

Energy security vs. food security – comparing Brazil, Indonesia and Tanzania

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Abstract: While being at different stages in the development of a biofuels industry, the three states, Brazil, Indonesia and Tanzania, all have high ambitions regarding biofuel production. The article focuses in particular on the issue of land and land availability, based on the fact that dislocation from the land can involve human rights violations, and that land-use change is said to contribute to 18 per cent of global green house gas emissions. The article demonstrates that all three states face serious problems with regard to food security. The state with the best overall record on food security, Brazil, has particular challenges in complying with its obligations regarding indigenous peoples. Both Indonesia and Tanzania are faced with increased food and energy insecurity, even if Indonesia saw a reduction in its proportion of hungry people from the early 1990 to 2005. The most relevant legislation is reviewed, finding that the rights of local communities and indigenous peoples' to make demands on the investors is not properly ensured.

Key words: International Covenant on Economic, Social and Cultural Rights, biofuels, indigenous peoples, energy security, right to food,

1 Introduction

After some decades where little attention was paid to agriculture, the emphasis on agriculture is now seen among all development actors.¹ Moreover, within the broader area of agriculture, the focus is increasingly on biofuels.² This article focuses particularly on land issues. As both first generation and second generation biofuels

- 1 The World Bank's *World Development Report 2008* has the sub-title 'Agriculture for Development'.
- 2 FAO's *The State of Food and Agriculture 2008* has the sub-title: 'Biofuels: Prospects, Risks and Opportunities'. Observe, however, the figures given at p. 11 in the report, saying that currently 80 per cent of all biomass globally is used in households, 18 per cent is used in industry and only 2 per cent is used for transport.

will require land for its production, unless if waste or algae is the raw material, the article will not address 'agrofuels' (fuels made of food plants) specifically.

Not only developed countries are establishing ambitious goals for the use of biofuels in the transport sector. This article analyzes the strategies of three developing countries with regard to their own energy security, and how the national strategies for increased biofuel production take adequately into account the respective states' right to food obligations. Brazil and Indonesia are currently important actors in biofuels production,³ and are active in challenging any stricter certification requirements on biofuel production.⁴ Tanzania is in the process of developing a biofuels industry.

Two recent UN Special Rapporteurs on the right to food have expressed grave concerns over increased emphasis on agrofuel.⁵ While the former Special Rapporteur called for a five-year moratorium on all initiatives to develop biofuels through converting food into fuel,⁶ the current Special Rapporteur has called for international guidelines for the production of agrofuels, which "... should incorporate the requirements of human rights instruments."⁷ The concerns raised by the former Special Rapporteur are given under four headings: (i) Increasing food prices; (ii) Increased competition over land and forests, and increased evictions;⁸ (iii) employment and conditions of work; (iv) increasing prices and scarcity of water.⁹ To this list can be added the harmful effects of agrofuel plantations on peoples' rights over their natu-

3 See notes 17 and 19 below.

4 When faced with a proposal that 40 per cent of EU's goal of having a 10 per cent share of biofuels by 2020, and that 40 per cent of the biofuels should be 'non-food and feed-competing second-generation biofuels', this was criticized by Brazil, Malaysia and Indonesia; see EurActive 2008: 'EU faces pressure from overseas biofuel-makers' (19 September). The 40 per cent proposal was not included in the text adopted by the European Parliament adopted at first reading on 17 December 2008 (T6-0609/2008).

5 See A/62/289: *Report of the Special Rapporteur on the right to food* (2007) paragraphs 32-44 and A/HRC/9/23: *Report of the Special Rapporteur on the right to food* (2008), paragraphs 25-34.

6 Ibid, paragraph 64 (c).

7 Note 5 above, paragraph 32; see also the 2009 document *Large-scale land acquisitions and leases: A set of core principles and measures to address the human rights challenge*, containing 11 recommendations; see: <<http://www2.ohchr.org/english/issues/food/docs/BriefingNotelandgrab.pdf>>.

8 Note in this context that General Comment No. 7 *The right to adequate housing (art. 11.1 of the Covenant)*: *forced evictions* (UN Doc. E/1998/22, pp. 113-18) states in paragraph 1 that the right to adequate housing comprises: "... security of tenure which guarantees legal protection against forced eviction." Observe also the Universal Declaration of Human Rights Article 17.2 says: "No one shall be arbitrarily deprived of his property."

9 Note 5 above, paragraph 35-42.

ral wealth and resources and the enjoyment of their cultural rights. The emphasis of this article will be on the second concern, relating to land and forests.

The introductory part will outline the food and energy consumption and importation patterns in the three countries. Second, there is a presentation of land availability and the national strategies relating to utilization of land in the three states. This emphasis on land is justified because ownership and usage of land are the most pressing and contentious issues relating to biofuels. Moreover, there is a wide discrepancy in the estimates of how much land that is – and should be – available for biofuel production. Third, the article will proceed with an analysis of the relevant national legislation relating to land issues, and the corresponding institutional framework of the three states. Fourth, there is an analysis of the rights of indigenous peoples and local communities. Fifth, there is a review of developed countries' emerging requirements on biofuel producers relating to use of land. Sixth, there are some conclusions and general recommendations in order to identify the appropriate balance between energy security¹⁰ and food security.¹¹

The article seeks to identify whether the human rights obligations and national legislation, relating particularly to land issues, are taken adequately into account by the respective governments in their strategies for increased biofuel production for the domestic market.

2 Food and energy consumption and national biofuel strategies

Before presenting data on food and energy consumption and importation, a brief explanation for the human rights basis for the enjoyment of these two resources will be given.

The right to adequate food is recognized in Article 11.1 of the International Covenant on Economic, Social and Cultural Rights (ICESCR), in the context of the right to an adequate standard of living, and in Article 11.2 in the ICESCR as the right to be free from hunger, being the only human right which is termed 'fundamental'.

10 The International Energy Agency has this definition of energy security: "the uninterrupted physical availability at a price which is affordable, while respecting environment concerns"; <http://www.iea.org/Textbase/subjectqueries/keyresult.asp?KEYWORD_ID=4103>.

11 The 1996 World Food Summit adopted this definition in paragraph 1 of the Plan of Action: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

International human rights treaties, with one exception referring to electricity,¹² do not address energy. The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) recognizes in Article 14.2(h) the human right of rural women to "... enjoy adequate living conditions, particularly in relation to [...] electricity ..."

According to FAO's *State of the World's Food Insecurity 2008*, there has been an increase in the *number* of undernourished persons in both Tanzania and Indonesia, from 1990-92 to 2003-05.¹³ The *proportion* of undernourished persons has, however, decreased slightly in Indonesia in the same time period, from 19 per cent to 17 per cent, while it has increased in Tanzania from 28 per cent to 35 per cent. Brazil has seen a decrease from 10 per cent to 6 per cent in the same time period.

The proportion of stunting children, however, is even more appalling. In Tanzania, 50 per cent of the children are stunting, in Indonesia the proportion is 42 per cent and in Brazil 11 per cent.¹⁴ Among the three categories of developing countries in which these states find themselves (low, lower middle and upper middle) their share of child stunting is among the highest, with Tanzania having the second highest proportion of stunting children in the first category and Indonesia the fifth highest in the second category. In the third category (upper middle), there are seven countries with a higher proportion of child stunting and six countries with a lower proportion of child stunting than Brazil.

By comparing cereal importation and exportation, Brazil has reduced its net import (import minus export) of cereals from 2002 to 2007, while the two other countries increased their cereal importation.¹⁵

This clearly shows that there are food deficit problems in all three countries and – with the possible exception of Brazil – the situation for the most vulnerable is relatively more serious than for states on the same level of economic development.

Regarding energy consumption, it is hardly a surprise that there are considerable increases in all three states. Rather than studying energy consumption, the net im-

12 For arguments saying that access to electricity is a human right, see Tully, S. "Access to electricity as a human right", *Netherland's Quarterly of Human Rights* Vol. 24, No. 4, 2006, p. 557-87; and Tully, S. "The Human Right to Access Electricity", *The Electricity Journal*, Vol. 19, No. 3, 2006, p. 30-39.

13 FAO 2008: *State of the World's Food Insecurity 2008*, table 1, p. 48-50, shows that the following changes in the number of undernourished persons for the three states from 1990-92 to 2003-05: Brazil: 15,8 to 11,7 million; Indonesia: 34,5 to 37,1 million; Tanzania: 7,5 to 13,0 million

14 Ibid, table 2, 51-53.

15 See <<http://comtrade.un.org/pb/CountryPages.aspx?y=2007>> and 2005, tables 3 and 4, category 04. Brazil's cereal trade deficit was reduced from 1095,7 million USD to 151,8 USD; Indonesia deficit increased from 1194,6 million USD to 2045,8 million USD; Tanzania's deficit increased from 58,9 million USD to 176,2 USD.

portation of petroleum will be analyzed. There was almost a doubling of Brazil's net petroleum import from 2002 to 2007, a twelvefold increase in Indonesia's net imports, while the petroleum import bill of Tanzania increased ninefold in real prices over these six years.¹⁶ Currently, in Brazil petroleum import represents 15 per cent of total import, in Indonesia 29 per cent, and in Tanzania petroleum represents 30 per cent of all import. These figures reveal that there is a severe oil production decrease in Indonesia,¹⁷ while Tanzania has never been a major producer of petroleum.

What are the three states' respective strategies regarding biofuels? Brazil is currently the only country in the world where biofuels represent more than 50 percent of all fuel,¹⁸ and says that its production shall triple by 2020.¹⁹ From 1 July 2007, there is a 25 per cent mandatory blend of ethanol in fuel. The Biodiesel law of 2005 says that there shall be 5 per cent biodiesel to diesel in 2013. Also regarding overall energy production, Brazil's record is impressive, with a share of renewable energy of approximately 45 per cent.²⁰

Indonesia has launched a strategy saying that biofuels shall constitute 15 per cent of all fuels and 20 per cent of all diesel fuels by 2025.²¹ While the Indonesian go-

16 Ibid, category 33. Brazil increased its deficit from 2834,1 million USD to 5069,8 million USD; Indonesia went from a positive balance of 912,6 million USD to a deficit of 9351,1 million USD; and Tanzania increased its deficit from 196,7 million USD to 1764,8 million USD.

17 According to US Energy Information Administration, Indonesia, after having a relatively constant production of oil in the range between 1,4 million and 1,7 millions barrels of oil a day in the 1980s and 1990s, has seen a reduction to 1,043 barrels a day in 2007, while the oil production in Brazil has been more than doubled from 1997 to 2007; <<http://tonto.eia.doe.gov/country/index.cfm>>.

18 In 2007, the share of ethanol was above the share of petroleum; see: *Agência Brasil* 2008: ANP: consumo de álcool combustível é 50% maior em 2007 (15 July).

19 *O Globo* 2008: "Brazil is to triple ethanol production up to 2020, says Petrobras", press release 1 December 2008. The goal is to produce 70 billion liters of bioethanol a year. The 2007 global production was 50 billion litres; <<http://www.ethanolrfa.org/industry/statistics/#E>>, but according to the *Brazil Biofuels Ethanol Annual Report 2008*, 26,7 billion litres were produced in Brazil in 2008. The financial crises will, however, lead to reduced investments; see *Boston Globe* 2008: "Brazil's biofuel industry dries up. Economy stalls ethanol efforts" (23 November).

20 Global Bioenergy Partnership (GBEP) 2007: *A Review of the Current State of Bioenergy Development in G8 + 5 Countries*, GBEP Secretariat: Rome, p. 64. Hydroelectricity is said to represent 14,5 per cent and biomass 30,1 per cent. In US Energy Information Administration 2008: Country Analysis Brief, Brazil is said to have 35 per cent of its energy production from hydroelectricity; 8 per cent from ethanol and 2 per cent from other renewable sources; see: <<http://www.eia.doe.gov/cabs/Brazil/Full.html>>.

21 *Biofuel Indonesia* 2007: "Indonesia pushes ahead with biofuel development" (27 April). The objectives are to produce more than 10 billion litres of biodiesel and more than 6 billion

vernment has sought to reduce price subsidies on fuels, there was a quadrupling of fuels subsidies from 2005 to 2008.²² In 2009, there will be a subsidy on palm oil biofuels, as a result of the drop in oil prices, which have made palm oil biofuels more expensive than oil-based diesel.²³ Despite the high ambitions, Indonesia faced a decrease in biofuel production in 2008, compared with 2007.²⁴

Tanzania does not have a specific target or a comprehensive policy in place, awaiting the final report from the National Biofuel Task Force, and this absence of a policy is said to be "... the single most pressing problem facing the development of the sector."²⁵ In the Draft Biofuel Guidelines, an emphasis is on domestic consumption: "Biofuels producers should ensure that local market is of priority followed by export."²⁶ While lack of specific strategies can be interpreted as indecisiveness, there is no doubt that Tanzanian authorities are eager in principle to facilitate investments in biofuel production. A study finds that the Tanzanian government is "... evidently committed to fast-tracking agrofuel initiatives, and switching over vast areas of land to sugar cane, palm oil and jatropha."²⁷

Hence, it seems reasonable to conclude that all three states have high ambitions regarding both biofuel production *per se* and with an emphasis that the production shall be for the domestic market, and not only for export. The capacities of the three states regarding necessary infrastructure and institutions differ substantially, however, with Brazil and Tanzania being at each end of a specter.

litres of bioethanol by 2025. For two excellent analyses on Indonesia and biofuels, see Colbran, N. and A. Eide 2008: "Biofuels, the Environment and Food Security: The Global Problem Explored through a Case Study of Indonesia, in *Sustainable Development Law and Policy*, Vol IX, No 1, 4-11; and Friends of the Earth, LifeMosaic and Sawit Watch 2008: *Losing Ground: The human rights impacts of oil palm plantation expansion in Indonesia*; <<http://www.wrm.org uy/countries/Indonesia/losingground.pdf>>.

- 22 The Global Subsidies Initiative of the International Institute for Sustainable Development (IISD) 2008: *Biofuels – At What Cost? Government support for ethanol and biodiesel in Indonesia* (Geneva: IISD), p. 12.
- 23 PalmOil Headquarter 2009: 'Indonesia to subsidise palm oil biofuel' (30 January); <<http://www.palmoilhq.com/PalmOilNews/indonesia-to-subsidise-palm-oil-biofuel>>.
- 24 Indonesia Biofuels Annual Report 2008; <<http://www.thebioenergysite.com/articles/222/indonesia-biofuels-annual-report-2008>>.
- 25 FAO 2008, note 2 above, p. 84. The mandate of the National Biofuel Task Force was renewed for another two years in 2008, with funding coming from Sweden and Norway.
- 26 Sawe, E.N. 2008: "Bioenergy Policies in Tanzania", presentation at Compete International Workshop 'Bioenergy Policies for Sustainable Development in Africa', Bamako, 25 to 28 November 2008, p. 20; <<http://www.compete-bioafrica.net/events/events2/mali/Session1-5-Sawe-COMPETE-WS-Mali-2008.pdf>>.
- 27 African Biodiversity Network 2007: *AGROfuels in Africa – The impacts on land, food and forests Case Studies from Benin, Tanzania, Uganda and Zambia*, p. 14 [Tanzanian study written by Abdallah Mkindi].

3 Land availability and strategies for increased use of land

This section will analyze how the issue of land availability is addressed in the three states.

The highest estimates say that the three states have 'land with total rainfed production potential' of 5.822.000, 585.000 and 551.000 km² in Brazil, Indonesia and Tanzania, respectively.²⁸ This represents 69, 32 and 62 per cent, respectively, of these states' total land area, While the authorities of Brazil and Indonesia have not been found to refer to these figures, the figures are frequently referred to by both government representatives and NGOs in Tanzania.²⁹ Hence, a figure which FAO itself continues to present with qualifications, is widely reproduced – without such qualifications. As there is general agreement that land-use change represents 18 per cent of global greenhouse gas emission,³⁰ any expansive biofuel strategy claiming that there is huge areas of available land should be treated with utmost caution.

The Brazilian authorities, while not frequently referring to the very high estimate given in the 1995 FAO study, claims that there is no conflict between food and fuel, as there is "... enough land to produce both."³¹ While the authorities are not acknowledging the land scarcity and land conflicts that exists,³² Brazil has a substantial land potential, as illustrated by it being ranked as number 13 among all

28 FAO 1995: *World Agriculture: Towards 2010. An FAO Study*, pp. 464-66. On p. 151 FAO warns that this area. "... should not be considered as a reserve readily available for agricultural expansion." FAO 2008, note 2 above, p. 60 refers to the number on global land availability (20 million km²), on which these respective figures on land availability in each state is based, noting that this "... should be treated with considerable caution ..."

29 Tanzania Investment Center 2008: *Tanzania Investors Guide*, p. 2. The Guide also says: "Currently, 58,3 million hectares [583.000 km²] of land is available for development." A presentation by the Tanzanian ambassador to Germany during the 3rd German-African Energy Forum 23 to 25 April 2008 (on file with author) gives a number for 'arable land': 55 million ha (550.000 km²). E.N. Sawe, representing the NGO Tanzania Traditional Energy Development and Environment Organization (TaTEDO), also uses this number without qualifications.

30 World Bank 2008: *Global Monitoring Report 2008*, p. 219 identify 'land use change' to represent 18 per cent of the global emissions of greenhouse gasses, while 'power' represent 24 per cent of the global emissions of greenhouse gasses.

31 *Reuters* 2008: Brazil: biofuels threaten food production only in U.S (24 April).

32 MST 2007: 'Catholic Church Denounces Brazil's Agribusiness and Slavery' (Press Release 23 May). The World Organisation Against Torture 2008: *List of Issues arising from the Second Periodic Report of Brazil to the Committee on Economic, Social and Cultural Rights* emphasizes violence and land conflicts, and has one section devoted to biofuels; <<http://www2.ohchr.org/english/bodies/cescr/docs/info-ngos/OMCTBrazilwg40.pdf>> .

states regarding 'land resource potential and constraints'.³³ 10 per cent of the arable land of Brazil is currently under permanent crops, said to be 66.000 km²,³⁴ which indicates that there is a potential for agricultural expansion.

Indonesia is ranked lowest of the three countries in FAO's ranking of 'land resource potential and constraints', being number 81. Moreover, almost 2/3 of the so-called arable land in Indonesia is already defined as being 'under permanent crops', the latter representing 134.000 km².³⁵ An estimate on the expansion of area for biofuel plantation says that Indonesia has the potential to almost double the area used for palm oil, by adding more than 100.000 km² to the current area of 60.000 km² "... without damaging virgin forests."³⁶ As there are no guarantees that the areas defined as suitable for biofuels production actually will not include virgin forests,³⁷ this assurance is not too convincing.

Tanzania is ranked as number 64 regarding 'land resource potential and constraints', and has only 11.000 km² or 1,2 per cent of its territory as 'land under permanent crops'.³⁸ While FAO estimates Tanzania to have less than 5 per cent as arable land, the World Bank's World Development Indicators Database³⁹ says that 10 per cent of Tanzania's land is arable, representing 89.000 km². Both these figures are, however, much lower than the figures quoted by Tanzanian actors.⁴⁰ It is therefore reasonable to say that there is much uncertainty with regard to the total available land in Tanzania.

33 FAO 2000: *Land Resource Potential and Constraints at Regional and Country Levels*, World Soil Resources Report 90 (FAO, Land and Water Development Division: Rome), p 44-45 and 111-14. The country ranking is based on seven variables: potential arable land as a percentage of total land area, deserts and drylands, steepplands, land degradation severity, land presently cultivated (actual arable land) per capita, cultivated land as a percentage of potential arable land, and population increase (percent per year).

34 FAO Compendium of Food and Agriculture Indicators 2006; <http://www.fao.org/statistics/compendium_2006/list.asp>.

35 Ibid.

36 Reuters 2007: 'Indonesia palm oil sales seen up in 2008 – official' (24 September), interview with M.R. Chandran, adviser to the Roundtable on Sustainable Palm Oil.

37 In this context it should also be noted that the Roundtable on Sustainable Palm Oil's (RSPO) revised Principles & Criteria states under Criterion 5.1 only that "Environmental impact assessment should cover [...] Replanting or expansion of planting area [...] Clearing of remaining natural vegetation." Hence, the RSPO does not prohibit the clearing of virgin forests. See more on the draft EU Directive, note 74 below, addressing 'continuously forested areas' in Article 17.4(b).

38 Note 34 above.

39 The information is available at <www.worldbank.org/data/countrydata/countrydata.-html>; 'Data by Topic'; 'Agriculture'.

40 Notes 28 and 29 above.

It is clear from these figures that both Brazil and Tanzania have a potential for increased agricultural area, while the potential is more limited for Indonesia.

4 Laws relating to land use, in particular the ‘social function’ of land

The Constitution of Brazil contains several provisions addressing the distribution, ownership and use of land, based on the principle of the ‘social function’ of the land.⁴¹ Most notable, the ‘social functions’ principle is found in the provision on ‘Equality’;⁴² in the provision on the designation – in principle – of judges with exclusive jurisdiction for agrarian matters (‘Rural Propriety Deputies’);⁴³ in the provision outlining the economic order of Brazil;⁴⁴ in the provision recognizing expropriation for social interests;⁴⁵ and in the provision outlining the legal possibility to acquire ownership of the land, provided that there has been no opposition.⁴⁶ The principle of the social functions of the land is also included in the Land Statute as revised in 1988.

In 1995, the Constitution was amended so that foreign investors were subject to national treatment, but there is still a basis in the Constitution to give preferential

41 The following definition of social function is given in Article 186 of the Constitution: “The social function is met when the rural property complies simultaneously with, according to the criteria and standards prescribed by law, the following requirements: I – rational and adequate use; II – adequate use of available natural resources and preservation of the environment; III – compliance with the provisions that regulate labour relations; IV – exploitation that favours the well-being of the owners and labourers.”

42 Article 5.XXIII reads: “Ownership of property shall attend to its social function.”

43 Article 126.0 reads: “For resolving conflicts relating to rural property, the Court of Appeals designates special level judges with exclusive jurisdiction for agrarian matters.” According to the World Organisation Against Torture 2008, see note 45 above, p. 4, this provision has not been implemented.

44 Article 170.0.III says that one of the principles in the economic order shall be “the social function of property.”

45 Article 184.0 reads (extracts): “... expropriate for social interest, for purposes of agrarian reform, rural property which is not performing its social function.”

46 Article 191.0 reads: “The individual who, not being the owner or rural or urban property, holds as his own, for five years, without interruption or opposition, an area of land on the rural zone not exceeding fifty hectares and with his labor and that of his family makes the land productive and dwells thereon, shall acquire ownership of the land.” In accordance with Article 191.1, this applies only to private land, not public land.

treatment for small enterprises and companies.⁴⁷ Brazil can be considered to be investor-friendly to foreign investors.⁴⁸

Turning to Indonesia, the Indonesian Constitution is less specific regarding the social function of the land, and contains no definition or criteria to define the social functions of the land, unlike the Brazilian constitution. Indonesia's Constitution regulates land in most detail in Article 33.3 and 33.4, reading:

The land and the waters as well as the natural riches therein are to be controlled by the state to be exploited to the greatest benefit of the people. [...] The organization of the national economy shall be based on economic democracy that upholds the principles of solidarity, efficiency along with fairness, sustainability, keeping the environment in perspective, self-sufficiency, and that is concerned as well with balanced progress and with the unity of the national economy.

The phrase 'controlled by the state' has consequences for customary rights of indigenous peoples, which will be analyzed in the section below. This provision implies, moreover, that economic actors can only be given a temporary title, in the form, of a lease. In accordance with Article 22.1(a) of the 2007 Investment Act, this lease can be granted for 60 years with a possible 35 year extension. This lease has been interpreted to include the right to obtain, use or exploit water in an amount and manner determined and controlled by the government in accordance with license conditions.⁴⁹

Moreover, the Investment Act has a separate Chapter devoted to 'Enhancement of investments in micro, small and medium enterprises, and cooperatives' (Article 13). This is a means to promote the social functions of investments. Article 13.2 reads:

The Government must establish business sectors that are reserved for micro, small and medium enterprises and cooperatives, as well as business sectors that are open to large businesses on condition that they cooperate with micro, small and medium enterprises, and cooperatives.

This is an obligation on the Government. There is an explanation just after the paragraph saying that the special benefit to smaller enterprises and cooperatives is to

47 Article 170.0.IX says that one of the principles in the economic order shall be "preferential treatment for small enterprises organized under Brazilian laws and having their head-office and management in Brazil." Article 179 provides for 'differentiated legal treatment' of small and micro companies.

48 Brazil's National Immigration Council's has in Resolution 60/04 defined 50.000 USD (or less if the investor can prove that at least ten new jobs will be created over five years) as the minimum amount of invested capital for foreigners who want to obtain a 'permanent visa' (five years), provided that the investment is 'productive'; see: <http://www.brazilisf.org/-brazil_press2.htm>.

49 E-mail from Nicola Colbran 2 June 2009.

make them "... capable and equitable to other economic actors". There is no similar explanation on the 'cooperation condition' in the second part of the paragraph. Hence, it is not clear how the Government can actually ensure that this condition is respected.

Finally, *Law No.32/2004 on Regional Governance* determine that local government has the authority over nine land service functions, including dispute settlement and compensation for land used for development. The function relating to determination and resolution of collective land ('ulayat') will be analyzed, in the next section on indigenous peoples.⁵⁰

Neither in Tanzania is the social function of the land as explicitly formulated as in Brazil. The local administration of land is implicitly recognized in Article 146.1 of the Constitution, which reads (extracts): "*Local government authorities shall have the right and power to participate, and to involve the people, in the planning and implementation of development programmes ...*"

This provision must be understood in the context of the Village Land Act of 1999, which confirms in Article 3.1(b) "... that all land in Tanzania is public land vested in the President as trustee on behalf of all its citizens." The Village Land Act and the 1999 Land Act "... place 70-75 per cent of the agricultural land is in the hand of the villagers."⁵¹ Many villages are not sufficiently aware of how much land that actually belongs to the village, and ten years after the Village Land Act was adopted, very few villages have adopted a land use plan, and some village councils are not even aware of the Village Land Act.⁵²

The Village Land Act says in Article 3.1(f) that persons exercising powers under the Act are to "... ensure that land is used productively and that such use complies with the principles of sustainable development." The Land (Amendment) Act of 2004 is also relevant in the context of using land for biofuels production. The latter provides in Article 112.3 the conditions for persons or corporate bodies to obtain land for purposes of investment approved under the 1997 Investment Act.

The latter legislation provides for the establishment of the Tanzania Investment Centre (TIC), established for the purpose of facilitating all investments. Representatives from relevant ministries are physically present at TIC to coordinate, encourage,

50 An analysis of collectively held land is made in World Bank 2003: *Project Information Document: Land Management and Policy Development Project*, p. 3; <<http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2003/11/07/00009494603102404005320/Rendered/PDF/multi0page.pdf>>.

51 Mwamila, B. et al. 2009: *Feasibility of Large-Scale Production in Tanzania: Costs and Benefits of Large Bio Fuel Production in Tanzania*, p. 131.

52 Ibid, pp. 92-93, saying on p. 92 that only 150 villages have land use plans.

promote and facilitate investment.⁵³ Investors can, in accordance with the Investment Act and Article 112.3 of the Land (Amendment) Act, lease land for up to 99 years. The requirement is that a certificate of incentives and protection has been granted by TIC in accordance with Article 17 of the Investment Act.

One paragraph in the Investment Act is particularly interesting. Article 19.2 reads: “*For the purposes of creating a predictable investment climate, the benefits {...} shall not be amended or modified to the detriment of the investors enjoying those benefits.*” This must be interpreted to imply that a granted certificate gives legal rights which cannot be revoked.

Moreover, under the Investment Act, there are no ownership restrictions or performance requirements.⁵⁴ It must be questioned whether this understanding complies with the wording of Article 3.1(f) of the Village Land Act, saying that the land is to be used productively.⁵⁵ As soon as village land is transferred to the TIC it is no longer defined as village land. Therefore, when transferring village land to general land to be disposed of by TIC, the village needs to be properly involved, as provided by Article 146.1 of the Constitution (see above) and Article 4 of the Village Act, specifying the roles of the village councils and village assemblies in the transfer of land.

In summary, the ‘social function’ principle seems to be taken most explicitly into account in the Brazilian Constitution. We will now analyze how the three states seek to ensure the interests of communities which are vulnerable, depending on unimpeded access to forests.

5 Indigenous peoples and local communities’ access to resources

Indigenous peoples are generally considered as belonging to the international law category of ‘peoples’.⁵⁶ For other collectives, such as minorities, the human rights

53 Sitta, S. J. 2005: ‘*Investment for African Development: Making it happen*’, presentation at NEPAD/OECD Investment Initiative, Entebbe, 25-27 May 2005, p.7; <www.oecd.org/data-oecd/35/60/34974158.ppt> (Sitta is Executive Director of the TIC).

54 Ibid, p. 18.

55 East African Business Week 2009: ‘Tanzania: Biofuels Cause Land Scramble’ (7 February) tells about an ‘Asian business tycoon’ who bought 7,500 hectares of land in Mbeya province under the pretext of starting large-scale farming, but has rather leased the land for farming for a fee – without adding anything to the land.

56 See the ICESCR Article 1.2: “*In no case may a people be deprived of its own means of subsistence.*” See also ICESCR Article 25: “*Nothing in the present Covenant shall be interpreted as impairing the inherent right of all peoples to enjoy and utilize fully and freely their natural wealth and resources.*”

protection relating to control over natural resources is recognized as a means to upholding the culture of a minority.⁵⁷ In this section, the term 'local communities' is used to refer to communities independent of whether the community is constituted by a minority or not, acknowledging that minorities enjoy stronger human rights protection relating to their culture than local communities which do not constitute minorities.

Indigenous peoples and local communities are getting most of their food and their energy by harvesting and collecting. As indigenous peoples and local communities' dependency on the natural resources is substantial, any impact on their livelihood should be carefully understood and taken into account in any biofuel project.

Turning to the three states, Brazil's Constitution's most important provisions on indigenous peoples and land are Article 231 on Native Populations and Lands Article 216 on Cultural Heritage and Article 225 on Environmental Protection. These provisions are explicit and have strong legal guarantees, as expressed by Article 231.2 (extracts): "*lands traditionally occupied by Indians are intended for their permanent possession ...*"

Subsequent legislation on indigenous land, in particular Presidential Decree 1775 of 1996, allows for any non-indigenous actor to challenge any demarcation of indigenous lands.⁵⁸ The Decree has been criticized.⁵⁹ Hence, the principles contained in the Constitution are not appropriately reflected in the specific legislation. Moreover the land distribution of Brazil still is too skewed to be termed 'social'.

Regarding Indonesia, we saw above that Article 33.3 of its Constitution applies the phrase 'lands controlled by the state'. Read in light of other Indonesian law, this

See also the 1989 ILO Convention 169, Articles 6-8 and 13-19, and the 2007 Declaration on the Rights of Indigenous Peoples, Articles 8.2(b), 18, 19 and 26-29, as well as Salomon, M. and A. Sengupta 2003: *The Right to Development: Obligations of States and the Rights of Minorities and Indigenous Peoples*, p. 18-22 (Minorities Rights Group International), and report E/CN.4/Sub.2/2004/30 on 'Indigenous peoples' permanent sovereignty over natural resources'.

57 See the 1992 Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities Article 4.2. See also paragraph 7 of *General Comment No 23: The right of minorities (Art 27) CCPR/C/21/Rev.1/Add.5*.

58 The lack of progress in land demarcation was criticized by the Committee on Economic, Social and Cultural Rights in the 2009 Concluding Observations on Brazil; see paragraph 9 of document E/C.12/BRA/CO/2. For a study on demarcation, see Hutchison, M. et al. 2005: *Demarcation and Registration of Indigenous Lands in Brazil*; <<http://gge.unb.ca/Pubs/TR238.pdf>>.

59 Turner, T. 1996: Brazil's Giant Step Backward on Indigenous Rights. Report to the AAA Commission for Human Rights; <<http://www.aaanet.org/committees/cfhr/rptbrazil.htm>>.

provision implies that customary rights to land are only recognized if such rights are exercised 'consistent with national and State interests'.⁶⁰

Moreover, with regard to respect of customary rights, the Constitution has three relevant provisions. Article 18B.2 reads (extracts): "*The State shall recognize and respect, to be regulated by law, the homogeneity of societies with customary law along with their traditional rights ...*"⁶¹ Article 28I.3 reads: "*The cultural identities and rights of traditional communities are to be respected in conjunction with progressing times and civilization.*" In practice, however, as was seen above, such recognition and respect is subject to several conditions with regard to customary land rights.

Article 28 is the human rights provision of the Constitution, and Article 28H.4 reads: "*Each person has the right to own private property and such ownership shall not be appropriated arbitrarily by whomsoever.*" This right applies only to private persons, and there is no explicit recognition of collective ownership rights over land. Recognition of collective ownership ('hak ulayat') of land belonging to traditional communities ('adat') can be registered only as 'tenure', not as 'official title', and only the latter provides for actual property rights.⁶² As we saw above,⁶³ determination of what constitutes collective land rights ('hak ulayat') is under the authority of local governments.

Moreover, there are a diversity of land ownerships available in Indonesia, and there are different rights relating to the different ownerships. These rights include the right to use land, the right to build on land and the right to harvest from the land. Titled land is "estimated at three to five percent of total land area and is the only land which can be subject of a private property market system."⁶⁴ Regarding these titled areas, the World Bank acknowledges: "Private landowners are in a weak legal position in land assembly negotiations with the state institutions on behalf of

60 Law No 5/1960 on Agrarian Principles, Article 3. More recent legislation, such as Law No 41/1999 on Forestry and Law No 18/2004 on Plantations seemingly recognize customary rights, but in reality these rights are easily circumvented (see Sawit Watch et al. 2007: *Request for Consideration of the Situation of Indigenous Peoples in Kalimantan, Indonesia, under the United Nations Committee on the Elimination of Racial Discrimination's Urgent Action and Early Warning Procedures*, Committee on the Elimination of Racial Discrimination Seventy-First Session, pp. 19-21.

61 In the 'Annotations to the Constitution' ('Section V'), it is said: "In the territory of Indonesia there are approximately 250 self-governing regions (zelfbesturende landschappen) and village communities (volksgemeenschappen) [...] These regional units have their own indigenous social systems and thus may be considered as special regions"; see <<http://asnic.utexas.edu/asnic/countries/indonesia/ConstIndonesia.html>>.

62 See note 50 above, p. 2.

63 Ibid, p. 3.

64 Ibid.

commercial enterprises.”⁶⁵ Traditional communities with tenures are in a weaker position than private landowners with official titles.

Article 15(d) of the 2007 Investment Act reads: “*Every investor shall have obligations [...] to respect the cultural traditions of the community around the location of investment business activities.*” This paragraph does not say anything explicit about land rights of local communities. The Investment Act does therefore not provide an adequate guarantee that the business does not infringe rights relating to ownership and use of land.

Moreover, Article 15(b) says that “... *all investors shall have obligations [...] to implement corporate social responsibility.*” CSR is explained as a responsibility “... *to keep creating relationship which is in harmony, in balance and suitable to the local community’s neighborhood, values, norms, and culture.*” The vague formulation ‘implement social responsibility’ leads to a wide divergence in views on what CSR actually entails. According to the ASEAN Foundation: “CSR is gradually moving from its historical focus on business philanthropy to a broader set of activities that integrate the practice of CSR into the core strategy of the organization.”⁶⁶ In Indonesia there has been an understanding that CSR is about ‘activities’ seen as additional to the core business activities. One early study on CSR in Indonesia refers to SCR as ‘cosmetic’.⁶⁷

In Tanzania, the term ‘indigenous peoples’ is not widely recognized, but the nomads particularly depend upon access to adequate natural resources for their herds. There are conflicts between nomads and farmers in parts of Tanzania. This is expressed in the 1995 National Land Policy, which says as a ‘policy statement’ under the chapter ‘Rangeland and livestock keeping’: “Shifting agriculture and nomadism will be prohibited.”⁶⁸ While there has not formally been a prohibition, there seems to be a pattern that the local and regional authorities are siding with the companies in order to squeeze the nomads and pastoralists.⁶⁹

In a study of the alternative use of land in Tanzania, an assessment was made of the total amount of ‘non timber forest products use values’ as a ‘household average’ in different districts.⁷⁰ These products include grass, soil, charcoal, medicine plants,

65 Ibid, p. 2.

66 Uriarte, F. A. Jr 2008: *Corporate Social Responsibility in ASEAN*, presentation at League of Corporate Foundations (LCF) CSR Conference 2008, p. 8; <www.aseanfoundation.org/documents/ed/CSR_in_ASEAN_presentation.ppt>.

67 Kemp, M. 2001: *Corporate Social Responsibility in Indonesia: Quixotic Dream or Confident Expectation?*, Technology, Business and Society Paper No 6 (Geneva: United Nations Research Institute for Social Development), p. vi.

68 Tanzanian Ministry of Lands and Human Settlement Development 1995: *National Land Policy*, p. 36.

69 The authors’s report from a field study to Tanzania 19 March to 2 April 2009; p. 5; on file with the author.

70 Mwamila, note 51 above, pp. 117-22.

wood, vegetables, fruits and other food. It was found that in particular where there is a dependency on wood as a source of energy, the value of the 'non timber products' are considerable. Actually, the benefit from these products are found to be above the benefits from agricultural production in the most wood-dependent districts, and approximately similar in those districts where there is less dependency on wood as a source of energy. These 'livelihood benefits' are crucial for the human rights realization of persons living in traditional communities, independent of whether these communities are considered to be indigenous communities or not.

We see that there are challenges with regard to local communities and indigenous peoples in all three countries, especially as regards determination of and demarcation of indigenous lands. Moreover, as larger areas are devoted to biofuels production, less land is available for the continuation of the traditional life styles. While the three countries under study have to enhance their domestic energy production, there is a risk that this is being done to the detriment of these peoples' rights. Another concern, which is beyond the scope of this article, is the indirect land use change ('ILUC') resulting from the increased cultivation of biofuels. In the Gallagher review, ILUC was defined as encompassing both increased food prices and "The displacement of agricultural production onto uncultivated areas with impacts on biodiversity, GHG savings and local land rights as a result of biofuel production."⁷¹

The legislation regarding minorities and indigenous peoples does not adequately enable them to influence and give their prior informed consent to decisions regarding biofuels projects. Hence, neither of the states have legislation appropriate to ensure the rights and prevent any destruction of these communities' livelihoods. The UN Special Rapporteur on the right to food finds that the state-initiated and voluntary criteria on biofuels are inadequate "Unless affirmative action is taken to ensure that smallholders are included in the production of agrofuels in a way that is beneficial to them, the development of agrofuels can only lead to greater inequality within developing countries."⁷²

71 Renewable Fuels Agency 2008: The Gallagher Review of the indirect effects of *biofuels production*, p. 19; <http://www.dft.gov.uk/rfa/_db/_documents/Report_of_the_Gallagherreview.pdf>.

72 A/HRC/12/31: *Report of the Special Rapporteur on the right to food* (2009) paragraph 24.

6 Importing countries' requirements on biofuel companies regarding use of land

While the author believes that 'international guidelines'⁷³ would be the most appropriate in order to have coherent and operational global standards, there are currently a plethora of national, fuels-specific, and general criteria for assessing biofuels. This section analyzes the criteria in importing states to ensure that the biofuel is produced without causing damage to people and nature. The focus will be on whether customary land rights have been respected. While the issue of land rights is considered to be a 'social' issue, the conversion of land to plantations can also increase the CO₂ emissions and lead to destruction of the local environment, including water, soil and biological resources.

To illustrate the development regarding concerns relating to land in the context of biofuels, the UK's Renewable Transport Fuel Obligation (RTFO), effective from 15 April 2008, but still subject to amendment,⁷⁴ will be presented. The RTFO has been in operation longer than any other national or regional biofuels sustainability requirements. The Dutch sustainability criteria were published in March 2009.⁷⁵ The and EU Renewables Directive was adopted in March 2009 and contains challenging procedures for verification.⁷⁶ The German legal requirements have not yet

73 See note 7 above and accompanying text.

74 UK Department for Transport 2009: *Summary of responses to Part One of the Consultation on the Draft RTFO (Amendment) Order 2009*.

75 The Dutch 'Cramer Commission' Report 2007: *Testing framework for sustainable biomass*, identifies nine principles, which have been supplemented by 'sustainability criteria' presented in the Nederlands Normalisatie-instituut 2009: Dutch Technical Agreement NTA 8080: Sustainability Criteria for biomass for energy purposes (English version available with the author). The compliance with the criteria will be assessed by a certification body, and state subsidies will only be available for those who have their production or importation of biomass certified as 'sustainably produced' (ibid, p. 4). The certification body ('organisation') shall, however, only test the requirement of the NTA "as far as these requirements are applicable" (ibid, p. 7). This must be understood to imply that if the requirements are 'not applicable' which could be in situation of inadequate information, this will not disqualify the biomass from being categorized as 'sustainably produced'. The issue of land arises most clearly in the third principle on 'competition with food' (criteria on 'change of land use'; ibid, p. 14) and the ninth principle on 'social well-being' (criteria on 'human rights', which explicitly includes right of indigenous peoples and 'property rights', including customary law; ibid, pp. 22-23).

76 The 'Directive on the promotion on the use of energy from renewable sources' (2009/28/EC) was adopted by the European Parliament 23 April 2009 (see also note 4, referring to the first reading on 17 December 2008). Article 17 on sustainability criteria and Article 18 is on verification of these criteria, deciding, inter alia, eligibility for financial support (Article 17.1(c)). On the issue of land-use change, Article 17(4) says that in order to be considered

been approved.⁷⁷ The Dutch sustainability criteria were published in March 2009.⁷⁸ The RTFO is designed with the clear intention of having a "... practical scheme that can be operated by businesses supplying biofuels ..."⁷⁹ Moreover, the issue of land is addressed in a relatively comprehensive manner in the RTFO.

The RTFO is based on seven principles, five environmental and two social.⁸⁰ The distinction between these two categories is not very strict, such as in the case of the principle relating to 'contamination and depletion of water sources', which belongs to the former, but which clearly also relates to the latter. Principle 6 addresses workers rights and working relationships, and will not be analyzed further in this article. Principle 7 reads: "Biomass production does not adversely affect existing land rights and community relations." This implies that any certification scheme which

sustainable, biofuels "... shall not be made from raw materials obtained from land with a high carbon stock", determined by this land's status by January 2008, applying to wet land and forests.

77 The Biofuel Quota Law of 2007 (BioKraftQuG) amended the Energy Tax Act, whose Section 66(1) No 11.a(a) now says that to be termed biofuel "... proof can be furnished that certain requirements pertaining to a sustainable cultivation of agricultural land or certain requirements for protecting natural habitats are satisfied ...". For an unofficial English text; see: <http://www.ufop.de/downloads/BiokraftQuG_engl.pdf>. The phrases 'sustainable cultivation' and 'protecting natural habitats' is a general wording; the requirement must be specified in order to be operational. The most recent German legislative proposal, on requirements for the sustainable proposal of biomass for use as biofuel (BioNachV) has not yet been approved by the EU Commission; see The BioenergySite 2009: *Germany Required to Revise Changes to Biofuel Law*; <<http://www.thebioenergysite.com/news/2961/germany-required-to-revise-changes-to-biofuel-law>>.

78 The Dutch 'Cramer Commission' Report 2007: *Testing framework for sustainable biomass*, identifies nine principles, which have been supplemented by 'sustainability criteria' presented in the Netherlands Normalisatie-instituut 2009: *Dutch Technical Agreement NTA 8080: Sustainability Criteria for biomass for energy purposes* (English version available with the author). The compliance with the criteria will be assessed by a certification body, and state subsidies will only be available for those who have their production or importation of biomass certified as 'sustainably produced' (ibid, p. 4). The certification body ('organisation') shall, however, only test the requirement of the NTA "as far as these requirements are applicable" (ibid, p.7). This must be understood to imply that if the requirements are 'not applicable' which could be in situation of inadequate information, this will not disqualify the biomass from being categorized as 'sustainably produced'. The issue of land arises most clearly in the third principle on 'competition with food' (criteria on 'change of land use'; ibid, p. 14) and the ninth principle on 'social well-being' (criteria on 'human rights', which explicitly includes right of indigenous peoples and 'property rights', including customary law; ibid, pp. 22-23).

79 Van Dam, Jinke et al. 2008: 'Overview of Recent Developments in Sustainable Biomass Certification' *Biomass and Bioenergy* Vol 32, No 8, 749 at 754.

80 UK Department for Transport 2008: *Carbon and Sustainability Reporting Within the Renewable Transport Fuel Obligation: Requirements and Guidance. Government Recommendation to the Office of the Renewable Fuel Agency*, p. 24.

does not address the land issue will not be considered a 'qualifying social standard'.⁸¹ According to the 'norm' for these standards, it is possible to have 'partial compliance' with a certain number of indicators under the seven principles.⁸² The Renewable Fuels Agency finds that: "No schemes currently meet all of the environmental and social principles; although two schemes meet all of the environmental principles."⁸³

There are two indicators under the principle relating to land rights and community relations. First, that the use of land "... does not diminish the legal or customary rights of other users, and respects important areas for local people." The term 'important areas' must be understood to refer to territories which are crucial for the sustenance of the livelihood of persons belonging to local communities. Therefore, unimpeded access to these 'important areas' shall not be undermined but rather respected.

Second, that "[p]rocedures are in place to consult and communicate with local populations ..."⁸⁴ How such consultations can be undertaken is outlined in a draft 'Guide on Human Rights Impact Assessment', by the International Finance Corporation, the UN's Global Compact and the International Business Leaders for Sustainable Development.⁸⁵

Hence, any biofuel producer or importer who wants to comply with the UK's Renewable Transport Fuel Obligation (RTFO) must operate under a scheme which includes requirements on both indicators relating to land. It must, however, be noted that neither of the seven principles of the RTFO address food security concerns directly.⁸⁶

81 Ibid, p. 62.

82 Ibid.

83 Renewable Fuels Agency 2009: *Tenth Monthly Report: April 2008 – February 2009*, p. 3.

84 Note 79 above, p. 74.

85 International Finance Corporation, UN Global Compact and the International Business Leaders Forum for Sustainable Development 2007: *Guide to Human Rights Impact Assessment: Road-Testing Draft*, p. 38-44.

86 The lack of explicit references to food security were addressed several responses to the RTFO; see UK Department for Transport 2008: *Summary of responses to consultation on RTFO's carbon and sustainability reporting requirements*. Question 3 in the call for responses read: "Are the Environmental and Social principles set out in chapter 3 the right ones?" The Summary of responses reads: "Several respondents had concerns about food security and some suggested this should be added as an extra criterion." Also Charnovitz, S., J. Earley and R. Howse 2008: *An Examination of Social Standards in Biofuels Sustainability Criteria*; <http://www.agritrade.org/documents/SocialStnds_Biofuels_FINAL.pdf> notes on p. 2 the lack of food security standards in many of the sustainability schemes.

7 Conclusions and general recommendations

The article does find that the three states do have a bioenergy potential, and that particularly Brazil and Tanzania have land available that could be used for biofuel production. Biofuel production can contribute to an enhanced appreciation of the agricultural sector in general and revive the countryside in developing countries in particular. This article therefore does not categorically reject the potential for biofuel production as a way to enhance the energy security.

There is a considerable risk, however, that the use of agricultural resources in order to enhance the energy security nationally results in a depletion of the resources, and hence the food security, water security and general resource security of the most vulnerable parts of the population, belonging to indigenous peoples and local communities. These problems are exaggerated when there is weak national capacity for monitoring the different actors' compliance with the standards. A problem which is similarly serious is that the representative bodies on the local and regional levels are not familiar with crucial information. The local authorities might not know the relevant national legislation, the exact amount of land that actually belongs to a specific village, the local community or indigenous people, the human rights obligations of their respective governments, or the requirement that must be met for determining that a reasonable compensation has been given.

In many developing countries, bioenergy is the primary energy source, and in particular for those most dependent upon natural resources, there will be "... potential conflicts arising from competition for food, feed or fuel use of biomass."⁸⁷ While small scale and local biofuel production can be advantageous provided that virgin forests, biodiversity-rich areas and land that provide the livelihood of local communities are not negatively affected,⁸⁸ larger projects will involve greater risks for environmental depletion, land disputes and worsened community relations. As food security is depending on access to land and food-producing resources, any impediment in the access to these resources should at least lead to a readjustment or – when necessary for ensuring the rights and interests of the local population – a cancellation of the project.

Finally, while acknowledging that there will be differences in the estimates of available land, both globally and nationally, the figures in the 1995 FAO study must be considered to be highly problematic. As FAO has presented much different

87 FAO's Bioenergy and Food Security Project (BEFS), a project in which Tanzania is one of the three participating states (with Thailand and Peru; <<http://www.fao.org/nr/ben/befs/-background.html>>).

88 FAO and Policy Innovation Systems for Clean Energy Security (PISCES) 2009: *Small-scale Bioenergy Initiatives: Brief description and preliminary lessons on livelihood impacts from case studies in Asia, Latin America and Africa*.

and lower figures on land availability subsequently, and as it is widely recognized that land-use change is the second largest source of the most significant effect on greenhouse gas emissions, the FAO should officially express strong reservations that the figures appearing in the 1995 report are used to argue for a huge expansion in agricultural area.