

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.

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QUESTIONS ANSWERED:

Question 1

ANSWER:

The investments and plantings suggest that yes, but most of society hasn't a clue on such issues

Question 2

ANSWER:

That they should not be used to keep the poor poor, as seems to be the economics of Jatropha and Castor, which are hand picked and require much labor - yet high prices are not paid. That agricultural or range land be turned to biofuels, nor fresh water used to irrigate such crops

Question 3

ANSWER:

Yes. From peer-reviewed and other literature as well as some first hand knowledge

Question 4

ANSWER:

The place they will play will depend on economics of feedstock usage and the rapidity of deployment of nuclear energy. There is a resource competition with food crops, despite the hype, both for land and for water (except with third generation crops such as marine algae cultivated on desert lands)

Question 5

ANSWER:

Only algae, cultivated using flue gases will have a major impact on GHG levels, and only if they do not emit N₂O.

Question 6

ANSWER:

Algae are the only ones that can make a truly major impact, due to their primary productivity and ability to use seawater, point source CO₂ emissions, and desert land. The algae, if cultivated correctly will not emit N₂O and will supply feed as well as fuel, alleviating the other major limiting resource on the planet.

Question 7

ANSWER:

Algae that supply feed and fuel. When successful will not require more land to be put under the plow to supply feed, and might even be sufficiently competitive with soy that land will be taken out of production. Intensive fisheries industries can be set up near algal farms to use the algal meal, providing industrial type jobs in developing countries.

Question 8

ANSWER:

Again, algae far surpass lignocellulosics, because the meal, equivalent weight for weight with fismaeal can be used as a livestock/fisheries feed.

Question 9

ANSWER:

Most of the species being tested for biofuels have not undergone thousands of years of domestication, as have most contemporary crops, and all lack critical traits. Breeding can only deal with genes that exist within a genome, and tissue specific silencing of genes very hard using breeding. Genetic engineering can easily add needed genes not in the genome, and can modulate gene expression in a tissue specific manner. Synthetic biology, as present practised (and not as promoted) seems to be little more than multi-gene genetic engineering.

Question 10

ANSWER:

There are often multiple patents on same pathways. Compulsory licensing with fair license fees would move everything forward much more quickly and grant fair value to those making new discoveries. There is a need to balance.

Question 11

ANSWER:

good robust varieties harvesting and downstream processing

Question 12

ANSWER:

genetic engineering with rapid regulatory clearance joint teams of gov't and academia, with industry present ex-officio

Question 13

ANSWER:

they surely are as most "underutilized" lands are utilized for other purposes, and except for deserts, there are few wastelands available. careful, and honest regulation. There already seem to be many dis-honest land grabs going on in developing countries.

Question 14

ANSWER:

level of corruption in govt in land allocation and population displacement.

Question 15

ANSWER:

using true, full (not partial) life cycle analyses

Question 16

ANSWER:

monoculture of crops bring new problems. If non-toxic varieties of castor and jatropha are developed, there will be problems of gene flow from the poisonous wild types. Engineer immunity to wild type. Algae,

because of the vast numbers in ponds, must be rendered unable to exist in natural ecosystems, because of environmental impact should ponds be breached. Engineer suppression or deletion of genes needed to exist in the wild, but not in intensive culture.

Question 17

ANSWER:

Yes -but - Detoxified jatropha and castor, as well as algae can provide animal feed as well as fuel.

Question 18

ANSWER:

The developed world has resources to deal with problems no matter what. Corruption, land grabs, peasant subjugation are clearly issues to be monitored in developing world.

Question 19

ANSWER:

seemingly only in the developing world where land ownership is not as well defined as in the developed world, and where corrupt officials can confiscate land. Monitor not just the crooked locals, but the crooked investors who bribe them. They typically come from the developed world.

Question 20

ANSWER:

noted above

Question 21

ANSWER:

Except for development of technologies - where public funding is justified - the rest should be private, based on real economics, not govt subsidies. If it cannot be done profitably, it should not be done. Capitalists should be capitalists, and not depend on welfare, which they call subsidies.

Question 22

ANSWER:

At present most funding agencies look only on the fuel aspect of R&D. Efficient ag has always been based on multi-products from a crop, and the fuel/feed duality should be supported.

Question 23

ANSWER:

support not the products, as is done in the USA but support the first version and all truly new versions of the developing technologies. The US system does support sufficiently support new innovations, and is more towards the status quo.

Question 24

ANSWER:

The possible terrorist use of the vast amounts of curcin and ricin that will be produced by Jatropha and castor, as well as worker safety in dealing with the vast amounts of powders generated .

