

Environmental justice: EU biofuel demand and oil palm cultivation in Malaysia

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"As a metaphorical image, friction reminds us that heterogeneous and unequal encounters can lead to new arrangements of culture and power"

(Tsing, 2005)

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Acknowledgements

The sequence of and the importance of the support provided by the respective individual do not correlate as every input received contributed to my learning process and this paper.

I am indebted to Prof. Dr. Alberto Gomes and Kamal Solhaimi Bin Fadzil, MA for all forms of support they provided to me, which was invaluable to this work.

Also, I am very thankful to Dr. Colin Nicholas and Ms. Reita Rahim for sharing their insights and experiences with me.

Finally, I would like to thank my family and friends, especially Ben, Michi, Mona and Victoria, for their unconditional support.

I am the sole person to be held responsible for any possible mistake, possible misinterpretation or error in this work.

Abbreviations and acronyms

ASEAN	Association of South East Asian Nations
CBA	Cost benefit analysis
COAC	Centre for Orang Asli Concerns (lit. Jaringan Orang Asal Semalaysia)
EIA	Environmental Impact Assessment
EU	European Union
FAO	Food and Agriculture Organization
FNR	Fachverband für Nachwachsende Rohstoffe (Agency for renewable resources)
GHG	Greenhouse Gas
IEA	International Energy Agency
ISO	International Organization for Standardization
ILO	International Labour Organization
IUCN	International Union for the Conservation of Nature
JAKOA	Jabatan Kemajuan Orang Asli (Department of Orang Asli Development), formerly known as JHEOA
JOAS	Jaringan Orang Asla SeMalaysia (Indigenous Peoples Network of Malaysia)
JRC	Joint Research Council of the European Commission
MPOB	Malaysian Palm Oil Board
MRA	Mutual recognition agreement
NEM	New Economic Model
NEP	New Economic Policy
NGO	Non government organization
OECD	Organization for Economic Co-operation and Development
PME	Palm methyl ester
RED	Renewable Energy Directive 2009/28/EC
RSPO	Roundtable on sustainable palm oil
SUHAKAM	Suruhanjaya Hak Asasi Manusia (Human Rights Commission of Malaysia)
UNCBD	United Nations Convention on Biological Diversity
UNDRIP	United Nations Declaration on the Rights of the Indigenous Peoples
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
USITC	United States International Trade Commission
WTA	Willingness to accept
WTP	Willingness to pay

Abstract

This paper addresses transboundary dimensions of social, economic and environmental justice, related to the Renewable Energy Directive and its impact on oil palm cultivation in Malaysia. Specifically, the effects of promoting a 10% increase in biofuel use in transportation within the European Union by 2020 are discussed and analysed in light of the social, economic and environmental impacts on the Orang Asli, the indigenous population of Peninsular Malaysia, whose livelihood, culture and nature-based spiritual beliefs are closely linked to their inhabited ecological niche.

The analysis includes the inequalities faced by the Orang Asli in the competition for natural resources, examines their access to material resources and the impacts on their legal empowerment under Malaysia's New Economic Model and the 2020 vision. To this end, the scope and limitations of cost benefit analysis and contingent valuation as supporting tools for public policy are considered, in the context of attributing value to environmental resources and services without expressed market values by using willingness to accept or willingness to pay approaches.

The concept of common but differentiated responsibilities is discussed from a global justice perspective. The European Union boundaries of liability in fostering biofuel are reflected upon and set against the accountability of Malaysia for biodiversity conservation and the protection of indigenous peoples' rights. The paper concludes that various facets of the rule of law and transparency, including the legal recognition of the Orang Asli, need to be targeted concurrently to ensure the sustainable sourcing of biofuel from Malaysia.

1 Introduction

The world faces a fast rate of deforestation with the greatest losses occurring in developing countries. Among the primary causes of deforestation in tropical rain forests are inadequate government policies and institutional weakness, illegal, uncontrolled and unsustainable logging for exports of timber and other goods cultivated on forest land, population growth and poverty as well as lacking recognition for the ecological services provided by the forests (FAO, 2007).

Palm oil constitutes, due to the oil palm's high productivity and its worldwide abundance, the least expensive vegetable oil (USITC, 2010). The expansion of large-scale commercial crops, particularly oil palm to meet growing food and biodiesel demand, the latter encouraged through the Renewable Energy Directive 2009/28/EC, hereafter RED, target for transportation, will be the most significant cause of deforestation in Southeast Asia (FAO, 2009, USITC, 2010).

Malaysia and Indonesia lead world palm oil production with cumulated exports amounting to more than 85 percent (LMC International, 2011). In Malaysia, the land devoted to palm-oil plantations increased to 4.48 million hectares in 2008, or 11.1 million acres, from about 641,700 hectares in 1975 (MPOB, 2010). With the 2010 New Economic Model (NEM) fostering private sector growth by promoting involvement of large-scale corporations in agriculture, this expansion is predicted to continue at an even faster speed.

Geographical limitations and the economic rationale related to using productive soil from previous primary growth tropical rain forest to achieve higher annual yields rather than replanting existing plantations or using degraded land, present some reasons for deforestation. The conversion of tropical rain forest into oil palm plantations affects the indigenous minority of Peninsular Malaysia, the Orang Asli. They depend, both for their existence, small-scale economic activities and cultural practices, on services and products provided by forest and aquatic ecosystems (Dentan et al., 1997).

1.1 Problem definition

Interests in Orang Asli territories, such as for the expansion of palm oil cultivation, challenge Orang Asli livelihoods and their culture. Contrary to their counterparts on Malaysian Borneo, their native status is not recognized on the Peninsula which further translates into their customary land rights not being acknowledged. In many cases, they are on the losing side in the contest for resources. (Nicholas, 2000)

Weak national forest land terminology and the Malaysian national objective of developing additional oil palm plantations, which collide with geographical limitations on the Peninsula, all pose a challenge to the ecological niches, referred to as *tanah adat*, inhabited by the Orang Asli and their access to them (JRC-IE, 2008, Nicholas et al., 2010).

Empirical literature analyzing the sustainability of the RED and palm oil production in South-East Asia is widely available. To a limited extent, the correlation between the European energy target for transportation and the social impacts of palm oil plantation have been explored (Ecorys, 2010).

This paper aims to contribute to the existing academic literature by filling the gap between the economic and political analysis of the European renewable energy policy and carrying the discussion of social impacts beyond labour costs and employment effects to encompass the realities of the native population of the Peninsular.

1.2 Research questions

Why does additional oil palm cultivation foster the inequalities encountered by the Orang Asli with regards to their access to natural resources?

How does the RED 10 percent target for transportation influence natural resource management in Malaysia?

1.3 Method

The research for this paper partially builds on research conducted in the context of another project addressing a similar topic. It employed qualitative methods namely consultations and discussions, visits, observations and personal experiences.

The literature review and data gathered from insights obtained from academia, NGOs and government perspectives, was of high importance. With a view to consultations, primarily academics knowledgeable in Orang Asli issues and NGO workers working closely with Orang Asli were contacted. A few conversations with members of the Mah Meri that were met when the author accompanied a local researcher on his field visit and the observations, related to the conduct of village and household activities, made during this visit, played an important role in improving the reliability of the data gathered during the literature review.

Open-ended consultations were conducted with two NGO representatives, both collaborating with the Orang Asli, one of them in selling Orang Asli handicrafts and the other mostly involved in cases related to land tenure. Four academics who are specialised in anthropology, environment and women's development, law and political sociology were consulted to obtain a broad overview of issues encountered by the native population and to extend the understanding of concrete government policies and theories.

1.4 Limitation and scope

This paper is limited to an analysis of the implications in terms of environmental justice and social impacts on the Orang Asli living on Peninsular Malaysia from the 10 percent renewable energy target for transportation provisioned by the RED. The RED objectives are not contrasted with those set out in the Fuel Quality Directive 2009/30/EC.

1.5 Audience

This paper is targeted towards European and Malaysian advisors in the field of energy, environmental and economic policy who provide recommendations for national or regional strategies.

It addresses European importers of crude and refined palm oil and processors/refiners, distributors as well as end users in the transportation sector.

It is also aimed at all stakeholders in the palm oil industry in Malaysia, especially the Malaysian Palm Oil Board, the Roundtable for Sustainable Palm Oil and industry representatives, particularly from IOI and Sime Darby Plantation Berhad.

1.6 Disposition

Chapter 1 presents the nature of the problem addressed in this research. It describes the methodology used, the method of data collection and identifies research limitations, provides an outline and describes the audience, for which this research may be interesting.

In Chapter 2, the literature analysis is described and main gaps in the research field are outlined.

Chapter 3 presents the findings related to the main topics of this paper, the Renewable Energy Directive, palm oil demand for food and biodiesel, the Malaysian economic development response and the Orang Asli and their struggle for environmental justice.

Chapter 4 juxtaposes and analyses these fields in light of Orang Asli empowerment.

Chapter 5 discusses the influence of the methodology applied on the results obtained.

Chapter 6 summarises the main findings of this research, highlights research contributions and provides suggestions for further research.

2 Literature analysis

The gaps in the empirical analysis appear to be in the detailed analysis of the social impact of the RED target for transportation and the envisaged expansion of palm oil cultivation on marginalized groups which are most vulnerable to environmental injustice.

Indigenous land tenure rights have been a focus for the timber industry, for instance in Western Africa, and certification became relevant with international trade in timber. (Machacek, 2007) This industry has faced similar problems to the ones the palm oil industry confronts today.

In order to answer the research questions, the analysis relied on a preliminary literature scan for the identification of information sources and literature and actor groups. The literature review was centred around the core topics of this work: European energy policy, the Malaysian economic development policy in form of the NEM, palm oil industry development, the Orang Asli and their legal status and land tenure rights, and environmental justice.

For these purposes, the Europe 2020 vision was researched along with an analysis of RED, information on the NEM was derived from government publication, reports from LMC International were consulted to obtain an overview of the palm oil industry and publications by renowned anthropologists and activists including Dr. Alberto Gomes and Dr. Colin Nicholas were consulted to obtain a deeper insight into Orang Asli issues.

3 Environmental justice: renewable energy and palm oil

This chapter discusses the effects of promoting a 10 percent increase in biofuel use in transportation within the European Union by 2020 in light of the social, economic and environmental impacts on the Orang Asli, the indigenous population of Peninsular Malaysia.

3.1 EU Renewable Energy Directive

The European Union (EU) has elaborated a growth concept, entitled 'Europe 2020' which is supporting the regional grouping on its path to a 'smart, sustainable and inclusive economy' characterised by high productivity, employment for a large portion of the EU population, and a cohesive society. One of the five objectives of the vision which are to be accomplished by 2020 addresses climate and energy. (EC, 2012)

Specifically, this means, greenhouse gas emissions (GHG) need to be cut by 20 percent (or possibly by 30 percent, given favourable conditions) measured by the baseline of GHG emissions in 1990. This target should be reached by two means: ensuring 20 percent of the energy used is renewable and facilitating a 20 percent increase in energy efficiency. (EC, 2012)

A minimum of 10 percent biofuels¹ should be used in the total transport fuel by 2020. This minimum target which is binding to all Member states. (Official Journal of the European Union, 2009, Art. 3 (4), EC, 2012)

Three conditions needed to be fulfilled in order to pass the binding target, namely the biofuel generation from sustainable production, the amendment of the Fuel Quality Directive to permit sufficient blending levels and the future availability of second-generation biofuels². (Official Journal of the EU, 2009, Preamble 9)

3.1.1 Sustainability criteria

The adherence to certain sustainability standards is required for a biofuel and bioliquid to be used to reach the national target of the RED. These standards disapprove land with certain features to be used for biofuel cultivation, including wetlands and continuously forested areas, and they disqualify biofuels from peatlands. Member states are to ensure compliance with the sustainability and they can request suppliers, who are to implement a "mass balance system" to provide data outlining their adherence to the defined criteria. (Official Journal of the EU, 2009, Art. 18 (1), Switzer, McMahon, 2011)

Article 17 (2) to (5) (Official Journal of the EU, 2009) outlines the sustainability criteria which refer to

- the GHG emission savings from the use of biofuels and -liquids which need to be at least 35 percent with increasing saving targets for 2017 and 2018
- biofuels not derived from raw materials cultivated on land with specific statuses such as:

¹ Biofuel is defined as liquid or gaseous fuel used for transportation purposes which is produced from biomass. Bioliquids are used to derive energy for heating, energy or electricity, not for transport. (Official Journal of the European Union, 2009)

² Second generation biofuels are made from non-food feedstock, or ligno-cellulosic material such as wood and -residues, straw, grass and fast growing trees. They have higher potential, compared to first generation biofuels which are produced from biomass, regarding quality, less environmental impacts and costs but their commercialization is only expected in about 10 years. (Ecorys, 2009)

- a) primary forest and other wooded land without clear visible indication of human activity,
- b) areas for nature protection purposes, and areas for the protection of rare, threatened or endangered species as per international agreements or lists such as from the International Union for the Conservation of Nature (IUCN)
- c) highly biodiverse grassland
- biofuels not produced from raw material gathered from high carbon stock land such as:
 - a) wetlands,
 - b) continuously forested areas, and
 - c) land³, and
- biofuels not produced from raw material grown on peatland.

A destruction of biodiverse lands is discouraged in the RED, demanding that biofuels and bioliquids do not originate in biodiverse lands, such as primary forests according to the Food and Agriculture Organization (FAO) definition. Biofuel and -liquids can be derived from other forest types⁴ including areas used for the collection of non timber forest products, where the human impact is negligible. (Official Journal of the EU, 2009, Art. 69)

3.1.2 Acquis communautaire for third countries

In Art. 18 (4) of the RED, the Community is being encouraged to enter into bilateral or multilateral agreements, which reflect the sustainability criteria of the Directive, as per Art. 17 (2) to (5), with third countries. It emphasizes the need for consideration of conserving areas providing ecosystem services. (Official Journal of the EU, 2009) How does the EU apply its environmental protection measures to third countries?

The European Commission enters, as an alternative to the *acquis communautaire*⁵, mutual recognition agreements (MRAs) with third countries, which would not harmonize their national laws in accordance with the EU *acquis*, containing, among others, provisions for environmental quality protection. A mutual recognition of legal standards and principles, including trust in the other nation's processes related to conformity assessment, such as shared agreement on systems of certification, is a precondition for entering into MRAs, which foster the mutual trade liberalisation in areas of importance to the EC and the third country, e.g. agricultural products. (Petrov, 2008)

MRAs don't form part of the EU conditionality policy towards third parties as part of its foreign policy. This means that MRAs are started only once the third country envisages the demanded economic, legal and political transformations. (Petrov, 2008)

The achievement of the 10 percent national target will be dependent on the sufficient availability of efficient biofuels. In Europe, rapeseed is the preferred choice for the

³ Both b) and c) refer to areas extending to more than one hectare with tree growth higher than five metres while b) requires a canopy cover of more than 30 percent and c) a canopy cover of between 10 and 30 percent.

⁴ The FAO categorizes other types of forests, which are not classified as primary forests into: modified natural forests, semi-natural forests and plantations.

⁵ "*Acquis communautaire* is a French term referring to the cumulative body of European Community laws, comprising the EC's objectives, substantive rules, policies and, in particular, the primary and secondary legislation and case law – all of which form part of the legal order of the EU. This includes all the treaties, regulations and directives passed by the European institutions, as well as judgements laid down by the European Court of Justice." (Eurofound, 2012)

production of biodiesel which meets fuel specifications. Limits to the expansion of rapeseed cultivation in Europe are expected to lead to an unsatisfied demand of rapeseed by 2013 with production meeting the future demand for rapeseed in food use only. It is likely that imported oils and oilseeds, particularly palm oil, which is a more affordable, will redirect and substitute EU rapeseed oil. (JRC, 2008).

3.1.3 The efficiency of palm oil methyl ester

Palm oil methyl ester (PME) or palm biodiesel comes with a number of technical advantages including full blending potential with conventional diesel, improved combustion in compression ignition engines leading to low sulphur and particulate emissions, and that no engine changes are required for low blends, such as B5 to B10⁶.

Figure 1 illustrates that palm biodiesel⁷ is most efficient in terms of mileage performed from the yield per hectare output compared to other biofuels.

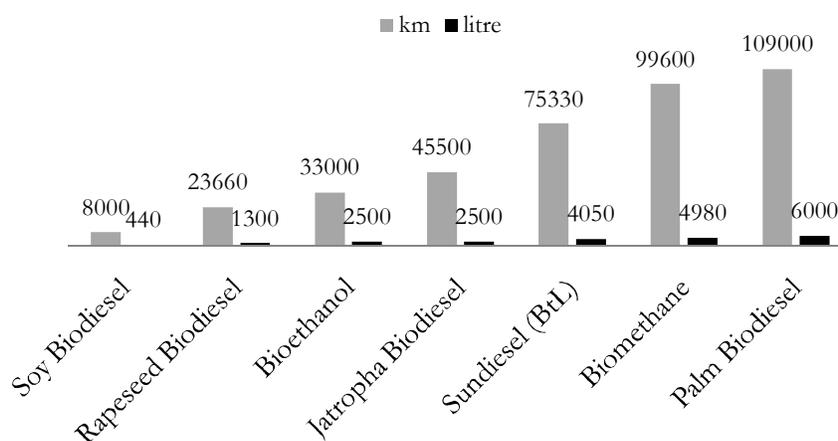


Figure 1- Mileage per hectare per year, based on a VW Polo vehicle⁸

Source: amended from 'Biofuels', Fachagentur Nachwachsende Rohstoffe e.V. (FNR), 2006 and own data. In JRC-IE, 2008.

Both direct correlations between the palm oil price and the price of petroleum and an increase in policies targeting GHG emission reductions suggest a large potential market for biodiesel given the further improvement of production technologies for synthetic biofuel. The market potential is calculated at approximately 20 total energy (EJ) by 2050. (OECD/IEA, 2007). In 2005, ethanol and biodiesel provided for 0.9 EJ in 2005 accounting for an estimated one percent of the total demand of fuel used for transport (IEA, 2004).

⁶ B5 refers to a 5 and B10 to a 10 percent blend of ethanol with gasoline. (OECD/IEA, 2007)

⁷ "PME is a biofuel and refers to methyl esters of long chain fatty acids derived from palm oil. It has a high cetane number and can be used in compression ignition engines (diesel engines) without modification to the engines. Palm biodiesel is produced in the continuous transesterification reaction of palm oil with methanol in the presence of sodium hydroxide as catalyst." (Oiltek Sdn Bhd, 2001)

⁸ The estimated yield from vegetable crops by the OECD/IEA (2007) amounts to 700-1300 liters of diesel equivalent biodiesel (lde)/ hectare, which equals approximately the presented result by the Agency of Renewable Resources (lit. Fachagentur Nachwachsende Rohstoffe, (FNR)) RME estimate (2006). The OECD/IEA estimate for the palm oil yield is at 2500-3000 lde/ha which amounts to half of the efficiency FNR (2006) suggested.

Given the outstanding results in lde/ha output and efficiency of PME, achieving the 10 percent biofuel share in transportation fuels by 2020 appears to be dependent on the contribution of oil palm.

3.2 Emerging economies' demand for palm oil

Both PME and palm oil are also expected to be high on demand in emerging countries, primarily in Asia, especially in China and India, where further economic development and an increasing part of the population obtaining comparatively higher purchasing power will find the consumption of oil and fats more affordable. Political targets related to the reduction of GHG in this geographical area will increase the demand for PME. (USITC, 2010)

Figure 2 shows that palm oil production contributes a quarter of the global oil and fat production in 2008.

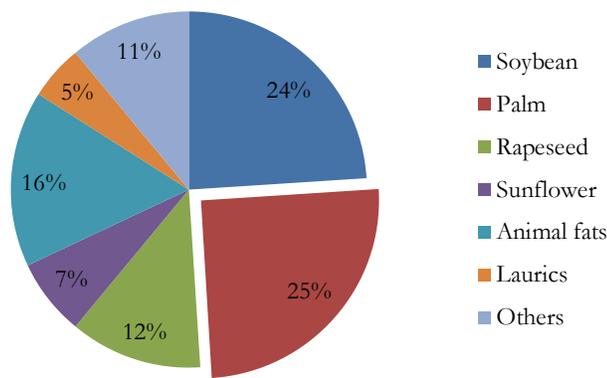


Figure 2 - World oil and fat production share

Source: *Oil World in JRC-IE, 2008*

"Palm oil production overtook soy in 2004 to become the world's largest source of vegetable oil. [FAPRI 2007] expect palm oil to account for half the growth in world vegetable oil production between now and 2017." (JRC, 2008, p.10)

The palm oil sector is concentrated in South-East Asia. Indonesia and Malaysia jointly make up 85 percent of the world's palm oil production. (LMC International, 2011) Some 88 percent of the expected growth in palm oil production until 2017 will originate from Indonesia and Malaysia. Their joint supply is forecasted to meet up to 44 percent of the extra vegetable oil demand as a result of its use in biofuel. (JRC, 2008, p.10) Palm oil constitutes already by far the most important food and agricultural commodity in Malaysia. (FAOSTAT, 2011)

With this background it is evident that the commodity is perceived as high potential for economic growth, the details of how this potential is expected to be explored in Malaysia will be described in the following section.

3.2.1 Malaysia's New Economic Model

The New Economic Model (NEM) which was presented in 2010 by the Prime Minister in office, Najib Tun Razak, aims to "transform the Malaysian economy to become one with high incomes and quality growth" by 2020 (Deputy Prime Minister's Office of Malaysia,

2011). The NEM aims to achieve economic growth by encouraging private sector expansion with a focus on large enterprises and support decisions being taken on the basis of needs rather than ethnicity. (Nicholas, 2010)

Land and agriculture is the area where a noteworthy policy orientation change has taken place when comparing the previous New Economic Policy (NEP) to the NEM. The NEP focused on "massive land schemes to provide agricultural lots to thousands of landless Malay farmers", the NEM stresses "involvement of the corporate sector in agriculture. Small farmers are being crowded out." The question on how Orang Asli are affected by the NEM needs to be brought up. Smallholders, let alone marginalized groups, such as the Orang Asli, are not very favourably treated in the design of NEM. (Nicholas, 2010)

In general, the palm oil industry in Malaysia is dominated by large, multinational corporations, such as Sime Darby, which own the regionally integrated production chain. It is common for small scale palm oil producers without direct consumer access to sell crude oil to be refined, or refined oil to domestic processors with renowned national brands. (USITC, 2010)

While Malaysian law applies certain restrictions to foreign land ownership, it grants complete foreign ownership of companies with production for export purposes. (USITC, 2010)

3.2.2 The RSPO and its principles

Established in 2004, the Roundtable for Sustainable Palm Oil (RSPO), a non profit association connecting stakeholders from seven sectors⁹ of the industry, aims to increase the use of oil palm products generated from sustainable production through the application of credible global standards and the commitment of its stakeholders. (RSPO, 2009)

The RSPO appears to be the sole organisation with considerable influence on the Association of Southeast Asian Nations (ASEAN) palm oil production and marketing with its importance augmenting as participation rises. (USITC, 2010) Membership requests have been increasing sharply since 2009 and approved memberships experienced a peak in 2011 leading to a total of approximately 600 ordinary members by the end of the first quarter in 2012. As of March 2012, 17 producers and supply chain members have been RSPO certified, eight of which are Malaysian. (RSPO, 2009)

The RSPO principles and criteria have been based on various principles and key provision derived from international agreements such as the UNDRIP, Art. 25 and 26, United Nation Convention on Biological Diversity (UNCBD) and the International Labour Organisation Convention on Indigenous and Tribal Peoples with regards to just land acquisition. (RSPO, 2007)

Table 1 - RSPO principles

Principle 1	Commitment to transparency
Principle 2	Compliance with laws and regulations
Principle 3	Commitment to long-term economic and financial viability
Principle 4	Use of appropriate best practices by growers and millers

⁹ The seven sectors include oil palm producers, palm oil processors or traders, consumer goods manufacturers, retailers, banks and investors, environmental or nature conservation and social or developmental NGOs. (RSPO, 2009)

Principle 5	Environmental responsibility and conservation of natural resources and biodiversity
Principle 6	Responsible consideration of employees and of individuals and communities affected by growers and mills.
Principle 7	Responsible development of new plantings
Principle 8	Commitment to continuous improvement in key areas of activity

Source: adapted from RSPO, 2007

The use of these principles and criteria is further adapted to each major producing country applying National Interpretation. (RSPO, 2007)

European consumers are willing to pay a higher premium for palm oil from sustainable sources, while emerging nations including China and India, have been, as a result of the expected higher price of certified palm oil, less eager to participate in certification and continue to buy uncertified palm oil. From the Malaysian producer perspective, an RSPO certification influences the export competitiveness of palm oil to the European Union positively and in addition it can attract investment by enterprises which aim to secure sustainable palm oil supplies.

(USITC, 2010)

Geographical conditions limit the possibilities for the expansion of oil palm plantation on the Peninsular and Sabah. The JRC (2008) estimates that approximately 12 percent of the additional oil needed for the conversion to biodiesel will be cultivated in form of oil palm plantations on peat land. Almost inexistent land rights for the Orang Asli and broad, non-specific forest land definitions allowing for various interpretations facilitate land use change. Very rough estimations and calculations provided by one JRC (2008) expert conclude that this land use change could efface all EU biofuel GHG savings.

Degraded forest land and rubber tree plantations have great potential for plantation expansion but primary forest is logged to cultivate oil palm since, from an economic point of view, deforestation to obtain nutrient rich soil is preferable to an expansion on less productive soil. (JRC, 2008).

3.3 The Orang Asli

Malays, Chinese and Indians, constitute the three major ethnic groups next to the indigenous population, the Orang Asli¹⁰, who live on Peninsular Malaysia, which will be referred to as Peninsular. The Orang Asli population was counted at about 141,000 in 2006¹¹, making up some 0.5 percent of the total Malaysian population (JAKOA, 2011) and can be divided into three main groups: Senoi counting about 60,600 members, Aboriginal Malay (also referred to as Proto-Malay) with approximately 49,400 members and about 3,500 Negrito (Semang). These main groups are further subdivided into six subgroups, or seven if the Temoq are added to the Aboriginal Malay which are made up of Temuan, Jakun, Semelai, Orang Kanaq, Orang Kuala and Orang Seletar. Batek, Jahai, Kensiu, Kintak, Lanoh and Mendriq belong to

¹⁰ Orang Asal addresses both the Orang Asli on the Peninsular and the indigenous populations of Sarawak and Sabah, the Malaysian western part of Borneo.

¹¹ According to the Orang Asli population statistics collected from various sources including academic articles, official seminar presentations, government- and newsreports. The figures take only account of Orang Asli living in centres or settlements at the time investigation was carried out. (JAKOA, 2011)

the Negrito and Chewong, Mah Meri, Semai, Semoq Beri and Temiar are classified as Senoi. (Nicholas, 2000)

Figure 3 illustrates the geographical distribution of the three main Orang Asli groups and their respective 19 subgroups (COAC, 2006).



Figure 3 - Distribution of the the Orang Asli Subgroups.

Source: COAC (2006)

All defined ethnic groups among the Orang Asli strongly associate themselves with the ecological niche they inhabit which defines their living (Lai, 2011).

3.3.1 Bumiputera status

Malays and the indigenous peoples of Sarawak and Sabah, the Malaysian Borneo, have been granted the legal status of "bumiputera" or "princes of the soil". This recognition as per Article 153 of the Federal Constitution acknowledges their native presence, as compared to the Chinese and Indian population, and grants them special rights including the reservation of quotas for service permits. (Laws of Malaysia, 1957, Dentan, R. K. , Endicott, K., Gomes, A.G., Hooker, M.B., 1997)

In government forms, Orang Asli are often absorbed as "Malay" or "other", an approach which continues to legitimize the special rights granted to the Malays and the natives of Malaysian Borneo. For the Orang Asli to obtain the same rights as other indigenous citizens under the "bumiputera" status, they need to change their identity. (Dentan, 1997)

Both the official description of figure 4 and the presentation of the figure itself illustrate openly the lack of recognition of the Orang Asli and as pointed out by Dentan (1997), it can be assumed they are counted into the section 'Others'.

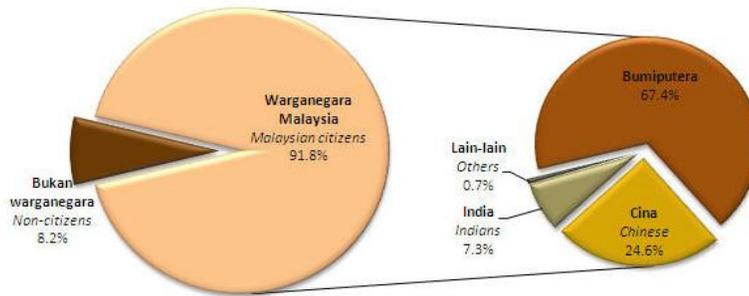


Figure 4 - Percentage distribution of the population by ethnic group, Malaysia, 2010

Source: Department of Statistics, Malaysia (2011). *Ethnic composition*.

3.3.2 UNDRIP and JOAS

In September 2007, following a drafting process of more than 20 years, the United Nations Declaration of Rights of the Indigenous Peoples (UNDRIP), which is considered customary law, was adopted. Malaysia also voted to adopt the UNDRIP. The Declaration counts several provisions which aim to protect indigenous peoples' rights on a global scale, among others, the protection of indigenous peoples' cultures, land and way of life. (Nicholas et al., 2010).

The inequalities faced by the Orang Asli, both related to their presence as inhabitants of Malaysia and in the competition for natural resources, are addressed by the Indigenous Peoples Network of Malaysia (lit. Jaringan Orang Asla SeMalaysia, JOAS)¹². The umbrella organization refers on behalf of the Orang Asli to the provisions of the UNDRIP and calls upon the Malaysian government to implement the Declaration in consultation and co-operation with the Orang Asli, in particular in view of the current violations to the UNDRIP regarding (Nicholas et al., 2010):

- the right to self-determination, which presents a violation of UNDRIP Art. 3
- the non-recognition of customary lands, a clear violation of Art. 26
- no free, prior and informed consent, violating Art. 32
- forced resettlement, infringing Art.
- the violation of right of self-governance, violating Art. 20
- pressured assimilation and the right to freedom of religion, infringing Art. 12 and
- with a view to the consequences of non-documentation.

¹² The Indigenous Peoples Network of Malaysia (lit. Jaringan Orang Asla SeMalaysia, JOAS) represents a total of 21 indigenous peoples organisationa and communities across Malaysia, regionally and on an international scale. (Nicholas et al., 2010)

3.4 Environmental justice: the Orang Asli ecological niche

Environmental injustice¹³ is apparent when marginalized people, who share one or more characteristics in being an ethnic minority, indigenous, of low-income and more vulnerable to external influences, are exposed to higher environmental costs, in the form of environmental pollution from industrialization, militarization and consumer practices, as compared to the average population. (Mohai et al., 2009)

In the late 1990s, the environmental justice movement redefined environmentalism by classifying environment as "everything" with Robert Bullard suggesting that "(...) we can't separate the physical environment from the cultural environment." (Schweizer, E., 1999).

Among the ten principles which were drafted at the First National People of Color Environmental Leadership Summit in Washington, DC in 1991 were the right to "be free from ecological destruction", the "right to clean air, land, water, and food" and the right to "political, economic, cultural and environmental self-determination of all peoples". In principle 10, environmental injustice caused by governmental acts represent violations of international law and of the Universal Declaration on Human Rights and the United Nations Convention on Genocide. (Mohai, 2009)

The meaning of "pollution" as applied in the definition of environmental justice by Mohai et al. (2009) could be extended to comprise also the loss of biodiversity. Fargione et al. (2010) suggest that biodiversity decreases by about 85% in Southeast Asian oil palm plantations when contrasted with unchanged habitat. This loss, in the view of Orang Asli, represents not only a loss of biodiversity but also a loss of a territory to which innumerable values that define their culture, are attached. In this sense, exposing the native population of the Peninsular to losing their ecological niche represents an environmental injustice, as they bear higher costs for the loss or pollution than the average population. A decrease in biodiversity results in an imbalanced ecosystem which in turn may lead to ecosystem services being disrupted, such as the availability of clean water in rivers and the access to certain species, which might have migrated as a result of the change.

¹³ The term has gained attention with the first study conducted by the US General Accounting Office on the location of hazardous waste sites in 1983 which revealed that an unbalanced number of waste sites in the southern states of the US were located in the proximity of African American communities. A follow up study in 1987 by the United Church of Christ Commission for Racial Justice on Toxic Wastes and Race in the United States confirmed the earlier finding and suggested that waste sites were predicted to be located close to communities of marginalized groups. (Mohai, 2009)

4 Legal empowerment of the Orang Asli

Increasing demand for palm oil and biodiesel, and forecasted peaks in future demand by both emerging and industrialized nations across the globe, are expected to put further pressure on Orang Asli territory and their customary land rights.

As a signatory to the UNDRIP, the government of Malaysia should be held responsible for stopping the violations being committed.

4.1 Environmental justice enforcement

Numerous other challenges are connected to the enforcement of environmental justice, with the most inhibiting being related to knowledge gaps and a lack of awareness in environmental matters leading to a depreciation in the value attributed to the environment on behalf of policy makers (Nagai, 2011)

Both administrative fragmentation which describes the division of the governmental structure into separate policy sectors with distinct responsibilities pursuing narrow sectoral objectives and the resulting fragmentation of environmental and related laws pose a challenge to implementing environmental justice. (Carter, 2007 and Nagai, 2011)

Limited coordination between enforcement officers and corrupt practices influencing environmental law as well as the lack of provision of information to and access to environmental information by the public combined with a deficit in resources further complicate the translation of environmental justice into reality. (Nagai, 2011)

4.1.1 Public participation

Miller and Spoolman (2009) define environmental justice as the "fair treatment and meaningful involvement of all people regardless of race, color, sex, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies."

Public participation has started to gained more legal attention in Malaysia. (Lye, L. H., 2001) The Human Rights Commission of Malaysia, lit. Suruhanjaya Hak Asasi Manusia (SUHAKAM), commissioned a study on the human right situation of the Orang Asli and conducted both visits to Orang Asli villages with a selected team of experts and organized public hearings to allow for wider public participation. (SUHAKAM, 2010 and 2012)

The United Nations Economic Commission for Europe (UNECE) Convention, commonly referred to as Aarhus Convention, on access to information, public participation in decision-making and access to justice in environmental matters could serve as a guideline to develop a regional ASEAN agreement pursuing similar objectives.

4.1.2 Public policy accounting for the environment

While the use of cost benefit analysis (CBA) suggests a "more efficient allocation of society's resources" by identifying the decisions on behalf of the public which are to be pursued for the benefit of all, it does not account for values that cannot be expressed in monetary terms such as those related to the natural world, life and health (Heinzerling and Ackerman, 2002, p. 1).

CBA ignores environmental justice in the sense that it overlooks who bears most of the environmental costs. With this approach it runs the risk of underpinning prevalent models of social and economic inequality. (Heinzerling and Ackerman, 2002)

Geographic limitations for oil palm plantations lead to a high probability that Orang Asli territory will be affected by the planned expansion. Adhering to the UNDRIP Article 32 requesting free, prior and informed consent, would require a contingency valuation to be demanded from the Orang Asli. This evaluation attempts to estimate and attribute value to environmental resources and services without expressed market values¹⁴ by using willingness to accept (WTA) or willingness to pay (WTP¹⁵) approaches. A chart describing which criteria need to be available for the choice of one approach over another is provided in Appendix A.

The emphasis would have to be on WTA since their financial means are restricted and therefore their attribution of monetary values to natural resources could possibly misrepresent the values they inherently attach to them. This means Orang Asli would need to be asked about their willingness to accept the loss of their ecological niche. In other words, how much compensation would they be willing to accept for giving up their traditional territory. This would be a stated preference method rather than a revealed one.

4.2 Palm oil industry: RSPO versus EU sustainability criteria

Three of the eight RSPO principles, are particularly relevant for analysing whether certification of palm oil and plantations can be expected to have a positive impact on the Orang Asli:

Table 2 - Selected RSPO principles of relevance for Orang Asli communities

Principle 5	Environmental responsibility and conservation of natural resources and biodiversity
Principle 6	Responsible consideration of employees and of individuals and communities affected by growers and mills.
Principle 7	Responsible development of new plantings

Source: adapted from RSPO, 2007

The layout of the principles appears to be following aspects of an environmental management systems and principle 5 relies on environmental impact assessment (EIA) in the form of ISO 14001 and or an Environmental Impact Assessment Report. It is recommended to cover, amongst others, the replanting or expansion of planting area, and the clearing of remaining natural vegetation.

¹⁴ For this reason, it is suggested to apply the contingent valuation method rather than hedonic pricing or the travel cost method, both of which are revealed preference methods, which are more suitable for evaluating demand by observing purchases of related goods in the market. Hedonic pricing would most commonly be applied to the real estate market while travel cost would explore how high travellers value a tourism destination by examining the expenses they are willing to incur. (Zhai, G. and Suzuki, T., 2008)

¹⁵ "Poor countries, communities, and individuals are likely to express less WTP to avoid environmental harms simply because they have fewer resources." (Heinzerling and Ackerman, 2002, p. 2) Several empirical studies and behavioural reveal that WTP is usually substantially lower than WTA despite suggestions by neoclassical economics that they should in theory generate the same outcome. (Hanemann 1991; Horowitz and McConnell 2002 in Zhai, G. and Suzuki, T., 2008)

Principle 6 recognizes that "mill and plantation management can have positive or negative social impacts on access and use rights¹⁶, economic livelihoods (e.g. paid employment) and working conditions, subsistence activities, cultural and religious values, health and education facilities and other community values, resulting from changes such as improved transport and communication or arrival of substantial migrant labour force." It relies on national interpretation to outline the important issues and methodologies for data collection and using results arguing that "social impacts are particularly dependent on local social conditions" (RSPO, 2007, p. 28)

EIA is also required for principle 7 where the type of land under consideration for use is to be analyzed, be it forest, degraded forest or cleared land, the land ownership and user rights are under scrutiny, current land use patterns are examined, the social impact on the surrounding communities of a plantation are analyzed including the "differential effect on women versus men, ethnic communities, migrant versus long-term residents." While principle 7 acknowledges that the evaluation of ground carbon storage is imperative, it explains that this aspect will be reflected upon in the RSPO GHG Working Group, since it is beyond the EIA scope. (RSPO, 2007, p. 38)

For the purpose of this paper, it is relevant to note that the RED fails to address land use rights in the sustainability criteria. Also, several areas including indirect land-use changes (Art. 78), degraded land restoration and the prevention of disproportionate water use as well as social protection, are raised as concerns without providing specific measures except for the Commission's future reporting requirements on those. (Journal of the EU, 2009, Art. 18 (4), Switzer, McMahon, 2011)

While the EU sustainability criteria emphasize the type of land used for palm oil plantation with a view to achieving the GHG savings, the RSPO principles appear more comprehensive in their scope by including social impacts. To the disadvantage of the Orang Asli, the RSPO principles rely strongly on national interpretation, such as for the assessment of social impacts in general and the listing of unacceptable negative social impacts including for instance displacement and loss of the food security for local residents. (RSPO, 2007)

4.3 International agreement on sustainability criteria

An international agreement on sustainability criteria for palm oil production and sourcing could be a way forward to protect both the environment and indigenous peoples rights.

4.3.1 Trade barriers

The draft of such an agreement could also prevent the European Union from being accused of applying trade barriers to the import of palm oil, which is feasible to defend under the current EU Directive 2009/28/EC.

4.3.2 Common but differentiated responsibilities

This principle¹⁷, follows the objective of high participation of nations by supporting individual country's efforts towards the achievement of set goals e.g. through allowance of

¹⁶ The impact has been closely explored in a case study of Pulau Carey, where Sime Darby plantations encompass traditional Mah Meri territory and permits need to be requested to access it. (Machacek, 2011).

¹⁷ Common but differentiated responsibilities have been included in the Kyoto Protocol to the UNFCCC multilateral environmental agreement. (UNFCCC, 2012)

time delays in reporting data or providing technical and financial assistance, rather than applying penalization for non-compliance.

Common but differentiated responsibilities could achieve the participation of Malaysia and Indonesia, the two palm oil producers dominating world palm oil trade, and rising emerging and developing countries, make the agreement more meaningful from a global perspective.

5 Discussion

The choice of a qualitative method for this paper appeared to suit the purpose of exploring a causal relationship between the RED target for transport, palm oil plantation expansion and inequalities faced by the Orang Asli.

A strong reliance on literature review and data collection based mainly on consultations with academics and NGO representatives, as well as on a few discussions with Mah Meri representatives met when the author was invited to come along on a field visit, might have led to a stronger emphasis on the indigenous perspective. This focus could have been balanced out by conducting several interviews with industry and government representatives to achieve full triangulation.

The research question appears to be legitimate since the author's literature review suggested that existing empirical literature has not contrasted the economic and environmental dimension of palm oil use in food and biodiesel with environmental justice and social impacts for the Orang Asli.

Several factors related to the increase in oil palm cultivation which negatively influence the inequalities encountered by the Orang Asli have been examined. Further research would be beneficial to deepen the vast potential for analysis in this field which is characterized by many cross-cutting and broad topics. This research could for instance explore how the interests of marginalized groups could be protected in an international agreement on sustainability criteria. It could also further elaborate on the WTA by conducting a survey among Orang Asli.

The cultural perspective of the Orang Asli presented in this paper is special to Malaysia. With a view to the dimension of natural resource use and indigenous customary rights it can be argued that the results of this paper are also relevant in a different geographical and sectoral context, such as in the tropical timber industry in West Africa.

6 Conclusion

A reflection from a national, regional and a global perspective on the Orang Asli status on the Peninsular, and their inequalities enforced through the link between economic growth based on oil palm cultivation expansion in Malaysia and the 10 percent sub-target of renewable energy in transportation as part of the Europe 2020 vision will be presented here.

Under the prevailing neoclassical rule, economic growth is undoubtedly the objective which all nations share. Both the EU 2020 vision and Malaysia 2020 highlight economic growth as a prime concern. While the European approach fosters so-called "green growth", the vision in Malaysia is dominated by a reliance on the expansion of the primary sector.

The RED supports the conclusion of bi- or multilateral trade agreements and it is evident that palm oil and biofuel imports will need to contribute if the 10 percent biofuel target in transportation is to be achieved by 2020. Against the earlier described socio-economic conditions in Malaysia, the resource depletion and biodiversity loss caused by monoculture oil palm cultivations, it appears questionable whether greening Europe by the use of biofuels in transport, and thereby contributing to the legal and environmental injustice to which the Orang Asli are exposed to, is a worthwhile path to pursue towards achieving a sustainable society.

Despite the possibility of pursuing higher yields on current available lands, achieving highest productivity might focus on a plantation expansion on most productive soils instead, on unused land derived from deforestation, which could efface the entire GHG emission savings from bio-fuel use promoted in the Europe 2020 vision.

From a global environmental justice perspective, it appears that palm oil certified under credible standards is a precondition for establishing sustainable industry practices which respect the rights of the Orang Asli as laid out in the provisions of the UNDRIP, as the current sustainability criteria outlined by the RSPO rely heavily on the government recognizing the Orang Asli indigenous status and their customary lands, while the EU sustainability criteria raise social impacts only as concerns without further specifications.

Rather than entering bi- or multilateral agreements for the import of certified palm oil to meet the sustainability criteria laid out in the RED, which could potentially be interpreted as barriers to trade, the EU could launch negotiations for an international agreement outlining certification criteria which should also account for the social implications of palm oil cultivation, especially with reference to the prevalent conditions in the world leading palm oil exporting countries.

The benefits of certified palm oil need to be promoted in order to achieve not only a recognition of its importance but also higher participation in the international agreement outside the European Union, in emerging countries with increasing demand for the oil, such as China and India, where palm oil imports satisfy predominantly nutritional purposes but will more and more also be directed towards achieving GHG emission saving objectives. An application of the common but differentiated responsibilities principle could be applied to the agreement to achieve widespread participation and adoption of it.

This paper recommends advisors to various governmental institutions in Malaysia to work on compliance with regards to the provisions set out in the UNDRIP. With a view to the environment and as a supportive measure, the paper suggests developing a regional ASEAN agreement pursuing objectives which could be guided by those of the UNECE Convention

on access to information, public participation in decision-making and access to justice in environmental matters.

European policy makers are advised to initiate negotiations for the development of an international agreement on standards in order to prevent palm oil certification to be perceived as a barrier to trade and avoid a trade dispute. It further recommends European stakeholders of industries with an interest in palm oil to seek collaboration with ASEAN and non-ASEAN emerging countries in Asia, especially China and India, to promote the environmental benefits of certified palm oil.

Further research could investigate how the interests of marginalized groups could be supported in an international agreement on sustainability criteria. It could also conduct a survey to explore the WTA compensation for the loss of traditional territory to palm oil plantations among Orang Asli.

Finally, it is worth remarking that the objective of "greening" Europe should have a local or regional sourcing focus. This "think globally, act locally" strategy could prevent the overall achievement of the RED transport target being highly dependent on natural resources from emerging nations where marginalized groups such as the Orang Asli need to strive for environmental justice and legal empowerment regarding their status and recognition of customary land rights.

Bibliography

- Carter, N. (2007). The environment as a policy problem. In N.Carter, *The Politics of the Environment. Ideas, Activism, Policy*. 2nd edition. New York: Cambridge University Press.
- COAC (2006). Distribution of the Orang Asli subgroups, Source:
http://www.coac.org.my/codenavia/portals/coacv2/code/main/main_art.php?parentID=11374494101180&artID=11432711533516. Last accessed: 15.03.2012
- Dentan, R. K. , Endicott, K., Gomes, A.G., Hooker, M.B. (1997). *Malaysia and the Original People*. Upper Saddle River, USA: Allyn and Bacon.
- Department of Statistics, Malaysia (2011). Taburan penduduk dan ciri-ciri asas demografi. Population distribution and basic demographic characteristics 2010. Ethnic composition. Source:
http://www.statistics.gov.my/portal/download_Population/files/census2010/Taburan_Penduduk_dan_Ciri-ciri_Asas_Demografi.pdf, last accessed: 13.03.2012
- EC (2012). Europe 2020. Source: http://ec.europa.eu/europe2020/index_en.htm, last accessed: 15.03.2012
- Ecorys (2009). Trade sustainability impact assessment for the FTA between the EU and ASEAN. Phase 2 - Interim Report. Ref: TRADE07/C1/C01-Lot 2. Final report for the EC, DG Trade. Rotterdam: Consortium led by Ecorys Nederland BV.
- Eurofound (2012). Acquis communautaire. Source:
<http://www.eurofound.europa.eu/areas/industrialrelations/dictionary/definitions/acquiscommunitaire.htm>, last accessed: 15.03.2012
- FAO (2007). *State of the World's Forests 2007*. Rome: Electronic Publishing Policy and Support Branch, Communication Division, FAO.
- FAOSTAT (2011). Food and Agriculture Organisation Statistics. Source:
<http://faostat.fao.org/site/339/default.aspx>, last accessed: 15.03.2012
- Fargione J., E., Plevin, R. J., Hill, J., D. (2010). The ecological impact of biofuels. *Annual Review of Ecology, Evolution, and Systematics*, 41, 351–77.
- Heinzerling, L. and Ackerman, F. (2002). Pricing the priceless: Cost-benefit analysis of environmental protection. Washington, D.C.: Georgetown University.
- IEA (2004). Biofuels for transportation. Paris: International Energy Agency
- JAKOA (2011b), Department Program. <http://www.jakoa.gov.my/web/guest/programjabatan>, Last accessed: 15.03.2012
- JRC (2008), *Biofuels in the European Context: Facts and Uncertainties*. Ispra, Italy: European Communities.
- JRC-IE (2008). Expert Consultation on: "Direct and indirect impact of biofuel policies on tropical deforestation in Malaysia". Kuala Lumpur, Malaysia: JRC-IE
- Lai, W.T. (2011), Gender and Livelihood: A Case Study of the Mah Meri and the Oil Palm Plantations of Carey Island. *Asian Journal of Women's Studies*, 17, 2, 66-95.
- LMC International (2011). Oil palm annual reports. Indonesia and Malaysia 2011. Oxford: LMC International
- Laws of Malaysia (1957). Federal Constitution. Incorporating all amendments up to P.U.(A) 164/2009 Arrangement of Articles. Source:
<http://www.jac.gov.my/jac/images/stories/akta/federalconstitution.pdf>, last accessed: 15.03.2012
- Lye, L. H. (2001). Public participation in the environment: A South-East Asian Perspective. In Pring, G. (2001). *The law of public participation in mining and resources development*. London: IIED
- Machacek, E. (2007). *Sustainable development in Western Anglophone Africa*. Analysis of Millennium Development Goal 7's viability "Ensuring environmental sustainability in forest management" under corruption aspects in Ghana and Liberia. Munich: Grin Verlag.
- Machacek, E. M. (2011). Deforestation, palm oil and indigenous land rights: A field study from Malaysia. Lund University: LUCSUS (to be published shortly).

- Miller, G. Tyler, Spoolman, Scott, E. (2009). *Living in the environment: Concepts, Connections, and Solutions*. Belmont, USA: Brooks/Cole, Cengage learning.
- Mohai, P., Pellow, D. and Roberts, T., J. (2009). Environmental Justice. *Annual Review of Environment and Resources*, 34, 405-30.
- MPOB (2010). Official Website of the Malaysian Palm Oil Board. Source: <http://www.mpob.gov.my>, last accessed: 15.03.2012
- Nagai, M. (2011). Initiatives to strengthen countries' capacity in environmental justice and enforcement. *Brainstorming symposium on Integrated Capacity Building of the Enforcement Chain to combat illegal trade in ODS*. 9-10 June 2011. Paris: UNEP Source: www.slideshare.net/ozonaction/unepps-initiatives-enforcement, last accessed: 12.03.2012
- Nicholas, C. (2000). *The Orang Asli and the Contest for Resources: Indigenous Politics, Development and Identity in Peninsular Malaysia*. Copenhagen; Subang Jaya, Malaysia: International Work Group for Indigenous Affairs; Centre for Orang Asli Concerns.
- Nicholas, C., Engi, J., Teh Yen P. (2010). The Orang Asli and the UNDRIP. From rhetoric to recognition. Subang Jaya, Malaysia: Centre for Orang Asli Concerns (COAC)
- OECD/IEA (2007). IEA Energy Technology Essentials. Biofuel Production. Source: <http://www.iea.org/techno/essentials2.pdf>. Last accessed: 15.03.2012
- Official Journal of the European Union (2009). 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. Source: eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF, last accessed: 14.03.2012
- Oiltek Sdn Bhd (2001). Our products. Palm biodiesel plant. Source: http://www.oiltek.com.my/palm_biodiesel.html, last accessed: 14.03.2012
- Petrov, R. (2008). Exporting the *acquis communautaire* into the legal systems of third countries. *European Foreign Affairs Review* 13, 33–52.
- RSPO (2007). RSPO principles and criteria for sustainable palm oil production. Including indicators and guidance. Source: http://www.rspo.org/sites/default/files/RSPO%20Principles%20&%20Criteria_0.pdf, last accessed: 14.03.2012
- RSPO (2009). Promoting the growth and use of sustainable palm oil. About RSPO. Source: <http://www.rspo.org/page/9>, last accessed: 14.03.2012
- Schweizer, E. (1999). Environmental Justice: An Interview with Robert Bullard. *Earth First! Journal*. Source: <http://www.ejnet.org/ej/bullard.html>, last accessed: 13.03.2012
- SUHAKAM (2010). *Orang Asli*. Rights, problems, solutions. Kuala Lumpur: Idaman Print Sdn. Bhd.
- SUHAKAM (2012). The official portal of the Human Rights Commission of Malaysia. Source: <http://www.suhakam.org.my/home>, last accessed: 14.03.2012
- Switzer, S. and McMahon, J. A. (2011). EU biofuels policy: Raising the question of WTO compatibility. *International and Comparative Law Quarterly*, 60, 713-736.
- The Green Book (2011). Appraisal and Evaluation in Central Government. Treasury Guidance. London: HM Treasury.
- Tsing, A. L. (2005). *Friction: An ethnography of global connection*. Princeton, New Jersey: Princeton University Press.
- UNFCCC (2012). Kyoto Protocol. Source: http://unfccc.int/kyoto_protocol/items/2830.php, last accessed: 15.03.2012
- USITC (2010). Agro-based products: Palm oil. *ASEAN: Regional trends in economic integration, export competitiveness, and inbound investment for selected industries*. Investigation No. 332-511. Publication 4176.
- Zhai, G. and Suzuki, T. (2008). Evaluating economic value of coastal waterfront in Tokyo Bay, Japan with Willingness to Accept Measure. *Water Resource Management*, 23, 633-645.

Appendix A - Valuation techniques

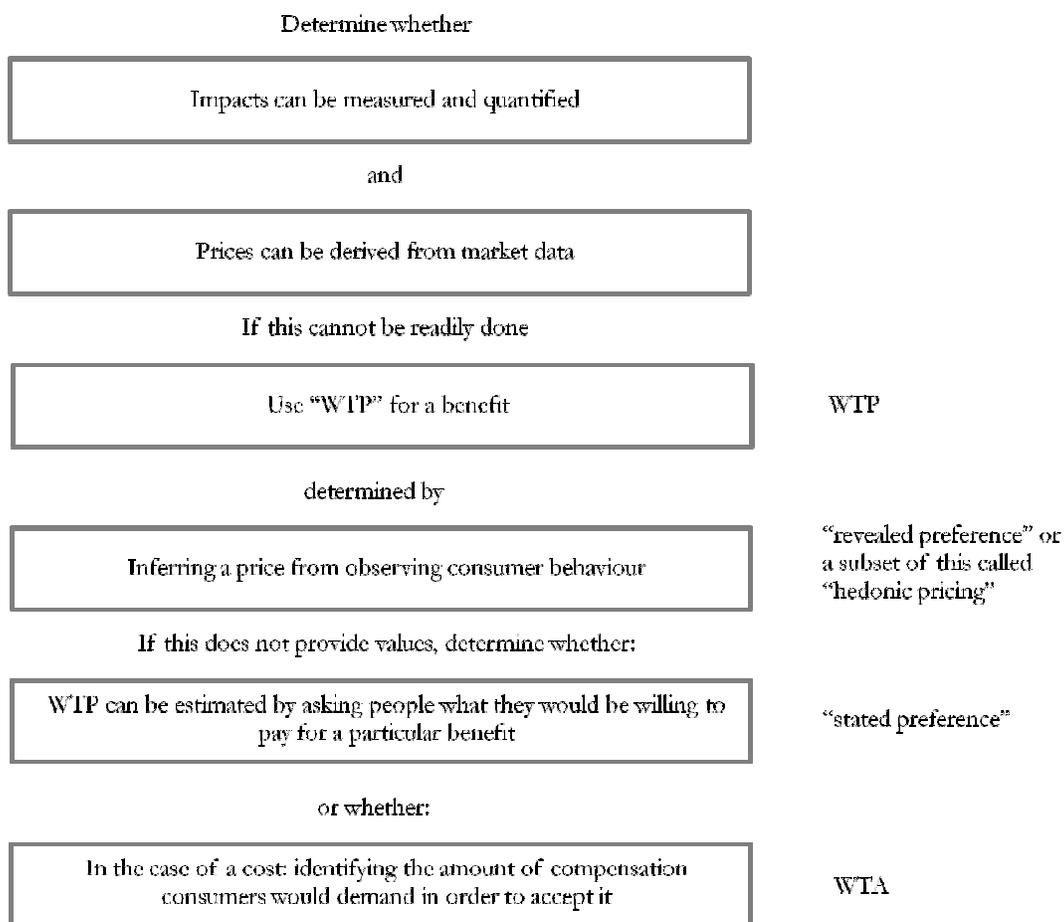


Figure 5 - Valuation techniques

Source: adapted from *The Green Book*, 2011