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SUSTAINABLE MANAGEMENT OF OIL PALM PLANTATION INDUSTRY AND THE PERCEPTION IMPLICATIONS

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Abstract

The palm oil plantation industry in Malaysia has been striving to make production sustainable and the industry stakeholders have set-up various sustainability certification schemes for palm oil. Perception of the industry from the media, Non-government Organizations (NGOs) and social groups seem to indicate that palm oil is generally not sustainable, and the industry thus should reduce any expansion policies it may harbour. This study reviewed perception trends with regards to oil palm plantations in Malaysia, and analysed the related variables that are important for palm oil production in the country. A perception survey of 742 stakeholders was carried out and the analysis shows stakeholders regard different issues as important for their respective groups. The perception for the growers and traders/manufactures indicated that their actual behaviour does not tally with the views of environmental NGOs and media. Although the industry has established its principles and criteria which are the backbone of the certification schemes, stakeholders still differ in their perception towards palm oil. The perception issues are linked with a lack of measurable variables for sustainability, which were considered not important previously. The overall conclusion shows that sustainable science is an important element for oil palm management. However it is still perceived that a number of additional measurable variables could be adopted by the industry, to assist in properly quantifying sustainability.

Key words

oil palm plantation, sustainability, perception, stakeholders, Malaysia

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1. Introduction

1.1. Background

Palm oil is the major export earner in Malaysia, among the primary commodities, and the revenue for 2014 was estimated at RM63.6 billion, accounting for 9 % of Malaysian export earnings[1]. An estimated 1.5 million smallholders cultivate oil palms in Malaysia and Indonesia. Malaysia alone employs about 600,000 people directly in the sector, in addition to a significant number engaged in related industries[1]. The attractive earnings from palm oil have fuelled the industry's growth in recent decades, particularly in Malaysia and Indonesia.

In 2014, the cumulative land area of oil palm plantations in Malaysia reached approximately 5.39 million hectares and accounted for about 33% of the world oil palm cultivated area, with about half a billion perennial carbon-sequestering palm trees[2,3].

In the two countries (Indonesia and Malaysia) responsible for over 80% of world palm oil production, smallholders account for 35–40% of the total planted area and as much as 33% of the output. Land has to be used for optimum output for the benefit of all, and to meet the world's consumption needs. In such a scenario, palm oil becomes a significant crop. Oil palm gives the highest yield per hectare among all oilseed crops[4]. There have been efforts by a diverse group of stakeholders in the palm oil industry to promote sustainable agriculture and address the environmental impacts of palm oil highlighted by NGOs[5,6].

Countries like Germany have developed their own sustainability standards, propagated through the ISCC (International Sustainability and Carbon Certification) system, and Indonesia has its ISPO (Indonesian Sustainable Palm Oil). All these efforts are to ensure production of sustainable agriculture produce in the primary form of CPO (crude palm oil) and CPKO (crude palm kernel oil) for the global oils and fats market. Governments have also taken the initiative to promote sustainable agriculture. The Malaysian Government through the Malaysian Palm Oil Board introduced Malaysian Sustainable Palm Oil (MSPO) standards and this is being geared for nationwide adoption. Indonesia has developed its own standard. Membership in the Indonesia Roundtable on Sustainable Palm Oil (ISPO) is expected to be made mandatory for all Indonesian plantation companies[7]. The palm oil industry is therefore providing the blueprint for other global agricultural industries to go green and sustainable.

The RSPO or the Roundtable on Sustainable Palm Oil formed in 2004 was set up to promote sustainable palm oil and is primarily meant to be a business to business undertaking. Other schemes also exist such as the EU REDD (Reduce Emissions from Deforestation and Degradation) which is an European initiative to address the underlying drivers of deforestation as well as to promote sustainable agriculture. These therefore also impact palm oil trade, especially its biofuel usage.

1.2. Problem Statement

This study examines the status of land as a natural resource, and its management for optimum use. This is in view of accusations by NGOs that the industry causes major deforestation in South-east Asia, reducing world tropical biodiversity and pressures wildlife habitat[8]. It appears that a lack of sufficient data and acceptable sustainability measurement in this sector perpetuates the lack of informed decision-making for the advancement of sustainable agriculture. The negative perceptions of NGOs from outside Malaysia to demand change in the industry or even cease operations need to be rectified and mitigated [9].

There is much difficulty in defining empirical measurements for setting sustainability requirements and the insufficient measurements clearly show gaps in the development of sustainability science, especially for the agricultural sector. The industry has set up its principles and criteria, yet these differ among stakeholder groups, according to geographical location and according to the stakeholders' priorities[10] .

For Malaysia, important sustainability criteria would include: greenhouse gas management, good forestry programs and effective communication of sustainability efforts. However, some of these variables are recent and may not have sufficient historical records for a meaningful analysis[11].

1.3. Objectives of study

The main objectives of this study are to:

(i) review perception trends with regards to oil palm plantation development and consider their implications;
(ii) analyse and relate the (economic, social and environmental) variables that are important for palm oil production practices and
(iii) derive the key variables that are required to measure sustainable land resource management in the palm oil industry.

2. Materials and Methods

2.1. Hypothesis of the study and supporting framework

In recent years, sustainability science has emerged as a focus area of cross-disciplinary inquiry. Sustainability science has not yet become established as an autonomous field or discipline of its own, and has tended to be problem-driven and oriented towards guiding decision-making. Currently, theories of sustainability have attempted to prioritise and integrate social responses to environmental and cultural problems.

For example, economic models of sustainability look to sustain natural and financial capital, ecological models look to biological diversity and ecological integrity, whereas political models look to social systems that promote human dignity. Religion has entered the debate with symbolic, critical, and motivational resources that aim to effect cultural change. The main economic theories that support this work are the Neo-Malthusian theory, Kuznet's Hypothesis and Hardin's Tragedy of the Commons[12] .

The Neo-Malthusian Theory is supported by the growing calls for sustainability to be practiced in agriculture to prevent this "crash" from occurring by managing the Earth's finite resources within the planet's capacity and not to go beyond the limit. The efforts to establish sustainability in agriculture now, will take the Neo-Malthusian Theory to its next phase of human civilization.

2.2 Theoretical & conceptual framework

In the preceding section, the subject of research was introduced and its link to economic theories established. To ascertain the validity of the sustainability needs that underlie the research, the analytical framework on which this study is based was theorized.

In Figure 1, a visual map is presented to show how the conceptual framework relates to the oil palm industry. It depicts how the management of oil palm plantations connects the Neo-Malthusian Theory, which is most relevant to palm oil production, to the stakeholder groups and the economic, environmental and social rationales for the current state of the oil palm industry. This helps to clarify how the sustainable production of palm oil is linked to the growth of oil palm plantations, with the Neo-Malthusian Theory as the basis for the increasing production of palm oil [12].

From the theoretical framework, the relevance of sustainable development to palm oil production is established. The sustainable development of the oil palm industry in order that it can meet the current need for food is therefore the focus of this study. Within this focal area, sustainable production is identified as the main focus. Limitations on the growth of the palm oil industry relate mainly to trade and innovations, and this study will not focus on those areas of concern.

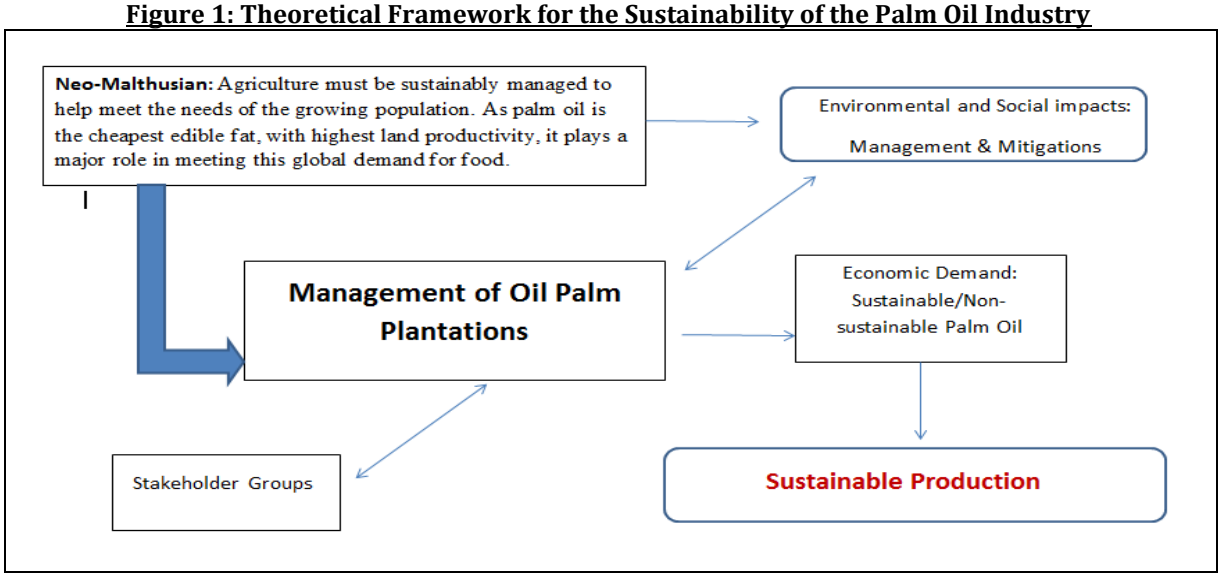
There are two elements of interest in relation to the sustainable production of palm oil. The first is the requirement that palm oil production is sustainably managed and the second is the ever-changing demands in terms of sustainability criteria that are imposed on palm oil producers. For good governance to prevail in sustainable palm oil production, it is crucial to manage the following: product demand, stakeholder perceptions of sustainability and the variables or determinants for sustainable management of palm oil production. Figures 2 shows the graphic connections among all the elements identified.

2.3 Methodology Employed

2.3.1 Survey and Construction of questionnaire

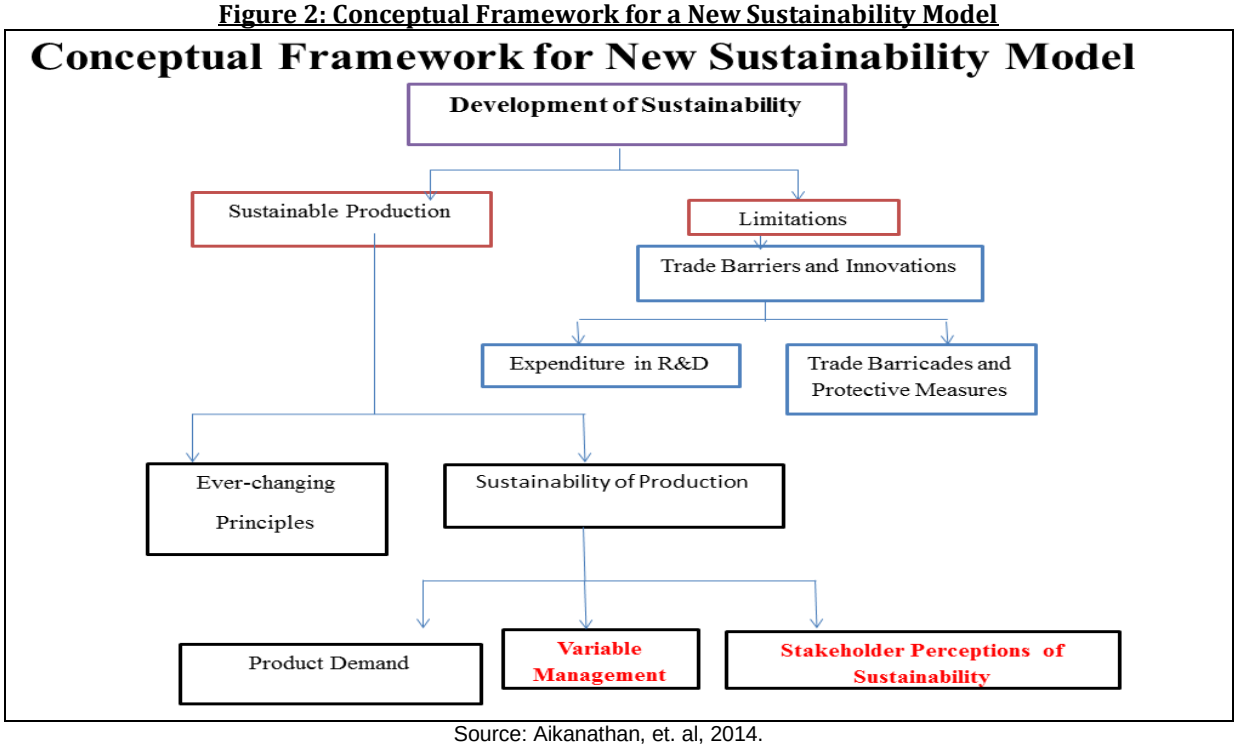
In search of primary data, a questionnaire was constructed, and administered at focus group meetings organised by the palm oil industry. Questionnaires were administered by research staff and by volunteers by the respondents. Clear, detailed instructions were made in either case, matching the needs of each audience. The questionnaire was constructed, and administered at focus group meetings organised by representatives of the palm oil industry. Questionnaires were administered to the respondents by research staff and

Figure 1: Theoretical Framework for the Sustainability of the Palm Oil Industry



Source: Aikanathan, et. al, 2014.

Figure 2: Conceptual Framework for a New Sustainability Model



Source: Aikanathan, et. al, 2014.

volunteers. Clear, detailed instructions were given in either case, matching the needs of each audience.

The construction of the questionnaire was based on examples of survey work carried out by Roundtable for Sustainable Palm Oil (RSPO), World Wide Fund (WWF) and Malaysian Palm Oil Council (MPOC). The questionnaire was made up of close-ended questions, where respondents' answers are limited to a fixed set of responses. Most scales are close-ended.

3. Analysis and Findings

This study consists of the perception survey, and prioritization of industry variables based on the survey findings. The perception survey results will be discussed first, and the findings from this will be used for regression test and variable prioritization. In the course of this study, surveys were conducted among the

industry stakeholders to obtain their perceptions about sustainability, their level of awareness about sustainable development and their observations about the concept.

3.1. Limitations for the perception survey

The study has confined itself to the largest and more visible component of the palm oil industry in Malaysia, that is, the plantation sector or the up-stream portion of the industry. Quantitative focus group surveys of the industry's three main stakeholder groups, namely (NGOs, local communities and plantation managers) were undertaken. The data from this quantitative study will depict a three-dimensional view of managing the palm oil industry. The results from this survey were analysed using statistical package (SPSS).

The focus group survey of the industries was targeted at the three main stakeholder groups. The data from this quantitative study depicts three-point views of managing the palm oil industry. Data collection was carried out by interviewer-administered questionnaires through focal group surveys. The study population consists of four stakeholder groups, namely: The Economic Sector (comprising traders/manufacturers); Environmental Sector (NGOs, local communities and oil palm growers); Social Sector (NGOs/growers/ local community) and the Media Group (Press/Network).

The focus area in the study was limited, and the data was collected from Malaysia (including Sabah and Sarawak), but was limited to Malaysian perspective only. Survey sample size: The total numbers were: 312 from the Economic Sector (traders or manufacturers); 323 from the Social Sector (Growers); 55 from the Environmental Sector (NGOs); and 48 Media (communication network or press) personnel. There were 742 respondents interviewed during the survey period, from the focus group gatherings carried out at conferences organised by the industry. Although, at first glance, the stakeholder spread looks imbalanced, the make-up of the sample reflects the reality of the palm oil sector. The community naturally has more growers and traders/manufacturers compared to NGO members or the press. Malaysia has only about 5-8 active environmental NGO's operating within the country and a further 15-20 NGOs dealing with various human development issues. As for the newspapers, magazines and other publications, the workforce is also limited, and those dealing with environmental and palm oil issues are small in number. The number of growers in Malaysia is large, as palm oil is the number one agricultural crop for Malaysia, while the traders/manufacturers that deal with palm oil also work on other commodities. As a result, these groups made up the largest number of participants in the survey.

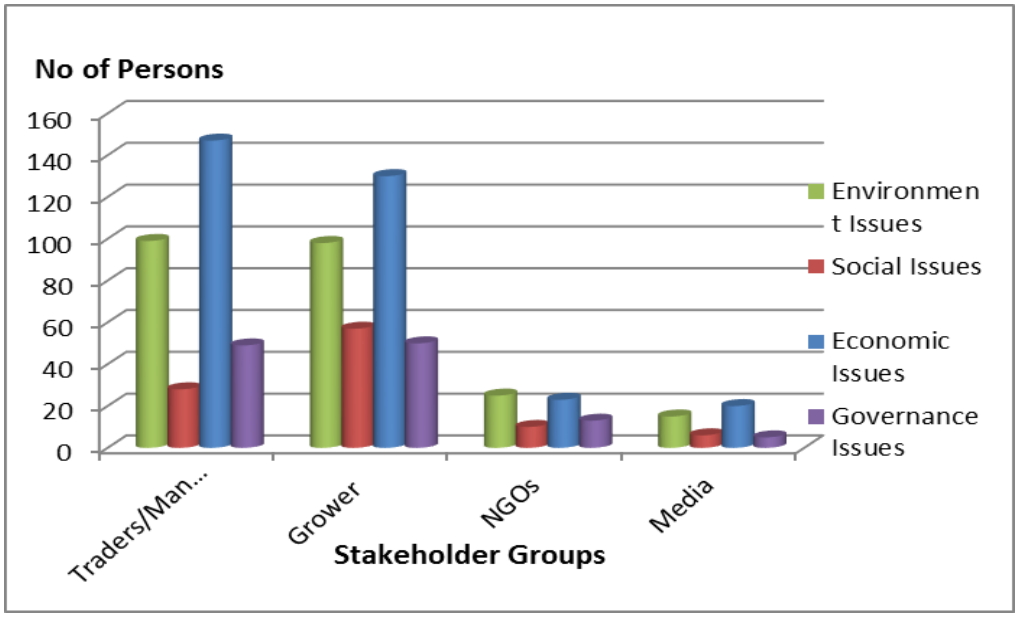
3.2. Perception Review, Survey Results and Analysis: Ranking of Sectors by Stakeholders according to Perspectives Held

The stakeholders were asked to rank their perceptions of the oil palm industry in the environmental, social, economy and governance sectors. The overall results of the stakeholders' rankings are depicted in Figure 3.

Traders and manufacturers felt that the economic sector was most important for them (Figure 3). The NGOs felt that environmental issues are most important for them, while the growers' and the local media's attention was on the economic sector as well. Oil palm being an agricultural crop is planted for profits, so it is legitimate for those involved to give priority to the economics of this industry rather than the other sectors. As for the NGOs involved, they are naturally concerned with issues that are created by the existence of the oil palm plantations or remain unresolved. In this case, the issues are mainly related to the environment or sustainability.

The stakeholders from the media who were interviewed were mainly Malaysians who are business reporters. Therefore, they give both economic and environmental issues almost equal attention because these are the issues that draw the attention of the readers and consumers. The next aspect of the analysis is depicted in Figure 4, where the nationalities of the respondents were considered in relation to the ranking they gave to the sectors. However, for more conclusive results, a survey that includes more nationalities is needed.

Figure 3: Stakeholder Ranking of Sectors (Environment, Social, Economic and Governance)



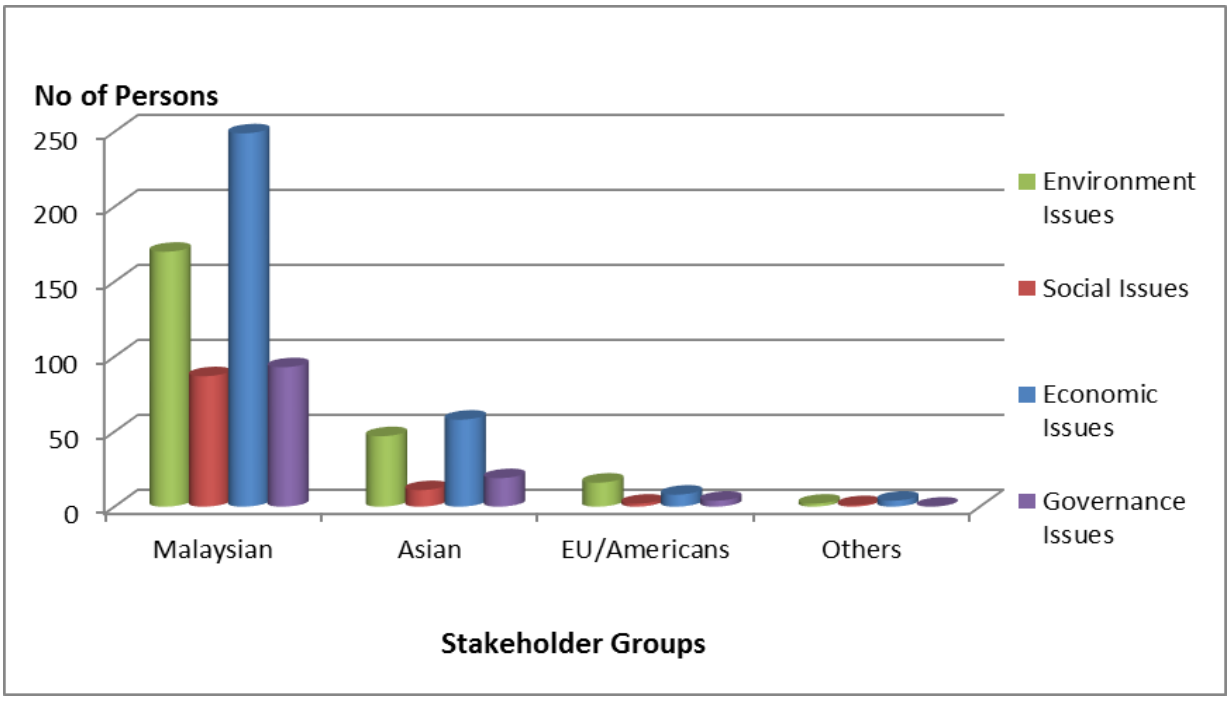
The evaluation of the survey results by the nationality of the respondents shows in Figure 4 that, the stakeholders of Malaysian, Asian and other nationalities place the economic sector in the first rank, followed by the environmental sector in second place. Only the Europeans and American stakeholders give first priority to the environment, followed by the economic sector. It can be said that this spread in the results exists because the Europeans and Americans, being non-growers, mostly want all the environmental issues taken care of, so that the industry is not hampered by sustainability concerns. Alternatively, they may not know what is happening at the ground level, and so they rely on the secondary views reported in the media in Europe or America.

It is seen that the Asian and other nationalities have a similar pattern of priorities as the Malaysian stakeholders. Most of them being growers or traders/manufacturers are keen to have the economic benefits of the industry, and at the same time manage the environment after the development of the crop. Significantly, those who do not have direct links to the ecosystem want it to be kept as natural as possible, without considering the industry's need for agricultural land.

3.3. The Traders and the manufacturers' views about the selected sectors

The next step in the analysis of the survey results was to focus on each stakeholder group, to see which issues or variables they prioritise. Three sectors, namely the environmental, economic and social sectors, were chosen to examine how variables of importance affected the stakeholders' perceptions. The analysis for the traders/manufacturers in the oil palm industry, represented in Figure 5, shows that these stakeholders felt that in the environmental sector, the most important variable was deforestation issues, followed by pollution-related matters. In the economic sector, it was clearly the palm oil price that was the most important variable, followed by land price. For the social sector issues or variables, cultural matters came out first followed issues related to land claims. It can be said that the traders place great importance on what affects their business most, and based their perceptions on the knowledge they derived from working on the ground or from reports or the media. It is legitimate for the traders and manufacturers that the price of palm oil carries the highest importance as a variable[13].

Figure 4: Ranking of Sectors according to the Stakeholders' Nationality



3.4. The NGOs' (Non-government Organisations) Views about the Selected Sectors)

The next area of focus in the survey results was the NGOs group, to determine their priority issues or variables and the overall results are presented in Figure 6, covering the selected sectors, namely the environmental, economic and social sectors. The results show that NGOs' views about the environment sector were that the most important variable was water balance issues, followed by deforestation-related matters. In the economic sector, it was clearly the palm oil price that was seen as the most important variable, with equal weight given to labour cost. For the social sector issues or variables, cultural matters came out first, followed issues related to land claims.

The stakeholders' choice of variables can be explained by the fact that for the NGOs, the price of palm oil was still the main variable, as without a good price for the commodity, the oil palm plantations would not be a viable business. Labour cost also got equal weight, as wage-related issues are the most vocally debated and dominant matter for many of these groups, which argue that palm oil, is a profitable business and all involved should be fairly paid. Deforestation and water balance are important environmental variables for the NGOs, as these two determinants can be easily be observed and monitored. Furthermore, when the water balance of a particular ecosystem or habitat is impacted, all the neighbouring activities are also affected. NGOs are normally the only stakeholders that do not derive any income from the palm oil sector and give unbiased opinions for the sustainable progress of the industry. However, this not completely true of the NGOs working in the palm oil sector, as most of them are paid by the industry players or associations related to the industry.

3.5. The growers and local communities' views for the selected sectors

The next group of survey responses that was analysed was that of the growers, and their perception of priority issues or variables were charted. The overall results of the analysis are presented in Figure 7, covering the selected sectors, namely the environmental, economic and social sectors. In the environmental sector, growers and local community

Figure 5: The Traders and Manufacturers' Priority Variables for the Selected Sectors

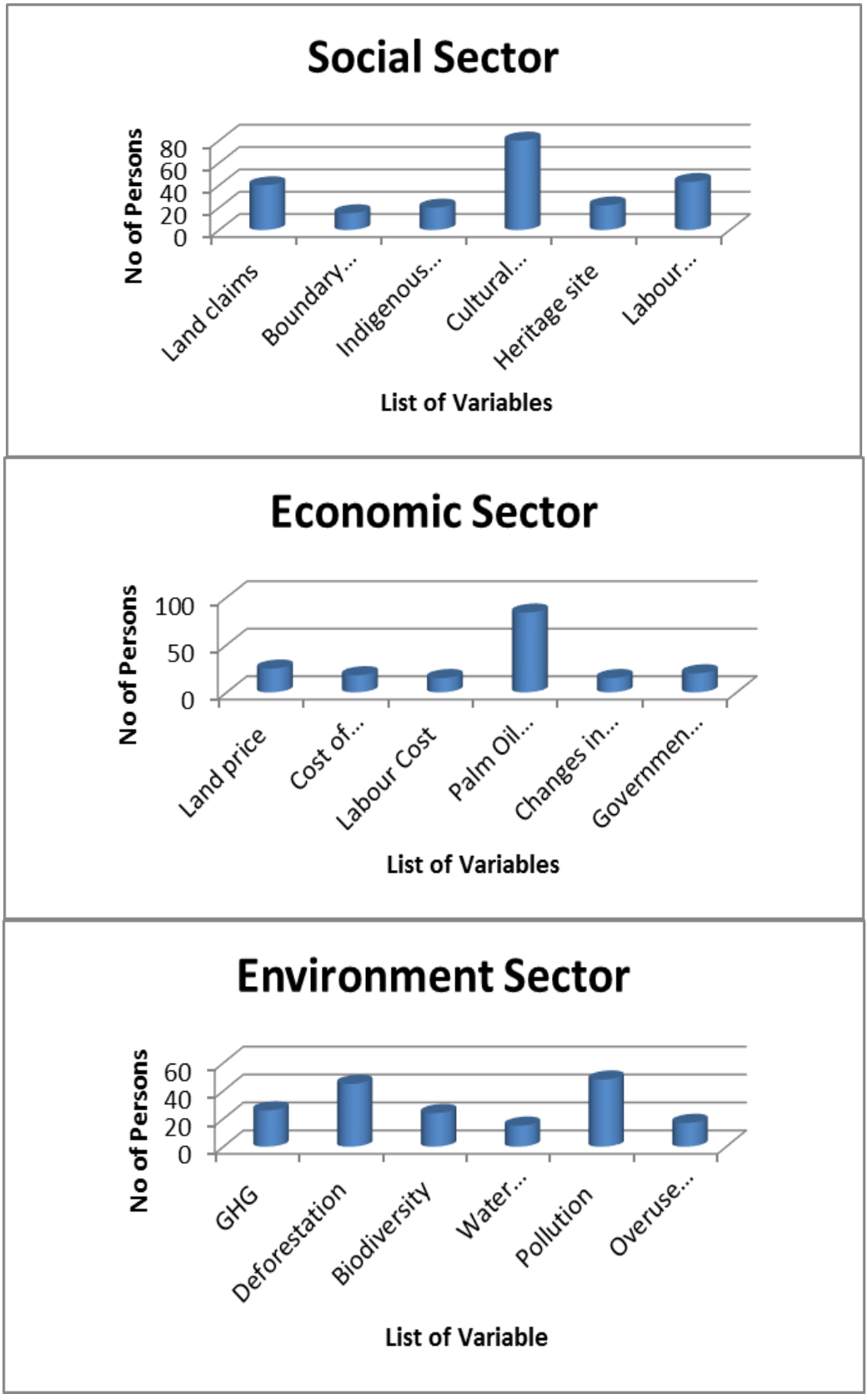


Figure 6: The NGOs' Priority Variables for the Selected Sectors

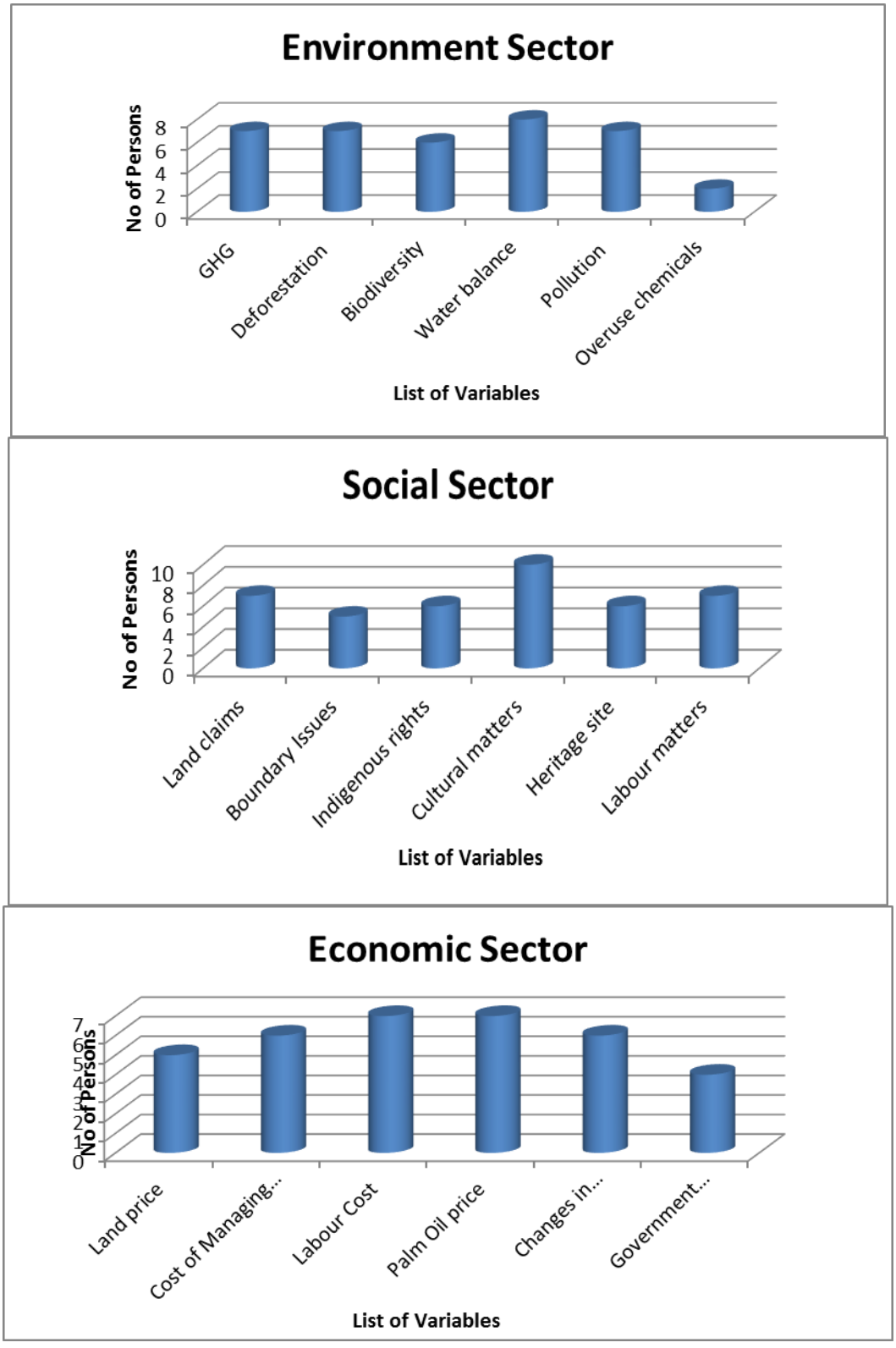
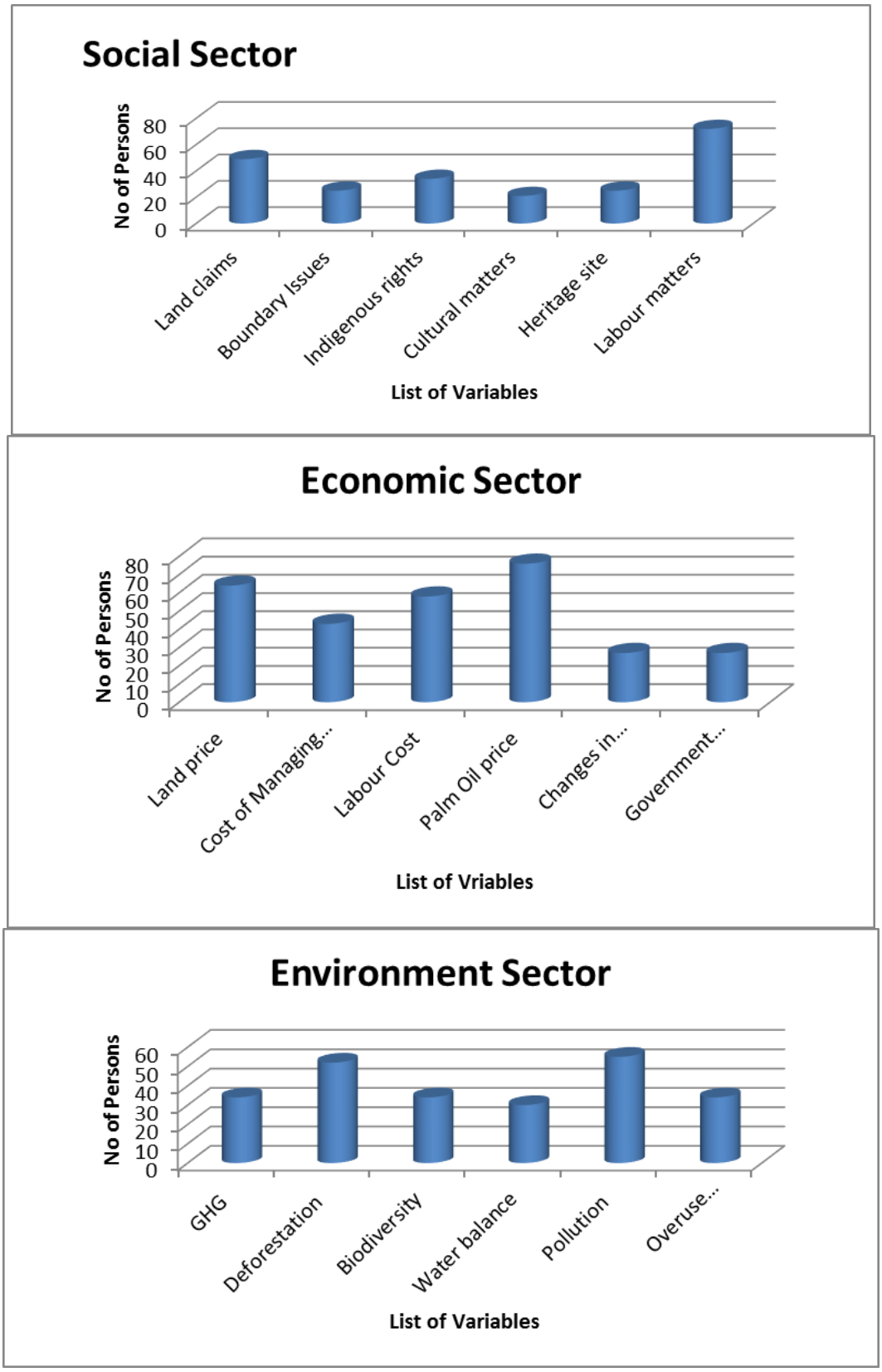


Figure 7: The Growers' Priority Variables for the Selected Sectors



representatives viewed pollution issues as the most important variable, followed by deforestation-related matters. In the economic sector, it was clearly the palm oil price that was the most important variable, followed by land price. As for the social sector issues or variables, labour matters came out first, followed by issues related to land claims.

Growers are the main group directly involved in the production of palm oil, and have both ground level and top management experience. The growers choose the price of palm oil as the most important variable, as without the profits from this commodity, they would not be involved in the business. As the biggest problems the Malaysian growers face have been managing labour and the cost of labour, therefore it is not surprising that this variable takes first place in terms of importance. With regards to the environment, pollution-related matters lead, as chemical use, particularly the application of pesticides, herbicides and fertilisers are a cause of concern[14]. Forest-related issues are not so pertinent, as most of our plantations are in the 2nd and 3rd planting cycles. Furthermore, the new plantings mostly involve conversion from other agriculture uses.

3.6. The media's views about the selected sectors

The next area of the survey results that was analysed was the media group, which indicated their perceptions of the priority issues or variables. The overall results of the analysis are presented in Figure 8, covering three sectors, namely the environmental, economic and social sectors.

As Figures 8 shows, the media's views concerning the environmental sector were that deforestation issues were the most important variable, followed by pollution-related matters. In the economic sector, the palm oil price was by far the most important variable, followed by land price. For the social sector issues or variables, cultural matters came out first, followed by issues related to labour matters.

Stakeholders from the media also chose the price of palm oil as the most important variable followed by land price. Both these variables get the most attention from investors when they want to venture into the oil palm planation industry. As with all other stakeholders, deforestation-related issues get the media's vote in the environmental sector, as this variable is a universal concern. Media stakeholders chose cultural matters as the most important social variable. However, it is not clear why this choice was made,[15,16].

4. Results

4.1. Perception survey: Key findings- Important variables for the oil palm industry

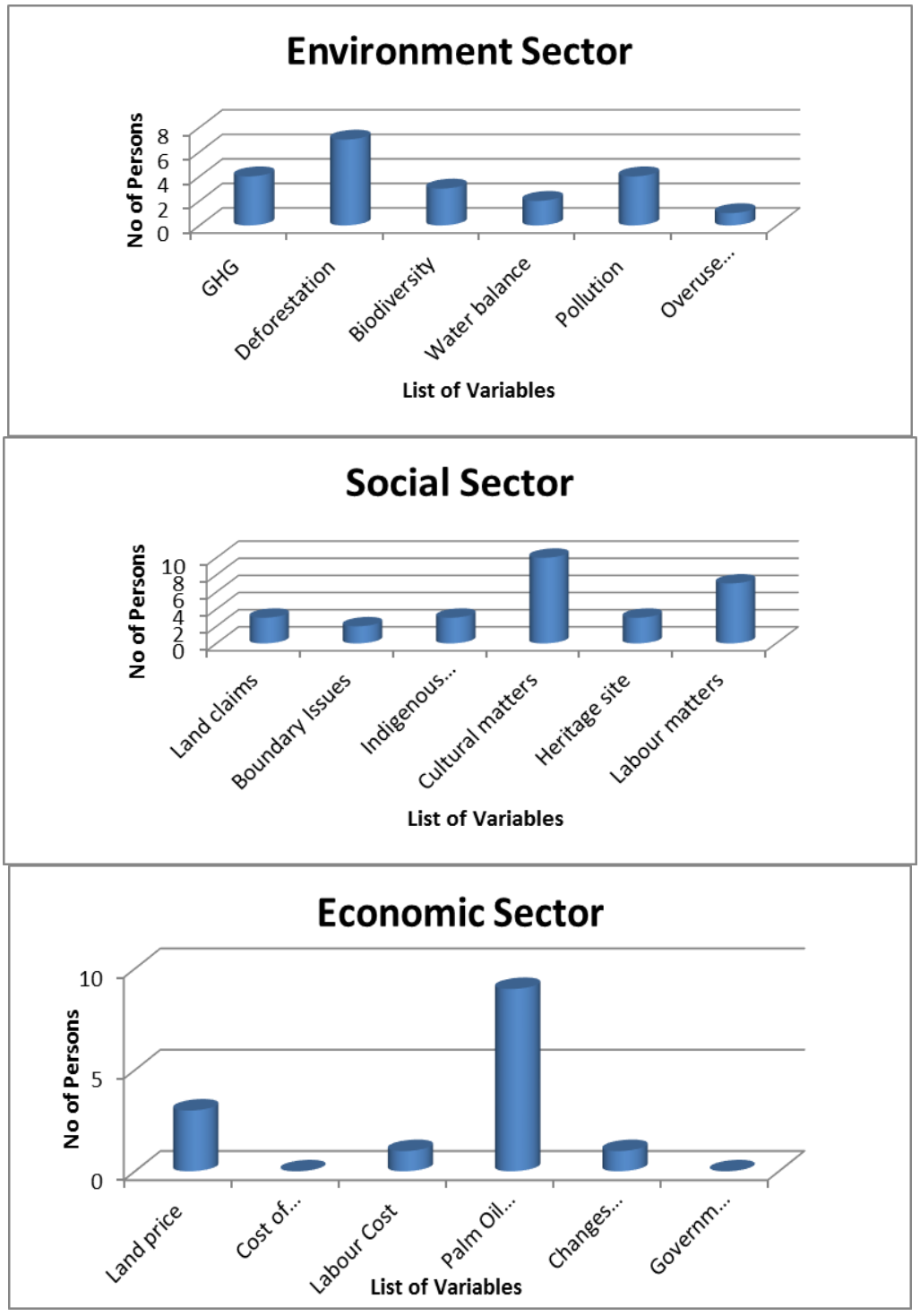
This study reviewed perception trends concerning oil palm plantations, and analysed the related variables (economic, social and environmental) that are important for palm oil production in Malaysia. The stakeholder groups surveyed for this perception study were: Growers; Traders and Manufacturers; NGOs and Media. Other groups, which include consumers and retailers, were not addressed in this evaluation, as the main focus was on the determinants related to oil palm planation activities and these groups were thought to be too far removed to impact the plantation industry, apart from giving their opinions based on information gathered from the media. Moreover, the overall opinion of the media was already included in the survey.

One of the key points about this survey is that the stakeholders groups are different in size and structure from one another. Both the traders/manufacturers and the growers/local community are very large in numbers compared to the media/press or the NGOs. However, when it comes to outreach, the last two speak louder through press and strategic communication outputs. Also, the general perception received from the press and internet-based media can be quite different from that expressed by members of the stakeholders' group when they are approached individually.

The survey of the 742 respondents from all the stakeholder groups gave rise to the conclusion that the most important variable for this agricultural produce is the palm oil price, followed by the total planted area for the crop. This perception did not differ for any of the stakeholder groups surveyed. Amongst traders and manufacturers, for the environmental sector, deforestation and pollution are most important variables. For the economic sector, it was palm oil price, and for the social sector, cultural matters take precedence. Among the Growers, the variables of importance in the environmental sector were deforestation and pollution, while the economic variables were

land price and palm oil price. The most important variable in the social sector was labour matters. Among the NGOs, the variables of importance in the environmental sector were water balance and deforestation. Important economic variables were the palm oil price and labour

Figure 8: The Media's Priority Variables for the Selected Sectors



cost. Among the social variables, land claims and cultural matters take priority. For the Media, the most important environmental variable was deforestation, while the top economic variable was palm oil price and the social variable was cultural matters.

All oil palm industry stakeholders regard the same land use issues as important. Environmental, economic and social variables are important to different stakeholder groups. The stakeholders state that their companies are doing enough in the sustainability area. They are also aware of a number of issues that arise in sustainability or land matters and take the appropriate decisions.

Their stated behaviour and perceptions however do not tally with the views found in the media, literature and reports of third parties. Hence a gap exists between what the industry perceives and what is actually required for sustainability in managing the industry throughout the palm oil life cycle.

4.2 Oil palm variable analysis and key issues: variables that cannot be tested empirically

Though the selection of variables for sustainability is extensive, there was insufficient data for statistical testing for many of the important variables. Also, some are new ideas and concepts of measurements, so the industry does not have extensive records of them. Sustainability variables and measurements are based on the RSPO Principles, ISPO Principles and ISCC procedures. The governing values for important sustainability variables for Malaysia need to be set out systematically so that unnecessary disputes do not arise.

Furthermore, as environmental variables refer to factual information about greenhouse emissions, water usage, rainfall and pollution connected to the oil palm plantations, these environmental or plantation variables are highly correlated or "redundant" in relation to one another[17] .Their exchange capacity is very tightly correlated, making statistical analysis difficult and cumbersome. In addition, the values per unit of the variables can also be vastly different from one another, making reasonable comparison impossible. Also, the variations in the time chart for each variable constitute large inconsistencies. The main micro variables that could be shown with relevant implications for the production of palm oil in Malaysia[18], but for which statistical measurements need to be in place are:

a. The non-recurrent cost in plantation establishment;
b. The upkeep and cultivation cost for Malaysia;
c. The fertilisation cost in palm oil plantations;
d. Local and foreign labour cost in the plantations;
e. R & D cost for plantation improvement and development;
f. Mechanisation cost within the industry

5. Conclusions

Perception issues are linked with the lack of measurable variables for sustainability and variables that were previously considered not important are now the key determinants for oil palm's lack of sustainability[19]. There are obvious gaps between what the industry perceives as important and the international media's perceptions[20] . Insufficient measurements clearly show gaps in the requirements for sustainability science, especially for the agricultural sector. Also, the industry has set up its principles and criteria, yet these standards differ with stakeholder groups, geographical differences and priorities in the stakeholders' requirements. Hence, perceptions have to be managed to ensure that a sound reputation for the palm oil industry is nurtured.

A model for sustainable management of land for the palm oil industry is lacking. A sustainability model or index can now be constructed for sustainable oil palm measurements based on this study, as the survey results indicated the two most important dependent variables are total planted area and price of CPO.

Sustainability requirements need to be locality-specific, and should not be driven by generalities, unsubstantiated science or 'scientific assumptions'. For Malaysia, important sustainability criteria would include: greenhouse gas management, good forestry programs and efficient communications on sustainability efforts. However, some of these variables are recent in their importance and need to be systematized further to ensure that

the development of sustainability progresses well.

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