquid biofuels extended to biomass
Again, all this has major implications for food production

Watergrabbing is also a major issue – wherever land is grabbed, water is also affected. The issue has received less attention to date, but has obvious implications for food security. Biofuels require far more water throughout their life cycle than equivalent fossil fuels. They compete with food production for available water. Groundwater reserves are being depleted beyond rates of replenishment, for example in Libya. In other regions, water abstraction from rivers is greatly increasing. Increasing demand for irrigation will add to the pressures, for example in the African Agricultural Growth Corridors.

Irrigation also causes salinisation and degradation of soils, and there may also be other ecological and sociological impacts. These include loss of biodiversity in the area and damage to ecosystems downstream. Social impacts may include increased incidence of disease and inequity generally plus negative impacts on land use patterns, land tenure and the displacement of communities. See: FAO. 2011. The state of the world's land and water resources for food and agriculture (SOLAW) - Managing systems at risk. Food and Agriculture Organization of the United Nations, Rome and Earthscan, London.
See summary
Chapter 4: Major impacts of irrigation and drainage projects
http://www.fao.org/docrep/V8350E/v8350e09.htm

Biofuels and food security: many complex impacts
The impacts of biofuels on food security are many and they are complex. They include impacts on biodiversity, land, soils, water supply and quality, competition for land use, indirect and direct land use change – and impacts on local climate, particularly if they involve the clearance of forests. They also have important social impacts. By potentially converting small producers into outgrowers for companies (for example producers of oil palm and jatropha), biofuels production can shift them into situations of dependence on production companies for income to purchase food, rather than producing food themselves. In this situation, companies set the terms, eg: the price paid for production, conditions for credit etc. Money to purchase food instead of producing it is of no use if there is no food to be bought or if the price is too high.

Re-ordering land use and tenure
More subtly, biofuels may be part of a whole new reordering of land use and patterns of tenure, shifting communities from patterns of collective, sometimes shifting land use appropriate to the fragility of the land and climatic conditions, to small plots held by individuals. In parts of Africa, it looks as if such reordering is planned on a large scale through major projects such as the African Agricultural Growth Corridor projects in Tanzania and Mozambique.

Value of land tenure rights for local communities depends on context
Although such tenure might be secure in the terms of the World Bank, it may involve the loss of access to land and water that used to be common resources for food production and grazing. It may also help to marginalise still further the already marginalised. The value of secure land tenure depends entirely on the context in which it is developed, whether top-down and imposed, or bottom-up with genuine participation of local communities. Crucially it must also respect ecosystem functions, water and soils.

In Argentina, secure land tenure for small farmers was often no defence against the advance of GM soya monocultures. Those who did not wish to grow GM soya faced violent eviction and expropriation in some regions. This reinforces the critical importance of the policy context.

The position of women is critical, since there are barriers to their access and rights to land in some cultures and regions. It is clear that women are crucial to household food security, while men often dominate where cash crops are concerned. Great care is required lest biofuels and other crops favoured due to external interests further exacerbate inequalities between men and women.

Biofuels an artificial market based on targets and subsidies
Biofuels for export mean that the structure of the market, the crop, the price, etc, are dictated by outsiders. But biofuels are highly dependent on targets or mandates and on subsidies. Reports continue to appear at regular intervals that question the basic assumptions behind biofuels. If targets or mandates and subsidies were to be dropped, then biofuel markets would rapidly collapse and those who would be worst affected would be populations on the ground.

Company failures are already punishing local communities: there is one well-documented example of a company that leased land for biofuel production and then suspended its activities. This has left local people without income and other promised advantages. Worse still, it has left them unable to return to the land from which they had been removed. Even where such displaced people are paid compensation, there may be no appropriate land available for them to use. Something that is not often discussed is the fact that local communities often use and save locally adapted seed; displacement means the loss of this continuity, which is clearly important for food security, especially in the context of the increased rate of change and uncertainty we all face. There are vital lessons to be learned from such stories if such disasters are not to be repeated. See: UK firm’s failed biofuel dream wrecks lives of Tanzania villagers: The collapse of Sun Biofuels
has left hundreds of Tanzanians landless, jobless, and in despair for the future
http://www.guardian.co.uk/environment/2011/oct/30/africa-poor-west-biofuel-betrayal

Problems with biofuel and biomass have impacts (direct and indirect) on food security
The criticisms of biofuels touched on below all have implications for food production. As the International Assessment of Agricultural Knowledge Science and Technology for Development (IAASTD) says:

Climate change, which is taking place at a time of increasing demand for food, feed, fiber and fuel, has the potential to irreversibly damage the natural resource base on which agriculture depends. Climate change is affecting the distribution of plants, invasive species, pests and disease vectors and the geographic range and incidence of many human, animal and plant diseases is likely to increase. A comprehensive approach with an equitable regulatory framework, differentiated responsibilities and intermediate targets are required to reduce GHG emissions. The earlier and stronger the cuts in emissions, the quicker concentrations will approach stabilization.

Yet it is clear from the points below that biofuels actually cause an up-front spike in carbon emissions at exactly the time that we should be sharply reducing them. This means that the major justification for biofuels as renewable and sustainable sources of energy is flawed.

1. Claimed to be carbon neutral - but in making this claim:
   • emissions from collecting, processing and burning the biomass and
   • the impact of removing plants/trees/soils that would otherwise have absorbed carbon
   • plus the use of fossil fuel for harvesting and processing
   are NOT taken into account

2. Carbon debt
   Carbon emissions from land conversion to grow biomass may be higher than the emissions saved by using that biomass.

3. The time lag between burning biomass for energy before re-growth
   • when wood is burnt for energy it releases carbon emissions that take 35-50 years to be captured by the re-growth of the forest
   • yet we urgently need sharp and immediate emission cuts.

4. As this title says: "Large-scale bioenergy from additional harvest of forest biomass is neither sustainable nor greenhouse gas neutral": "We argue that such an increase in biomass harvest would result in younger forests, lower biomass pools, depleted soil nutrient stocks and a loss of other ecosystem functions." ERNST-DETLEF SCHULZE et al., 2012 Blackwell Publishing Ltd, GCB Bioenergy, doi: 10.1111/j.1757-1707.2012.01169.x

5. Limits to land available for further agricultural expansion:
   "current harvest affect up to 75% of the world’s ice- and desert-free land, depleting water supplies, and releasing large quantities of carbon into the air."

6. "Sustainable intensification" cited as the answer but....
   This approach is widely promoted and big yield increases promised without sold data to back up these claims: however yield increases have been flattening out in recent years, even with the use of chemical fertilisers, themselves a source of carbon emissions and a cause of other problems related to food security. For example:
“agro-chemicals (pesticides and fertilisers) can influence the biochemistry of crop plants, especially in repeated applications, interfering with protein synthesis. This may lead to increased levels of soluble substances, the building blocks of proteins and the genetic code, such as sugars and amino acids as well as nucleotides.

Such substances provide an accessible and abundant food source for the pests to build their own proteins, increasing their biotic potential, meaning that they live longer and begin to breed earlier, so producing more offspring. This may explain why the use of synthetic chemicals can sometimes be followed by an increase of pest attacks and the appearance of pests and diseases that were previously not troublesome.”

Such an increase in pests could be devastating for food production in the global south, especially in the context of climate change, which may also lead to increased pest attack.

7. Indirect land use change not currently included in biofuel calculations

This means if land in place A is planted with biofuels, any previous activity there is displaced to area B, eg: increased corn production for ethanol in the US has displaced soya production from the US to South America, where forest has been cleared: this is a serious problem but the discussion has now been postponed, for example, by the EC until 2014:

“But the commissioners have now agreed to postpone action until 2014, the last year of the mandate of the current Commission. Only then will they make their proposals to attach specific CO2 values to each type of biofuel – deferring any impact from new measures until 2016 at the earliest.” 22/9/2011


Thus, as noted above, using biomass actually causes an up-front spike in carbon emissions at exactly the time when we should be reducing emissions.

Invasive species

Recently a new report came out that reinforces the fact that the desired characteristics of biofuel plants – capacity to thrive with little water in degraded areas – is also characteristic of invasive species. It sets out the risks from a number of popular biofuel crops, including reed canarygrass, Napiergrass and giant reed. It notes the tremendous cost to the US economy from invasive plants alone – some US$34.5 billion. It also notes the serious impacts on biodiversity and ecosystems of invasive species.

The invasive potential of algae, which are often touted as a ‘solution’ for bioenergy, is considerable, as they are very fast growing and highly adaptable, yet it is often dismissed as negligible, with claims that they will not survive if they escape from bioenergy installations. However, we should remember that such claims are purely theoretical and cannot readily take adaptability into account. All living organisms have a vested interest in adapting in order to survive. In the case of algae, their spores could spread easily and rapidly over a large area and their adaptive capacity is also likely to be considerable.

Invasives may also be hosts for serious diseases, for example, the highly invasive vine kudzu is a host for Asian rust (phakopsora) which has in recent years become a serious problem for soy. Invasives compete with native plants for nutrients and water. They can rapidly create their own monocultures strangling and crowding out other plants (eg: kudzu)

Helena Paul, EcoNexus
30. Emmanuel Sulle, Independent Researcher, Tanzania

Dear Moderator,

I am pleased to read all highly impressive comments. I personally view that any debate or study about biofuels needs a pragmatic approach. Available literatures indicate that production of biofuels varies from one place to the other. This therefore, calls for a careful assessment of geographic characteristics, land availability, and labor migration patterns in areas/regions intended for biofuels production.32

Another aspect that needs an emphasis on biofuels production is the choice of feedstock and business model because all these have a significant effect on the ultimate success of any given project. There is a need to have strategic crop selections in different nations and localities. The current problem as pointed out in a number of studies is that nations just jump on feedstocks introduced by biofuels companies. A number of companies for instance in sub-Saharan Africa started to grow jatropha. Initially government supported this feedstock on the basis that it can grow in marginal land, and it is unlikely to lead to food competition. But, the reality is that in some areas jatropha plantations were allocated in the coastal forests. To-date a number of jatropha projects have failed either because of the 2008-2009 financial crisis or failure to carry out a thorough feasibility studies. Sustainable or inclusive business models as elaborated in a number of IIED/FAO33 studies need to be at the center of biofuels debates. Once implemented, these models are likely to improve participation of small-scale farmers, large scale operators and the regulatory authorities. The most critical part of biofuels development in developing is a lack of comprehensive policies, legal and institutional frameworks. All these issues have been identified in a number of studies since 2009, but, these countries have slow policy making processes. Therefore, the problem of land grabs is likely to persist even in the future because this is not only driven by foreign land seekers but also the local elites. So, even if the next study would suggest whatever measures to be undertaken, the desired outcome will depend on how fast most developing nations act to put in place required policy and legal tools.

Through established policy, legal and institutional framework, it is likely that nations can protect their populations from food insecurity. At this point, I should mention the successful ethanol production system in Brazil where sugarcane is used to produce either ethanol or sugar. With the built in technologies, Brazilian can increase the supply of either ethanol or sugarcane using the same facilities. Unfortunately, this may only be effective where there is good regulatory authority and established infrastructure and market.

31. Champak Ishram, India

Hello FSN participants

I felt this discussion on the biofuel issue is doubtful for the following three reasons.

1. There are alternative sources for energy but not for food. Therefore the land use for biofuel at the cost of food is not a compromising thing. If any agency of government

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32 Biofuels investments in Tanzania: policy options for sustainable business models: http://jed.sagepub.com/content/early/2012/04/30/1070496511435665.abstract

allocate budget for promoting biofuel in the country the government officials and other agencies including NGOs does it to show something and get money. The activities does little benefit and more harm for people but it benefit most for the people involved in the implementing agencies. HLPE is focusing more on food security issue of developing countries where food is critical problem. The members of the panel know the issue but putting on this discussion in developing countries. If they have not knowledge on this common sense problem they are not experts and got the job based on relationship with people who employed them. I think members of this forum are wasting time contributing on this undebatable issue.

2. The biofuel production is waste land and fence can be an option to use spare time of people and provide pocket money. But it make little sense to make meaningful income for living. I am very critical on this issue and consider the arguments are kids who have not made enough experience of society.

3. I doubt on whether the contribution of this FSN forum is considered in the report of HLPE. I request the moderator and management of FSN forum to check completed report of the HLPE whether previous contribution of the FSN has been acknowledged. Would you informed all members on this forum whether or not the HLPE acknowledged FSN contribution?

Thank you.
C. Ishram
Manipur

32. Luis Panichelli, Bioenergy and Energy Planning Research Group, Switzerland

The issue of biofuels and food security has been extensively treated, as demonstrated by some forum contributors and the large availability of scientific reports. Therefore, in a first step we may need to concentrate our efforts in those aspects that are still uncertain, that have been less treated and that may potentially play a major role in the debate. In order to move forward we need to address this issue constructing upon the state of the art if we want to come out with new insights for more robust policy recommendations.

In the scientific community, extensive modelling work has been performed regarding the impact of biofuels mandates on land-use change and commodity prices. While biofuel mandate policies have been extensively reviewed, less attention has been given to biofuel policies supporting the supply side such as subsidies and tax exemptions. In reality, what matters are not the biofuel production goals but the effective production of biofuels. In this case, addressing the effect of biofuel supporting policies, may give some light on developing plausible biofuels production scenarios.

Secondly, special attention should be given to the effect of additional accompanying policies that frame the biofuel supply chain in each case. For instance, extensive policy frameworks are already being developed to address biofuels sustainability. A comprehensive analysis of the effect of these policies, such as voluntary sustainability criteria may also be included to develop plausible scenarios of biofuel production patterns and its geographical distribution.

Some Forum contributors raised the issue of linking and addressing biofuel policies in the broader context of agricultural, energy and land-use policies. I am also convinced that the impacts of biofuels production have much more to do with agricultural and more crucially, land-use policies than with biofuel mandates and incentives. How can we produce feedstock for biofuels without threatening food security when most fundamental agricultural policies have already resulted in food insecurity?
33. Australia, sent through the Australian Embassy in Italy

The Australian Government recognises that global demand for biofuels, including fuel ethanol and biodiesel, is one of the many factors that may affect food security and food prices. In multilateral fora, Australia has been involved in developing options for how to better mitigate and manage the risks associated with the price volatility of food and other agriculture commodities, without distorting market behaviour, ultimately to protect the most vulnerable. Australia welcomes the planned HPLE science-based comparative literature analysis of the positive and negative effects of biofuels on food security as an input into the policy development process.

Australia supports a market-led diversification of its transport fuel mix and considers market forces as the optimum way to facilitate the uptake of alternative fuels such as biofuels. Australia considers that inflexible mandates for biofuels are policies contrary to creating an open trading environment and favours alternative product and market development measures, such as research, development and demonstration assistance to remove impediments for the entry of alternative energy sources into the market.

In relation to Australian agriculture, the government supports biofuels as an alternative income source for farmers; creating opportunities for farmers to grow and sell agricultural products (for example as rotational crops) for biofuel feedstocks. The sustainable development and use of biomass products has promising potential as an alternative, renewable energy source and there may be opportunities to build capacity of rural communities through development of regional energy facilities. Bioenergy resources and conversion technologies can also provide greenhouse gas emissions savings and reduce waste disposal issues.

The Australian Government recognises that advanced biofuels which are derived from agricultural and other waste and non-food crops (such as algae) which can be grown on marginal lands would assist in mitigating competition between food and fuel and is targeting investment in research, development and demonstration to support their development and commercialisation.

34. Jerome Bossuet, International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), India

Thank you for this interesting debate and contributions. I agree with Dominique Bordet [contribution n. 2] about the fact that questioning biofuel pros and cons should not be separate from a larger question of energy supply and demand societal choices. As Rio+20 will soon take place, a more sustainable world starts with fighting the wastages: wasting food, energy, etc.. and questioning lifestyles and inequity of resources access.

As mentioned, it is important to consider biofuel in a life cycle analysis, considering not only direct and indirect GHG emissions (eg use of fossil fuel-based fertilizer) but also the water footprint, land use etc. to assess a true impact on food security and environment, not to forget the social impact of any large-scale projects. As Rio+20 will soon take place, any agriculture/energy/land/natural resource policies should consider the sustainability and integration aspects as the general and compulsory framework.
For point 2 – multiuse crops / use of biomass else than grains, I would like to mention that ICRISAT, through the Biopower initiative is exploring since 2007 the potential of biofuel production from sweet sorghum by-products to give to smallholder farmers in addition to grains, other income opportunities from stover. And avoid competition for food production. **Multiuse trait selection** (eg quality of stover for biofuel production) is now part of the **crop breeding** programme. Improving the trait for “biofuel production” does not induce necessarily a reduction of grain yield as some varieties have both high yield and biofuel potential.

For Point 3 – we have to be careful about mobilization of marginal / degraded lands “not suitable for growing food” as it could be the way to greenwash large-scale biofuel production projects in developing countries where land management is not rigorous. As for agricultural production, if no adequate fertilization, degraded lands will not offer anyway a satisfying biofuel production from jatropha and other biofuel plantation. Environmental footprint and economic performance of such projects have to be carefully studied.

For point 5 – opportunities for smallholder farmers. With Biopower initiative, but also through the community watershed research programme, ICRISAT is exploring this question in India especially along with the environment and economic impact.

**Read for instance the** recent paper about the trade-offs for soil and water management of Jatropha production on wastelands in Andhra Pradesh, India at the watershed scale. Non-commercial small-scale biofuel production is an interesting option to explore for rural communities to improve energy access and a decentralized approach may be economically and socially more interesting than a centralized approach. Not sure how energy policies are taking into account this alternative. Often planners are not considering a decentralized approach thinking it is less efficient. In many cases, especially if we take into account the true life cycle of energy production, it may be better to support decentralized / small-scale innovation.

A reminder about the importance of the energy poor for whom the question of biofuel may not have any sense because they do not have access to any motorization. A majority of world population rely on biomass – firewood in particular - for energy (half population have their meals cooked on open fire or traditional biomass cookstoves for instance) including a majority of smallholder farmers. For this population, improving efficiency of their biomass-based energy systems with for instance “greener” biomass cookstoves may however be a most straightforward strategy to improve their energy situation than pushing for biofuel innovations. And it has food security consequences, eg less biomass consumption = less pressure on forestry resources – better soil conservation = less time for firewood collection.

Jerome Bossuet

Communications specialist
International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) [www.icrisat.org](http://www.icrisat.org)
Hyderabad, Andhra Pradesh, India

**35. European Commission, sent through the European Union Delegation to the Holy See, the Order of Malta and the United Nations Organisations in Rome**

The European Commission welcomes the e-consultation launched by the HLPE and would like to share with you the following comments:

On the whole, the proposed questions are pertinent and fairly well formulated.

The scoping paper is focusing on risks without a proper focus to opportunities; it should be changed and an integrated approach for the analysis of interrelation of several sectors of
relevance should be analysed having impact to food security, including the developments in a
general commodities markets and their share in increased pressure on natural resources
(cotton, flavours, cosmetics etc.), level of investment and research in agricultural market etc. as
it was used in the European Development report.

All four dimensions of food security should be assessed, not only limited to access; it is
particularly valid for importer countries of both: oil and food.

The role of biofuels in stabilising the agricultural output and stabilising the oil prices, which is a
-crucial issue for agricultural production at the input side, particularly at time of high oil price (as
it was the case in many countries during the very recent energy crisis, see the example of
June 2011, also available at this link: http://www-
wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2011/06/02/000158349_20110602
161941/Rendered/PDF/WPS5673.pdf

The prominent role of co-products of biofuels production has to be respected in the document,
particularly as regards the co-products use for protein rich feed in the World with increasing
meat demand - the largest user of land and water resources (only 20% of soybean is used for oil,
the rest goes for feed).

Some questions could be further developed:

- Question 2/ the risk of weakening the return of organic matter to the soil must be
  assessed not only with current practices but also under different scenarios of possible
  changes in cropping systems. For instance, one way to extract biomass while not
  competing with return to organic matter would be to use plants with more biomass for
  the same yield (i.e. plants with a lower Harvest Index: such plants exist as breeders have
  for a long time selected germplasm for high HI, not low HI), but producing more biomass
  sustainably could mean more fertilisers and more energy costs, so raising a question of
  profitability and overall balance in energy output/energy inputs...

- Question 5/ and/or question 6/ could give more emphasis to the possible impacts of
  biofuels policies on social differentiation between producers, at the national and
  international level (as is true for most innovations, bioenergy crops may to benefit more
  to farmers who are able to take a risk, and those are generally more well off producers)

- Question 8/ needs to tackle the more global question whether public policies can or
  cannot successfully "target" a specific type of biofuels (2nd generation as opposed to 1rst
  generation; locally produced as opposed to internationally traded; from fallow lands
  instead of cultivated land...). Some may argue that such targeting is impossible (or too
  costly to monitor). Some countries have tried to have such targeted public policies on
  biofuels, for instance Brazil to favour biodiesel from smallholders but without much
  success...

Some domains are not sufficiently covered and could justify additional questions:

- Beyond establishing the existence of trade-offs between the positive and the negative
  sides of biofuels development (and beyond trying to reduce the negative impacts), the
  study could help identify how to adequately "contain" these trade-offs, especially
  through public policies (for instance through social transfer)

- The impact of biofuel development on food security should take into consideration other
  factors like climate change, impact of instability of financial markets and speculations,
lack of investments and research in agricultural sector, growing consumption of other commodities, etc. and be compared (at least in order of magnitude) to the impact on FS of other public policies, like trade distortions or decoupled farm subsidies...

- The feasibility to develop biofuel from value chains based only on crop/food wastes should be studied (profitability, potential quantities, how to manage fluctuation in losses between years...)

European Union Delegation
to the Holy See, the Order of Malta and
the United Nations Organisations in Rome

36. Save the Children, UK

1. Save the Children UK (SCUK) welcomes the Global Forum on Food Security's commitment to "conduct a science-based comparative literature analysis, taking into consideration the work produced by the FAO and Global Bioenergy Partnership (GBEP), of the positive and negative effects of biofuels on food security".

2. The International Energy Agency projections suggest that biofuel demand could increase 15 times by 2050 – driven, in part, by biofuel mandates and subsidies.34

3. Bio fuels present significant economic opportunities for some developing countries and could, in some cases, increase energy security, fossil fuel dependence and CO2 emissions. However, a balance between economic opportunities, environmental protection, and the effects on food security and nutrition are required to ensure that progress towards the Millennium Development Goals are not undermined.

4. SCUK shares the high level panel's concern that biofuel policies may place upward pressures on food prices.35 We also share the concern that demand for biofuels has triggered large scale investments at the expense of food production, in some places associated with land acquisitions.36

The effects of high and volatile food prices

5. High and volatile food prices are a key detrimental factor for Newborn and Child Survival. As food prices rise, so do malnutrition rates in children. We estimated that rising food prices in 2011 put the lives of 400,000 children at risk. With the effects of climate change, growing populations and changing diets, food prices are expected to reach record highs in 2012 putting even more children at risk. Global food prices increased by 8 percent from December 2011 to March 2012.

6. Higher food prices have increased undernourishment and raised the poverty headcount, as well as putting children's right to food in jeopardy. As a result, progress towards MDGs closely linked to food and nutrition is lagging, particularly child mortality (MDG 4) and maternal mortality (MDG 5), with 105 countries of the 144 monitored not expected to reach MDG 4, and 94 off track on MDG 5. The food price spike of 2007/08 is estimated to have raised the poverty headcount by 95.6 million, and that of 2010/11 by 36 million

people. Globally the estimated annual economic cost of child hunger and undernutrition to developing countries is between US$20 billion and $30 billion.37

7. The drivers of food price rises and volatility are numerous and complex. At the national level, lack of investment in agricultural inputs limits production while poor infrastructure restricts distribution and supply. Trade restrictions between neighbours, hoarding, civil unrest, high fuel transportation costs and bad weather conditions also play a significant role. Limited reserves undermine the ability of countries to respond to environmental and economic shocks, by releasing food onto the market. Weather played a role in both the 2007/8 and the 2010/11 price spikes by disrupting harvests.38 High oil prices increase food prices by raising transport and production costs.39

The Role of bio fuels in placing upward pressure on global food prices

8. In 2011 ten international organizations including the World Bank, International Monetary Fund (IMF), Food and Agriculture Organization (FAO), World Food Program (WFP), Organization for Economic Cooperation and Development (OECD) and World Trade Organization (WTO) presented a report to the G20 on food price volatility.40 This report suggested that "projections encompass a broad range of possible effects but all suggest that biofuel production will exert considerable upward pressure on (food) prices in the future.

9. The evidence suggests that Biofuels raise global food prices in the long-run by:
   a. diverting agricultural commodities from food and feed into fuel production and competing with food production for land.
   b. rendering agricultural commodities substitutable with petroleum products, biofuel policies facilitate price transmission from energy to food markets: a high oil price incentivizes consumers to switch to biofuels as an alternative, increasing demand for the feedstock and pushing up food prices.41
   c. increasing volatility through driving down stock-to-use ratios limiting the ability of market participants to build stocks when prices are low and release them when prices are high to make a profit increasing the elasticity of demand and supply and dampening price movements. Price spikes in post-War cereal markets have always occurred when the ratio of stocks to use is low.42

To date, the transmission factors between global and local food prices and the effects of these upward pressures on local food security remain under-researched.

We recommend that the HPLE investigates these effects in detail and considers (a) the transmission factors between global and local food prices and (b) the impacts of biofuel production on local food markets to better understand the effects of global food price rises on food security.

We recommend that the HPLE also investigates mechanisms for using the economic potential for biofuel production to leverage resources to support those facing food insecurity as a result of food

41. http://www.agri-outlook.org/pages/0,2987,en_36774715_36775671_1_1_1_1_1,00.html

Global Forum on Food Security and Nutrition
http://km.fao.org/fsn
price rises. A global reinsurance mechanism to support government social protection policies is one such mechanism which could be tested.

The effects of large scale land acquisitions

10. Competition for productive agricultural land is likely to pose significant challenges for food security. Globally, 1.5 billion people and 42 percent of the very poor live on degraded lands. The availability of productive land in Africa per person for agriculture is decreasing dramatically. In 1950 an African had an average of 13.5 hectares of productive land. In 2050 an African is likely to have only 1.5 hectares.

11. The World Bank estimates that demand for food will rise by 50 percent by 2030, as a result of growing world population, rising affluence, and the shift to Western dietary preferences by a larger middle class.

12. The UK Foresight Report suggests that food production may have to increase by about 70 per cent to meet the demands of a growing population. However, the area of land given over to agriculture may have to remain static, or even decrease as a result of soil degradation and climate change.

13. There is potential for biofuel production on marginal land. However, SCJUK shares the IEAs concern regarding reliable data concerning unused land is a major problem: “[it is] difficult to identity “unused” land, since reliable field data is lacking on current land-use through smallholders and rural communities. Complex land tenure structures and lack of infrastructure in rural areas are additional challenges for the expansion of biofuels production in many African countries.”

14. Existing evidence on the role which large scale land acquisitions driven by biofuel demand suggest that the impact is significant. Yet the documentation of these land acquisitions and the kinds of governance which improve the food security outcomes of landuse policies and in the face of biofuel demand remain under-researched.

15. The International Land Coalition, recently published data on 'Land Grabs' in developing nations between 2000 and 2010. Their research suggested that 71 million hectares had been acquired, of which at least 37 million was for biofuel production.

The HLPE should investigate the amount of land given over to biofuel production, particularly in food insecure regions and recommend the investment in credible monitoring mechanisms for data collation.

The HPLC should consider policy mechanisms which incentivise the development of biofuels on marginal land and evaluate the effectiveness of current 'best practice' in the industry, such as sustainability clauses.

Are investments in biofuels and the biofuel production chains benefiting upstream agriculture?

16. Biofuels present significant income generating potential for farmers, yet it is unclear how these benefits are shared with small holders, and those most vulnerable to food insecurity. Food price rises can in some cases increase the food security of some producers by increasing income and therefore ability to purchase nutritious food.

17. Here land tenure is crucial as those vulnerable to food insecurity are least likely to have access to secure land tenure.

*We welcome the suggested focus of the HPLE on the upstream effects of biofuel production chains. This should focus on the pathways through which those who are food insecure derive a nutritious diet. The effects of biofuel production on these pathways should be tested. Here Save the Children’s Household Economic Survey and Cost of Diet Data may be instructive.*

*The HLPE should investigate the policy and governance frameworks which enable responsible land investment for biofuel production.*

**Can new technologies overcome the food security and resource issues?**

18. SCUK is supportive of the investigation onto new technologies for food security. The challenges identified above with regard to competition and pressure for land will depend on (a) yield (b) the development of crops that can be used for both biofuel production and food production, and the development of crops that can be grown on marginal land.

19. We are however mindful of the IAASTD conclusions which suggested that investing in women and smallholder-based low-input 'sustainable agriculture' approaches is highly productive and has significant spinoff benefits for those facing food insecurity.46 Investment in biotechnology should not be made at the expense of such investment in smallholders.

37. Argentina, sent through the Directorate of Multilateral Economic Negotiations of the Ministry of Foreign Affairs and Worship

[Original contribution in Spanish]

La Argentina considera de relevancia el estudio en cuestión y quisiera destacar los siguientes comentarios al respecto, los cuales esperamos sean tenidos en cuenta a la hora de diseñar e implementar el estudio propuesto:

- En primer lugar quisiéramos destacar que sugerimos profundizar en los siguientes aspectos, con los cuales coincidimos plenamente: “..los biocombustibles contribuyen al desarrollo agrícola y rural, generando oportunidades de empleo en los sectores asociados, es decir, agricultura, industria, infraestructura e investigación. Para los países importadores de petróleo, constituyen un medio para reducir su factura de importación del mismo. Para los principales países productores de biocombustibles, suponen nuevas inversiones y oportunidades comerciales junto al desarrollo de mercados internacionales. A menudo también se considera a los biocombustibles como una forma de contribuir a mitigar el cambio climático mediante la reducción de las emisiones de gases de efecto invernadero del transporte, generando menos contaminantes atmosféricos a nivel local...”.

- En segundo lugar, sugerimos rever la afirmación respecto de que existe una “elevada” utilización directa e indirecta de energía en el riego y en el transporte para la producción de biocombustibles de primera generación.

En este sentido quisiéramos destacar la importancia del clima así como de la localización y el tipo de transporte utilizado. En el caso de Argentina, por ejemplo, la producción se encuentra cercana al puerto y es trasladada a través de tuberías. A su vez, debido a factores climáticos, el riego no es una práctica que se encuentre ampliamente difundida para los

cultivos más utilizados en la producción de bio-combustibles dentro de la zona núcleo. Consecuentemente, en este caso en particular los factores de riego y transporte citados pueden no resultar en una "elevada" utilización de energía. Es por ello que recomendamos que el análisis tenga en cuenta la posible diversidad en la estructura productiva e infraestructura de transporte.

• Con respecto a la preocupación manifestada referida a la conversión al monocultivo, el aumento de la deforestación y la pérdida de biodiversidad, debe considerarse que no puede realizarse una relación causal entre la producción de bio-combustibles y estas. De hecho estos eventos pueden evitarse con buenas prácticas en la agricultura como ser la rotación de cultivos, la utilización de siembra directa o de sistemas mixtos, así como la implementación de un ordenamiento territorial.

• Respecto de la preocupación existente por el impacto que las políticas de bio-combustibles pudieran tener sobre la seguridad alimentaria, quisésemos destacar que dicho efecto debe ser analizado tanto en el corto como en el largo plazo. Para ello deberían evaluarse los potenciales incrementos en la productividad debido a shocks tecnológicos positivos resultantes del mejoramiento o la incorporación de nuevas tecnologías tanto en la agricultura como en el proceso de producción de bio-combustibles, estimulados por dichas políticas. A su vez, debieran considerarse los efectos de una matriz energética más diversificada en términos medio ambientales, sociales y económicos, como alternativa a un modo de producción basado en combustibles fósiles. En este sentido, cabe destacar los posibles efectos estabilizadores sobre los mercados energéticos que dicha diversificación pudiera generar, con los consecuentes efectos estabilizadores en variables macroeconómicas claves como la inflación.

• Referido a la preocupación planteada con respecto a la pérdidas de alimentos, cabe destacar que dichas pérdidas no son atribuibles a la producción de bio-combustibles. El único caso que pudiera considerarse es el de las pérdidas pos-cosecha en las cuales se obtiene como subproducto alimento balanceado. Sin embargo, en dicho caso las pérdidas son atribuibles a las cadenas de valor de la carne y no a los desperdicios de alimentos en sí mismos.

• Respecto a la pregunta del punto 4 ¿Bajo qué circunstancias y condiciones podrían desempeñar los biocombustibles un papel importante en el aumento de los ingresos agrícolas y la mejora del desarrollo agrícola?" quiséramos destacar que la instalación de biorrefinerías generan una serie de productos a partir de la biomasa (agro-energía, productos químicos y alimentos). Estos productos constituyen fuentes adicionales de ingresos, son una herramienta de diversificación productiva y dan valor agregado a las producciones primarias, contribuyendo así a alcanzar los objetivos de desarrollo que persigue la región.

• Por último quiséramos destacar que, para que los biocombustibles se constituyan cada vez más en una fuente alternativa de energía con consecuencias importantes para la competitividad global y la seguridad energética, es preciso el mejoramiento e incorporación de nuevas tecnologías, meta que será alcanzada con mayores niveles de inversión e incentivos a la producción e inversión en este tipo de energía.

38. Oxfam

Oxfam welcomes the opportunity the HLPE provides to comment on the proposed issues for its review of the biofuel policies as mandated by the CFS in October 2011. Biofuel policies are indeed a critical factor to the achievement of Food Security, and we hope the HLPE report will contribute to eventually facilitate the policy debate around it at the CFS session in 2013.

Some general comments:

• Oxfam believes that it is crucial that the study clarifies the framework of its assessment. This should refer – likewise the HLPE study on Social Protection – to the relevant human rights standards and obligations, including the Right to Food, the Voluntary Guidelines on the
Responsible Governance of Tenure of Land, Fisheries and Forests, the UN Women's Rights and other relevant UN Conventions. These should frame the required assessment to see how the current biofuels do affect these rights on the ground and are likely to affect them in the future.

- Oxfam believes that this analytical framework of the study should also consider the specific challenges to feed the world: the sustainable production challenge and its ecosystems impacts, the equity challenge and poverty eradication, and the resilience to climatic and price shocks challenge. Specific attention should be given to gender equity impacts (not just related to access to land, but evenly in the bioenergy production, access to other productive resources, income, empowerment, ...).
- The primary focus of the study needs to be on the impacts of the current policies and practices. These would also help to better address potential or hypothetical evolution of biofuel production (often referred in the questions on what might be possible in a best case scenario). There is the need also to consider a worst case scenario (i.e. bioenergy planted on arable rather than degraded land, bioenergy production leaving parts of the plant as waste even when these can be used for food because it's cheaper not to bother, etc.).
- We believe it is important to distinguish biofuel production and consumption from household/community level, regional, national and international levels.
- The study should incorporate the opportunity costs related to the investments in biofuels to achieve food security. There is a need to compare investments in biofuels to alternative options to achieve food security, support rural employment, increase income, enhance sustainability, equity and resilience.
- The study should seek to address governance and accountability questions: how to ensure that policies deal with potential effects and are accountable to external or impacts? What are the challenges to enhance global governance?
- The proposed text seems to pre-empt certain conclusions by using expressions like “food-security biofuels” or by assuming presumed advantages of advanced biofuels and technological fixes. A realistic assessment of the commercial availability of such advanced biofuels should be part of the assessment.
- The proposal could already refer to a list of key reference documents. Oxfam is keen to provide some references.

Some specific comments:

- The study should incorporate the different impacts of Indirect Land Use Change, including those on GHG emissions, but also its social and food security impacts (ex. conversion of land for food to land for fuel production, impacts food prices, impacts on land rights, on migration)
- Building on the HLPE Study on Food Price Volatility, the study should provide an overview of the demand side of biofuels at local, national and international levels. This would help to differentiate global and local effects. Also attention should go to new emerging threats to food security given the potential expansion of the first generation biofuels market into air transport, heavy road transport and military procurement, as well as the use of biomass for electricity generation
- The report should also examine the available evidence of the impact of the biofuel and energy policies of the main biofuels production and consumption countries on food prices, food availability and natural resources needed to produce food (land and water) both at the global level and in a number of significant local markets in vulnerable countries. The blending targets put high pressure on the market to produce high volumes of bioenergy in a relatively short period of time, while food security policies require long term investments. Both short term and long term impacts should be looked at.
- The study will need to better distinguish different types of production models, e.g. smallscale vs outgrowing vs intercropping vs monoculture - not just in terms of whether small farmers can get involved, but in terms of the impact on food security and natural resource management.
When looking at food security issues, it is important not to focus just on prices as a proxy, but also do some analysis of impact on availability and nutritional quality of food, especially for those who rely on subsistence farming for their food security. In many areas, subsistence farming can be essential for local food security, employment. The question « Can biofuels help to make a transition from subsistence farming » seems odd.

When looking at prices, it is necessary to distinguish their impacts at local, major national/regional and international markets.

How are other land uses displaced when so-called marginal land, often communal land, is used for bioenergy production - including growing and collecting food, collecting water, fuel and building materials and grazing animals as well as for spiritual and cultural practices related to rites of passage.

Challenges and opportunities of future developments should be seen through their relevance for developing countries, eg. are capital intensive and less labor intensive technologies adequate and affordable for them?

39. Bjorn Marten, Geist, Sweden

Dear all,

There is a huge possibility to increase the bio fuel targets without violation of food security. To manage five basic insights need to be considered:

1) Biomass is fertilizer. Scaling up bio fuel production to global levels will never be sustainable without recycling of nutrients. The only bio fuel that can recycle nutrients in a sustainable way to farming land is biogas technology since the digester feed is just a loan. All nutrients will be recycled as bio manure including organic waste and source separated black water. Bio methane has the best energy balance and lowest GHG emissions of all bio fuels in a WTW perspective Monoculture Bio ethanol and biodiesel production will never be a sustainable alternative since it will create a demand for chemical fertilizer and chemical pesticides causing soil degradation and poisoning of water.

2) There is no marginalized land for exploitation of foreign investors. A majority of the populations in Africa are farmers and the land recently not used is spared to be a gift to their children so they can survive. It is also used as i.a. a pharmacy for gathering herbs for curing diseases.

3) Violation of human rights for reaching bio fuels targets with support from taxpayers in the North should never be accepted. Many contracts between farmers and land grabbers are now signed without giving the farmers the entire knowledge of what is written in the contract. They have also got the wrong information about the duration of the contracts. In one example the farmers had been told that the contract was for 5 years but in the contract it showed up to be 20 years. Those contracts should be cancelled immediately and the land should be returned to the local farmers. All companies involved should pay back all their subsidies to their donors.

Only in 2009 the arable land grabbed by foreign investors in Africa, summed up to 40 million hectares. The same figure for 1961 to 2007 was 1,8 million hectares. For comparison the total arable land area in Sweden is 2,5 million hectares.

4) Diet considerations
It is not relevant to discuss bio fuel targets without involving diet considerations, and especially meat production. A vegetarian can feed on 800 m2 arable land per year, a raw vegan on 300 m2.
and a meat eater needs 3200 m². Further on the water demand is up to 100 times higher for a
meat eater compared to a vegetarian.

Degradation of food by boiling and frying is a waste of energy and nutritious value. Enzymes are
all destroyed when heated above 40 °C. Food preparation energy demand is up to 50% of the
total energy demand when including everything from production to consumption.

Worldwide around 240 Mha are used for cattle raising. By changing the diet towards a vegan or
far more better a raw vegan diet, 200 Mha of arable land can easily be released for growing grass
or any crop chosen by the local farmer. Biodiesel and bio ethanol, are s closely linked to cattle
feed production through their by products, and will thus not be an option. Consumption of
animal products is the main reason for heart diseases, cancer and diabetes, and costs tax payers
billions of Euros every year. They are also the biggest contributor to the global warming

5) Increasing biomass demand for chemical industry
Another key issue closely related to the bio fuel potential is the increase in demand for bio
chemicals.
Energy and chemical will compete in the future for increasing their market shares.
The biodegradable plastic industry is growing fast so there is already a demand to optimize the
energy output from our biomass resources for production of food, fertilizer, vehicle fuel and raw
material for bio chemicals, without violation of human rights.

The only relevant alternative biofuel is bio methane which can be produced with organic small
scale farming. Monoculture production linked to biodiesel and bio ethanol - agrofuels, will
never contribute to mitigation of global warming. Here are some of the reasons:

- the albedo effect from jatropha plantages will cause a temperature increase
- long time release of carbon dioxide from biomass stored in the soil after clearing of land
- Linkage to cattle raising by cattle feed production

The outputs will instead be, violation of human rights, increase of food prices, degradation of
soil, food and water and increased global warming.

The only sustainable bio fuel that can be scaled up to global levels is bio methane since it’s just a
byproduct, the main product is bio manure and it has the potential to be a substitute for diesel
and gasoline up to 100%. Bio methane can also be used directly mixed with up to 10% hydrogen
or in fuel cells. Any crop can be used for making bio methane. Thermal gasification of biomass
for bio methane production
gives 3 times higher energy output than the third generation of bio ethanol. The bio methane
can be used as feedstock for production of Fisher Tropsch – diesel, the purest diesel fuel on the
market.

Bio methane can be produced by local farmers in rural areas and linked to metropolitan areas
with a gas pipe fishbone network. Upgrading plants and fuel filling plants for bio methane can be
built at node points along the fish bone structure. It can also be combined with a water pipe for
irrigation and/or wired connections for internet communication and digital TV, without
exposure of living beings to harmful micro wave radiation. By giving farmers possibility to grow
100% organic food and create self sufficiency on vehicle fuel, will create economic growth in
rural areas, paving the way for a necessary change of wave of migration back to rural areas. The
threats upon nature and humanity from wireless internet connections are many, and have been
neglected for many years. One of them is the correlation to declining bee populations worldwide

The following initiatives need to be taken immediately

Global Forum on Food Security and Nutrition
http://km.fao.org/fsn
Abandon all subsidies and targets for monoculture production of biodiesel and bio ethanol
Phase out all existing monoculture bio fuel projects
Raise the target for the only sustainable Bio fuel – bio methane to 20% before 2020 and 90% before 2030 on EU and global level.
Abandon all subsidies to animal production
Give the farmers an alternative to cattle raising by supporting the build up of a biogas infrastructure including construction of bio methane fishbone networks with water pipes and wired internet as an option
Implementation of a software lab for training s in strategic planning – Future Lab Solutions to give decision and policy makers appropriate information for taking true sustainable initiatives

Summarizing, the present bio fuel initiatives aiming at mitigation of global warming will have the opposite effect and at the same time violate human rights and create a new colonial era supported by military interests, oil companies and GMO, chemical fertilizer and chemical pesticide suppliers and unaware politicians and institutions. Time is ripe create awareness about sustainable alternatives and to get the biogas ball rolling.

Best Regards
Bjorn Marten, Sustainable system designer, Chairman Geist
www.geistsweden.eu

40. Stephen Thornhill, Agri-Food and Development Consultant, and University College Cork, Ireland

I have been researching the impact of biofuels on food security in recent years (Mozambique and Tanzania) and currently advising the Roundtable on Sustainable Biofuels on their Food Security Guidelines.

1a. Are biofuels compatible with food security concerns at different levels, global to local?

Biofuels can be compatible with food security at the local and global level. Biofuel investments can bring much needed employment to rural areas, improving the food security of employees and stimulating demand for food from local farmers, creating a multiplier effect in the locality. Farmers may also have the opportunity to sell feedstocks to biofuel operations as an additional income source.

Research in Mozambique and Tanzania showed that those households with biofuel employees were significantly more food secure than other households in the same locality, and they also showed the most improvements in food security. Outgrower farmers also benefitted in some areas, although the scale of their feedstock production was generally too small to make a significant impact on food security outcomes.

At the global level compatibility with food security would largely depend on the extent of any biofuel feedstock expansion and the type of feedstock used and co-products produced (see 3 below).

1b. What could be done to ensure their development does not go against (and even favours) food security?
The Roundtable on Sustainable Biofuels (RSB) has developed a certification process which incorporates food security within its sustainability criteria. Operators in food insecure areas must provide evidence that they have enhanced the food security of directly-affected stakeholders in their locality, and must also mitigate any negative impacts that their operation may have.

2. **What is the extent of the competition for biomass feedstock?**

Biofuels have largely generated increased local feedstock production to meet demand, whilst co-products from the feedstock processing have indirectly made additional food supplies available through increased animal feed. Where increased domestic production has not been able to keep pace with rising biofuel demand, or where domestic supplies have been switched from food to biofuel use (as in the EU), this has tended to generate increased imports from exporting countries, such as Indonesian palm oil into the EU.

In many developing countries fuelwood is the main energy source and this has created deforestation problems, increased acute respiratory disease caused by indoor smoke inhalation and increased hours spent collecting fuelwood, mainly by women and children. Bioenergy, such as biofuels or biogas, can provide cleaner energy for use in modified stoves, and as a fuel for irrigation and storage pumps and for machinery, such as generators and hand-held ploughs.

The use of cellulosic material from plants, such as straw and other residues, could reduce fodder supplies for animal feed and could reduce soil fertility, particularly in the rapidly-growing zero-till or conservation agriculture areas around the world which help to reduce greenhouse gas emissions and help crops to adapt to climate change.

3. **What is the extent of competition for land because of biofuels?**

There are various estimates of arable land availability, many of which suggest potential for a significant expansion from current cropland of up to 50% of current levels.

Various estimates suggest the potential for a significant expansion of global arable land of between 250 million to 800 million hectares from the current level of 1.6 billion hectares. The

47 The main biofuel feedstocks used are cereals, sugar cane and vegetable oils, such as rapeseed, soyabean and palm oil, and waste vegetable oil. Maize is the main cereal used, mostly in the US, where there are competing uses primarily for animal feed but also for high-fructose corn syrups and other foods and for exports. The rapid expansion in maize use for biofuel production has led to a rise in maize plantings, but the total US crop acreage has remained relatively constant since the wheat area has continued its long-term downward trend. Biofuel demand for maize has therefore been accommodated through an expansion in production to meet the new demand, with only limited impacts on animal feed and exports which have remained fairly constant, and more than offset by sales of the biofuel co-product distillers dried grains onto the animal feed market.

Brazil accounts for much of the sugar cane used, where operators have been switching between sugar and ethanol use since the 1970s, depending on the price relationship between sugar and ethanol.

The main biodiesel feedstock is rapeseed, mainly in the EU, as well as soybeans and palm oil. Biofuels are now the major market for EU-produced rapeseed, leading to larger imports of other vegetable oils, such as palm oil and sunflower seed to meet food and other demand (as rapeseed supplies are switched to biofuels). Note that oilseed processing co-products, such as rapeseed meal, remain a major feed source and waste vegetable oil is being increasingly used as a feedstock in the EU.

48 FAO State of Food Insecurity (SOFI) report – 2008, plus World Bank study by Fisher et al showed a range of 263 million to 453 million hectare available
required additional crop area to meet food needs by 2050 was recently estimated by FAO at 70 million hectares. However, other studies note that larger areas may be required to meet food needs in order to end food security and in the face of climate change impacts. Bio fuel feedstocks occupied about 40 million hectares in 2010, and on the basis of forecast trends and announced policies, this is expected to rise to 75 million by 2020 and 100 million hectares by 2030. If one assumes an additional 100 million hectares required to meet food needs and 60 million hectares to meet biofuels needs, the combined total of 160 million hectares would still be well within the minimum range of availability estimates. But caution is required regarding climate change impacts on food productivity and more research is required in this area.

Marginal lands might also be used for tree crops such as jatropha and croton and pongamia in order to produce oils for biofuel production. If such lands could be restored from a degraded condition through the planting of biofuel feedstocks and following conservation practices to reduce emissions, this would have additional benefits.

4. Are investments in biofuels and the biofuel production chains benefitting upstream agriculture?

There is some evidence that biofuel projects can help to promote increased food productivity in its locality, through technology transfer and input-sharing practices, such as the loan of machinery or bulk purchases of fertiliser. RSB requires biofuel operators to enhance food security in food insecure locations. It is in the interest of biofuel operations to help food productivity in its locality in order to ensure workers can afford sufficient food and maximise labour productivity.

5. Can biofuel production be compatible with smallholders?

There are many examples of successful outgrower systems involving sugar cane and other feedstocks. There is concern however that smallholders often have very small areas to devote to food production, so any diversion to biofuel feedstocks could reduce food security, unless the return from the sale of the biofuel feedstock outweighs the nutritional benefit of the replaced foodcrop. Also there is some evidence of biofuel feedstocks replacing vegetable plots which provide essential micronutrients in the household diet, and an increased crop failure risk associated with growing a new crop, as well as increase labour burdens on women and children.

6. Can a range of social issues be addressed where new plantations for feedstocks are established?

RSB incorporates all social issues within its sustainability certification system, including land rights.

7. Non-commercial small scale production

Local small-scale production of biofuel feedstocks, such as oil-bearing plants and trees for straight vegetable oil production, can provide essential energy for generating electricity, powering drip irrigation and food storage systems, fuel for machinery and transport to market, fuel for use in modified stoves, etc. The feedstock would generally replace expensive diesel or fuelwood collected from trees, which involves long hours lost to other productive activities and increased respiratory-related deaths and deforestation.

8. Is it possible to distinguish between first and second generation biofuels?

Biofuels from feedstocks with poor energy yields per acre of land should be discouraged, whilst those with a high energy balance and high greenhouse gas emission reductions, such as sugar
cane should be encouraged, taking into account other factors such as co-products produced and production systems employed (eg no-till or conservation agriculture techniques). Furthermore, any significant increase in the use of feedstocks which can be clearly linked to a rise in food prices should also be discouraged. Second generation biofuels have yet to prove commercial viability, but may have improved food security outcomes, providing the impacts on loss of food and ground cover (re soil emissions) are accounted for.

9. Can new technologies overcome the food security and resources issues?

Research should be conducted into the relative efficiency of all energy sources and related technology – eg solar, electric versus liquid fuel cars, etc – in order to assess the future direction for biofuels.

41. FAO’s Bioenergy and Food Security (BEFS) projects, Italy

The global demand for modern bioenergy, and especially liquid biofuels, is rapidly growing, driven mainly by climate change mitigation policies and increasing oil prices. This creates both opportunities and risks for developing countries. Modern bioenergy development, through its environmental and socio-economic impacts, may have positive or negative effects on the four dimensions of food security: availability; access; utilization; and stability.

On one hand, modern bioenergy development can boost both agricultural and rural development by raising agricultural productivity, with positive effects on food availability; by creating new employment and income-generating opportunities, with positive effects on food access; and by improving access to modern energy services in rural areas, with positive effects on food utilization. On the other hand, if not properly managed, modern bioenergy development can trigger a number of negative environmental and socio-economic impacts. If good practices are not implemented, modern bioenergy development can lead, for instance, to negative impacts on the productive capacity of land and on water availability and quality, with negative repercussions on food availability and stability.

Both the nature and magnitude of the impacts of modern bioenergy development on food security will depend on a number of factors, related mainly to the type of bioenergy considered, the way production is managed, and the environmental, socio-economic and policy context in which such development takes place. In particular, these factors include:

- the environmental and socio-economic characteristics of the specific country, area or group considered;
- the regional, national and local policy environment;
- the types of bioenergy, feedstocks and processing technologies;
- the types of agricultural and forestry management approaches, systems and practices adopted in bioenergy feedstock production;
- the scale and ownership of production, and
- the types of business models found along the bioenergy supply chain.

When assessing the impacts of modern bioenergy development on food security, an important aspect to consider is the time horizon of the assessment, which may affect quite significantly its outcome and the analysis and interpretation of its results.
The importance of some of the factors listed above and of the time horizon of the assessment is clear when considering, for instance, the impacts of bioenergy development on the prices of staple crops. The contribution of bioenergy to potential changes in the prices of staple crops will depend, among other things, on: the crops that are used as bioenergy feedstocks; the local availability and affordability of land, water, labour and agricultural inputs, and the domestic agricultural, energy and trade policies. Changes in the prices of staple crops may affect different types of countries and households differently in the short run. For instance, an increase in the price of these crops tends to have, on average, a positive impact on net-exporting countries and net-producing households, and a negative impact on net-importing countries and net-consuming households, in the short run. Beyond these immediate effects, however, behavioural responses by consumers, who may switch to cheaper crops/foods, may mitigate the negative welfare impacts on net-consuming households. In addition, in the longer-run, an increase in the price of main staple crops may trigger a supply response, which may reduce or even neutralize the impact of bioenergy on the prices of main staple crops.

Another important aspect concerns the scale(s) where the impacts of bioenergy production on food security may arise and/or be felt. Some of the impacts (both positive and negative) of bioenergy on food security may arise from – and be attributed to – specific bioenergy projects and operations. Most of these impacts will be localized in and around bioenergy production areas. Examples of these are the impacts on soil quality in bioenergy feedstock production areas. Other impacts of bioenergy on food security will be the result of the cumulative effects of the domestic bioenergy sector. These impacts, which may not be attributed to specific bioenergy projects and operations, will have macro level implications, some of which will have repercussions for local food security as well. Examples of these are the impacts of bioenergy on the prices of staple crops.

A third category entails the local-level impacts attributable to specific bioenergy projects and operations which may also trigger impacts at larger scales. For instance, each individual bioenergy project or operation may affect local water availability. In addition, the overall use of – and pressure on – water resources by all bioenergy projects and operations combined may compete with other water uses and affect water availability at larger scales (e.g. basin/watershed level), even if each individual bioenergy project and operation uses water efficiently.

Last, but not least, there is an important international dimension to the links between bioenergy and food security and to the impacts of the former on the latter. More precisely, food security in a country may affect (or be affected by) bioenergy production and use in other countries, for instance through changes in imports or exports of staple crops, which may contribute to variations in the international prices of these crops. Part of these variations may be transmitted to domestic markets, with repercussions for national food security.

1. Develop bioenergy policies and strategies aligned with the country’s environmental and development objectives and based on a robust information set, including a thorough

49 In addition to bioenergy, several other factors may affect the prices of main staple crops, including: demographic growth, income growth and associated dietary changes (demand side), adverse weather conditions (supply side), trade barriers and export restrictions, and speculation.
assessments of the bioenergy potential (e.g. land suitability and biofuel production costs), and an analysis of the environmental and socio-economic dimensions and implications of different bioenergy development pathways, with particular attention to the inclusion of smallholders.

The FAO Bioenergy and Food Security (BEFS) Analytical Framework and the associated tools can be used for such bioenergy potential assessments and for the related environmental and socio-economic analyses. Full BEFS analyses have been carried out so far in Peru, Tanzania and Thailand.

2. Identify, prevent and manage both environmental and socio-economic risks associated with modern bioenergy development, for instance by providing incentives for ‘good’ practices and disincentives for ‘bad’ practices.

FAO has compiled a set of good environmental and socio-economic practices in modern bioenergy production (e.g. to foster smallholder inclusion and local food security), and it has described a range of policy instruments that can be used to require or promote these good practices.

3. Appraise proposed bioenergy investments/projects through an assessment of the main environmental and socio-economic effects (both positive and negative) associated with such investments/projects.

The FAO BEFSCI Operator Level Food Security Assessment Tool can be used for such investments/projects appraisals.

4. Monitor, evaluate and respond to the environmental and socio-economic impacts of modern bioenergy development at both national and project levels.

FAO has developed an indicator that can be used to monitor the impacts of modern bioenergy on the price and supply of a national food basket (in the context of the Global Bioenergy Partnership – GBEP). In addition, it has described a range of policy responses.

For further information please feel free to contact the Bioenergy and Food Security project team: Andrea Rossi (andrea.rossi@fao.org) and Heiner Thofern (heiner.thofern@fao.org)

42. Jiwan Prava Lama, Department of Food Technology and Quality Control, Nepal

The production of liquid biofuels (bioethanol and biodiesel) surged in past decade. However, almost all commercial biofuel industries are producing first generation liquid biofuels (bioethanol from sugar and starchy food materials and biodiesel from edible fat and oil). These biofuels would be a serious threat for global food security in near future. Therefore, the second generation biofuel (from agricultural wastes, municipal wastes, non-edible fat and oil, fast-growing aquatic plants etc.) must be encouraged. This would lead to partial substitution of


globally depleting fossil fuel and at the same time improvement of productivity of agricultural sector.

Agriculture is the main occupation for around 67% of Nepalese people; still the nation is not self-sufficient in some agricultural commodities. The existing productivity of Nepalese agricultural sector is very low. Therefore, it became least attractive field for young generation. The low productivity is not only because of fewer yields of main agricultural products but also due to wastage of various agricultural byproducts. If the farmers could earn some money by selling corn cob and corn stover to biofuel industry, the corn grower would be motivated to produce more corn; same story will be repeated with other food crops. Therefore, second generation biofuel would not be a threat for food security rather it favour it. However, each nation must have a clear biofuel policy to recommend appropriate feedstock for second generation biofuel production. Utilization of the recommended feedstock for biofuel must improve food production at the same time. Such feedstock would vary from region to region within each country depending on the soil quality and availability of water, among others. Besides, the national policy must provide a mandatory guideline to leave the certain portion of non-edible part of plant in farm land to avoid degradation of soil quality in long term due to lack of organic matter in farm land. Moreover, the feedstock which does not simultaneously produce food materials (like switch gras) should not be allowed to grow in arable land for commercial biofuel production.

Production of biofuel to substitute petroleum products lead to flow of money from urban to rural area and industrial country to agricultural country. Therefore, small farmers and marginalized people will be benefited from biofuel industries due to utilization of agricultural wastes and creation of jobs in rural areas. The integrated bioprocessing industries are now focusing for the production of not only liquid biofuels but also a number of valuable chemicals, which are otherwise produced from petroleum raw materials. Substitution of petroleum derived plastics, organic acids, solvents, foam cushions and many other chemicals by bio-based materials would have significant impact to reduce our high dependency in petroleum as well as to mitigate climate change problem. Therefore, bio-based economy should be encouraged in the agricultural country like Nepal, where tremendous amount of biomass could be produced as byproduct. Thus, the investment for the research and development activities should be globally increased to make bio-refineries commercially viable.

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43. USA

General Comments

Although the assignment was given to the HLPE to focus on biofuels, the issue of energy from biomass needs to be considered more broadly. As several of the proposed questions make clear, bioenergy is not just liquid transportation fuels, but also the use of biomass for power generation and the village- and household-scale use of biomass for cooking and electrification. The terms need to be clarified throughout the document.

The task, as it is presented in the scope of work, is extensively elaborate and multidisciplinary, requiring expertise in Agricultural Economics, Environmental Sciences, Forestry, Microbiology, Biotechnology, Sociology, Engineering, Atmospheric Sciences and Climate Change, Agriculture, and International Trade, among others.
We suggest that the tasks presented at this time should be streamlined and prioritized to allow optimal use of the HLPE expertise and time. One focus area could be looking at ways to sustainably produce and use biofuels to enhance food and energy security for the world’s burgeoning population. The discussion should not be one of fuel versus food, but fuel and food produced sustainably together using the latest technology and innovation to increase yield efficiency and overall productivity so that we can feed the world, alleviate hunger, and provide access to modern energy services to the 1.3 billion people living in energy poverty.

**Specific Comments**

1. It would be preferable for the scoping exercise to identify themes and issues that would form the basis for the literature review and analysis rather than posing questions based on impressions and perceptions. It is entirely possible that there is not enough technical literature in order to unambiguously answer all of these questions.

2. As currently phrased, the outcome of this review will likely be typical of what has been done before. A more interesting approach would be to engage "food security" and "bioenergy" experts and come up with a novel integration that helps provide a plan forward for optimal co-production of food and fuel. For example, lack of energy access often is a driver of food insecurity. What are the actionable mechanisms by which energy from biomass can improve yields of food crops that in turn provide additional energy feedstocks, thereby creating a virtuous cycle in which additional biomass begets improved food security.

3. The questions are currently framed in a very value laden way, both for positive and negative impacts. The situation is more complex and we hope when moving from scoping to implementation of this study, that the study authors can do a thorough review that considers multiple sides of each question.

4. In the first paragraph, recommend revising the first sentence to read as follows: "Bioenergy holds a special place among renewable energy resources because it is the only source that can serve as a substitute for the three main outputs from a barrel of oil - power generation, transportation, and petrochemicals."

5. In general, if one is linking food security to food prices, then there is a need to define how food availability and accessibility are being evaluated. The GBEP "Price and supply of a national food basket" provides clear and technically sound ways to accomplish this need.

6. Is the study solely on transportation fuels or will it address more broadly the potential benefits and challenges of bioenergy broadly defined as energy from biomass, such as renewable cooking fuels and methane captured from anaerobic digestion? In the developing world, transportation biofuels are less relevant to the national needs and context. As such, focusing the study on transportation biofuels will not properly treat the potential food security benefits of energy from biomass for smallholders. The focus of this study appears to be on transportation biofuels. Consideration should be given to bioenergy broadly defined. The USG is approaching the use of biomass as a broader category of the bioeconomy. Biomass used for transportation fuels, biomass for heat and power, and biomass for biobased products. All uses of biomass should be considered.

7. Care must be taken when describing public policy support of biofuels. While having some similarities, the policies of the United States, the EU and Brazil differ in significant ways.

8. Care also must be taken in recognizing the distinction in public policies that "support biofuels" but also the linkage/interaction with agricultural and development policies. The EU, Brazil, and the United States have different agricultural and biofuels policies. Further there is a
significant difference between developed and developing economies and what the respective
governments are trying to achieve with policy intervention.

10. Question 2 asks if the production of biofuels (bioenergy) impoverishes soil. The question
should also ask whether byproducts of bioenergy generation, such as biochar, can contribute to
soil enrichment.

11. Question 6 implies that bioenergy production is a primary cause of concentration of
landholding for large-scale production. We think this is a false assumption. Land concentration
is driven by other factors, not by the dominance of any one crop. The appropriate response to
protection of smallholders is clarification of land tenure, diversification, and use of social safety
nets, not prohibition of production of a crop.

12. Question 7: This question is garbled and needs to be rewritten in any case, but it seems to
suggest that the development of industrial-scale bioenergy generation “will compete with
traditional biomass used for local household energy.” The question makes no sense. If the goal
is to produce energy for domestic consumption, local energy consumers will prefer whatever is
cheaper. Smallholder farmers who raise crops specifically for bioenergy production may suffer
in competition with industrial-scale production, but surely national policies should not favor
making energy costs higher for the sake of promoting small-scale production of bioenergy. It
would not be in the interest of energy security or food security.

44. KV Peter, World Noni Research Foundation, India

At a critical time of high petroleum energy cost making living difficult in all it's meanings, the
current HLPE report is an eye opener.
I await for the action plan.

K V Peter

45. Federal Ministry of Food, Agriculture and Consumer Protection, Germany

The Federal Ministry of Food, Agriculture and Consumer Protection welcomes the opportunity
to participate in the e-consultation-process on the design of a study on “biofuels and food
security”.

General Comments:

1. Considering the strong political controversy on the impact of biofuels on food security
we welcome the initiative of the CFS High Level Panel of Experts (HLPE) to conduct a
scientific study on this topic.

2. We believe in the potential of bio-mass as a contributor to renewable energy and as an
income source especially for small scale farmers and appreciate the aim of the CFS study
to explore this further. At the same time it is important to stress that in the case of
conflict clear priority should be given to food security.

3. The study should make full use use of the internal know-how and experience within FAO
and take into account ongoing related studies and projects, especially the one on
Bioenergy and Food Security (BEFS).
Answer to Specific Questions asked in the E-Consultation Paper:

1. What do we know about the extent of current and forecasted biofuel policies, and what is the current state and the prospects for the production, technologies and use of liquid biofuels in the world?55 How do this compare to agricultural production and food demand?

The Federal Ministry of Agriculture (BMELV) sees a rather clear picture on current policies which are reviewed in a high number of publications. More uncertainties remain about the prospects with a broad spectrum of scenarios and forecasts for biofuels, agricultural production and food demand.

There are insights from the IEA Technology Roadmap Biofuels for Transport 2011, lately published by the IEA secretariat. This roadmap identifies technology goals and defines key actions that governments and other stakeholders must undertake to expand the sustainable production and use of bioenergy. It summarises major barriers, opportunities, and policy measures for policy makers, industry and financial partners to accelerate efforts for sustainable biofuel technologies and ensure sustainable feedstock provision on both a national and international scale:

2. What is the extent of the competition for biomass feedstock: food versus feed versus traditional bioenergy like fuelwood, versus bioenergy and biofuels in different parts of the world, in local and international markets? If biofuels are produced by other parts of the plant than the grain, which would otherwise go to soil, does the production of biofuels pose a risk in weakening the return of organic matter from the plant to the soil, therefore posing a risk to longer term food security?

The Federal Ministry of Agriculture (BMELV) estimates the specific competition a matter of individual commodity, country and region and sees the need for case by case assessment.

Germany is involved into the international work of the Global Bioenergy Partnership (GBEP) which promotes a global high-level policy dialogue on bioenergy and facilitates international cooperation. The GBEP Task Force on Sustainability, established in June 2008 has developed the report “The Global Bioenergy Partnership Sustainability Indicators for Bioenergy”. The 24 sustainability indicators for bioenergy and their methodology sheets presented in this report are intended to provide policy-makers and other stakeholders with a tool that can inform the development of national bioenergy policies and programmes, monitor the impact of these policies and programmes, as well as interpret and respond to the environmental, social and economic impacts of their bioenergy production and use.

Furthermore, it has to be mentioned that closing the cycles for nutrients and organic matter is a general challenge for agriculture and forestry and only in some cases specific to bioenergy. In Germany and the EU this is already addressed in legislation, e.g. the Common Agricultural Policy as well as the Renewable Energy Directive.

Further efforts are needed on sustainability standardisation and certification. BMELV expects further contributions by the work of GBEP (primarily for policy makers) and ISO 13065 “Sustainability criteria for bioenergy” (primarily for market actors).

3. Given the world’s limited arable land resources, what is the extent of the competition for land because of biofuel? Is there evidence for indirect effects on land-use change, even remotely, or biofuel policies, which could have an effect on food security? For countries with large land resources, like Russia for example, biofuel production can offer perspectives for diversification of

55 Some scenarios predict an increase in the share of biofuels in transport fuel from about 1.5 percent on average today to 8 percent in the developed countries and 6 percent in the developing countries in 2020. The corresponding shares in 2030 are respectively 12 percent and 8 percent.
the agricultural production and for job creation for farms which cannot rely on the production of high quality agricultural products. Is there a real prospect for the mobilization of marginal or degraded lands not suitable for growing food, and where biofuels feedstock, particularly of second generation, could be grown under sustainable practices? Could the use of abandoned agricultural land or extensively used grasslands cause relatively lower impacts than the use of other lands?

The land-use change in general an the specific impact of bioenergy crops is currently discussed on European level. The Commission is required to submit a report reviewing the impact of indirect land use change on greenhouse gas emissions and addressing ways to minimise that impact. In preparing its report, the Commission has launched a number of pieces of work in order to better understand the phenomenon of indirect land use change associated with biofuels and bioliquids and has admitted the lack of necessary scientific modeling to solve the issue of rain forest protection. Any additional land demand – for biofuels, food, feed, road or building construction, will have indirect effects. The challenge is to determine the causal relationship between biofuel policies and land use change. The effect of land use change on food security may be even more complex.

The IEA Report “Bioenergy, Land Use Change and Climate Change Mitigation” also addresses this issue. It states that changes in land use, principally those associated with deforestation and expansion of agricultural production for food, contribute about 15% of global emissions of GHG. There is evidence that less than 1% of global agricultural land is used for cultivating biofuel crops and land use change associated with bioenergy represents a very small percentage of overall changes in land use. The report shows that bioenergy production interacts with food and forestry production in complex ways. It can compete for land, water and other resources but can also strengthen conventional food and forestry production by offering new markets for biomass flows that earlier were considered waste products. Bioenergy demand can provide opportunities for cultivating new types of crops and integration of bioenergy production with food and forestry production in ways that improve overall resource management. It can also lead to over exploitation and degradation of resources.

Bioenergy development ultimately depends on the priority of bioenergy products versus other products obtained from land – notably food and conventional forest products – and on how much biomass can be mobilised in total from agriculture and forestry. This in turn depends on natural factors (e.g. climate, soils, and topography) and on agronomic and forestry practices employed to produce the biomass, as well as how society understands and prioritises nature conservation and soil/water/biodiversity protection and how the production systems are shaped to reflect these priorities.

Further reference can be made to the IPCC (Intergovernmental Panel on Climate Change) Special Report on Renewable Energy Sources and Climate Change Mitigation from 2011:

4. As the production of biofuels is linked to agriculture, are investments in biofuels and the biofuel production chains benefiting upstream agriculture? How are economic benefits shared along the biofuel production chain? Under which circumstances and conditions could biofuel play an important role in increasing farm income and enhancing agricultural development? What can be done so that the current development model for biofuels is turned profitable for farmers? Farmers have to get access to the market and to credit facilities for fertilizers and other agricultural inputs. Can effective and balanced partnerships between farmers and agro-industrial biofuel companies be found?

The Federal Ministry of Agriculture (BMELV) is very much dedicated to provide opportunities to rural areas and to give perspectives to the agricultural production chain in general. The individual measures of a country specific policy have to take into account a number of factors.
like technology, size of investment, ownership, market power of the different actors in the value chain. German policies strive to give priority to regionally adapted bioenergy solutions. Also within the sustainability certification, the German policy involves the whole production chain and takes into account special needs of smallholders.

In Germany, a tool for calculating the communal effects of renewable energies was developed and is available online: [http://www.kommunal-erneuerbar.de/de/kommunale-wertschoepfung/rechner.html](http://www.kommunal-erneuerbar.de/de/kommunale-wertschoepfung/rechner.html)

Some of the mentioned questions are not biofuel specific.

5. Can biofuel production be compatible with small-farming and smallholders, which form the majority of the agricultural systems in many parts of the world, and who are key to the wealth of livelihoods and food security? Income raising activities could in many cases improve the situation of the poor - like production of cane, sorghum, or other crops, whether for the food, fuel or feed, domestic or export markets. Is it possible to engage family farmers, smallholders, based on which adequate crops, into biofuels, with which effect on their own food security, on local food security and on global food security? How do the structure of the supply market and the sharing of the benefits from biofuels production determine the impacts on food security?

Since 2002, the Federal Ministry of Agriculture (BMELV) has supported several projects of the Food and Agriculture Organization of the United Nations (FAO) to eliminate hunger and malnutrition through a Bilateral Trust Fund (BTF). One set of projects (BEFS and BEFSCI) deals with bioenergy and food security and developed an analytical framework to give country-specific answers to the key regional questions and provide the governments with guidance as to how bioenergy production can be made socially and environmentally compatible.

In general, there are some important locally adapted solutions such as ethanol cookstoves; see: [http://www.cleanstarmozambique.com/](http://www.cleanstarmozambique.com/)

Reference is also made to the work of the Global Bioenergy Partnership (GBEP) and the 24 sustainability indicators, mentioned under 2.

6. By causing land concentration for plantation-type production, due to considerations of economy of scale, biofuels have been accused to cause evictions or marginalization of vulnerable groups and individuals, including women in the developing countries, particularly in Africa, and indigenous peoples and other groups with insecure land titles. Can a range of social issues be addressed, including poor working conditions for labourers and loss of land rights for indigenous peoples where new plantations for feedstock are established?

The example of palm oil, only 5% of the world-wide amounts used for bioenergy, shows the complexity of markets and that the plantation-type production is not biofuel specific. The evaluation methods have to take into account this broader perspective. Reference is also made to the above mentioned projects of the Food and Agriculture Organization of the United Nations (FAO) and the 24 sustainability indicators of the Global Bioenergy Partnership (GBEP), mentioned under 5. An ISO 13065 standard is under development.

Further key insights can be found in the Global Assessments and Guidelines for Sustainable Liquid Biofuels Production in Developing Countries from IFEU (Institute for Energy and Environmental Research), CI (Copernicus Institute), OEKO (Oeko-Institut - Institute for applied ecology): [http://www.unep.org/bioenergy/Portals/48107/doc/activities/GEF%20Liquid%20Biofuel%20Project.pdf](http://www.unep.org/bioenergy/Portals/48107/doc/activities/GEF%20Liquid%20Biofuel%20Project.pdf)

7. Non-commercial small scale production of first-generation biofuels in rural settings, e.g. for household purposes in tropical developing countries has been cited as an asset for rural development and access to energy in remote areas, avoiding expensive imports and difficult provision of fossil fuels? Aren’t at the contrary careful planning and comprehensive policies required as biomass feedstocks that will be used for industrial biofuels will compete with...
traditional biomass used for local household energy, important for rural populations in many developing countries?

As described under 4., the Federal Ministry of Agriculture (BMELV) is very much dedicated to provide opportunities to rural areas. According to German experience the biogas technology is very well fitting to rural settings and has bio potential also for developing countries.

8. Not all biofuel feedstocks are equal. Feedstock vary in the amount of energy yielded per acre of land; the amount of inputs needed such as fertilizer, pesticides and water for production; and the extent to which they compete with traditional agriculture for land. By all of these criteria, the second generation of biofuels (from high-yield ligno-cellulosic biomass such as perennial grasses and tree species) is expected to fare better than existing biofuels. The nitrogen fixing legumes, new oil crops like Camelina sativa (L.), Eruca sativa Mill. and others, GMO plants with reduced amount of lignin are promising feedstock in that regard. Is it possible, and on which basis, to distinguish the first and second generation of biofuels in terms of food security? To reach these goals, can more suitable crops, be grown, which ones, perennial versus annual, and how? What is the prospect to use biomass residues from agriculture, and forestry and also related waste, as a feedstock source as well?

As it is not sure that the global demand of biofuels influence the level of agricultural raw material prices in the long run in a more than moderate way, it is hard to say what kind of biofuel has better effects in terms of food security. Generally feedstocks for biofuels have to be chosen in a regional context to provide a efficient and sustainable production that includes supply of water.

The Federal Ministry of Agriculture (BMELV) strongly supports research and development projects on new biofuels. A main focus is on the use of residues from agriculture and forestry. At the same time, the reduction of overall energy consumption and improvement of energy efficiency remain major targets.

Knowledge about the specific food security impacts of certain new biofuels are not yet completely understood since these technologies have not yet entered the commercial markets. More important than questions of biofuel generations in this context is the question how biofuels are produced. Important will be a biofuel production in almost closed loops, including phosphor recycling. Biofuel production based on utilisation of the whole plant has to be compared with feedstocks that allow byproducts for feed.

9. Can new technologies overcome the food security and resource issues? Third generation biofuels, currently in the research and development (R&D) stage comprise integrated bio-refineries for producing biofuels, electricity generation and bioproducts (such as petrochemical replacements). In advanced technologies, like algae-based biodiesel or micro-organism based “solar-to-fuel” methods, the use of natural resources such as land and water are expected to be reduced resulting in lower concerns with on food security. What can we expect from these new technologies, in terms of price and production potential? As these technologies mature, how far are they from being commercially viable, and what kind of multidisciplinary research programmes are needed? What are the policy options for future commercial and R&D investment? Should we step up scientific research efforts, in which one of those technologies, as a way to overcome the current negative effects of large scale biofuel production? It is worthwhile to investigating multipurpose feedstock making use of the bio-refinery concept (Bio-based Economy)?

Currently, there are high expectations by the Federal Ministry of Agriculture (BMELV) regarding the concept of algae-based biofuels. In addition BMELV is promotion R&D projects that are aiming at synthetic biofuels made of agricultural residues e.g. straw. These efficient biofuels have the potential to reduce demands for land-use. Although, few knowledge is yet available to finally predict price, production potential and commercial viability for new biofuels. Considering
the time new developments need it is crucial to undertake serious R&D efforts now and continuously for the next decades.

Bio-refinery concepts seem to be promising. Products for chemical utilisation could generate prices that could compensate higher biofuel costs.

It has also to be taken into account that current energy scenarios until 2050 show a huge variation of energy and food demand, depending on population growth, food and feed habits, economic growth in developing countries, implementation of energy policies etc.

**Concluding note by Prof MS Swaminathan, HLPE Steering Committee Chairperson and Maryam Rahmanian, HLPE Steering Committee Vice-chairperson**

We would like to thank all participants to this lively consultation on the proposed scope and building blocks of the HLPE Study on Biofuels and Food Security.

As you know, the HLPE is the science-policy interface of the Committee of World Food Security. Very often science takes too much time to give an answer. The HLPE aims to organize a collective, evidence-based, response of science and research, directly from the knowledge holders, to urgent requests for policy making. The HLPE provides independent and comprehensive analysis and concrete recommendations and readily available solutions that serve as a starting point for debates in the CFS.

The HLPE takes great care to establish and follow a rigorous process, to ensure the reports are elaborated in a transparent, open and scientifically inclusive way, maintaining a very high scientific standard. In doing so, the HLPE aims to open the circles from which evidence is made available to various sources, including experiences from the ground, and to distil it into policy-relevant analysis and recommendations.

This is why, to feed into the work, the HLPE runs two open electronic consultations per report. We are glad these consultations are increasingly successful. This is quite significant and an invaluable input to our work. We would like to thank those of you that have taken time and effort to read our drafts, made comments and proposed inputs. We thank the FSN for their work in providing a platform to run these consultations.

The HLPE Steering Committee is now to carefully review all the comments received. The Project Team, to be appointed, will also be instructed to take them into account in the elaboration of the draft report, of which an advanced draft will also be proposed for open e-consultation later this year or in early 2013, for which we will also seek your views and inputs.

The HLPE thanks everyone again for the important contributions.

Best regards,

Prof MS Swaminathan, HLPE Steering Committee Chairperson  
Maryam Rahmanian, HLPE Steering Committee Vice-chairperson