

This response was submitted to the consultation held by the Nuffield Council on Bioethics on *New approaches to biofuels* between December 2009 and March 2010. The views expressed are solely those of the respondent(s) and not those of the Council.

Faculty of Science, University of East Anglia

**QUESTIONS ANSWERED:**

**Question 1**

**ANSWER:**

Positive

**Question 2**

**ANSWER:**

\* not to compromise food security \* Protect basic human rights viz a viz land use and slave labour etc

**Question 3**

**ANSWER:**

Yes, Academic - Microbiologist. Make technologies available globally

**Question 4**

**ANSWER:**

\* economic - is it cheaper than current sources? \* energy security \* GHG emissions \* Long-term sustainability of using fossil fuels

**Question 5**

**ANSWER:**

\* production of crops for biofuel can still result in GHG generation notably nitrous oxide \* need to understand the impact of cropping and nitrogen input into the soil on GHG production, i.e. understand more than just CO<sub>2</sub>

**Question 6**

**ANSWER:**

Solar energy. However the path - perhaps 30 years - to solar energy will require that we engage with biofuels en route but this may not be the final solution.

**Question 7**

**ANSWER:**

\* It might also displace jobs from food and farming \* More likely that non-biofuel approaches e.g. wind, water, nuclear will create

**Question 8**

**ANSWER:**

Unable to comment

**Question 9**

**ANSWER:**

unable to comment

#### **Question 10**

##### **ANSWER:**

unable to comment

#### **Question 11**

##### **ANSWER:**

unable to comment

#### **Question 12**

##### **ANSWER:**

unable to comment

#### **Question 13**

##### **ANSWER:**

A useful approach for considering land use problems related to biomass (food security in particular) is described in: Lovett, A A, G M Sünnerberg, G M Richter, A G Dailey, A B Riche and A Karp (2009), "Land Use Implications of Increased Biomass Production Identified by GIS-Based Sustainability and Yield Mapping for Miscanthus in England", *Bioenergy Research*, 2(1), pages 17-28. This use constraints mapping and GIS capability to examine yield and determine where planting might avoid problems. In terms of where problems might come from from biofuels – policy may well lead to the problems if not managed properly: “the Renewable Energy Directive (European Parliament and the Council of the European Union, 2009a) and Fuel Quality Directive (European Parliament and the Council of the European Union, 2009b) has placed strict obligations on all member states to achieve targets which are likely to have implications beyond their borders. The Fuel Quality Directive requires that GHG emissions from transport are reduced by at least 6% in all member states by 2020, whilst the Renewable Energy Directive requires that each member state shall ensure that the “share of energy from renewable sources in all forms of transport in 2020 is at least 10% of the final consumption of energy in transport in that Member State” (European Parliament and the Council of the European Union, 2009a, Article 3, paragraph 4). The significance of this target for non-EU countries should not be underestimated. As an example, the UK Biomass Strategy (Department for Environment, Food and Rural Affairs, 2007) has set a target of 5% of transport fuel coming from renewable sources by 2010 (with existing levels equivalent to just 0.5%). The implications for the UK and other EU countries are, thus, that they will need to import biofuels to meet their legislative obligations” extract from Gallardo and Bond (submitted to Environmental Impact Assessment Review March 2010) European Parliament and the Council of the European Union (2009a), "Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC", *Official Journal of the European Communities*, L140, 16-62. European Parliament and the Council of the European Union (2009b), "Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC", *Official Journal of the European Communities*, L140, 88-113. Gallardo, ALCF and Bond, AJ (submitted) Capturing the implications of land use change in Brazil through environmental assessment: time for a strategic approach? *Environmental Impact Assessment Review*.

#### **Question 14**

**ANSWER:**

Differences between the developed world and developing countries depends very much on the country concerned and inherent procedures for predicting implications. In the UK – spatial planning does not spread to agriculture and financial incentives (and in some cases regulations) are used to control what happens. That is, market forces prevail. In Brazil, Environmental Impact Assessment is applied to sugar cane planting, and areas planted are controlled by agri-environmental zoning (Gallardo and Bond, submitted). All countries will be different.

**Question 15****ANSWER:**

Unable to comment

**Question 16****ANSWER:**

This is big question. The Relu-biomass project examined this in England with respect to SRC and miscanthus planting Essentially a Sustainability Appraisal approach was employed to examine implications more holistically. Some would argue that it is inappropriate to examine environmental security in isolation from socio-economic issues. The approach has potential.

**Question 17****ANSWER:**

Biofuel could lead to food security issues. But approaches like that employed by Lovett et al. (2009) mean that they can be identified and managed.

**Question 18****ANSWER:**

As it stands, decision-making frameworks examining implications of land use change tend not to consider food security. Where environmental assessment is legislated – it covers specific issues detailed in legislation (that do not include food security). There is no difference here between developed and developing countries

**Question 19****ANSWER:**

Concerns have been raised by NGOs that European Policy will lead to expansion of sugar cane crops in Brazil and Palm oil in Indonesia and Malaysia in particular. Some of the concern related to potential human rights abuses – although I'm not clear on the direct evidence for this.

**Question 20****ANSWER:**

Unable to comment

**Question 21****ANSWER:**

unable to comment

**Question 22**

**ANSWER:**

Agri-environmental zoning used in Brazil looks promising as a means of better controlling planting.

**Question 23**

**ANSWER:**

Unable to ocmment

**Question 24**

**ANSWER:**

unable to comment