

EXCERPTED

Key Sustainability Issues in the Palm Oil Sector

*A Discussion Paper for Multi-Stakeholders Consultations
(commissioned by the World Bank Group)*

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(Basiron, 2008). Leveraging on their experience with FSC certified timber; The Forest Trust (TFT) has proposed to develop a unique model for trade in sustainable palm oil using market leverages to prevent deforestation (TFT News, 2010).

In spite of this criticism, May and Juniper (2009) opined that “for all its faults, there is no other forum other than the RSPO that will ever bring together all the major growers of palm oil in Southeast Asia with its major users in Europe and the US.”

However, in the absence of a mechanism such at RSPO, there is a valid question as to what alternative global platforms or initiatives exist that could ensure the continued production of palm oil to meet increasing global demand for food and fuel without jeopardising the earth’s finite natural resources. Other organizations, such as the Rainforest Alliance or Global GAP, have developed certification systems for other agricultural crops which could be applied to the palm oil sector. The Forest Stewardship Council (FSC) has relevant experience in developing a certification system which might be applicable to the

sector. Other organizations such as The Forest Trust (TFT) or the Sustainable Agriculture Network (SAN) may also have relevant approaches which could be considered. Given the different national realities and cultures, another possibility would be for producing countries to develop their own certification systems for sustainable palm oil that could perhaps be accredited by an international organization such as the International Organization for Standardization (ISO). Numerous major producers and manufacturers of palm oil products are already certified according to ISO standards (such as ISO 14001, ISO 22000).

Whatever approach is considered, it is important to not lose perspective: voluntary certification is not the sole solution to all problems. Even the best designed and managed roundtable cannot do everything and solve every issue—it needs to work effectively within a complex and constantly evolving framework of market and technology needs, and international, national and local laws and regulations and industry practices in order to achieve sustainability in the sector.

E. Challenges and Opportunities for the Oil Palm Sector

Introduction

This section considers key challenges confronting the palm oil sector at present. The intention is to highlight for the stakeholder consultations the main issues that the WBG should consider when developing its new strategy for engagement and investments in the sector. Opportunities for addressing the challenges by stakeholders and in particular for furthering WBG’s involvement in palm oil sector will be discussed. The list of challenges builds on the areas of contention identified in the preceding section on the palm oil debate. It is recognized that this paper will not be able to cover in depth all issues of concern

to all stakeholders, particularly at the regional or local levels, but it is expected that through the series of global consultations that additional issues of significance and opportunities will be identified to support the strategic planning process of the WBG.

Considering that sustainable production and use of palm oil should be based on a framework for sustainable development and good governance, the challenges and opportunities will be discussed under the broad headings covering economic, environmental and social aspects and governance. However, it should be clear that these issues are highly interrelated,

and solutions must address the linkages among them.

Economic Aspects

Economic Aspects – Challenges

Yield Gaps: The most important technical challenge to the palm oil sector is probably the large productivity gap between the actual and achievable yields of palm oil. Although plant breeders have made impressive progress in raising the genetic potential of oil palm yields over the years, the actual yields and the national productivity of oil have stagnated since 1975 in the range of 3.0 to 4.4 tonnes oil per ha (Tinker, 2000). In 2008, the Malaysian national oil yield was 4.08 tonnes per ha (Mohd. Basri, 2009) while the average yield in Indonesia was 3.51 tonnes oil per ha (Rosediana Suharto 2009). Considering that current planting materials are capable of producing more than 8.6 tonnes oil per ha (Henson, 1990), this gap in yield is one of the biggest challenges for the industry.

Improvement of productivity of smallholders is a greater challenge as there is a wide difference between the palm oil production by plantations and small holders. For example, in Indonesia, the average yield of the smallholder sector in Indonesian in 2008 was 2.52 tonnes oil per ha which was about 35 percent and 40 percent lower than the production from private and Government-owned plantations respectively (Rosediana Suharto, 2009). Variability in yield within the smallholder grouping is also significantly greater, which may be due more to differences in farming practices and inputs than in the genetic potential of the plants.

In addition, there are also opportunities to increase CPO mill extraction rates, which could range between 18 to 26 percent, depending on the operator.

Declining Prices and Rising Costs: The next major challenge for the sector is the

rising cost of production coupled with declining real price of palm oil. Although the current prices look attractive in real terms, Fry (2009) has shown that that palm oil prices have declined by about 2.3 percent annually since 1950, from about USD 1600 (in 2007 terms) to a long-term average of about USD 400 per tonne of oil currently. Meanwhile, costs of inputs have escalated over time, particularly for fertilizers which now constitute more than 50 percent of the total production cost of palm oil. Prices of fertilizers fluctuate considerably with the price of fossil fuel, and exorbitant increases were recorded recently for example when prices of commonly used fertilizers such as muriate of potash increased by 3 times (Mohd. Basri, 2009). It has been estimated that oil palm productivity needs to increase by 1.0 to 1.5 percent annually to keep pace with rising production costs (about 2-3 percent increase annually) and the declining real price of palm oil (about 2-3 percent decline annually) (Chandran, 2010b).

Poor uptake of certified sustainable palm oil (CSPO): The first shipment of certified sustainable palm oil arrived with much fanfare at Rotterdam in November 2008; however the early excitement turned to disappointment for the growers when it became obvious that the demand for CSPO by the buyers in EU was just a fraction of that anticipated. By mid 2009, when RSPO-certified plantations were able to supply 1.50 million tonnes of CSPO per year, only 15,000 tonnes of CSPO had been taken up by EU manufacturers, many of whom had earlier made public commitments to source only CSPO by 2015 or earlier.

In order to assess actions against words of European companies and to encourage the uptake of CSPO, WWF developed a "Palm Oil Buyers' Scorecard" to assess the progress of sourcing of CSPO by 59 European companies from March to September 2009 (www.panda.org/palmoilsscorecard).

This initiative had an immediate impact on the volume of CSPO traded. When the scorecard results were published in October 2009, the volume of CSPO bought had increased to 195,000 tonnes. But this quantity is less than 5 percent of the EU's total annual consumption of palm oil! However, it is encouraging to note that recent uptake has been very good; about 95 percent of CPSO produced during the first quarter of 2010 has been purchased. Total uptake in the past 12 months was about 50 per cent (Mongabay, 2010a).

Economic Aspects - Opportunities

Closing the Yield Gaps: Improving land productivity is one of the most effective ways for improving the profitability of the sector and mitigating rising production costs. Closing the wide difference between actual and potential yields would also have a positive impact on the environmental bottom-line as increased productivity could reduce the pressure to open new land. This was underscored by a Greenpeace call that "Indonesia must boost yields to save forests" cited in a recent Reuters report (Bhui and Davies, 2009).

Assuming a 20 percent increase in production, an additional 7.7 million tonnes of palm oil could be produced by Indonesia and Malaysia -this is equivalent to the production from about 1.9 million hectares of new plantings. In order to make truly significant changes, the sector should be aiming for a productivity target of 6 to 8 tonnes oil per ha. While this would be a very challenging goal, it is not unrealistic as demonstrated by some companies such as IOI Corporation Berhad which had achieved an average oil yield for the whole Group in excess of 6.0 tonnes oil per ha in 2008 and several estates produced more than 7.0 tonnes oil per ha (IOI Corporation 2008).

While improvement of productivity in existing plantations could be achieved through implementation of Better Management Practices (BMPs) such as

efficient management of crop collection, soil fertility, water resources and attention to milling efficiency, timely replanting of oil palms at the end of their economic cycle with superior planting materials would be the most effective long term approach towards raising productivity. Investments by the private sector on R&D in this aspect have been yielding exciting results; for example, PPTP London Sumatra Indonesia's research has developed F₁ hybrid seeds (non-GMO) that are potentially 3 times more productive than conventional planting materials (Sumatra Bioscience, 2008).

In Malaysia, Asiatic Development Berhad and Sime Darby Berhad have made significant breakthroughs in sequencing of the oil palm genome (Oh, 2009). Through a better understanding of the genetic make-up of the oil palm, researchers will be able to pinpoint genes useful for producing superior planting materials with desirable traits such as disease resistance, drought tolerance and oils with a higher level of unsaturated fats.

Raising the productivity of smallholders: While private estates have the financial resources and capacity to address the productivity gaps, the smallholder sector needs urgent help to improve their productivity and production practices. Given the right training and technical support and extension service and management inputs, there is no reason that smallholder production cannot approach the productivity of larger estates.

Environmental Aspects

Environmental Aspects – Challenges

In "World Agriculture and the Environment", Clay (2004) indentified the main environmental problems arising from production of palm oil as habitat conversion, threats to critical habitats for endangered species, burning and air pollution, soil erosion, use of pesticides and use of fertilizers. While

environmental NGOs generally share these concerns, the main challenges that are frequently featured in campaigns and programmes are deforestation and loss of biodiversity through conversion for oil palm cultivation and timber plantations.

Deforestation: The state of the world's forests has been assessed by the UN Food and Agriculture Organization (FAO) at 5 to 10 year intervals since 1946. In the latest assessment, the Global Forest Resources Assessment 2010 (FRA 2010) (FAO 2010) reported that the rate of deforestation since FRA 2005 show signs of decreasing but the overall loss of forests is still alarmingly high, particularly in South America and Africa. However, it is noted that the rate of deforestation in Brazil and Indonesia, which had the highest net forest losses in the 1990s, has decreased since the last assessment.

On the loss of forests in Indonesia, Rautner *et al* (2005) showed that the forest cover on the island of Borneo had declined from 73.7 percent in 1985 to 50.4 percent in 2005 while the projected cover in 2010 and 2020 was 44.4 percent and 32.6 percent respectively. The total forest decrease in Kalimantan from 1985 to 2002 was about 13.3 million hectares while the forests lost in Sabah and Sarawak in Malaysia was estimated to be 0.25 and 0.40 million hectares respectively. As the remaining lowland forests on the island remain under serious threat from conversion, the governments of Indonesia, Malaysia and Brunei signed a historic declaration in February 2007 to conserve the "Heart of Borneo" covering about 220,000 sq. km of biodiversity-rich tropical forests in the three countries (WWF, 2007).

Loss of forest cover in Sumatra, Indonesia, has also been very alarming, particularly in the Province of Riau which has the largest area of lowland peat forests in the country. An assessment of deforestation and forest degradation from 1982 to 2007 (Uryu *et al*, 2008) showed a

65 percent loss of forest cover over the 25-year period, or a loss of about 4.2 million hectares of forest. It was estimated that the development of timber plantations (*Acacia*) contributed to 24 percent while the cultivation of oil palm contributed to 29 percent of the forest loss following initial exploitation of the timber resource.

Deforestation has significant environmental impacts, including:

- loss of biodiversity
- changes in climate both at the local, broader landscape and global scales (especially when burning is used to clear forest land)
- hydrological changes due to alteration in precipitation retention and rainfall rates

These result in the loss of valued ecosystem services for human populations, particularly poor people who may have no or few other resources.

Discussions of forest loss are complicated by lack of agreed definitions of what types of forest are being destroyed. In most lowland areas, the original tropical forests have already been logged, and the resulting secondary forest may have been further fragmented by agricultural development before being finally felled for oil palm development. One important question that needs to be addressed is whether logged-over secondary forest is suitable for conversion to oil palm.

Loss of biodiversity: Concerns about biodiversity loss are directly related to the loss of natural forests. It is well established that biodiversity in oil palm plantations is very much lower than in natural forests, essentially due to the reduced structural complexity in such plantations. The reduced habitat structure provides fewer niches for flora and fauna. There has been considerable attention focused on charismatic endangered species such as the Sumatran tiger, Asian elephants and the orangutan.

These and other charismatic species are particularly vulnerable when forest areas are cleared, as the increased access leads to increased hunting pressure as well as opening the area to other human settlement. Increased habitat fragmentation and access leads to increased conflicts between humans and these species. A case in point is the elephant-human conflict along the floodplains of the Kinabatangan River in Sabah, Malaysia where the natural forest corridor of the pygmy elephants has been fragmented by development of oil palm plantations. Similar situations have been reported in Riau and Bengkulu provinces in Indonesia.

Among the flagship species, the orangutan in Southeast Asia has become symbolic of the problems regarding deforestation and forest degradation and they have often been used as a 'barometer' of the health of the forests (Eko Hari *et al*, 2007). The plight of the orangutan has been highlighted in numerous publications and NGO campaigns. UNEP's publication, "*The Last Stand of the Orangutan*" (Nellemann *et al*, 2007) assessed the status and future of the orangutan. The Bornean orangutan has been classified by the World Conservation Union (IUCN) as "endangered" while the Sumatran orangutan was listed as "critically endangered". It was recently estimated that the population of the orangutans living in the wild on Borneo Island ranged from 45,000 to 60,000 individuals, most of which are concentrated in Kalimantan while there are only 7,300 orangutans remaining in Sumatra. The survival of this endangered species is seriously threatened by illegal logging, illegal hunting and trade, forest fires, subsistence agriculture and the development of plantation agriculture (notably, oil palm and acacia plantations).

A central problem in regard to biodiversity concerns is that little attention is given during the planning phase for plantation development as to whether the area being

converted is of significant biodiversity value—whether it has any Critical Habitat (according to IFC's Performance Standard 6) or is of High Conservation Value (as per the definition adopted by RSPO). There have been few tools to do this in the past, and there has been a lack of attention to this in formal environmental impact assessment procedures.

Climate Change: Concerns about climate change due to global warming initially focused on combustion of fossil fuels for heat and transportation, and the subsequent release of CO₂. With further study it has become clear that a variety of other anthropogenic activities are also contributing significantly to the release of CO₂, and that conversion of carbon-dense tropical forests is likely to be an important part of these. It has been estimated that deforestation contributes to about 18 percent of the global greenhouse gas emissions (Stern, 2006).

With regard to the potential contribution of the palm oil sector to climate change, there are serious concerns that development of plantations on tropical peat lands is resulting in significant CO₂ emissions. As these areas are drained, the peat is exposed to oxidation resulting in significant CO₂ release over an extended period. A Delft Hydraulics study showed that at present, CO₂ emissions arising from decomposition of drained peat lands in Indonesia are likely to be 632 Mt/yr, with the range of 355 to 874 Mt/yr (Hooijer *et al*, 2006). Further, an estimated average emission of 1400 Mt/yr was caused by peat land fires over 1997-2006. These and other data have been cited as ranking Indonesia as the third largest emitter of CO₂ after China and the USA. However, these conclusions have been challenged (Hanim Adnan, 2009; Paramananthan, 2008). As there is no common understanding over the nature and scale of emissions from tropical peat lands, the RSPO has convened a Peat Land Working Group to address the problem (www.rspo.org).

Other significant sources of GHG emissions associated with oil palm are the use of fires for land clearing and the emissions of methane from the effluent treatment ponds of palm oil mills. Although the ASEAN countries have signed the ASEAN Agreement on Transboundary Haze Pollution in 2002 and had adopted regional policy to implement zero burning (ASEAN Secretariat, 2003), use of fire for clearing land for agriculture continues and has contributed to air pollution in the region annually. Use of fires among smallholders and farmers is common as this is a traditional agricultural practice for them and lack access to heavy machinery to do otherwise. There is, however, substantial evidence that the use of fire by plantations has reduced in recent years.

Currently in most countries, there are regulations in place that require the treatment of palm oil mill effluents before they can be discharged into waterways. The most widely used system used is the anaerobic digestion of the effluent through a series of ponds. However, the open ponds are a major source of GHG emissions as methane which is more potent than CO₂ in terms of global warming potential, is released through the digestion process. At present, most of the open pond treatment systems do not capture the methane released. Larger firms are moving to implement technology for the capture and use of methane, but this is often financially out of the reach of smaller operators.

A major challenge to the palm oil sector with regard to climate change is compliance with the European Union (EU) Directive for Renewable Energy which requires biofuels to achieve a minimum 35 percent reduction in emissions compared to fossil fuels by 2010 and this will be raised to 60 percent by 2017. There is also requirements relating to emissions from indirect land use change (iLUC) arising from demand for biofuels. On the reductions in emissions from palm-based

biofuels, the EU has ascribed to palm oil a 'default value' of 19 percent reduction compared to fossil fuel and a 'typical' GHG savings value of 36 percent but this has been disputed by the producers as an independent study showed that the potential GHG savings from palm oil could be understated by 20 percent (MPOC, 2008b).

In a recent paper, Pehnelt and Vietze (2010) stated that "the EU Renewable Energy Directive is discriminatory from the outset and the GHG saving values and their interpretation are based on wrong assumptions and faulty calculations. For example, under the Directive biofuel producers in the European Union are permitted to claim higher GHG savings than biofuel producers outside the EU. This is protectionism and clearly in violation of established international trade laws".

Use of pesticides and fertilizers: Misuse of pesticides and fertilizers is frequently cited as a negative impact of oil palm cultivation. In general, pesticide use is low compared to many other crops, but some chemicals used pose significant risks to operators and smallholders and the environment. The RSPO Principles & Criteria require the elimination of the use of chemicals categorized as World Health Organization as Type 1A and 1B, or listed by the Stockholm or Rotterdam Conventions, and that paraquat be reduced or eliminated (www.rspo.org). Among these hazardous chemicals, the herbicide paraquat gives the most cause for concern as it poses serious health hazards to the spray operators. The Pesticides Action Network--Asia & the Pacific has called for a ban on paraquat production and use on numerous occasions but to no avail (PAN AP, 2009). RSPO recently commissioned a study to look for suitable replacements for paraquat (Rutherford, 2009) but no clear solutions have been forthcoming. Clearly, this is a challenge that must be addressed on an urgent basis. The overall aim is to

minimize the dependence on herbicides within the context of Integrated Weed Management (IWM) which uses a combination of physical, cultural, biological and chemical control approaches.

Substantial fertilizer use is needed for oil palms on what are often nutrient-poor tropical soils. Environmental impacts relate particularly to improper application resulting in excessive runoff and loss to surface waters, resulting in eutrophication (nutrient enrichment). While nutrient requirements for the palm are commonly based on soil and foliar analyses, the efficiency of use of fertilizers is sometimes questioned. Corley (2009) observed that of the nutrients supplied by fertilizers, only a small fraction of the nitrogen and potassium are exported to the palm oil and kernel. The implication is that there is inefficient recycling of nutrients after replanting and much of the excess nutrients are lost. Thus, he questioned if it was necessary that high inputs of fertilizers should continue. More efficient fertilizer usage would mean lower production cost as well as lower environmental impacts. Again, further research is needed on this point. In the past, the empty fruit bunches (EFBs) were often burned in incinerators at the mill. Current good practice is to either apply

the EFBs directly or to compost the EFBs with CPO mill effluent and apply the compost to the plantation, thus returning these nutrients directly to the field for eventual uptake by the palms and interrow vegetation.

Environmental Aspects – Opportunities

Moratorium on deforestation: Greenpeace and Unilever are working together in a coalition and have suggested a moratorium on deforestation in Indonesia (Unilever, 2009b). The proposal calls for a two to three year moratorium on conversion of all types of forests in order to allow the mapping of High Conservation Value Forests and High Carbon Value Landscapes. Based on these maps, a new land use planning policy could be developed at the national, provincial and district levels.

However, the proposal has met resistance from Indonesia, which claimed that it infringes on national sovereignty as well as being a potential trade barrier. Grower members of RSPO felt that the moratorium would not be necessary as compliance with the P&C requirements for development of new land would ensure that HCV forests are not converted.

Use of degraded land for oil palm cultivation: The threat of deforestation

“Degraded Land”

- The term “degraded land” is often used without a clear definition of what is being discussed, and this can lead to confusion when stakeholders use differing definitions. The term “degraded” can refer to the land itself (the soil) or to the forest or vegetation cover that is on it.
- Degraded soil is generally considered to be eroded or leached of nutrients. Some tropical soils are prone to the loss of nutrients and salinization, which results in very low productivity if they can be farmed at all.
- Degraded forests are those in which the structure, species composition, biomass and/or canopy cover are reduced from what is considered to be the original pristine forest cover of the area. (Forest harvesting generally results in forest degradation, rather than deforestation). There can thus be a broad range of forest types which could be termed degraded.
- Any discussion of the use of “degraded land” for growing oil palm needs to be clear on which aspects are considered degraded, and by how much. “Degraded land” may belong to people who may not consider it to be degraded and who may have legitimate claims over this land that need to be respected or factored in.

could be minimized if future expansion of oil palm is directed to degraded land (see Box 1 for definition). While reliable authoritative estimates of the extent of degraded land are not readily available, Clay (2004) claimed that there are about 20 million hectares of such land in Indonesia that are suitable for agriculture while the World Resources Institute (WRI) provided an estimate of 15 to 20 million hectares (www.projectpotico.org). The use of degraded land would depend on the cost of rehabilitation and it is also recognized

that it would be more profitable to develop plantations from forest lands as revenue could be realized from the sale from timber that would support the non-productive phases of the plantation. However, if the payment for environmental services is taken into consideration, rehabilitation of degraded land may offer significant carbon sequestration potential (Clay, 2004).

WRI has launched a new project called "POTICO" (**P**alm **O**il, **T**imber, **C**arbon **O**ffsets) to promote the use of degraded land and reduce the pressure on primary forests and also to curb illegal logging (www.projectpotico.org). "POTICO consists of a portfolio of investments—in sustainable palm oil, FSC-certified timber, and carbon offsets—that is designed to divert new oil palm plantations onto degraded lands and bring the forests that were slated for conversion into certified sustainable forestry."

Mechanisms for reducing GHG emissions:
CDM. Among the flexible mechanisms under the Kyoto Protocol, the Clean Development Mechanism (CDM) allows industrial countries to support the achievement of their emissions reduction commitments by earning 'carbon credits' (Certified Emissions Reductions or CERs) through assisting developing countries in achieving sustainable development. This is done through implementing CDM projects that are accepted by the host

country and approved (registered) by the CDM Executive Board.

In the palm oil sector, CDM projects have been implemented mostly for the capture of methane gas released from palm oil mill effluent treatment plants and utilizing the biogas for power generation. However, the number of such CDM projects registered is still rather low compared with the number of palm oil mills in operation. High initial capital requirements have been often cited as a barrier for such CDM projects. However, in view of the potential revenue from the CERs, the number of CDM projects could be set to increase. Recently, Felda of Malaysia announced its plan to maximize the use of biomass wastes and effluents from all its 60 palm oil mills into renewable energy through CDM projects involving 56 biogas plants (Hanim Adnan, 2010). Harnessing of biogas for power generation has also been applied though the CDM route by the palm oil industry in Colombia (Becerra and Hoof, 2005).

REDD+. Conceived as a key mechanism for the post-2012 climate agreement, REDD stands for "**R**educing **E**missions from **D**eforestation and **D**egradation". The (+) was inserted later to signify the addition of conservation and enhancement of carbon stocks, such as through sequestration. The basic concept is that "countries that are willing and able to reduce emissions from deforestation should be financially compensated for doing so" (Scholz and Schmidt, 2008). Simple as it seems, REDD has generated a huge global debate since it was put on the agenda of the UN Framework Convention on Climate Change (UNFCCC) for discussion at the 11th Session of the Conference of Parties (COP11) in Montreal in 2005. Intense negotiations were seen at the COP15 meeting in Copenhagen in late 2009 as there is much uncertainty over the real benefits and effectiveness of REDD and how it will be implemented and funded.

Many CSOs do not support REDD, as they see it as a market-oriented mechanism for industrialized countries to continue to pollute without real effort to arrest deforestation. Greenpeace (Mongabay, 2010b) argued that introduction of tradable forest credits could adversely affect the world's carbon market and instead proposed an alternative mechanism that includes the establishment of a global fund to support forest conservation projects in tropical countries. Friends of the Earth (2008) stated that "the REDD proposals currently on the table are intended to generate profits for polluters, not to stop climate change"

On the other hand, WWF views REDD as "a critical component of the overall greenhouse gas emission reductions required to achieve the goal" of keeping the rise in global temperature to below 2°C. To support this goal, WWF suggests a strategy involving a phased approach that is driven by national level REDD programs (Brickell, 2009).

What is the relevance of REDD to the palm oil sector? An analysis of the profitability of converting forests to oil palm plantation versus conserving was undertaken by Butler *et al* (2009) and they concluded that it would be more profitable to convert forests to oil palm rather than earning carbon credits from conserving it. However, the results could be more favourable for conservation if carbon credits from avoided deforestation are accepted in REDD schemes and if payments for environmental services (PES) (which were not factored in the study) are also included.

Of the two mechanisms discussed, the CDM approach is currently operational and ought to be encouraged for the palm oil sector. While there has been significant preparatory work for REDD+, the failure to agree on implementing mechanism for it at Copenhagen has resulted in considerable uncertainty as to when this

will be implemented. The role of REDD+ in the palm oil strategy needs to be further defined.

Market transformation: Strategies to address complex environmental challenges such as deforestation, biodiversity conservation and climate change should include holistic market-based approaches involving various players in the supply chain. The WRI POTICO project discussed earlier is one such market transformational approach. Another is the IFC Biodiversity and Agricultural Commodities Program (BACP).

The BACP is designed to address the threats posed by expansion in agricultural commodities through market transformation strategies of target commodities, initially palm oil and soybeans. The BACP provides grants for projects that would promote, from the perspective of biodiversity conservation, improvements of public and institutional policies, adoption of better management practices (BMPs), increased market demands for products with positive biodiversity impacts and promotion of pro-biodiversity financial products and services (www.bacp.net). The BACP provides the opportunity for partnerships among industry, public sector and civil society stakeholders to bring about significant progress in biodiversity conservation.

There are currently four approved BACP projects in the palm oil sector: three projects test and refine practices such as High Conservation Value Assessments and one directly supports the RSPO to put in place the relevant tools and information to members so that they may implement more easily the biodiversity related principles and criteria (www.bacp.net). An on-going BACP project is collaboration between the Zoological Society of London (ZSL) and several palm oil producers, of which Wilmar International is one, to develop a scientific framework for biodiversity conservation in oil palm

landscapes (RSPO, 2008). In addition, BACP is developing, with the support of Eco-agriculture Partners, a web-based tool to monitor and account for impacts of certification so that it will be possible to track what transformation effects actually take place.

Another market-driven approach that is taking shape is the WWF Market Transformation Initiative (MTI) for a wide range of global commodities, including palm oil and soy (soybean oil and meal). Change in the market place is being undertaken through an integrated framework involving multi-stakeholder engagements such as the RSPO, transformational partnerships with companies to improve the sustainability of supply chains, developing and promoting BMPs and sustainable investments in commodities (http://www.panda.org/what_we_do/footprint/agriculture/). With regard to the palm oil sector, the MTI key priorities include maintaining and improving the effectiveness of the RSPO and its standards, promoting land use planning to identify and protect HCV areas, encouraging manufacturers and retailers to adopt sustainable procurement practices and influencing investment and lending practices (Tan 2010, *pers com*).

In the sustainable investments component of this initiative, WWF has published *The Palm Oil Financing Handbook* for sustainable investments in oil palm (Taylor *et al*, 2008). Although the handbook provides practical guidance on the development and implementation of a responsible palm oil financing and investment policy, adoption of the approach has mainly been limited to international banks to date (Tan, 2010 *pers com*). The financial and investment sector can play an effective role in ensuring sustainable investments in palm oil, and mechanisms need to be identified to encourage the incorporation of best practice in their lending.

Through the above mentioned programs or separately, a number of CSOs, companies, governments, research entities and partnerships such as RSPO or the Business and Biodiversity Offsets Program (BBOP) are looking at creative ways to organize and pay for the costs of nature stewardship, conservation and certification while adding value to the economy. One of the main reasons why biodiversity is lost is because its value is not adequately reflected in the economy and because those who preserve its benefits are not paid. Carbon storage, or GHG avoidance, is for now about the only ecosystem service which may receive a payment under certain conditions.. This is a win-win with biodiversity conservation but is not presently sufficient, in scope and payment level, to cover all needed costs.

Social Aspects

Social Aspects – Challenges

A range of social issues have been associated with the development of the palm oil sector. In Southeast Asia, these have been documented in a variety of publications (Martí, 2008; Colchester *et al*, 2007; Zen *et al*, 2008; McCarthy and Cramb, 2008). Similar issues arise in other regions. Many of these issues center on the questions of land use, land ownership and tenure, and how rights are transferred. Related to these are the roles of smallholders and the risks they face in terms of low productivity, fair prices, and access to finance and markets. These issues are of course common to many other agricultural sectors , but they are especially problematic in areas which are experiencing rapid modernization and changes from basic subsistence agriculture to modern cash crop or industrial farming.

Land rights, land use and land acquisition: Obtaining access to large contiguous tracts of land for oil palm planting is a central issue in all regions. Large palm oil companies prefer to gain access to

contiguous lands as there are significant economies of scale in clearing, planting and managing such properties. This requirement is often in conflict with the needs of both individuals and local communities who may want to retain access to their existing holdings. In many cases the application and interpretation of the law is unclear.

In Indonesia, companies can apply to district (*kabupaten*) authorities for access to land. The process involves several permits and requires negotiation with local communities and individuals. Many complaints regarding abuses arise from the lack of understanding by individuals and communities of their rights and how the process works and the procedures they need to follow.

While many land conflicts can be traced back to early days when forest lands were being opened up for timber concessions and rural development projects, the palm oil sector has had a significant share of the land conflicts. An analysis of the forest and land conflicts recorded in Indonesia by the Consortium on Agrarian Reform in 2001 showed that plantation-related conflicts accounted for 32 percent or 261 cases of the total cases documented. In 2008, Sawit Watch recorded and monitored 570 conflicts in oil palm plantations, of which many date back to the Suharto era when the land rights of communities were not duly recognized (Jiwan, 2009). In Sarawak, of the 150 cases of land conflicts in the courts at the time, about 40 cases involved oil palm plantation developers (Colchester *et al*, 2007).

In Latin America, particularly in Brazil, there have been numerous incidents of "land invasions", where landless groups have invaded large agricultural estates and occupied the land. These also reflect the need for close attention to land tenure issues.

Indigenous peoples and local communities:

To the indigenous peoples, land is life. Common land is an important aspect of most indigenous peoples' tenure systems in many countries in Southeast Asia. When their claim to the land that has been used for generations is threatened or diminished through development, the indigenous peoples have fought back. An example is the landmark event in 1987 when the Penan, Kayan and Kelabit communities blocked roads at 23 different sites in Sarawak for a period of eight months (Rautner *et al*, 2005). Protests have continued periodically, albeit at a lower scale than the 1987 event. A recent protest was the blockage of logging roads by Penan natives in the Upper Baram region to prevent the logging of the last remaining virgin forests in the area by a timber company in March, 2010 (www.world-wire.com/news/1004060001).

An underlying cause for land conflicts with indigenous peoples is the inconsistencies of the laws relating to the recognition of and respect for native customary rights to land. Indonesia and Malaysia and other Southeast Asian countries have inherited the colonial principle of state control over land resources. Under the Domain Declaration of the colonial Dutch 1870 Agrarian Law, land which was not under clear ownership was considered State Land; communities' rights to land based on customary laws were not recognized as ownership by Dutch law (Marti, 2008). Although the 1945 Constitution of Indonesia recognizes the existence of traditional political entities based on the heritage of indigenous peoples, some laws enacted retain the 'domain' principle which affects the rights of indigenous peoples in Indonesia. For example, the introduction of the Basic Forest Law No. 5 during the Suharto regime discriminates against indigenous peoples' use of the forest ecosystem goods and services (Jiwan, 2009). A similar situation was seen in Sarawak in Malaysia where the 1957 Sarawak Land Code recognized the

Dayaks' rights to land, but the Forest Ordinance of 1953 which classified large tracts as Permanent Forests restricted or controlled the activities of the indigenous peoples in these areas in order to curtail the practice of shifting agriculture (Raunter *et al*, 2005).

Land conflicts between indigenous peoples and local communities and plantation companies are often the result of the lack of adequate consultation and agreement amongst the parties. RSPO requires (Criterion 7.5) the application of the principle of Free Prior Informed Consent (FPIC) when land is being acquired. This approach has also been recommended by WWF as due diligence tool to minimize risks by investors. Within the RSPO context, FPIC is linked to issues such as customary rights, land acquisition, compensation and conduct of social impact assessments.

Smallholders: Raising productivity is perhaps the biggest challenge facing the smallholder sector. The problem is more serious among independent smallholders, because supported or 'scheme' smallholders under land schemes like Felda in Malaysia and the NES schemes and subsequent cooperative schemes (KKPA) in Indonesia have access to technical and financial support from the 'parent' companies. A study by MPOB showed that inefficiencies among independent smallholders were attributed mainly to use of unselected planting materials, insufficient fertilizer application and harvesting of unripe fruit bunches (Ayat Rahman *et al*, 2008).

Major constraints to smallholder production cited by Vermuleun and Goad (2006) include difficulty in securing capital to meet upfront expenses. They often do not have the necessary collateral for bank financing, and lack good technical advice and market information. Obtaining a fair price for their produce is a key concern for smallholders. According to the oil palm farmers association in West Kalimantan,

Serikat Petani Kelapa Sawit (SPKS), there is lack of transparency in establishing the mechanism for pricing of fresh fruit bunches (FFB). Although the Ministry of Agriculture in Indonesia establishes the formula for FFB pricing, the smallholders do not have the opportunity to participate in the process. Their perception is that the system is unfair to the smallholders (Aleksander, 2009). Being in a monopsonic situation in the rural areas, they usually have weak bargaining power over pricing.

As the palm oil industry moves towards production of certified sustainable palm oil according to the standards set by the RSPO, smallholders face the risk of missing market opportunities if they do not improve production practices to meet the stringent certification requirements. This will be particularly challenging for the independent smallholders. As scheme smallholders are part of the supply base of a certified palm oil mill, they should receive the necessary support to improve. Under the RSPO certification scheme, the palm oil mill is obliged to ensure that all smallholders and out-growers which form part of its supply chain are of 'certifiable standard within 3 years' (RSPO, 2007). For independent smallholders, they might achieve certification through a group certification scheme, as being done for other commodities such as coffee, although some may not be comfortable being forced into such an arrangement. Although the RSPO is working on modified versions of its Principles and Criteria for sustainable palm oil production for application to scheme and independent smallholders, putting these into practice will be a major task.

Plantation workers: Effective implementation of the RSPO P&C, particularly Principle 6 which requires "responsible consideration of employees and of individuals and communities affected by growers and mills" as well as applicable national laws would ensure a safe and just work place for workers in

plantations. While companies that have undergone the RSPO certification are well placed to give this assurance, the challenge is to see how these requirements are implemented consistently throughout the sector. Areas of concern include occupational safety and health (OSH) policies and practices, freedom of association, child labour and various forms of discrimination. In general, there is little quantitative data on how and whether workers are covered by workers' compensation schemes and how medical treatment and lost wages are covered. There is a major need for further study in this area.

Although minimum wages and job benefits are set either by relevant Government agencies or through collective agreements between employers and the workers' unions, consistent application of standard wages and benefits across the industry may not be achieved. A case in point is Malaysia where collective wage agreements have been made between the Malaysian Agricultural Producers Association and the National Union of Plantation Workers and the All Malayan Estates Staff Union for workers and staff respectively in Peninsular Malaysia since the 1960s. However, collective agreement at the industry level is not practiced in Sabah or Sarawak which account for more than 40 percent of the national production of palm oil. In the absence of registered trade unions in these two states, wages and work benefits are largely determined by employers (Daud Amatzin, 2008).

Treatment of women workers in plantations deserves attention. Women are largely employed to undertake field operations such as planting, weeding and application of pesticides. Spraying of hazardous chemicals such as paraquat has been reported to cause health problems among women workers and the risks are exacerbated when they work during early stages of pregnancy. Women are at greater risk when dealing with chemicals

with organophosphate active ingredients that are endocrine disrupters that can be absorbed through fats tissues and subsequently affect fetal growth. For this reason, pregnant and lactating women should be excluded from doing work that exposes them to such chemicals.

Until the adoption of the RPSO P&C in 2005, the development and systematic implementation of gender related policies to address issues such as discrimination, sexual harassment, violence against women and protection of reproductive rights had seldom been applied to plantations. This is an area that needs to be addressed by the industry; the experience gained by Sime Darby Berhad which worked in collaboration with the women's social NGO, *Tenaganita*, on the development of a consultative approach for the development of a gender-based policy could provide useful guidance for other companies (Syed Mahdhar and Intan Shafinaz, 2008). Fundamental social requirements such as income equity, job quality and gender equality and "Decent Living Wage" as defined by the ILO have yet to be taken into account.

The palm oil industry in Malaysia is highly dependent on guest or immigrant workers; it is estimated that about 450,000 foreigners are working on its plantations, most of them being Indonesian workers. Although the law allows them to enjoy most of the benefits available to Malaysian workers, there are reports that they are often paid less than the minimum wage (Marti, 2008). Foreign workers are allowed to join employees unions but they cannot become office bearers because of their temporary residence status (Daud Amatzin, 2008).

Child labor: The existence of child labor occurs through a complex interaction of many factors, including family social status, desire for children to learn a trade, poverty and lack of access to education. Families tend to work together in agriculture, making it likely that children

will either be expected to do work for the family (child care or domestic work), or, as they grow older, begin to engage in wage-earning tasks. The location of plantations and fields often puts children too far from accessible schooling, except when plantation companies provide such facilities in their estates. The position of RSPO on use of child labour is specified in Criterion 6.7 of the Principles and Criteria (P&C) which states, "Child labour is not used. Children are not exposed to hazardous working conditions. Work by children is acceptable on family farms, under adult supervision and when not interfering with education programmes." (RSPO, 2005)

Security issues: In Latin America, particularly in Colombia but also elsewhere, there are a variety of issues related to the presence of insurgent groups (guerrillas), often complicated by drug-trafficking groups. In Indonesia, in cases of local unrest, some plantations have worked closely with the Indonesian military to provide local security and face down local protests.

Social Aspects – Opportunities

Legal land reforms: Overhauling the laws relating to land and natural resources would be the fundamental way forward to a give effective recognition of customary rights that are already protected by the Constitutions of Indonesia and Malaysia (Colchester et al, 2006 Promised Land, and Colchester et al, 2007 Land is Life). While legal reform would be a complex and protracted process, it is supported by legal precedents such as the landmark Medali case whereby the Federal Court of Malaysia has confirmed customary rights over a former petroleum company concession area in Sarawak (Borneo Post, 2007). Recently, the Miri High Court in Sarawak ruled in favour of the Kayan native community that a lease to IOI Corporation by the Sarawak government was illegal and unconstitutional (<http://www.world-wire.com/news/1004010001.html>, 2010).

Conflict resolution mechanisms: In addition to its Grievance Process for addressing complaints against its members, the RSPO is establishing a Dispute Settlement Facility (DSF) to specifically address land-related disputes. The primary objective is to "provide a means for achieving fair and lasting resolutions to disputes in a more time efficient and less bureaucratic and/or legalistic manner, while still upholding all RSPO requirements including compliance with relevant legislation." It is hoped that through the DSF, disputes can be handled at an early stage, preventing them from escalating into full-blown conflicts.

The draft DSF framework and protocol has undergone public consultation and is expected to be finalized soon and will be put into operation once funding for the initial 2 to 3 years has been secured. As social disputes are often complex and dynamic, the DSF would start with pilot testing of a few cases (Wolvekamp, 2009). The DSF would need to learn from the experiences of other organizations and an example could be the role that the IFC's Office of the Compliance Advisor/Ombudsman (CAO) played in resolving community issues in West Kalimantan.

Institutional support for the smallholder sector: When the RSPO was established, it was stressed that the smallholder sector must be an integral part of the initiative. As the RSPO Principles and Criteria for sustainable palm oil production were initially developed primarily for plantations, the RSPO set up a Task Force for Smallholders (TFS) in November 2005 to assess the suitability of the P&C for smallholders and recommend how best they could participate in the process. Led by the Forest Peoples Programme and Sawit Watch, the TFS has been successful in mobilizing the participation of smallholders and relevant stakeholders and has developed guidance documents for implementation of the P&C for scheme

and independent smallholders. It has also developed the protocol for a group certification scheme for independent smallholders. Specific issues addressed by the TFS included how smallholders would be able to obtain land use rights, improve of productivity and get access to finance and markets.

Building on the progress achieved so far, the TFS at its meeting in November 2009 looked at the need for widening its mandate from standard setting to promotion of implementation and bringing the smallholder sector into mainstream production of sustainable palm oil (Colchester, 2009). As the TFS now includes the participation of national bodies such as the Indonesian Palm Oil Commission (IPOC), PNG Oil Palm Research Association (PNGOPRA), Felda and the National Association of Smallholders (NASH) in Malaysia and the Thai Oil Palm Association in its Steering Group, it provides a good platform for exchange and learning between the various specific implementation and support practices that serve to meet smallholder needs further. The participation of international agencies and donor organisations could help further the cause of the TFS.

Supporting smallholders for certification: Recognizing that smallholders will face financial constraints in preparation for certification, the RSPO has decided to establish an *escrow fund* to support the smallholder sector. While the mechanism for managing is not yet developed, it is envisaged that RSPO income generated from the trade in certified oil (through registration by Utz Certified) and from certificates traded (Greenpalm) could be dedicated to the smallholder fund (Verburg, 2009). The proposed fund could provide an opportunity for international agencies and donor organizations to play a direct role in smallholder participation in the market for certified sustainable palm oil.

A market-driven initiative called the Palm Oil Support Initiative (POPSI) by Solaridad, WWF and the RSPO provides an opportunity for various players in the supply chain to support the overall goal to "add value to the oil palm supply chain by supporting oil palm smallholder and plantation workers in the palm oil sector worldwide to obtain RSPO certification". POPSIs target is train about 35,000 smallholders and farmer groups and raise the awareness of about 100,000 plantation workers on compliance of the RSPO P&C in the major producing countries in Asia, Africa and Latin America. Pilot activities for co-funding between POPSI and supply chain participants would include smallholder training on Better Management Practices, organizational support for group certification and financing tools for smallholders (Dros, 2009).

Use of smaller mills: Independent smallholder dependence on estate palm oil mills to purchase their fresh fruit bunches (FFB) could be eliminated if they could collectively, for example through cooperatives, have their own palm oil processing facilities. Mini mills could be introduced which could process about 5 to 10 tonnes FFB per hour (compared with the normal capacity of 30 to 60 tonnes per hour in conventional mills). Mini mills using an innovative continuous sterilization system have constructed in several locations in Sumatra since 2003 (www.modipalm.com.my/images/projects). The modular concept allows the milling capacity to be scaled up as FFB production increases over time. Mini mills as well as 'micro mills' which are capable of processing 1 to 5 tonnes FFB per hour have also been recommended for small scale biofuel production in Aceh (Fricke, 2009). Concerns with such mills include difficulties with effluent treatment and milling efficiency.

Promoting integrated farming: Although the average income of oil palm smallholders is significantly higher than

that of subsistence farmers in Indonesia (Shiel, et al 2009), it is often feared that being a perennial crop with an economic cycle of about 25 years, boom-bust price cycles of palm oil would make smallholders more vulnerable economically.. To minimize this risk, smallholders could plant additional crops or integrate livestock rearing in oil palm plantings. Mixed farming is particularly relevant to support the smallholder during the first 3 to 4 years when palms are immature. Integration of livestock with oil palm is one of the objectives of MPOB for maximizing productivity and income of smallholders and a dedicated Crop and Livestock Integration Unit has been set up to drive this agenda. While diversifying into other crops may reduce the vulnerability of smallholders to economic uncertainties, the realities of managing more crops by the smallholders must be taken into consideration.

Governance Issues

Governance Issues – Challenges

Ineffective policies, governance structures and management systems relating to environmental and social performance are perhaps one of the major threats to sustainable development, at various levels, from governments, international institutions and industry bodies down to individual companies.

Governments: At the government level, inadequate policies, planning and legal and regulatory frameworks, particularly with regard to land development, could put HCV areas at risk. For instance, the proposed Kalimantan border oil palm mega-project covering 1.8 million hectares along the Kalimantan-Malaysia border drew a lot of criticism from civil society and others who claimed the project would destroy the forests of three National Parks in the area and also destroy the customary rights of indigenous peoples in the project area (Wakker, 2006).

In addressing the challenges to promoting production of sustainable palm oil, Bangun (2009) stated that "the first challenge is law enforcement. The law on forestry was promulgated in 1999 but the enforcement was weak, resulting in cases of illegal logging and degradation of protected forests."

RSPO Principle No 2 states that "there is compliance with all applicable local, national and ratified international laws and regulations." In situations where the national laws are less stringent than regional or international regulatory frameworks, the implication is that the international laws would take precedence. However, this is not necessarily the case in reality. For example, for national reasons, Indonesia has not yet ratified the ASEAN Agreement on Transboundary Haze Pollution which was signed in June 2002 while Malaysia has not yet ratified some ILO Conventions such as the "Freedom of Association and Protection of the Right to Organize Convention 1948 (No 87)".

International Institutions: Multilateral international organizations such as the WBG have in place systematic processes to ensure that their involvement in development projects complies with sound sustainability standards and practices. The IFC and the Multilateral Investment Guarantee Agency (MIGA) have sustainability policies and procedures to guide their performance at the project level and their clients are required to comply with a set of Performance Standards covering diverse topics such as social and environmental assessment, land acquisition and involuntary settlement and indigenous peoples. The World Bank has a set of 11 Safeguard Policies for good environmental and social governance. IFC's Performance Standards are currently being reviewed and revised.

While these systems should provide a high level of assurance of good E&S stewardship, criticism has been directed at

IFC and the World Bank for not properly following their own procedures. IFC's Compliance Advisor/Ombudsman (CAO) recommended areas to be strengthened, including preparation of a comprehensive strategy for the palm oil sector.

Multi-stakeholder Platforms: In multi-stakeholder initiatives such as the RSPO, the conduct of its members and relationships with its stakeholders are governed by its statutes and by-laws. However, poor or ineffective performance of its members could present a reputational and credibility risk to the organization. Although members have upon joining, given an undertaking to uphold the Code of Conduct which includes observance of the RSPO Principles and Criteria, NGOs have been able to produce evidence of non-compliances, which include deforestation by some members.

The Grievance Procedure does not seem to be effective to address complaints from stakeholders. That Unilever, Nestlé and other companies chose to act directly on complaints from NGOs rather going through the established RSPO grievance process could undermine the credibility of the organization. Several governance weaknesses have been identified in papers such as Laurance *et al.* (2010). Thus, it is critical that the RSPO strengthens its governance and monitoring of members performance in order remain relevant. .

Civil Society Organizations: Traditionally, CSOs played the role of watch dogs to safeguard public interests and have shaped the course of global debates on critical issues like climate change, poverty alleviation and health. Like other organizations, CSOs have their own primary stakeholders such as boards of trustees, donors and their membership at large that they are accountable to. At the turn of the 20th century, an international study was undertaken to examine the future roles and directions for the 21st century (21C) NGOs. On accountability,

the study gave the view that "the 21C NGOs adopt best practice in transparency, accountability and governance" (Sustainability, 2003).

On future challenges for NGOs, the study recommended that "the first thing is to recognize that markets are central to their future. Markets are becoming legitimate channels for social change –and are also likely to be, on balance, more efficient and effective than many traditional approaches" (Sustainability, 2003). The need to drive change through markets has already been appreciated by some NGOs which have started market transformation initiatives. This points to the usefulness of voluntary certification and other schemes, which use market forces to function as a complement to governmental regulation.

Corporations: At the corporate level, the 3Ps mantra (People, Planet and Profit) pervades in company brochures and reports but in reality, many companies might not have fully put the triple bottom-line philosophy into practice. Many are driven by the certification mind-set and attainment of a certification is seen as an end in itself. Yet their license to operate can be threatened by the corporation's poor performance with respect to their social and environmental bottom lines. Recent reports of breaches by large plantation groups have resulted in termination of future palm oil purchases by their major buyers. Besides loss of sales revenue, these companies suffer severe brand and reputational damage and loss of trust of its customers and stakeholders, reinstatement of which would require much effort, time and expense.

The main challenge for companies is how they can internalize sustainability as an integral part of their corporate culture and management system. For this to happen, strong and clear commitment from top management of the corporation is critical and this has to be demonstrated by words

and action. A systematic and holistic approach is necessary for managing sustainability. While generic management systems such as the ISO 14001 environmental management systems are relevant for this, some companies have developed their own management systems that are aligned to the RSPO P&C's. Teoh and Tan (2007) developed a generic system that is based on the RSPO principles to deliver balanced scorecard results integrating key performance indicators in the legal, economic, social and environmental aspects of the business.

Governance Issues – Opportunities

Public:Private:CSO Partnerships for sustainability: In GlobeScan surveys on sustainable development trends, sustainability experts around the world concluded that the groups providing the most important leadership in sustainable development are governments, companies and NGOs. In the 2006 survey, broadly similar results were given for these groups - governments (29 percent of respondents), companies (28 percent) and NGOs (25 percent) (GlobeScan, 2006). In

tracing the roles of these three players as the "problem", "solution" or "catalyst/monitor" in sustainable development since the 1980s ([Table 4](#)), Najam (2009) concluded that for the future, the groups must work as partners to address the urgent environment and social challenges and climate change.

The need for private: public partnerships together with civil society to drive sustainable development has been recognized since the UN Conference on Environment & Development (UNCED) in 1992. It is encouraging to see that recent market transformation initiatives by NGOs involve partnerships with companies and governments. Companies have also taken the initiative to forge partnerships with NGOs and other stakeholders for conservation, an example being the Agropalma SA partnership with Conservation International and Instituto Peabiru (a social NGO) to create a Private Reserve of Natural Heritage (PNRP) in 64,000 ha of forest reserve owned by the company in the Belem Centre of Endemism in Brazil (Brito and Baiao, 2009).

Table 4: Role of Government, Civil Society and Business in Sustainable Development (After Najam 2009)

	1980s	1990s	2000s	Future
Government	Solution	Catalyst	Problem	Partner
Civil Society	Monitor	Solution	Catalyst	Partner
Business	Problem	Problem	Solution	Partner