

Global Assessment of Biomass and Bioproduct Impacts
on Socio-economics and Sustainability

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Assessment of Public Perception on Biofuels and Bioproducts In Indonesia

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1. Introduction

This report presents the results of a rapid analysis of public perception of biofuels in Indonesia. A combination of desk based research; expert interviews and a small scale questionnaire survey have been used to inform the analysis, which is a contribution to Global Bio-Pact WP7: Public Perception of Biomass Production for Industrial Use. The report is intended to provide an overall impression of the current status and possible dynamics of public perception towards biofuels in Indonesia. It does not claim to be widely representative or to present a fully comprehensive picture. Based on this limited analysis, however, it is concluded that biofuels are broadly perceived favourably in Indonesia. They are seen as environmentally friendly, potentially beneficial to job creation and economic development and as a desirable part of Indonesia's energy mix. Nevertheless, the reality of the biofuel industry in the country is a picture of confusion and of limited commitment by both the government and the industry.

The report begins with brief overview of the methods employed, then goes on to present a description of the key stakeholders involved in the Indonesian biofuels landscape. Consideration is given to possible external and cultural influences on public perception and the results of a media analysis are presented. Finally, the results of the analysis, along with the questionnaire survey are synthesised.

2. Methodology

2.1 Internet and desk methods

Identification of and background research on key stakeholders was undertaken through desk based research. Websites of relevant organisations were consulted along with a number of key reports about Indonesia's biofuels industry. These findings were confirmed and discussed during interview and stakeholder discussions.

The methodology for the Media Analysis was a content analysis of five Indonesian newspapers over a six month period (1/10/2010 to 1/05/2011). The newspapers included two with national circulation in Bahasa Indonesia (*Kompas* and *Republika*), two Jakarta based newspapers published in English (The Jakarta Post and the Jakarta Globe) and one based in North Sumatra, the case study region (*Waspada*). For each newspaper, the search terms '*biofuel*', '*bahan bakar nabati*' and '*BBN*' were used to search the online archives. Each article was then analysed according to the following criteria:

- Whether biofuels were the focus or a minor element of the article
- The type of article (e.g. news, opinion, feature) and section of the newspaper the article was published in.
- Whether the article had a national, international or local focus
- The way in which the article framed the issue of biofuels

Articles in which reference to biofuels was incidental and was judged to be an insignificant part of the report were discarded. The included articles were then further classified and analysed based on their topic of focus.

2.2 Expert interviews

Three in-depth expert interviews were conducted as part of the data collection for this report, with interviewees selected to represent three of the main stakeholder groups: the government, the private sector and the research and development community. These were supplemented with a number of shorter, informal discussions with a range of stakeholders attending a biofuels exhibition in Jakarta¹. These discussions provided additional information and support for the other methods, although they have not been referenced directly.

The interviews were conducted with the following experts:

- **Dr. Tatang Soerawidjaja**, Associate professor of chemical engineering, Institut Teknologi Bandung; Member of National Research Council: Technical Committee on New and Renewable Energy Resources; Member of Board of Experts, Indonesian Renewable Energy Society (IRES); President of Indonesian Association of Bioenergy Scientists and Technologists (IABEST); Chairman of Indonesian Biodiesel Forum; Representative of Indonesia in the ERIA's (Economic Research Institute for ASEAN and East Asia) Working Group for Standardization of Biofuel for Vehicles.
- **Harry Hanawi**, Corporate Affairs Director for Sinar Mas (one of the largest palm oil companies in Indonesia) and Vice Chairman of Permanent Committee on Food Security, KADIN (Indonesia Chamber of Commerce and Industry).
- **Royhan Setiawan**, Member of the Energy Efficiency Group at BPPT (Agency of Assessment and Application of Technology)

The interviews followed a series of open questions, tailored slightly for each interviewee. Questions were designed both to gather and confirm information necessary for this report and to understand the respondents' particular perspective and opinions on the biofuels industry.

2.3 Questionnaire design

The questionnaire survey used a slightly modified version of the standard questionnaire issued to Global Bio-Pact case study partners, translated into Bahasa Indonesia (Annex 1). The survey was conducted in Medan, North Sumatra. This location was chosen as it is the regional focus for the Indonesia case study, although it is likely that specific factors in this region mean that the results are not completely representative of the country as a whole. In particular, this region is the centre of the palm oil industry in Indonesia, meaning that a higher than average number of people have direct experience in the sector, and in many cases livelihoods are directly or indirectly dependent on it; it would be assumed that this is likely to affect perceptions of palm oil related issues. In addition, biodiesel, distributed by Pertamina, is more widely available in North Sumatra than some other regions.

The survey involved a sample of 30 respondents, interviewed in a selection of public locations in Medan with the aim of capturing a range of occupational groups: a petrol station, shopping area, university campus, high school and housing area. The sample was stratified by gender and age groups, although it was not possible to achieve a perfectly even distribution of these variables (Annex 2).

3. Stakeholder mapping

3.1 Policy makers

Indonesia's policies on biofuel development require the involvement of a large number of government agencies. A *National Biofuels Development Team (TINMAS BBN)*, was established in 2006, charged with designing and advising on biofuel policy, although this group is now defunct; the *Coordinating Ministry for Economic Affairs* plays the coordinating role in biofuel development, supply and utilisation. In addition, Presidential Memorandum No. 1/2006 defined roles for a range of other Ministries in implementing biofuel policy (figure 1). Particularly important is the *Ministry of Energy and Mineral Resources*, and specifically the *Directorate General for Oil and Gas (Ditjen Migas)* and the newly created *Directorate General of New and Renewable Energy and Energy Conservation (EBTKE)*, which oversees Indonesia's energy policy and specifically energy diversification and conservation. In addition, the Agriculture Ministry, Forestry Ministry, Industry Ministry and Finance Ministry have critical roles.

Indonesia's biofuel policy in its current form dates back to 2006. High oil prices in 2005 prompted a number of initiatives designed to kick-start biofuel development in Indonesia as part of a strategic plan for energy security². These included the introduction of blending targets for state owned oil and gas company Pertamina, and the formation of the National Biofuels Development Team. The policy objectives of Indonesia's biofuels policy are to create jobs, particularly in the agricultural sector, while reducing dependence of fossil fuels. Production and utilisation of biofuels is a key part of the Government's attempts to diversify the country's energy mix as part of its overall energy policy; the target for 2025 is for 17% of energy to come from new and renewable sources, including 5% from biofuels³. Early expectations of Indonesia's biofuels programme, however, have not been met, and a range of obstacles has meant that biofuel development has been much slower than was initially hoped for⁴.

National Biofuel Development Team (TINMAS BBN)

The National Biofuels Development Team was formed in 2006 under the direct control of the President and charged with planning and advising on Indonesia's biofuel development. The team included former cabinet members as well as CEOs of state-owned enterprises (SOEs)⁵. It did not, however, have powers to implement policy; this remained the role of the various Ministries. Although the team is now defunct, it initially had a high profile role.

In the early stages of policy development, TINMAS was responsible for developing a blueprint and roadmap for the development of biofuels targeted at reducing poverty and unemployment, preparing formulas for the provision and use of biofuels and acting as a facilitator for both farmers and investors. It was envisaged that as policies were implemented, the team would be responsible for evaluating the impact of biofuel development on poverty and unemployment and for reporting on the progress of biofuel development⁶.

Given the team's limited powers, however, implementing their strategy required the participation of the various Ministries listed in figure 1; coordination issues between this

plethora of actors with often conflicting objectives has presented obstacles to the implementation of TINMAS's strategy⁷.

<i>Institution</i>	<i>Role</i>
Coordinating Minister for the Economy	Co-ordinates preparation & execution of supply and utilization of biofuel.
Department of Energy and Mineral Resources	Executes policy of supply and exploitation of biofuels. Settles policy of incentives and tariffs for development of supply and exploiting of biofuels by co-coordinating with related institutions. Defines the standard and quality of vegetable fuel (biofuel). Defines system and procedure for quality testing of vegetable fuel (biofuel). Encourages companies to be active in energy and mineral resources to exploit biofuel.
Department of Agriculture	Promotes supply of raw material, including seed. Facilitates supply of raw material. Integrates activity of development and activity of post crop and raw material production.
Department of Forestry	Issues permits from exploitation of non-productive forest land for development of biofuel raw material pursuant to law and regulation.
Department of Industry	Increases development expansion of domestic equipment for processing of vegetable fuel raw material and encourage entrepreneurs in developing biofuel industry.
Department of Trade	Facilitates availability of supply of biofuel and raw material. Guarantees availability of supply and distribution equipment for processing and exploiting biofuel.
Department of Communication	Facilitates improvement of exploitation of biofuel in transportation sector.
State Minister for Research & Technology	Develops technology and recommends applications for exploitation of supply technology and processing, raw material distribution and utilization of biofuel.
State Minister for cooperatives & small and medium enterprise	Promotes cooperation within small and medium sized industry to participate in development of raw material and processing and trading of biofuel.
State Minister for state owned enterprises	Promotes government-owned corporations of agriculture, plantation and forestry to develop crop vegetable fuel raw material (biofuel). Promotes government-owned corporations to develop industry processing of vegetable fuel (biofuel). Promotes government-owned engineering corporations to develop technological processing of vegetable fuel (biofuel). Promotes government-owned energy corporations to exploit vegetable fuel (biofuel).
Department of Home Affairs	Coordinates and facilitates local government lines and preparation of public in supply of land in each area,

	especially land critical for raw material.
Ministry of Finance	Studies regulation of laws in finance-related issues to provide incentive and priority of fiscal measures for supply of raw material and biofuel.
State Minister for Population	Performs socialization and communications to the public about exploiting vegetable fuel (biofuel) as an environmentally friendly fuel.
Provincial Governor (Province level)	Executes policy to increase exploitation of biofuel in its area as according to its authority. Executes socialization of exploitation of biofuel in its area. Facilitates supply of land in its area with its authority, especially critical land for clean energy from vegetable fuel raw material (biofuel). Reports execution of this instruction to The Minister of Home Affairs.
Regent / Major (Bupati) (District level)	Executes policy to increase exploitation of biofuel in its area as according to its authority. Executes socialization of exploitation of biofuel in its area. Facilitates supply of land in its area appropriate with its authority, especially critical area for clean energy with appropriate vegetable fuel raw material (biofuel). Reports execution of this instruction to Governor.

Figure 1: Role of Ministries and other government institutions in implementing biofuel policy⁸

3.2 Research and Development

Research into various aspects of biofuel development is undertaken by a range of institutions in Indonesia, including the Agency for the Assessment and Application of Technology (BPPT) and LEMIGAS (oil and gas research institution) which are both government agencies, a number of universities and research institutes focusing on particular aspects of biofuels, such as the Institut Teknologi Bandung (ITB) and Institut Pertanian Bogor (IPB), along with research undertaken by State Owned Enterprises (SOEs) and the private sector. There is, however, no coordinated bioenergy research agenda or dedicated bioenergy research centre in Indonesia.

Research areas include: on farm technology, such as high quality seeds and higher land productivity, which in the palm oil industry is led by the Indonesian Oil Palm Research Institute (IOPRI) but also undertaken by private sector palm oil companies; development and testing of biofuel blends; improving biodiesel performance and quality; testing the application of biofuel in industrial equipment; integration of biofuel plants; second generation biofuels from ligno-cellulose and biomass and the effect of biofuels on emission reductions. Biofuels research in Indonesia has been ongoing since the 1980s when the first pilot bioethanol plant was constructed in Sumatra by BPPT, and research on biodiesel process development began in 2000⁹.

Agency for the Assessment and Application of Technology (BPPT)

BPPT is a non-departmental government agency under the coordination of the Ministry of Research and Technology, established in 1974. The agency carries out government duties

in the field of assessment and application of technology. BPPT performs a number of functions, including directly formulating government policy and providing training and services to both government agencies and the private sector in the field of assessment and application of technology. Biofuels research primarily falls under the remit of the Directorate of Energy Resources Development Technology and the Energy Technology Centre. Recent biofuels work has included the development of a 'greener' diesel fuel with Pertamina¹⁰.

3.3 Agro-Industrial Producers and Investors

In the early days of biofuel development in Indonesia, interest in biodiesel production was high: at an event held in Jakarta in 2007, 67 agreements for biofuel development were signed¹¹. Many of the private sector palm oil companies expressed an interest in developing biodiesel plants, and several made their plans public¹². Only a fraction of the projects were ever implemented however: the refinery planned by Sinar Mas was a large scale example of plans being shelved¹³.

Gathering information about current biodiesel producers and scale of production is difficult. Production data and projections from APROBI are widely quoted, but often differ from other sources. Moreover, while companies' biodiesel plans are often reported, it is more difficult to find out whether these plans have been followed through. Efforts to verify reports with companies directly were unsuccessful.

In 2010, USDA FAS reported (based on APROBI data) that total installed biodiesel capacity stood at 4.3 million kilolitres per year, but that actual production had fallen far short of this: in 2010, utilisation stood at 9.3% of capacity, with production of 400,000 million kilolitres¹⁴. The same source reported that there were 20 biodiesel producers in Indonesia¹⁵. Although this report gave no specific details, it seems likely that this figure includes both producers with small scale, experimental plants, along with commercial producers of various scales. Wilmar is the largest producer of biodiesel, although it is unclear how much of Wilmar's production is used domestically and how much is exported¹⁶.

It was not possible to compile a full, current list of producers, but figure 2 provides a summary of the situation in 2008, with projections for 2009 and 2010, as reported by Dillon et al (2008). This report also notes the wide variation in data and urges caution over production figures. It seems likely that additional producers can now be added to this list, but, as noted above, plans and projections are difficult to verify.

Company	Location	2008		2009*		2010*
		Capacity	Production	Capacity	Production	Capacity
Asian Agri Tbk	Lubuk Gaung, Dumai	200 (227.2)	70 (79.5)	200 (227.2)	80 (90.9)	200 (227.2)
BPPT	Serpong, Banten	0.3 (0.3)	0.3 (0.3)	0.3 (0.3)	0.3 (0.3)	0.3 (0.3)
Darmex Biofuel	Bekasi, East Java	150 (170.4)	30 (34.1)	150 (170.4)	60 (68.2)	150 (170.4)
EAI	Jakarta	0.5 (0.57)	0.5 (0.57)	0.5 (0.57)	0.5 (0.57)	0.5 (0.57)
Energi Alternatif Indonesia PT	Jakarta	0.3 (0.3)	0.3 (0.3)	1 (1.1)	1 (1.1)	1 (1.1)
Eterindo Wahanatama Tbk	Gresik, East Java & Tangerang, Banten	120 (136.3)	120 (136.3)	240 (272.6)	240 (272.6)	240 (272.6)
Ghanesa Energy Group	Medan, North Sumatra	3 (3.4)	3 (3.4)	10 (11.4)	10 (11.4)	10 (11.4)
Indo Biofuels Energy	Merak, Java	60 (68.2)	60 (68.2)	160 (181.8)	100 (113.6)	160 (181.8)
Multikimia Intipelangi	Bekasi, East Java	5 (5.7)	5 (5.7)	10 (11.4)	10 (11.4)	10 (11.4)
Musim Mas Group	Medan, North Sumatra	50 (56.8)	10 (11.4)	350 (397.6)	100 (113.6)	350 (397.6)
Permata Hijau Group	Duri, Sumatra	200 (227.2)	75 (85.2)	200 (227.2)	100 (136.3)	200 (227.2)
RAP	Bintaro, Jakarta	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)
Sumi Ashi	Bekasi, Java, and Lampung	100 (113.6)	50 (56.8)	200 (227.2)	200 (227.2)	200 (227.2)
Wilmar Group	Dumai, Riau	700 (795.5)	300 (340.8)	1000 (1136)	300 (340.8)	1000 (1136)

Figure 2: Biodiesel producers with installed capacity in 2008. Production figures in '000 tonnes ('000 KI) per year¹⁷.

*expected figures based on projections

Indonesia Biofuels Producers Association (APROBI)

Established in January 2007, APROBI (Asosiasi Produsen Biofuel Indonesia) is the industry body representing biofuel producers in Indonesia. It negotiates on behalf of its members and lobbies the government on biofuel policies. Specifically, APROBI has called for: clear incentive policies (tax reductions, mandatory use of biofuels, etc); securing of the feedstock supply through percentage allocation of CPO for biodiesel; acceleration in the availability of diversified feedstocks such as jatropha, coconut etc.

Financing of Biofuels

Early indicators suggested that there was considerable interest in biofuel development amongst investors. In 2006, Business Watch Indonesia reported that a number of

Indonesian banks, both state-owned and private, were providing loans with special interest rate for biofuel development projects; major investors included PT Bank Negara Indonesia Tbk (BNI), Bank Republik Indonesia (BRI), Bank Mandiri, Bank Bukopin, Bank Daerah Sumatra Barat and Bank Daerah Sumatra Utara, amongst others¹⁸. Along with producers, however, confidence in biofuel developments amongst banks and investors has waned. Again, it is difficult to establish an accurate, up to date picture of investment in the biofuel sector.

3.4 Smallholders

Smallholders¹⁹ cultivate around 41% of oil palm producing land, and their share of production is estimated to be growing at an average of 12% per year²⁰. Palm oil smallholders therefore hold a significant stake in the production of the main potential biodiesel feedstock (CPO). However, as small farmers sell their product (fresh fruit bunches) into a supply chain where biodiesel is just one end product, their involvement in the biofuels sector is indirect. Furthermore, oil palm smallholders engaged in commercial FFB production have not been targeted directly by Indonesia's biofuels policy.

Instead, Indonesia's biofuels policy objective of reducing poverty and unemployment has primarily been addressed through the 'Desa Mandiri Energy' ('Energy Self-Sufficiency Village') program. This was designed to directly engage smallholders in energy production, with the objectives of reducing the dependence of rural communities on fossil fuels while promoting rural development. The production and use of bio-energy is one strand of the program; villages received support to develop energy crops, in particular *jatropha curcas*, for a central conversion facility, with the aim being that villages would provide sufficient energy for their own needs²¹. Initial targets envisaged the creation of 1000 energy self sufficient villages by 2010²².

Like the biofuels policy as a whole, the ESSV program required coordination between a variety of Ministries; in total seven ministries were allocated roles in activities related to the program, while overall monitoring was the responsibility of the Coordinating Ministry for Economic Affairs. The state electricity company, PLN, was to act as a stand-by buyer for excess blended biodiesel²³.

Recent reports and evidence from interviews suggests that this policy has met significant obstacles; targets have not been met and the impacts of the policy at village level for villages focused on energy from biomass have been disappointing²⁴.

3.5 NGOs and pressure groups

A significant number of social and environmental NGOs are engaged in the biofuels debate in Indonesia, including international, national and local organisations. While their focus and engagement strategies vary, broadly speaking the positions of these organisations towards biofuel development range from 'proceed with caution' to active opposition.

The table below summarises a selection of social and environmental NGOs active in Indonesia who have expressed a position on biofuel development.

NGO	Scale	Focus	Position on biofuels
Greenpeace http://www.greenpeace.org/seasia/id/	International, with an Indonesian operation	Environmental focus	Opposed/very cautious position on biofuel development in Indonesia. Main concerns: Opposed to any destruction of remaining natural ecosystems; issue of land availability for food production ²⁵
WWF Indonesia http://www.wwf.or.id/	Indonesian member of the Global WWF Network	Environmental and conservation focus.	Supportive of bioenergy production that is environmentally, socially and economically sustainable – i.e. where properly managed and environmental and social standards are applied ²⁶
WALHI (Friends of the Earth Indonesia) http://www.walhi.or.id/	Indonesian organisation - part of international Friends of the Earth Network	Environmental and conservation focus	Position on biofuels led by an assessment of their impact on climate change (greenhouse gas balance) Opposed to use of palm oil as a biofuel Main concerns: Deforestation caused by palm oil expansion; loss of biodiversity ²⁷
Sawit Watch http://www.sawitwatch.or.id/	National network of social and environmental organisations	Social justice and environmental issues in the palm oil industry	Opposed to use of palm oil as a biofuel Main concerns: Biofuel demand will act as a driver of palm oil expansion. Concern about land acquisition, social conflict and rights abuses ²⁸
Setera Jambi	Local (Jambi Province)	Social justice issues in the palm oil industry	Opposed to use of palm oil as a biofuel. Main concerns: Biofuel demand will act as a driver of palm oil expansion. Concern about local food security, land rights, impact on traditional subsistence farming ²⁹

Figure 3: NGOs involved in biofuels campaigns in Indonesia.

In addition to organisations campaigning against biofuel development, a number of lobbying groups have emerged which campaign in the interests of the palm oil industry. One high profile and example of these is World Growth International, which has attracted controversy over its aggressive campaigning³⁰.

3.6 Buyers and distributors of Biofuels

Pertamina (Perusahaan Tambang Minyak Negara)

Indonesia's state oil company operates a vertically integrated system covering upstream and downstream activities. It is under a mandate from the government to provide transport fuel and kerosene at subsidized prices, and is also required to provide blended biofuels at the same price as subsidized petroleum fuels. Pertamina is designated as a "standby" consumer of any excess bioethanol and biodiesel production³¹. Pertamina began selling biodiesel blended with petroleum diesel in May 2006, under the brand name "Bio Solar." Initially, Bio Solar was a blend of 95 per cent automotive diesel fuel and five per cent biodiesel (B5), although this was scaled back to one per cent biodiesel in May 2008 due to high costs of purchasing biodiesel³². Commencing in 2009, MEMR Decree No. 32/2008 made biofuel consumption mandatory.

As the only domestic blender of biofuels, the biodiesel purchase price offered by Pertamina has been the subject of much dissatisfaction amongst biodiesel producers³³, who have argued that the formula used to calculate the buying price, which is based on the Ministry of Trade's export tax valuation, undervalues their product³⁴. For their part, high CPO prices meant that Pertamina has made a loss on biodiesel blends³⁵, although the Rp. 2000 per litre biofuel subsidy, agreed in 2009, has gone some way to address this³⁶.

PLN (PT Perusahaan Listrik Negara)

Indonesia's state-owned power utility, which has monopoly control over electric power generation has also been designated as a "standby" consumer of any excess fuel-grade straight vegetable oil at market price³⁷. Currently, however, no biofuel is being used for power generation in Indonesia, and, other than limited scale trials, little progress is being made in this direction³⁸.

4. External influences and crises

The dominant influence on the fortunes of the biofuels industry in Indonesia is the economics of production. Both CPO and oil prices determine the degree to which biodiesel production is profitable, while pricing and subsidy arrangements from the government heavily affect incentives. All of these factors, to varying extents, are determined by influences external to Indonesia.

The global economic crisis, which began in 2008, also had an impact on biodiesel production. While Indonesia's economy as a whole fared reasonably well, the crisis affected conditions for investors, and was an additional factor in the decision of some companies such as Sinar Mas to shelve biofuel development plans³⁹. Moreover, the crisis prompted a readjustment of priorities by a number of ministries involved in biofuel development, further hampering efforts to move the program forward⁴⁰.

While these external factors have undoubtedly been felt by producers, the extent to which they have affected public perception of biofuels is unclear. Although the media analysis did not cover the period of the financial crisis, there was evidence that the impacts of external influences such as unrest in the Middle East on biofuel issues were being covered. A number of articles also made connections between high food prices and biofuel production, although these were rarely treated in much detail. These issues will be discussed further in the following section.

While the media analysis therefore suggests that external influences may filter through to public opinion, the questionnaire analysis revealed no particular evidence that this was the case. Beyond a general awareness of the scarcity of fossil fuels, and the dependence of Indonesia on oil imports, there was no mention by respondents of the external context. Again, these results will be discussed at more length in section 7.

5. Media Analysis

Between the five newspapers surveyed over the six month period from 01/10/2010 to 01/05/2011, a total of 71 articles were found which included significant reference to biofuels. Of these, 41 (58%) had biofuels as their primary focus, while in 31 (42%) articles biofuels were a more minor, but still significant element. Biofuel articles were most frequently found in the News sections of the newspapers (42%), but a significant proportion (34%) were published in the Business or Economy sections. 3% were found in the Opinion or Comment sections, while the remainder appeared in Science or Environment sections or in special supplements.

The majority (69%) of articles had a national focus or focused on stories from within Indonesia in newspapers with national circulation, while 28% appeared in International sections or had an international focus. In the regional newspaper there were 2 biofuels articles with a local focus on North Sumatra. There was some evidence of temporal clustering of articles on specific topics, which is described below.

Following initial analysis, the articles were grouped into topics. Figure 4 lists the topic categories used along with the distribution of articles between topics.

Topics in which biofuels were usually the primary focus:	Topics in which biofuels were usually a minor element:
<ul style="list-style-type: none"> • Indonesia's biofuels policy (17%) • Small scale and experimental biofuel projects (14%) • Other countries' biofuel developments (10%) • Indonesia's existing biofuel projects and developments (7%) • Private sector use of biofuels (6%) 	<ul style="list-style-type: none"> • Sustainability of palm oil (15%) • Indonesia's energy policy (8%) • CPO demand and prices (8%) • Food security and food prices (6%) • Other countries' energy policies (4%) • Macro-economic issues (4%) • Oil prices (1%)

Figure 4: Distribution of articles by topic

The most frequently reported topic, where biofuels were the primary focus, was Indonesia's biofuel policy. Articles on this topic were distributed evenly between the News and Business sections. While their foci varied slightly, broadly speaking all articles framed biofuel development as a desirable policy objective for Indonesia; the argument that there is a need for Indonesia to develop biofuels in order to reduce dependence on oil imports was frequently repeated. 3 of the 12 articles in this topic category explicitly linked the need for Indonesia to have a biofuels policy to recent unrest in the Middle East. Alongside the assumption that biofuels are necessary for Indonesia, it was commonly asserted that Indonesia has excellent potential for developing biofuels. This potential was generally not described explicitly, but was generally based on an assumption of easily available feedstock.

Another theme within this topic, particularly common in articles from the Business and Economy sections was the economic feasibility of biofuels in Indonesia. There was consensus that there are significant economic hurdles to biofuel development at present, including pricing, fuel subsidies and access to finance. There was also consensus on the need for biofuel subsidies in order to make biofuel production economically viable.

In addition to articles focusing on biofuel policy, 8% of articles addressed the issue of biofuels within reports about Indonesia's energy policy more broadly. These articles tended to follow similar lines and repeat similar assumptions; they commonly emphasised the need for and desirability of biofuels as part of an energy mix to increase Indonesia's energy security.

The second most frequently covered topic was small scale and experimental biofuel projects, which was the focus of 14% of articles. A diversity of projects was covered, including biofuel from organic waste, bintaro seed and micro-algae on waste water. In these articles, biofuels were framed positively and quite differently in comparison with other topics. A number of these articles adopted a scientific or technical perspective, detailing the processes involved in biofuel production; 4 of the 10 articles appeared in the Science or Technology sections. Another common framing was as a profitable opportunity for entrepreneurs; a perspective which contrasted to the argument applied to the national scale that biofuels are uneconomic. Biofuels were also seen here as holding potential benefits for rural development and the environment, particularly through reduction of waste and slash and burn practices.

In contrast to the positive framing of projects in their early stages, the newspapers' coverage of biofuels developments and projects already underway was considerably more critical. 7% of articles addressed this topic, with most of these focusing on the Desa Mandiri Energi (Energy Self Sufficient Villages program). All of these reported on the failures and problems faced by the program, including the lack of support received by farmers and inappropriate incentives. Articles covering existing biofuel developments also addressed the current status of Indonesia's biodiesel plants, reporting that most are not operating; a situation framed as disappointing given early expectations about biodiesel production.

Biofuel developments in other countries received more mixed treatment. The most positive coverage was given to Brazil; in three articles, Brazil was held up as a success story of biofuel development and as an example for Indonesia to emulate. However, with the exception of one article framing Brazil's sugar cane as environmentally beneficial, praise for Brazil was generic; in contrast to the treatment of biofuels in Indonesia, none of these articles evaluated Brazil's biofuel development through an economic lens.

Other international biofuel developments covered included a biodiesel refinery recently opened in Singapore. This was reported optimistically, but mainly on account of its potential future use of second generation feedstocks. Biodiesel developments in Malaysia were treated critically with similar arguments to those levelled at Indonesia's biodiesel 'disappointments' being applied. Finally, the article which included the strongest criticism of biofuel policy was an opinion piece focused on US ethanol subsidies. Although the article outlined the arguments in favour of subsidies the balance was negative; interestingly contradicting the policies advocated elsewhere for Indonesia.

A topic in which biofuels appeared frequently as a minor element was the sustainability of palm oil; a frequently reported and discussed issue. Articles classified under this topic, however, framed sustainability issues in quite different ways. Interestingly this was the topic which saw the greatest divergence between the various newspapers. Also notable is that over a third of the articles in this category were found in the Opinion sections. Almost half of the articles addressed issues of deforestation and carbon emissions, attributing them largely

to palm oil expansion and identifying biofuel development as one driver of this expansion. All of these articles appeared in two of the five newspapers.

A second, contrasting group of articles within this topic focused on the argument of Indonesian palm oil producers that the industry is subject to a smear campaign led by European competitors. By repeating the arguments of producers, the framing of palm oil in these articles is as a sustainable crop, but subject to victimisation on the world stage. A final theme within this category addressed strategies being proposed or implemented to improve the sustainability of palm oil, and by extension biofuel from CPO. These included reports of planting on degraded land and the launch of the Indonesian Sustainable Palm Oil (ISPO) certification. In these articles, the framing was of palm oil as potentially sustainable with appropriate interventions.

A range of other topics, in which biofuels were treated in less detail, made up the remainder of the sample. 8% of articles, all from the Business and Economy sections, addressed the recent high prices of CPO; many of these made links between high CPO and high oil prices. Some articles within this group partly attributed high CPO prices to biofuel demand, especially from Europe, while others presented the high oil prices as an opportunity for CPO producers to benefit from biofuel production.

Articles focused on food prices and food security comprised 6% of the articles. These all took an international focus and were all opinion pieces. In all cases biofuels were presented in general terms as being in competition with food and therefore seen in a negative light as being one driver of high food prices.

6. Cultural parameters

During the course of the research for this report, no evidence was found of particular cultural influences on public perceptions of biofuels in Indonesia. In one expert discussion, there was mention of 'farmers' mindset' being an obstacle to the success of jatropha in some rural areas, but it would be difficult to generalise from this comment, or attribute this to particular cultural influences.

7. Synthesis

7.1 Current public perception of biofuels

The results of the questionnaire indicated that currently public perception of biofuels in Indonesia is overwhelmingly positive. 87% of respondents expressed an entirely positive opinion about biofuels in general, and 93% were in favour of biofuel development in Indonesia. Biofuels were viewed as being an important oil substitute, and were broadly perceived as being sustainable and 'environmentally friendly'. Within the Indonesian context, their development was seen as being as offering potential for economic growth and job creation.

Most respondents had some knowledge about biofuels: when asked how much they knew, 83% claimed they knew a little and 4% felt they knew a lot. Only 13% claimed that they knew nothing (and some of these then went on to demonstrate some knowledge). There was a high level of awareness that biofuels originated from plants or organic materials, with 63%

volunteering this information; 20% of respondents also named specific feedstocks, with palm oil being the most common. 27% of respondents were aware that biofuels are used in a mixture with fossil fuels and 20% identified them as a substitute for oil based fuels.

It appears that information about biofuels is disbursed through a wide range of channels. While the most common sources of information were television (identified by 43% of respondents) and newspapers (37%), all other options listed in the questionnaire were identified as information sources by at least one respondent. Interestingly, 17% of respondents received information about biofuels from petrol stations. Only 50% of respondents could identify when they found out about biofuels. Two thirds of these had known about biofuels for less than 2 years. There was no particular evidence that awareness of biofuels is linked to specific events, although the two year time frame does coincide with when biofuel blending became mandatory for Pertamina, which may have been when respondents first encountered biodiesel.

Knowledge of specific biofuels projects was very limited; 73% knew of no projects or programmes at any scale. Of those respondents who claimed some knowledge, only 5 people (17%) were able to give specific information (such as the name of a place or project). Most of these were local projects, such as a local refinery and research centre. Knowledge of other countries' biofuels developments was limited to mention of Brazil and Malaysia; these countries were also the ones identified in the Media Analysis. The lack of knowledge of specific projects was perhaps surprising, given that 14% of newspaper stories focused on specific projects, although these tended to receive isolated coverage in 'one off' stories.

When asked to identify which public priorities they felt were particularly pressing for Indonesia, respondents gave a range of unprompted responses. Unemployment and job creation were most commonly identified (by 23% of respondents), followed by energy and fuel concerns (although this answer may have been influenced by the questionnaire's focus), and economic development priorities. The remainder of answers were distributed fairly evenly between issues such as deforestation, poverty, corruption and food prices.

Respondents were then given options for public policy priorities, all of which were related directly or indirectly to biofuel development, although this was not stated in the question. Employment generation was still viewed overwhelmingly as the most important concern for Indonesia, with 87% of respondents ranking it as their first or second priority and only 4% ranking it fifth or sixth. Food security was perceived to be the second most pressing problem; 37% of respondents ranked it first or second and 4% ranked it fifth or sixth. The issue viewed as the least pressing for Indonesia's public policy was climate change; only 4% ranked this as one of their top two concerns while 43% considered it be one of the lowest two priorities. The other issues were perceived to have a similar level of importance by the respondents as a whole.

Interestingly, these concerns echo the stated policy objectives of Indonesia's biofuels policy, namely to reduce unemployment and improve energy security. This alignment of policy goals with citizens' key concerns is perhaps one reason why the policy has broadly been viewed in positive terms. Moreover, the possible role for biofuels in reducing Indonesia's greenhouse gas emissions has neither been highlighted as a prominent policy goal nor debated extensively in the media⁴¹. Again, this is perhaps reflective of (or possibly has contributed to) the low priority accorded to this issue.

When asked for their opinions about biofuels in general terms, respondents were overwhelmingly positive. Responding to an open question, 87% of people gave an opinion that was entirely positive. The most common reasons for their positive opinion of biofuels was that their use reduces the use of oil, viewed as positive in general terms, or more specifically that their use will reduce Indonesia's dependence on oil imports. Other reasons for a positive view of biofuels included the fact that they are renewable, that they can help development and job creation and that they are 'environmentally friendly'. This final point was expressed in general terms; only one respondent identified reduced air pollution as a benefit and another specified that biofuels can help reduce climate change. While no one expressed an entirely negative view of biofuels, 13% of respondents gave a partially negative or conditional opinion about biofuels in general; 2 people raised the issue of potential environmental damage.

The perception of biofuels being 'environmentally friendly' dominated however. This view was also reflected in the question about sustainability; 80% of people believed that biofuel development was sustainable, with the remainder expressing a conditional view (i.e. that biofuels can be sustainable if developed carefully, or if political commitment is maintained).

When asked whether they would support biofuel development in Indonesia, the response was even more positive, with 93% expressing support. Reasons given were in line with those for other questions, and closely mirrored respondents' key priorities for Indonesia; the most common reasons for supporting biofuel development were that it can help reduce dependence on oil and that it can promote development and job creation. Again, these reasons are in line with the government's policy objectives for biofuel development.

Perceptions of the critical issues in biofuel development provoked a mixed response. In response to an open question, a broad spectrum of issues was cited, with reducing use of oil and fossil fuels being the most common (27%). When given a choice of issues to rank, some interesting results emerged (figure 5).

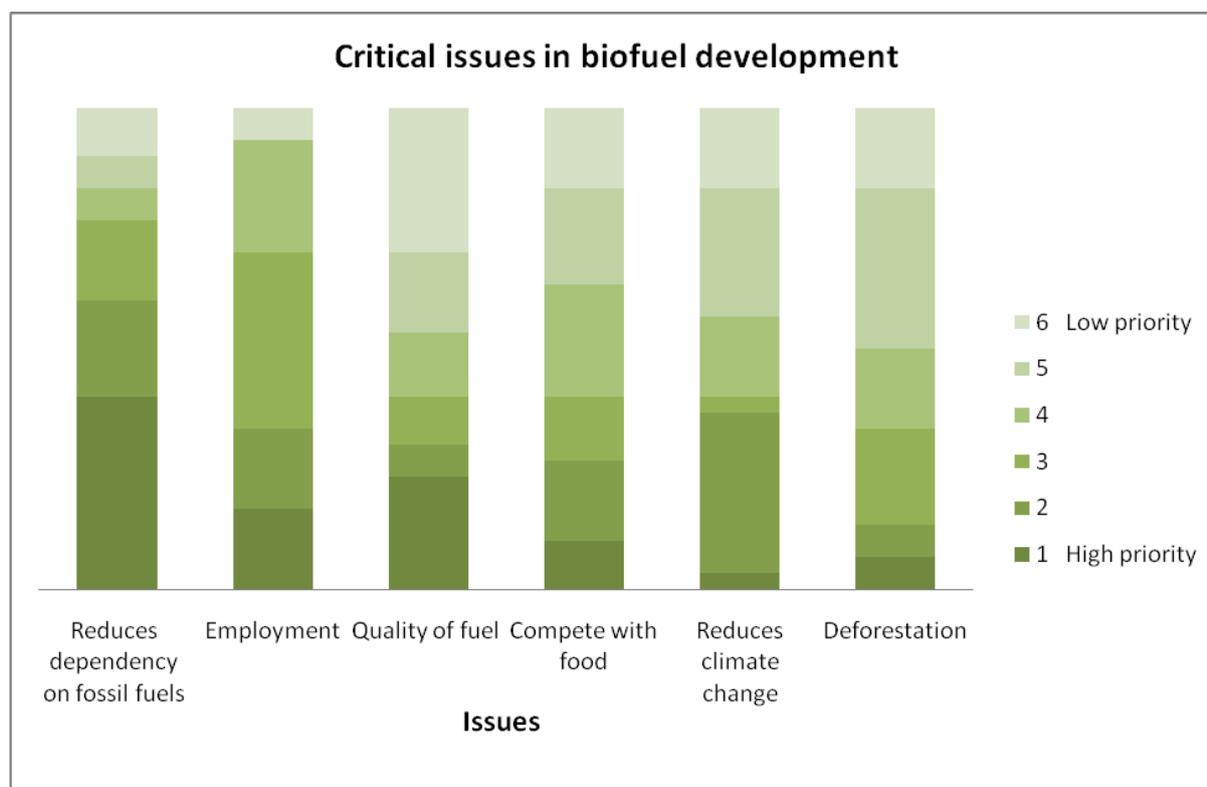


Figure 5: Priority accorded to issues in biofuel development.

The recurring theme of reducing dependency on fossil fuels again emerged as the most highly scored issue. The need for biofuel development to create jobs, another theme throughout the responses, unsurprisingly was also scored highly. The issue of fuel quality prompted an interesting distribution of responses, with 23% ranking this as the most important issue and 30% placing it lowest. This is perhaps reflective of respondents' information sources; 17% identified petrol stations as their sole or main source of information.

The issue of climate change was ranked more highly than was perhaps to be expected, given the low priority suggested by previous responses. Although only one person made a link to climate change unprompted, 37% of respondents scored this either 1 or 2. Nevertheless, a higher proportion (43%) placed it in fifth or sixth place.

Interestingly, deforestation was perceived as the least critical issue in biofuel development; only 13% ranked this as one of their two highest priorities while 50% placed it fifth or sixth. The issue of deforestation ranked more highly as a priority for Indonesia; 20% ranked it 1 or 2 while only 37% ranked it 5 or 6). This seems slightly discordant, as biofuel development is considered to be one of the key drivers (or potential future drivers) of deforestation. This may be a result of people not being aware of the indirect environmental consequences of biofuels, which are perceived as 'environmentally friendly'. Although this issue is covered by the media (7% of articles included reference to biofuels in articles about deforestation), this link tends to constitute a minor element of news stories or a passing reference.

The final question allowed respondents to add any other points about biofuels. While most repeated issues or opinions raised previously, a significant number (20%) made the point that public knowledge and socialisation of biofuels is currently low. This issue will be discussed further in the next section.

7.2 Variables affecting public perception and likely evolution of public perception of biofuels in Indonesia.

Changes to Indonesia's biofuels landscape, along with the way in which those changes are conveyed, represented and experienced are all likely to influence the public perception towards biofuels in the future.

It is difficult to predict how the biofuels industry will develop in Indonesia in the next few years. Currently, it is perhaps best described as stagnant – although there are a handful of smaller biodiesel producers, all but one of the large companies appear to be producing at a fraction of their installed capacity or have shelved or put on hold their plans for biodiesel development⁴². The key issues identified by producers are high costs and biodiesel pricing. The current high price of CPO means that biodiesel production is expensive; profitability depends on availability of subsidies and a favourable buying price. Although there have been some improvements in the biodiesel pricing formula, and the biofuel subsidy has been implemented, this continues to act as a break on the development of the industry domestically⁴³.

Government commitment to biofuel development is also questioned by producers; concerns were expressed in interviews about the lack of enforcement of blending mandates, the slow disbursement of subsidies, the lack of tax incentives for biodiesel producers granted by the government and concerns over the export tax⁴⁴. It was also apparent from interviews that while the blueprint and targets of the National Biofuels policy may have been designed, five years after its launch the details of the policy are still under discussion and it was felt that there has been a lack of leadership and direction⁴⁵.

The DME programme, which was the part of the policy directed towards promoting rural development and local level energy security, government commitment also seems to have faltered, and there has been only limited success in achieving the policy goals⁴⁶.

The question of whether the industry remains in its current state or is able to undergo some degree of 'revitalisation' therefore depends on a number of variables. The economics of biodiesel production will continue to be important: the attractiveness of investment in and production of palm based biodiesel are affected by both CPO and oil prices, which increasingly are following a similar trajectory. Secondly, government commitment to and support of biofuels will continue to be critical. The establishment of the Directorate General of New and Renewable Energy and Energy Conservation, under the Ministry of Energy and Mineral Resources, which has biofuels as an important part of its mandate is being viewed as a positive step. From the producers' perspective, more political certainty and financial support will be important. Beyond the domestic market, the opportunities for biodiesel producers to export will depend both on conditions in export markets, including the acceptance of palm based biodiesel in European markets⁴⁷, and the Indonesian export tax.

The likely effect of potential changes in the biofuels landscape on public perception of biofuels will depend on how these changes are experienced and represented, particularly by the media, but also by interest groups. Again, this analysis is speculative.

As has already been emphasised, current public perception of biofuels is favourable and is based upon a number of positive assumptions: that use of fossil fuels should be reduced and that biofuels are important as a substitute; that biofuels are 'environmentally friendly'; and

that biofuel development has potential to contribute to economic development and job creation. These are all assumptions present in much of the media coverage of biofuels. The broad alignment of public perception with media coverage is perhaps unsurprising given that 70% of respondents identified the media (TV, newspapers, internet or radio) as their source of biofuels information.

However, despite the underlying assumption in the press of the desirability of biofuels, the media analysis also found a significant degree of criticism, which was primarily levelled at government policy and pricing arrangements. There was also criticism of the DME programme and the extent to which it is meeting its objectives. By linking biofuel production to issues such as deforestation, there was also some questioning of the 'environmentally friendly' assumption, although, as noted previously, this coverage was limited.

While there was some evidence of these issues in current public perception, this was less apparent than in the media coverage and critical views were marginal. This perhaps suggests that critical media coverage, especially when underlying assumptions are often positive, is insufficient to challenge the public's widespread positive outlook on biofuels. Whether this is likely to change is difficult to know. While currently coverage of indirect negative consequences of biofuel production (such as impacts of deforestation and food prices, which were both ranked as moderate priorities for Indonesia) was limited, an increase in the extent and prominence of this coverage may filter down to public opinion. Similarly, increased critical coverage of biofuel 'disappointments', already evident from the media analysis, may undermine the assumption of economic development and job creation potential.

The role of and extent to which the representation of information by interest groups may shape future public opinion is also difficult to predict. Negative campaigns focusing on the environmental impacts of palm oil have predominantly been waged by international NGOs, and targeted at public opinion in developed country markets. These campaigns have had limited impacts in Indonesia itself, and most local NGOs, while vocal about destructive practices, seem to pursue a strategy of engagement rather than high profile campaigning. Direct experience of and in many cases livelihood dependence on oil palm as a crop, especially in the case study region of North Sumatra, is likely to have more of a bearing on public opinion of palm oil.

The role of other channels of information about biofuels should also be considered. While the media is currently the main source of information and there seem to have been limited efforts by the government at 'socialisation', this may change. It is likely, of course, that government socialisation will focus on the benefits of biofuel development and use, hence reinforcing existing positive views of biofuels.

The question of how direct experience may influence public opinion is again complex. One direct channel of experience is prices paid by consumers for transport fuel. At the moment, pump prices of petrol and diesel are kept artificially low by fuel subsidies. However as subsidies are increasingly economically unsustainable, their phasing out seems inevitable. While the consensus, as revealed from the questionnaire, is that reducing dependency on fossil fuels is necessary, it will be interesting to see whether this viewpoint is maintained amid the reality of rising fuel prices.

If the biofuel industry in Indonesia does expand in the future, the ways in which this is experienced is likely to vary regionally. Early talk of Indonesia's biofuel developments included plans to develop dedicated biofuel oil palm plantations, entailing significant land conversion⁴⁸. If future development reignited these plans, biofuels could again become a driver of plantation expansion. This expansion is unlikely, however, to affect North Sumatra directly; the region is home to the oldest plantations in the country and has insufficient contiguous land available for expansion on a large scale. Instead, land conversion, with the associated environmental and social impacts, are likely to be felt in regions closer to the frontier of plantation expansion such as Kalimantan and Papua. Conversely, economic benefits resulting from development of the downstream industry are more likely to be experienced in regions such as North Sumatra, which has a more developed industry and supporting infrastructure.

Endnotes

¹ 'Indo Bioenergi', Balai Kartini, Jakarta, 23-24 May 2011

² National Energy Policy (Presidential Regulation No. 5/2006)

³ Presidential Regulation No. 5/2006

⁴ Interview with Dr. Soerawidjaja

⁵ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.

⁶ Priyanto, U. 2009. The Policy of Bioenergy in Indonesia (Presentation) Feb 2009.

⁷ Interview with Royhan Setiawan

⁸ Winrock International, 2009. Implications of biofuel sustainability standards for Indonesia.

⁹ Soni's presentation

¹⁰ Interview with Royhan Setiawan

¹¹ USDA FAS. 2010. Indonesia Biofuels Annual. Jakarta.

¹² See for example: <http://palmnews.mpob.gov.my/palmnewsdetails/palmnewsdetail.php?idnews=3596> (plans by PT Astra Agro Lestari) <http://www.reuters.com/article/idUSJAK19460020080115> (plans by Bakrie Sumatera Plantations)

¹³ Interview with H. Hanawi

¹⁴ There are some discrepancies with reporting of capacity and production figures. Quoting APROBI, World Ethanol and Biofuels Report reported in January 2011 that 400,000 kl of biofuels were supplied to the domestic market in 2010, of which 340,000 Kl was biodiesel (Biofuels Supplies Below Target, 14 January 2011. Available at: <http://www.agra-net.com/portal2/home.jsp?template=pubarticle&artid=1294676189658&pubid=ag072>)

¹⁵ USDA FAS. 2010. Indonesia Biofuels Annual. Jakarta.

- ¹⁶ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.
- ¹⁷ Figures taken from Dillon et al 2008, quoted in tonnes which are rounded and in many cases estimates. Conversion to Kl uses 1 tonne = 1.136 Kl.
- ¹⁸ Business Watch Indonesia, 2006. Biofuel Industry in Indonesia: some critical issues.
- ¹⁹ These figures include both independent and plasma smallholders (outgrowers)
- ²⁰ World Bank, 2010. Environmental, economic and social impacts of palm oil in Indonesia: A synthesis of opportunities and challenges (draft discussion paper). Jakarta: World Bank.
- ²¹ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.
- ²² Chew, C.S., and Takashi, T., 2009 Biofuel promotion as a rural energy development policy in Indonesia. Presentation at R'09 Twin World Conference, Nagoya University Japan, September 14 - 16 2009.
- ²³ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.
- ²⁴ Interview with Dr. Soerawidjaja; Djumena, E. 2011. Desa Mandiri Energi Bohong- bohongan? Kompas (online) 18 March 2011. Available at: <http://nasional.kompas.com/read/2011/03/18/09224758/> [accessed 15/05/2011]
- ²⁵ Greenpeace Indonesia's Statement on Biofuels: <http://www.greenpeace.org/seasia/id/news/pernyataan-greenpeace-tentang/>
- ²⁶ WWF statement on sustainable bioenergy: http://wwf.panda.org/what_we_do/footprint/climate_carbon_energy/energy_solutions/renewable_energy/bioenergy/
- ²⁷ The use of palm oil for biofuel and as biomass for energy: Friends of the Earth position: http://www.foe.co.uk/resource/briefings/palm_oil_biofuel_position.pdf (no position specifically for WAHLI found)
- ²⁸ Sawit Watch, 2007. Open letter to the European Parliament, the European Commission, the governments and citizens of the European Union <http://tech.groups.yahoo.com/group/biofuelwatch/message/245>
- ²⁹ SETERA Foundation. 2009. Biofuel: A trap.
- ³⁰ Butler, R. 2011. Pro-deforestation group criticizes palm oil giant for sustainability pact. Mongabay News (online) 24 March 2011. Available at: http://news.mongabay.com/2011/0324-world-growth-international_vs_gar.html [Accessed 20/05/2011]
- ³¹ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.
- ³² Lane, J. 2008. Indonesia's Pertamina reduces biodiesel blend to B1 as crude palm oil prices continue upward climb. Biofuels Digest (online), 20 April 2008. Available at:

<http://www.biofuelsdigest.com/blog2/2008/04/30/indonesias-pertamina-reduces-biodiesel-blend-to-b1-as-crude-palm-oil-prices-continue-upward-climb/> [Accessed 05/05/2011]

³³ Interview with H. Hanawi

³⁴ Interview with Dr. Soerawidjaja,

³⁵ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.

³⁶ Interview with Dr. Soerawidjaja,

³⁷ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.

³⁸ Interview with Dr. Soerawidjaja,

³⁹ Interview with H. Hanawi

⁴⁰ Interview with Royhan Setiawan

⁴¹ Dillon, H. S., Laan, T., & Dillon, H. S. 2008. Biofuels at what cost? Government support for ethanol and biodiesel in Indonesia. Geneva, Switzerland: Global Subsidies Initiative.

⁴² Wilmar being the one large scale exception to this trend.

⁴³ Interviews with Dr. Soerawidjaja and H. Hanawi

⁴⁴ Interview with H. Hanawi

⁴⁵ Interview with Royhan Setiawan

⁴⁶ Interview with Dr. Soerawidjaja

⁴⁷ USDA FAS. 2010. Indonesia Biofuels Annual. Jakarta.

⁴⁸ USAID, 2007. From ideas to action: clean energy solutions for Asia to address climate change (Indonesia Country Report)

Annex 1: Media Analysis Results

Theme	Newspaper	Article	Date	Type (opinion, news, feature)	Section	National/ International	Topic	Mentioned in passing or focus?	Biofuel details (feedstock, information)	Framing (repeating story elements, metaphors etc)
Business/private sector usage of biofuels	Jakarta Post	Bangkok Motor Show sees plenty eco-cars	04/02/2011	News	Business	International	Eco cars at Bangkok motor show Shell's decision not to develop biofuels from Palm oil	Passing	General	Contributor to eco-cars; Thailand doing better than Indonesia at promoting the use of biofuels
Business/private sector usage of biofuels	Kompas	Shell will not develop palm oil 2011. Lufthansa Passenger Transport Ready to use Biofuel	17/03/2011	News	News	National		Focus	Biofuel from palm oil and sugar cane	Decision explained as due to environmental issues surrounding palm oil
Business/private sector usage of biofuels	Republika	Bank Mandiri Industry Commits Support Environmentally Friendly	01/12/2010	News	News	International	Airline biofuel use	Focus	General	As a positive development for Lufthansa - make airline more sustainable
Business/private sector usage of biofuels	Republika	Bank Mandiri Industry Commits Support Environmentally Friendly	20/11/2010	News	Economy	National	Bank Mandiri's commitment to funding environmentally friendly projects	Passing	General	An an example of an 'environmentally friendly' project
CPO prices/demand	Jakarta Globe	CPO Price Expected to Soar Amid Tight Supply	08/03/2011	News	Business	International/National	CPO prices (current high) CPO prices (dynamics of - including role of biofuel demand)	Passing	Link between high oil prices and biofuel demand - link to CPO prices Opportunities for palm oil as soy is used as biofuel with high oil prices	Linking biofuel potential to oil prices; link to middle east unrest
CPO prices/demand	Jakarta Globe	Rise in Palm Oil Output May Help Satisfy Food Demand	08/03/2011	News	Business	National		Passing		Linking biofuel potential to oil prices; link to middle east unrest
CPO prices/demand	Jakarta Globe	No End in Sight to Rising Soy, Palm Oil Prices, Refiner Says	18/01/2011	News	Business	International	High palm oil and soy prices	Passing		Biofuel needs from EU partly driving high vegetable oil prices. Links high prices to food security and middle east unrest
CPO prices/demand	Republika	World demand for CPO increases by 7-11%	02/12/2010	News	Economy	National	Increases in CPO demand	Passing	Biofuel from CPO	As one reason for increases in demand for CPO.
Food security/prices	Jakarta Globe	Rising Prices, Protectionism Will Prove to Be Recipe for Disaster	05/05/2011	Opinion	Opinion	International	Food security/ food prices	Passing	General	Competition of fuel for food resources is a long-term structural problem. Warning that crop-based biofuel production needs to be carefully evaluated Partly responsible for food insecurity; advocates cutting subsidies, especially in Europe and US
Food security/prices	Jakarta Post	Seven steps to prevent recurring food crises	25/04/2011	Opinion	Opinion	International	Food security/food prices	Passing	General	
Food security/prices	Jakarta Post	Averting another world rice price crisis	28/02/2011	Opinion	Opinion	International	Food prices	Passing	General	
Food security/prices	Jakarta Post	Price volatility and food crises pose a threat to world peace, security	28/01/2011	Opinion	Opinion	International	Food prices	Passing	General	
High oil prices	Jakarta Post	The week in review: Reforms, here and everywhere	27/02/2011	Editorial	Opinion	National	Middle East unrest	Passing	Biofuel from Jatropha	As a way of mitigating impacts of high oil prices on Indonesia. Indonesia's policies have failed, but other countries have done better (e.g. Brazil)
Indonesia's (existing) biofuel developments	Jakarta Post	Social activism fuels production of micro-hydro electricity	21/01/2011	News	News	National	Social business an micro-hydro electricity and biofuel	Passing	none	As a way of benefiting rural communities. Socially beneficial
Indonesia's (existing) biofuel developments	Kompas	Desa Mandiri Energi: a Failure?	18/03/2011	News	News	National	Desa Mandiri Energi project (biofuel from Jatropha)	Focus	Biofuel from jatropha	As a failure, farmers didn't get enough support, issues with operation of factory
Indonesia's (existing) biofuel developments	Kompas	Jatropha oil displaced	07/03/2011	News	News	National	Development of biofuel from jatropha - problems	Focus	Biofuel from jatropha	Jatropha as potentially beneficial but dogged by problems
Indonesia's (existing) biofuel developments	Kompas	After the crowd is over	18/03/2011	News	News	National	Failure of jatropha	Focus	Biofuel from jatropha	As a failure - farmers didn't receive support, wrong incentives in place
Indonesia's (existing) biofuel developments	Waspada	Biodiesel plants under threat of not operating	11/02/2011	News	News	N. Sumatra	Biofuel plants	Focus	Biofuel from CPO	As economically unviable with current pricing system - high price of raw materials holding industry back - means biofuel plants not operating
Indonesia's biofuel policy	Jakarta Post	Govt may require biofuels mixed into non-subsidized fuels	19/02/2011	News	Business	National	Possible government directive about mixing biofuels with non-subsidised fuel	Focus	Biofuel from CPO. High prices. Also mentions jatropha and cassava	As an expensive alternative; as a way of reducing dependency on oil
Indonesia's biofuel policy	Kompas	Market incentives for biofuels	25/02/2011	News	Business	National	Indonesia's biofuels policy	Focus	Biofuels from palm oil; current biofuels policy (blending targets etc)	Biofuels as an opportunity for Indonesia to reduce oil dependence and benefit producers
Indonesia's biofuel policy	Kompas	Second generation biofuels	03/12/2010	News	News	National/International	(Cancun Climate change summit). Indonesia's potential for producing biofuel from secon gen residues	Focus	Brazil's success with biofuels ; details about second gen biofuels, especially from EFBS	Brazil's biofuel developments seen as beneficial and eco-friendly - something to emulate; issues with food conflict/costs can be overcome by using residues - Indonesia has potential
Indonesia's biofuel policy	Kompas	Incentives for biofuel production needed	14/03/2011	News	News	National	need for incentives to boost biofuel production	Focus	Biofuel from	Economic. Currently not viable, but potential to change

Indonesia's biofuel policy	Kompas	Consistent time to work	18/03/2011	News	News	International	Need and potential to develop BF in Indo	Focus	BF from palm oil; germa success with biodiesel (from rape seed); Brazilian success	Great potential, possibility to increase employment and economic growth
Indonesia's biofuel policy	Kompas	Long Term Investments	18/03/2011	News	News	National	Investment in (various) biofuels in Indonesia	Focus	Bioethanol from cassava; success of policy in Brazil; BF from jatropha and CPO	economic: explaining pros and cons of BF in indo
Indonesia's biofuel policy	Kompas	Energy Credit Constraints	18/03/2011	News	Finance	National	Constraints on financing biofuel development	Focus	General	Economic: how to finance; problems with the existing system of financing in indo
Indonesia's biofuel policy	Kompas	Renewable energy conversion difficult	03/11/2010	News	News	National	Difficulties of switching to biofuels with fuel subs	Focus	Biofuel from CPO	Policy - the difficulties of developing BF with fuel subs in place
Indonesia's biofuel policy	Republika	BBN price reviewed	14/01/2011	News	Economy	National	Biofuel pricing	Focus	General	Economic - need to adjust pricing
Indonesia's biofuel policy	Republika	Difficult to develop biofuels	01/10/2010	News	Economy	National	Constraints on development of biofuels in Indo (price, food conflicts)	Focus	Biofuel from CPO, sugar cane, cassava	As economically unviable and difficult, but necessary
Indonesia's biofuel policy	Waspada	Government should review biofuels	29/11/2010	News	Economy	National	Biofuel pricing	Focus	Biofuel from CPO	As economically unviable with current pricing system - high price of raw materials holding industry back
Indonesia's biofuel policy	Waspada	Distribution of biodiesel fuel increases	29/11/2010	News	News	N. Sumatra	increase in biodiesel sales around Medan	Focus	General	As positive - environmentally beneficial, good for cars, welcomed by consumers
Indonesia's energy policy (general terms)	Jakarta Globe	Bumpy Ride Ahead for Wind Power, Experts Say	13/10/2010	News	News	National	Wind power - issues with developing	Passing	Listed as a renewable energy source	
Indonesia's energy policy (general terms, incl. Fuel subs)	Jakarta Post	Commentary: Stopping subsidies for private cars could be the best policy of the year	14/12/2010	Commentary	Opinion	National	stopping fuel subsidies for private cars	Passing	General	Listed as part of a package of beneficial strategies for reducing emissions/improving economy (in contrast to fuel subsidies - should attract investors to biofuels)
Indonesia's energy policy (general terms, incl. Fuel subs)	Kompas	RI can become the 'Saudi Arabia' of biofuels	25/02/2011	News	Business	National	Indonesia's energy security issues	One focus	General	As an opportunity for Indonesia to be successful and reduce energy issues
Indonesia's energy policy (general terms, incl. Fuel subs)	Kompas	After the nuclear crisis in Japan	23/03/2011	Opinion	Opinion	National	Energy policy (in context of Japan's nuclear crisis)	passing	National biofuel policy; BF from CPO and sugar cane, BF policy	As a part of a desirable energy policy for Indonesia
Indonesia's energy policy (general terms, incl. Fuel subs)	Kompas	Don't just look good on paper	18/03/2011	Opinion	Opinion	National	Indo's energy policy	One focus		outline of policy - limited critique of policy
Indonesia's energy policy (general terms, incl. Fuel subs)	Republika	Government Asked to Develop Alternative Energy	29/04/2011	News	Economy	National	Indonesia's energy policy	Passing	General;	As a desirable part of Indonesia's future energy policy
Macro economic issues	Waspada	By 2015, no more subsidies	10/11/2011	News	Economy	National	Changes to government subsidies	Passing	General	something desirable that needs investing in - need for subsidies to be economically viable
Macro economic issues	Waspada	2011, Rp 95.914 trillion in fuel subsidy	25/10/2010	News	Economy	National	Government subsidy plans	Passing	General	Planned subsidies for biofuels
Macro-economic issues	Jakarta Post	Benefiting from global inflationary beats	16/12/2010	News	Business	International/National	Inflation	Passing	General	cited as a contributor to inflation
Other countries' biofuel developments	Jakarta Globe	Surging Food Prices Fuel Ethanol Critics	13/04/2011	News	Business	International	Controversy over US ethanol subsidies	Focus	Ethanol focus, corn diverted from food to energy	Arguments against first: Competition between food and fuel increasing food prices, impact on poor. Impact of subsidies on environment. Links to Middle east unrest. Arguments in favour: energy security, US self reliance
Other countries' biofuel developments	Jakarta Globe	World's Largest Biodiesel Plant Opens in Singapore	09/03/2011	News	Business	International	Opening of biodiesel plant in Singapore	Focus	Possible future feedstocks for biofuel - focus of R&D; European and US biofuel mandates; Biodiesel from palm oil; Issues surrounding production and pricing;	Economic potential of biofuels; future possibilities for biofuels
Other countries' biofuel developments	Jakarta Globe	Malaysia Mulls Ways to Boost Biofuel	04/11/2010	News	Business	International	Malaysia's efforts to boost biofuel production	Focus	Biodiesel from palm oil; Issues surrounding production and pricing;	Biodiesel (from palm oil) as uneconomic
Other countries' biofuel developments	Jakarta Globe	With Green Energy Program Delayed, Malaysia's Biofuel Industry Out of Gas	06/12/2010	News	Business	International	Malaysia's struggling biofuels industry (Cancun Climate change summit). Indonesia's potential for producing biofuel from second gen residues	Focus	Biodiesel from palm oil; Issues surrounding production and pricing;	Biodiesel (from palm oil) as uneconomic
Other countries' biofuel developments	Kompas	Second generation biofuels	03/12/2010	News	News	National/International		Focus	Brazil's success with biofuels ; details about second gen biofuels, especially from EFBs	Brazil's biofuel developments seen as beneficial and eco-friendly - something to emulate; issues with food conflict/costs can be overcome by using residues - Indonesia has potential
Other countries' biofuel developments	Republika	Brazilian sugar cane for biofuel can cool the climate	18/04/2011	News	News	International	Benefits of sugar cane/biofuel in Brazil	Focus	Biofuel from sugar cane	As beneficial for the environment, climate. Brazil seen as a success story. Broadly scientific framing
Other countries' biofuel developments	Waspada	Biofuels become the world's defense	09/02/2011	News	News	International	Biofuel potential in Asia Pacific region	Focus	Biofuels from CPO, jatropha, canola	As generally positive, (although does point out negatives) and a potentially big deal internationally
Other countries' energy policy	Kompas	Reed China Green China	18/03/2011	News	News	International	China's energy policy	Passing	General	As part of China's renewable energy policy

Other countries' energy policy	Kompas	Conservation more efficient than converting to biofuels	14/03/2011	News	News	International	Energy security Finland's support for renewable energy (esp. Biomass/fuel) in Indonesia	Focus	Most efficient from molasses, production insufficient Biofuel and biomass from forest residues and household waste	As uneconomic compared to energy efficiency as an important contributor to renewable energy (benefits of this)
Other countries's energy policy	Jakarta Post	It is the only way to cope with climate pressures	04/02/2011	Interview	News	National				
Outlook for palm oil production	Jakarta Globe	2010 Review: Crude Palm Oil Sector Set for Bigger Things Ahead	29/12/2010	Feature (year review)	News	National	Outlook for palm oil production in Indonesia (good)	Passing	Links increased demand for palm oil to demand for renewable energy in Europe	Positive opportunity for Indonesian palm oil producers to increase production; links to environmental and social controversy, but suggests not inevitable
Small scale/experimental biofuel developments	Jakarta Post	In Bogor, cooking oil becomes biodiesel	30/12/2010	News	News	National	Biodiesel from cooking oil	Focus	Biofuel from cooking oil on a small scale	Business opportunity, small scale production. Environmental benefits of biofuel Opportunity to benefit communities reduce dependence on kerosene and firewood; environmental benefits in reducing slash and burn
Small scale/experimental biofuel developments	Jakarta Post	JPB finds 'bintaro' extract can be used as biofuel	30/12/2010	News	News	National	Biofuel from bintaro extract entrepreneur making bioethanol from organic waste material	Focus	Biofuel from bintaro Biofuel from organic waste and small scale bioethanol generation from molasses Bioethanol on a small scale can be produced from slak waste	Environmental benefits - reduce garbage; benefits for local community Economically profitable; eco-friendly as it reduces waste
Small scale/experimental biofuel developments	Jakarta Post	Soelaiman Budi Sunarto: Biofuel pioneer	21/12/2010	Infia	News	National		Focus		
Small scale/experimental biofuel developments	Jakarta Post	Environment Watch: UGM students turn fruit waste into bioethanol	05/11/2011	News	Environment	National	Student initiative to turn salak skin into bioethanol	Focus		
Small scale/experimental biofuel developments	Kompas	Biomass energy source potential	12/11/2010	News	Science	National	Energy potential of biomass	Focus	Potential for biomass/waste to be converted into bio ethanol Biofuels from wide range of feedstocks, including lemon juice	Scientific framing, explains process
Small scale/experimental biofuel developments	Kompas	Lemon fuelled car	20/11/2010	News	Innovation	National	Student innovation to run car on lemon juice	Focus		Scientific framing, explains process
Small scale/experimental biofuel developments	Kompas	Biodiesel from stored waste	08/04/2011	News	Science	National	Potential to make biodiesel from micro algae growing on waste water (from farms and slaughterhouses)	Focus	Biofuel from waste water	Scientific framing, explains process
Small scale/experimental biofuel developments	Kompas	Genset oil from bintaro seeds	25/02/2011	News	News	National	Biofuels from bintaro seed	Focus	Biofuel from bintaro seeds	Technical framing Mostly scientific framing - includes advantages (including not affecting food security) but also mentions not economically competitive As beneficial for community development (and environment)
Small scale/experimental biofuel developments	Republika	JPB develop biodiesel from agro industry waste	07/04/2011	News	Science	National	Biofuel from micro algae on waste water	Focus	Biofuel from algae	
Small scale/experimental biofuel developments	Republika	JPB-RAPP develop bintaro seed oil	03/01/2011	News	News	National	Biofuel from bintaro seed	Focus	Biofuel from bintaro seed	
Sustainability of palm oil	Jakarta Globe	New Research Tracks Palm Oil's Carbon Footprint Malaysia Outpaces the Rest of Asia in Forest Destruction	19/05/2011	News	Business	National	Carbon footprint of palm oil	Passing	Palm oil used for biofuel	Palm oil linked to carbon emissons
Sustainability of palm oil	Jakarta Globe	New Research Tracks Palm Oil's Carbon Footprint Malaysia Outpaces the Rest of Asia in Forest Destruction	01/02/2011	News	News	International	Deforestation Ways to improve sustainability of palm oil	Passing	CPO used for biofuel	Linked to deforestation As one of the positive benefits of palm oil (listed alongside poverty alleviation etc)
Sustainability of palm oil	Jakarta Post	Redefining sustainability of palm oil	03/12/2010	Opinion	Supplement	National		Passing	Biofuel from CPO EU RED standards on use of palm oil as biofuel;	
Sustainability of palm oil	Jakarta Post	Why Indonesia needs ISPO	02/12/2010	Opinion	Supplement	National	ISPO	Focus		As one reason for increase in commodity prices - positive spin as presenting an opportunity for Indonesia - degraded land being aquired by foreign investors. Desire to emulate Brazil. Large scale agricultural growth as a desirable model of
Sustainability of palm oil	Jakarta Post	The rise of agriculture and Indonesia's future	14/11/2010	Opinion	Opinion	National	Rising prices of agricultural commodities and potential for Indonesia to benefit Rejuvenation of palm oil plantations (associated with 100 years of palm oil celebrations)	One focus	Energy crops can be grown on degraded land. Sugarcane mentioned as a feedstock	
Sustainability of palm oil	Kompas	Difficult for farmers to rejuvenate plants	30/03/2011	News	News	National		Passing	Biofuel from palm oil	Environmentally positive: reduce carbon emissions by 62%
Sustainability of palm oil	Kompas	Business competition behind the Indonesian Palm oil campaign	17/12/2010	News	News	National	Negative campaigning against Indonesian palm oil	Passing	Biofuels from CPO	Victim of spear campaign (European producers in on it)
Sustainability of palm oil	Republika	CPO problem: Indonesia and Malaysia prepare action	13/12/2010	News	Economy	National	EU RED policy	Focus	Biofuel from CPO	EU RED as discriminatory against biofuel from palm oil. BF from Palm oil as environmentally friendly - Indo and Malaysia to fight back against EU
Sustainability of palm oil	Jakarta Globe	Strategic Asia: The Threat of Indonesia's Palm Oil Rush	31/03/2011	Opinion	Opinion	National	Reasons for and impacts of palm oil expansion	One of several foci	CPO is an alternative to diesel	Linking palm oil as an energy crop to deforestation and associated environmental impacts As one reason why REDD policies won't work - increased demand for biofuels will continue to provide incentives for forest destruction
Sustainability of palm oil	Republika	Assessed forest conservation programme won't save trees	24/01/2011	News	News	National	REDD Greenpeace map of Indo's forests - Indonesia's forest policy	Passing	General	
Sustainability of palm oil	Republika	Forest Map of Indonesia launched, the Government Must Immediately Follow	08/12/2010	News	News	National		Passing	Biofuel from CPO; indo's biofuel expansion plans	As a factor behind Indo's forest clearance (plans for biofuel expansion)

ANNEX 2



QUESTIONNAIRE
Public perception of biofuels in Indonesia

Occupation: _____

Gender: M F

Age: a) below 30 b) 31 to 45 c) 46 to 64 d) over 65

Knowledge of biofuels

1. How much do you know about biofuels?

a) Nothing b) A little c) A lot

2. What do you know about biofuels?¹

Media and other sources of information

3. Where and when did you learn about biofuels (and energy crops, palm oil in particular)?²

¹ If respondent doesn't answer, may prompt with examples: e.g. biodiesel from palm oil/soy; bioethanol from sugar cane; jatropha

² If respondent can identify *when* they learnt about biofuels, prompt them to find out if this was linked to a particular event

4. What are your major sources of information about biofuels (and energy crops, palm oil in particular)?³

TV: _____ Radio: _____

Internet: _____ Newspapers: _____

Social events: _____ Workplace: _____

Other: _____ None: _____

Biofuel initiatives

6. Do you know about any biofuel projects⁴

Locally: Yes: No:

If yes, please give details:

In Indonesia: Yes: No:

If yes, please give details:

In other countries: Yes: No:

If yes, please give details:

³ Please prompt for details, e.g. names of newspapers/TV channels/events

⁴ Please prompt respondent for details of projects such as whether they are past or present, who is involved in the Project, whether they think the project was successful

Role of public policies

7. What do you think are the main priorities for Indonesia, which government policies should address first? ⁵

8. Please rank the following issues in order of importance for Indonesia:

	Rank (1 – 7)
Employment creation	<input type="checkbox"/>
Climate change	<input type="checkbox"/>
Food security	<input type="checkbox"/>
Rural development	<input type="checkbox"/>
Deforestation	<input type="checkbox"/>
Non fossil fuel development	<input type="checkbox"/>
Air pollution	<input type="checkbox"/>

Opinions about biofuels

9. What is your opinion about biofuels (and energy crops, palm oil in particular)?

10. Do you consider that the development of biofuels and energy crops (palm oil in particular) is sustainable?

⁵ Please carefully note the order in which issues are mentioned spontaneously.

11. Are you in favor or against the development of biofuels and energy crops (palm oil in particular)? Why?

Issues

12. What do you consider to be the critical issues in the development of biofuels and energy crops (palm oil in particular)?⁶

If no issues are mentioned:

Please rank the following issues in order of importance:

	Rank (1 – 6)
Compete with food production	<input type="checkbox"/>
Quality of fuel	<input type="checkbox"/>
Help to provide employment	<input type="checkbox"/>
Deforestation	<input type="checkbox"/>
Help to reduce climate change	<input type="checkbox"/>
Reduces dependence on fossil fuels	<input type="checkbox"/>

Final open question

12. Would you like to add anything else about biofuels?

⁶ Please carefully note the order in which issues are mentioned spontaneously. If no issues are mentioned, move onto the next question.

Annex 3: Questionnaire results

No.	Occupation	Gender	Age	How much do you know about biofuels	What do you know about biofuels	Where and when did you learn about biofuels	Major sources of information about biofuels	Do you know about any biofuels projects			What do you think are the main priorities for Indonesia?	Please rank the following in order of importance of Indonesia										What is your opinion about biofuels?	Do you consider that the development of biofuels and energy crops is sustainable?	Are you in favour or against the development of biofuels and energy crops? Why?		Why do you consider to be the critical issues in the development of biofuels and energy crops? Why?																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
								Locally	In Indonesia	In other countries		Environment protection	Climate change	Food security	Rural development	Disaster	Non fossil fuel development	Air pollution	In favour	Against	Why?			Competition with food	Quality of fuel	Make to provide jobs	Contribute to rural development	Reduce unemployment	Reduce dependence on fossil	Would you like to add anything else about biofuels?																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1	Pensioner	M	d	b	used with diesel	Petrol station	none	no	no	no	Deorestation; unemployment	2	3	5	4	1	6	7	Good because it reduces the subsidy which means oil supplies last longer	Yes	Favour	Because the fuel subsidy costs the government too much. Developing biofuels also helps farmers	6	4	2	3	5	6	2	3	4	1	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000