Research for IFC Corporate Citizenship Facility and WWF-US:

Better Management Practices and Agribusiness Commodities

Phase Two Report: Commodity Guides

IIED, ProForest and Rabobank International
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Contents

Preface

The International Institute for Environment and Development (IIED), ProForest and Rabobank International were commissioned by the International Finance Corporation (IFC)'s Corporate Citizenship Facility and WWF-US to research the environmental and social issues associated with the production of a wide range of agribusiness commodities. The project aimed to understand how useful the development and application of 'Better Management Practices' (BMPs) would be for these commodities. Specifically, the project has sought to provide guidance on:

- the commodities future initiatives should focus on;
- the potential partners for these initiatives; and
- the key opportunities and constraints associated with each commodity.

The first phase consisted of a scoping review, which involved the collection of basic data and industry intelligence on each of ten commodities (cocoa, coffee, cotton, oil palm, salmon, shrimp, soy, sugar, tea and timber pulp). At the end of the first phase, IFC and WWF-US selected four commodities (cotton, palm oil, soy and sugar) for further investigation, on account of the perceived magnitude of sustainability impacts, financial sector traction, and the potential added value of an IFC/WWF initiative for each commodity.

This report is the product of the second phase of the project and is intended as a basis for discussion regarding future work on BMPs and agribusiness commodities. For each of the four selected commodities, it sets out background information on the sector; key environmental and social impacts; prospects for tackling these impacts through the adoption of BMPs; and preconditions, risks and strategic choices in relation to developing a BMP approach. The four commodity-specific chapters are preceded by a summary of common themes and potential approaches that emerge.

The research focused particularly on production issues (rather than processing, trading or retail). Processing issues were addressed where they are integrated with primary production (e.g. carried out at the same location as production). However, where non-production issues have significant implications in terms of the potential for BMPs, the research also highlights these.

This report was written by IIED and ProForest in co-operation with Rabobank. Readers should note that the report is intended as a rapid, 'first-pass' assessment of these commodities, and, given the evolving nature of commodity production and trade, elements of the report may be inaccurate or out of date. Furthermore, it should be emphasized that Rabobank provided input for this publication and was not involved in the final editing or writing of the report. As such the report does not necessarily represent the views of Rabobank in all areas.

1. Common Themes and Approaches

1.1 Common themes

Although we have taken a commodity-specific approach to this work, there are a number of clear themes common to most or all of the four selected commodities, and beyond to many other commodities.[1]

- **Potential of a BMP approach to achieve positive change:** Many of the key social and environmental issues associated with the production and processing of these commodities could be addressed by the application of BMPs. A BMP approach offers significant opportunities to align and simplify social and environmental expectations and interventions through the value chain. By clarifying and disseminating information on better practice, such an approach offers the prospect of focused, concrete improvements to production practices.
- **Value of ongoing initiatives:** There is a suite of existing initiatives that are developing criteria or BMPs for some individual commodities. There is significant potential to build on and drive forward this existing work.
- **Extent of agreement on BMPs:** For some commodities, there is considerable agreement among responsible producers and other experts on the BMPs that would mitigate many of the key environmental and social impacts. Again, this offers significant potential for moving forward through a BMP approach.
- **Links between financing and adoption of BMPs:** This report points to the emergence of various attempts to link finance with BMPs. So far the evidence on the efficacy of such arrangements is patchy, and the potential for financial actors to influence change will depend on the context. It is therefore impossible to draw general conclusions. However, given the potential leverage of the financial community in relation to the commodities covered here, this is clearly an area worthy of further investigation. Current activities indicate a growing interest among institutional investors in the agricultural commodities sector.[2]
- **Limits of a BMP approach:** However, some problems can't be solved by a BMP approach alone and would require flanking measures. This is particularly the case with impacts associated with the expansion of the agricultural frontier (such as habitat loss), and with macroeconomic issues such as terms of trade, subsidies, and structural oversupply.
- **Fluctuating and declining prices:** World prices for many commodities are on a long-term declining trend, often exacerbated by shorter-term imbalances in global supply and demand. It is often claimed that low prices lead to a prioritisation of short-term financial returns over investment in more sustainable production.
- **Lack of financial incentives to implement BMPs:** Any investment in promoting BMPs is likely to be wasted without creating sufficient incentives for adoption. Many of the potential savings through BMPs will only result where there is a cost associated with poor practice. Some BMPs will inevitably incur greater costs, at least in the short-run. For instance, some BMPs (e.g. Integrated Pest Management) can raise efficiency through minimising inputs. However, against a background of intense competition and declining prices, growers are unlikely to adopt BMPs unless this demonstrably contributes to productivity gains or reduced costs in the short- to medium-term. Furthermore, there is a risk that the burden of any associated costs will fall disproportionately on producers, with little if any compensatory financial return. The complexity and length of many commodity chains means that even if market premia existed at the consumption end of the value

[1] As is the case in the lists of issues and impacts in the commodity-specific chapters, the order of this list of themes is not intended to reflect an assessment of priority.

[2] For example, ISIS Asset Management recently carried out some work with ProForest on palm oil; and Insight Investment has recently been raising with retailers issues related to their sourcing of cotton and shrimp. In addition, the UK Social Investment Forum's *Just Pensions* project is looking at the impact of the food industry (retailers and processors) in emerging markets and developing countries, with a view to identifying management approaches and tools that are most likely to result in international development outcomes and financial benefits (www.uksif.org/J/Z/Z/jp/home/main/index.shtml).

chain, without establishing separate, more direct chains, it is unlikely that much of this premium would filter back to the grower.

- **Small-scale production and level of mechanisation:** The existence of many small-scale growers in some sectors is a barrier to adoption, given that smallholders are less likely to be able to access technical knowledge, finance and other capacity for investing in BMPs. Some BMPs are associated with mechanised production systems and are inappropriate for labour-intensive systems. Appropriate BMPs for different production systems, as well as dissemination efforts and technical support, are therefore likely to be necessary for commodities where these are significant issues. Experience with developing private sector channels for providing extension and other services to small-scale growers has had mixed results. Linking BMPs to finance provided to processors, who in turn could pass on incentives, knowledge and skills to large numbers of smallholders, is an option worth exploring further.
- **Limited proportion of traded commodities:** For some commodities only a limited proportion of production is traded internationally, with the remainder consumed and/or processed into finished goods domestically. Thus, attempts to change production practices need to take into account domestic as well as international markets, where points of leverage may be quite different.
- **Lack of visibility at consumption level:** Many commodities are consumed as ingredients within processed products. This means that they are 'invisible' to consumers, and not bought as a discrete product, thus reducing scope for consumer-led pressure through the value chain. This was emphasised in a recent survey of companies using palm oil, or products containing palm oil, which showed that although the companies acknowledged that unsustainable palm oil presented a reputational risk, few were sufficiently concerned to have taken any action to even find out where the palm oil they used came from.[3] Nevertheless, it is possible that further interest from financial institutions, institutional investors and NGOs may provide sufficient leverage to overcome the lack of visibility at consumer level.
- **Potential for exclusion from markets:** If a BMP becomes a market-entry standard, or a means to a premium, there is a risk of producers unable to implement it being excluded from markets. This is potentially particularly significant for small growers who may not have sufficient capacity, information or access to credit to implement or accede to a particular BMP. Any BMP approach should therefore be appropriate and realistic for both small and large growers, and backed up with necessary extension and support.
- **Compounding existing competition:** BMPs have the potential simply to increase the existing dichotomy between those who can compete at current world market prices and those who can't. Where growers go out of business or no longer have the resources to invest in sustainable production, this may have negative social and environmental impacts that outweigh the benefits of implementation of BMPs elsewhere.
- **Not tackling the worst producers:** As with any voluntary mechanism, there is a danger that a BMP approach simply recognises the existing good practice of responsible growers rather than tackling the worst practices of irresponsible growers.
- **Extent of traceability:** Relationships between growers and buyers range from direct business-business relationships, outgrowers and contract growing, informal arrangements with small producers, to commodity exchanges. In the case of commodity exchanges and informal buying relationships, there is less scope for traceability and market signals for the implementation of BMPs. In order to establish recognition in the market for a commodity grown according to BMPs, certification and segregated chains for sustainable commodities may be necessary. A future BMP initiative should consider the pros and cons of working with existing markets rather than investing in alternative supply chain structures or ensuring full chain of custody traceability. Several models exist, ranging from:
  - *certification and segregation* of sustainably-produced commodities. This provides the best guarantee that a commodity really does come from a producer or processor that implements BMPs, but runs the risks of losing the benefits associated with commodity markets (scale,

[3] ISIS Asset Management & ProForest (2003). *New risks in old supply chains: Where does your palm oil come from?*

liquidity and efficiency) and incurring the costs of establishing and monitoring a dedicated chain of custody within traditional complex supply chains;

- an *area-wide approach*, where production areas are targeted for BMP adoption and so the entire production of the area can be mixed and bulked. This allows most of the benefits associated with the commodity markets to be maintained, but runs the risk of unsustainably produced product entering into the 'sustainable' product; to
- a '*pool*' system, where a buyer pays the premium to the sustainable producer, but without taking physical delivery from that producer. Instead, the producer's commodity would be bulked with others in the normal way, and the buyer would buy from the 'pool' as usual (a mechanism analogous to that used in buying 'green' electricity). This has not yet been implemented for any commodity and may provide insufficient stimulus for widespread BMP adoption.

Although the cost of implementing traceable supply chain systems is often regarded as a barrier to the adoption of social and environmental practices within bulk commodity production, there are many situations in which traceability is being increasingly demanded and introduced for other reasons (see Box 1.1). In such cases, it may possible to make use of emerging technologies and systems to encourage environmental and social BMPs.

Box 1.1 Identity Preserved schemes[4]

'Identity Preserved' (IP) commodity production uses a combination of contract farming, information and tracking technology[5], production, processing and distribution technologies, and process standards. IP technology has so far largely been applied to managing risk, for example in excluding GMOs from supply chains, or ensuring quality, such as enhanced starch quality in maize. Once the technology and systems exist, there is the possibility of widening the set of attributes to include environmental and social issues more broadly. Use of this technology is growing. For example, General Mills announced in 2001 that half its total grain usage was expected to be identity preserved within the next few years.[6]

1.2 Common approaches

The following commodity-specific chapters highlight many of the issues and strategic choices in developing a BMP approach. But a key question in relation to all four commodities discussed here is the approach that an overall BMP-based initiative should take. This issue breaks down into four primary decisions:

- **National, regional or global?**
  Although the most high-profile BMP-based initiatives are global, there may be more potential to drive change by working at national or regional level. This is likely to be more appropriate for location- or context-specific discussions on BMPs, and it may be more likely to attract the interest of key regional players, at a scale at which they feel able to exert influence for positive change. However, a wider approach may be necessary to engage global buyers and processors, and to develop a greater understanding of and dialogue around the macro-economic and political context.
- **Leaders or laggards?**
  Similarly, a judgement needs to be made whether it makes more sense to work with a few leading companies, at least at first, rather than seeking to engage a whole sector. Working with both leaders and laggards is inherently difficult – both in terms of creating sufficient incentives for different companies to engage, and in moving the agenda forward. A sectoral approach runs the risk of moving only at the pace of the slowest. But by definition it is likely that there is greatest scope for social and environmental improvements through the application of BMPs by the 'laggards'.

[4] Adapted from ProForest and IIED (2003) *Feasibility Study for a Generic Supply Chain Initiative for Sustainable Commodity Crops: Findings and Recommendations*, report to the Advisory Committee on Consumer Products and the Environment, which advises the UK Department for Environment, Food and Rural Affairs.

[5] Such as that developed by IdentityPreserved (see www.identitypreserved.com) or efarm (www.efarm.com).

[6] Ron Olson, General Mills Grain Divisions, September 2001, cited in Shipman (2002) 'The Need for Greater Product Differentiation in the Grain Industry - from a USDA Perspective'. *Agricultural Outlook Forum* www.usda.gov/agency/oce/waob/oc2002/speeches/shipman.pdf.

- **Single or multi-commodity?**
  Given the common issues, barriers, preconditions and risks identified above, it is clear that there could be significant synergies from an approach that maximises shared learning rather than addressing only one commodity in isolation. There are many examples of schemes and approaches that apply to several commodities, such as Fairtrade, organic and IPM. In these cases, a set of overarching principles operates in tandem with specific measures for individual commodities, sometimes expressed in a commodity-specific protocol. The logistics of managing such a process, and attempting to gain commitment from stakeholders, would undoubtedly be a significant challenge.
- **Separate process or links with other initiatives?**
  A separate but related issue is the extent to which an approach should engage with existing initiatives. Where the key players are already engaged in a commodity-specific process (such as the Round Table on Sustainable Palm Oil), it could be counterproductive to establish separate processes. There are several initiatives involving other commodities that provide examples of innovative approaches and processes (see Box 1.2) – where possible, the insights from these should be fed into any parallel or overarching initiative. Finally, there are opportunities to engage with parallel multi-commodity initiatives, notably the IISD/UNCTAD Sustainable Commodities Initiative.[7] Engaging and collaborating with other initiatives would have reputational, managerial and institutional implications, and care would need to be taken to ensure that the goals of each initiative are complementary. But failing to engage with these initiatives runs the greater risk of diluting energy and commitment among industry stakeholders, and of failing to develop an authoritative set of BMPs and agenda for implementation.

Box 1.2 Sustainable Smallholder Production Systems
Unilever is developing a new market in Allanblackia seed oil, for use in soap and food products. This tree crop occurs in natural high forest and forest-edge farmlands in west, central and east Africa. The crop has the potential to raise smallholder incomes, through wild harvesting and possibly eventual domestication. As well as investigating BMPs for environmentally sustainable production, Unilever is seeking to develop guidelines on socio-economic issues in order to maximise the poverty reduction potential of this new market. This work could provide valuable lessons for other commodities, particularly smallholder tree crops. It may also have implications for other edible oil markets.

Given the need to take these four key decisions, we have not sought to provide a shortlist of key players who should be involved in a BMP initiative. Rather, we have identified the range of actors involved in the production, trading and financing of each of the four commodities, on a regional basis where possible. In addition, we indicate significant end-users and other key stakeholders. However, these listings are broad and inevitably incomplete. We recommend that further elaboration of who should be involved in a future initiative takes place only once the above questions have been resolved, noting that different players will need to be involved to address particular issues and specific production locations.

[7] Sustainable Commodities Initiative at www.iisd.org/trade/commodities/sci.asp. As a significant parallel initiative that is seeking to engage many of the key actors in the commodities covered by this report, the value of coordination and the potential for collaboration with the SCI is likely to be significant.

2 Cotton

2.1 The cotton sector

2.1.1 Production volumes and regions

Cotton is produced in approximately 90 countries worldwide, approximately 80% of which are classified as developing nations, with 30-35% of primary production traded internationally each year. The United States and China are the single biggest producers of cotton, while India, Pakistan, Uzbekistan and the West African region are also large producers (figure 2.1). While many developing countries are involved in cotton production, these six major producing nations account for 75% of total supply.

Figure 2.1 Distribution of world cotton production (average 1998-2003)[8]

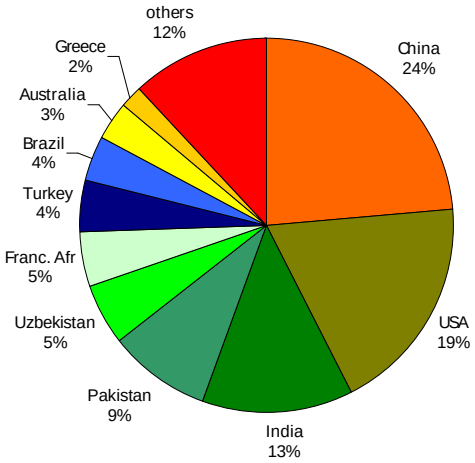
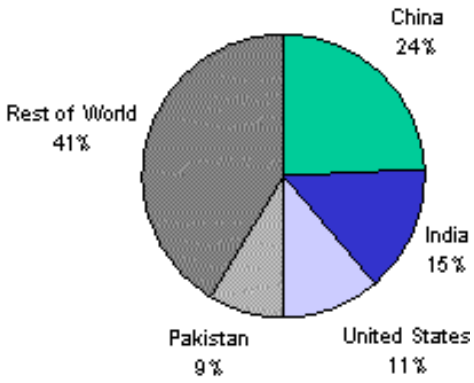
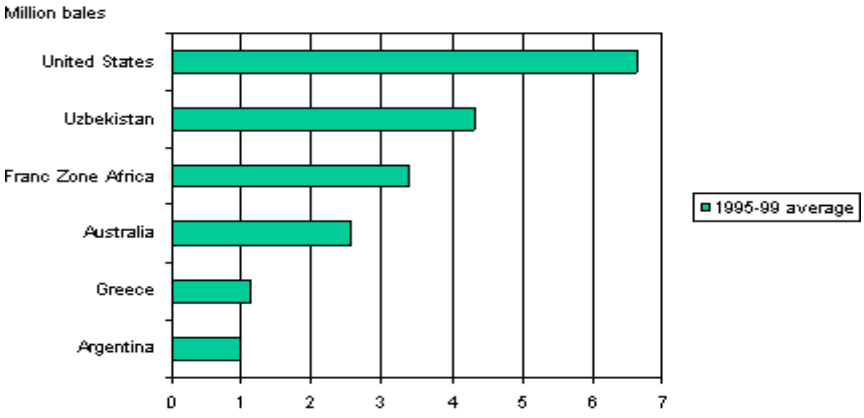


Figure 2.2: World cotton apparent consumption



Source: Foreign Agricultural Service, USDA

Figure 2.3 Leading cotton exporters



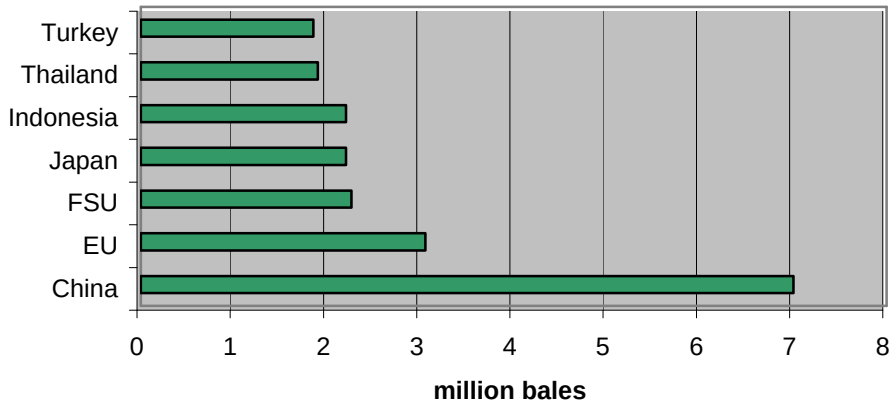
Source: Foreign Agricultural Service, USDA

Australia and the collective group of West African countries (Franc Zone Africa) are more important to the cotton complex in export supply, and the US role in export markets has increased steadily in the past five years as the local textile sector continues to contract. Leading export suppliers include the US, Uzbekistan, West Africa and Australia, which account for over two-thirds of total export supply (Figure 2.3). Noticeably only the US as a major producer is also a major exporter, reinforcing the local market apparent consumption of the big producers. The US has been able to successfully expand its exports with the use of the GSM-102 programme, whereby up to 3 years credit is provided to countries that buy

[8] Source: ICAC, 2004.

US cotton. Turkey is a major buyer of US cotton via this programme. Market access is also preferential through NAFTA into Mexico, which has also experienced a huge expansion of its textile sector. Other trade flows are concentrated regionally, for example Turkmenistan into Turkey/Pakistan. The biggest importer of cotton is now China, which is taking an increasing role in the textile sector (Figure 2.4).

Figure 2.4: Leading cotton importers, 2004 (USDA-ERS)



2.1.2 The value chain

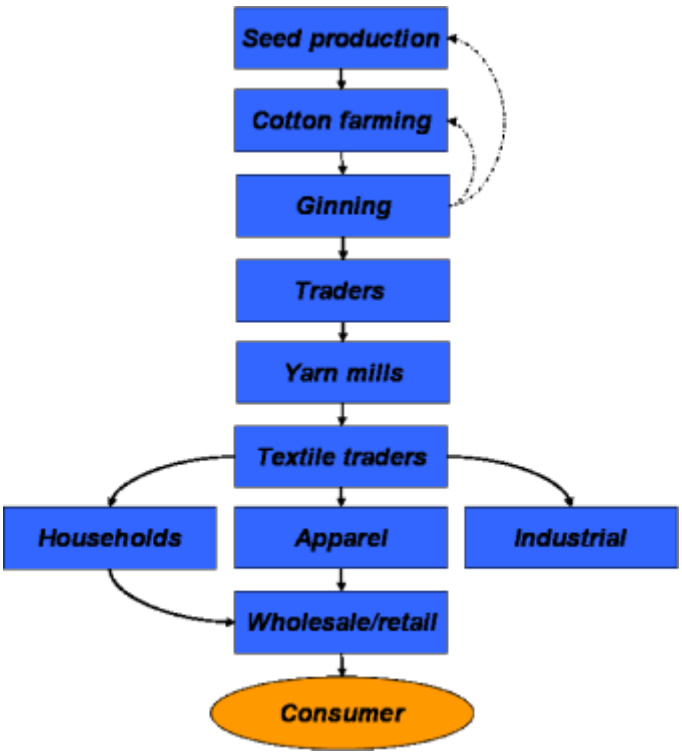
The simplified value chain for cotton is presented in Figure 2.5, but this is only indicative. The value chain differs markedly between countries and in some cases, e.g. China and Uzbekistan, there is a high degree of government involvement in chain activities. This has usually reflected the degree of economic development within the host country; the USA and Australia have effectively no government ownership of assets in the value chain.

Seeds and farm production are undertaken by specialist producers, usually on contract to seed companies. Production is usually in isolation of any other cotton to ensure product integrity. Not all cottonseed companies are global but they will usually have some sales representation (at least) in all major markets. Cotton is one of the few commercially approved GM crops being grown worldwide, with approximately 20% of global cotton produced using GM seed. About 34% of world's exports are of GM varieties. In the US, GM cotton varieties cover almost 75% of the cotton area. Cotton is an annual crop replanted each year and is a member of the hibiscus family. 34 million hectares of cotton were planted in 2002/03, with approximately 45% irrigated and 55% based on rain dependent systems. Farm size varies widely given cotton's production in developing and developed markets. In Africa farms can be as small as 0.5ha per farm, whereas in Australia farm sizes have reached over 15,000ha irrigated production. In some cases operations are integrated with ginning and marketing but usually the operations are split between production then processing. Income is usually largest from lint sales versus seed sales; in developed markets the ratio can be as high as 80(lint income):20(seed income)

Ginning and marketing: the largest ginners are commonly the largest marketers (i.e. Dunavant, Louis Dreyfus, Ecom, Cargill, Queensland Cotton). Cotton lint is sawn or rolled away from the seed using high speed ginning equipment. The process will vary with the type of cotton. Typically standard cottons are ginned using saw gins, while longer staple cotton is roller ginned. As a by-product, cottonseed is commonly used in animal feed (particularly dairy) and the extracted oil has many industrial and household uses. Ginning remains capital intensive even though the process has not changed markedly in the last twenty years. Similarly gins do not run for a full year and are only operating post-harvest. To balance out the cost of ginning equipment, marketing has taken on a global focus with major players usually located in all critical markets. The largest merchants account for over 50% of the world trade and are constantly looking to secure greater control over supply demands. Cotton is a supply-based market – when supply tightens prices will rise; however cotton is also price competitive with the

synthetic fibres, particularly polyester. Sustaining price competitiveness with polyester is critical, as cotton has faced increasing market share pressure from the synthetic fibres as production has exponentially expanded in recent years.

Figure 2.5 The Cotton Value Chain



International trade: approximately 30-35% of cotton is internationally traded per annum. Cotton is typically traded only after ginning; international prices are determined based on lint not seed cotton. Cotton has an active futures and options market with several banks (including Rabobank) offering their own individually tailored over-the-counter (OTC) risk management products. Due to the international nature of trade, foreign exchange risk is also a pivotal element of the cotton business. There is also a high degree of volatility in futures and spot prices as grades and supply varies widely between origins. For example, tighter supply from Australia (due to drought) has supported stronger prices for SJV (San Joaquin Valley – denotes cotton that conforms to a specific, rather higher than normal, quality standard) type cottons from the US, helped along by a declining US dollar value.

End use: cotton's market share for textile end use is under pressure even though production continues to expand and consumption is actually rising. This reflects a faster rate of growth in synthetic production over cotton production (concentrated in SE Asia) versus a downward movement in cotton utilisation. Stocks of cotton continue to fall as consumption is outpacing production; this trend has slowed somewhat on the back of sharp price rises. However, cotton stocks remain low without any clear sign that they will rise to the formerly price oppressive levels of over 45% of annual consumption.

2.1.3 The different types of producers

Globally, cotton production is generally either in the hands of either a relatively very small number of large, mechanised farmers (Australia, USA, Brazil) or millions of smallholders (China, S Asia, W Africa) – see figure 2.6. Only the FSU, especially Uzbekistan, represents an intermediate farm structure.

Small farmers have different access to technology – hand application of pesticides (usually with knapsack sprayers), hand weeding and manual picking, though cotton quality can be high. Even within predominantly smallholder areas such as Pakistan, larger farmers have preferential access to research

and extension. Farmers in the US, Australia and Brazil farmers use more herbicides, and mechanised soil preparation, pesticide application and picking.

Figure 2.6 Large and small cotton farming systems[9]

Country	Number of cotton farmers	Cotton area (million ha, 2003-04)
China	14 million	5.10
W and C Africa	2 million	2.51 (Franc Zone)
Pakistan	1.3 million	3.00
USA	25,000	4.88
Australia	1500	0.18
Brazil—Mato Grosso	200	0.31 (0.98 in total country)

In **China**, which is expected to produce 4.88 million tonnes of cotton in 2003-4 of a global total of 20.18 million tonnes,[10] 14 million smallholders are involved in cotton production.

India and Pakistan (2.72 and 1.72 million tonnes respectively) are also dominated by smallholder production. 60 million people derive income from cotton directly and indirectly in India, and there are 1.3 million cotton farms in Pakistan, half with less than 2 ha. In Punjab (India and Pakistan) agriculture is almost 100% irrigated, while central and southern zones of India are typically rain-fed.

Cotton production in **West Africa** (1.7 million tonnes) covers Mali (0.59), Benin (0.41), Burkina Faso (0.4) and Ivory Coast (0.37). Oxfam report that more than two million households are directly involved in cotton production in West Africa, with most farms average between 0.5-1.5 ha, and they employ large amounts of labour during planting, picking, and in other key seasons.

In the **Former Soviet Union** (FSU--1.46 million tonnes) especially **Uzbekistan** (0.91 million tonnes), 97% of crop production is conducted on irrigated land. Cotton production has halved since the 1980s. Partial reform of the agricultural sector has seen a large growth in the number of family farms and small farms. Small farms are expected to become the main agricultural producers in Uzbekistan: in 2002 there were around 72,000 small farms, 2,000 cooperatives, 3.3 million family farms, and 500 other private sector farms.

In the **USA** (3.96 million tonnes) there are only around 25,000 cotton farmers, with farm sizes ranging from an average of 800 ha in the Texas Plains to 200 ha in the Carolinas and Mississippi.

In **Brazil** (1.09 million tonnes), cotton acreage is moving from the south and northeast and into Mato Grosso, where there is much potential to expand the area under soy-cotton rotation. Mato Grosso has around 200 dryland (ie un-irrigated) cotton farmers, accounting for 50% of Brazil's cotton production, with an average 2,000 ha of cotton and three times as much in soybeans. These massive farms have large economies of scale, and are organised in cooperatives such as Unicotton.

In **Australia** (0.28 million tonnes), there are only around 1500 cotton farmers.

2.1.4 Financing requirements within the sector

Finance remains crucial for cotton farming, processing and trading. Cotton is an expensive crop to produce, yet this expense is concentrated in short periods of time, hence the need for pre-harvest finance and working capital to carry a farmer through the seasons. Similarly processing and trading of cotton requires substantial finance, which has become more sophisticated in recent years with a strong focus on the use of risk management/treasury products to control financing costs.

On-farm finance: Prior to harvest, banks provide money to fund production based on the forecasted incoming production via traditional channels (direct to farmers) and via third parties (e.g.

[9] Sources: USDA-FAS and USDA-ERS and misc. sources
[10] Converted from US Bales, where 1 bale = 480 lb = 217.724 kg. Source: USDA-ERS

merchant/ginner). Recently the trend has been towards traditional seasonal finance as the re-finance cost via the third party has become less economically viable. Merchants who continue to provide pre-harvest finance are often now making this finance conditional on delivery of that cotton to them for trading purposes, to the dissatisfaction of many farmers who would prefer to market their cotton with a number of merchants.

Ginning working capital: Cotton ginning occurs in a relatively concentrated time frame, yet in many cases as the gin is owned by a trading company sales will occur over a full year. As a result, it is not uncommon to see a short term injection of working capital from banks to ginning operations during this period of the year.

Trade finance: International traders require financing in order to be able to buy cotton in one location, transport it to another country and deliver it to a buyer. Finance is required to bridge the gap between paying for the cotton and receiving payment in turn. There has been a movement away from traditional Letters of Credit towards products that incorporate a higher degree of risk management, such as Total Return Swaps.

Project finance: Finance is required for any expansions, upgrades and green field projects that processors may wish to carry out. Project finance for cotton is usually for green field ginning or warehousing projects.

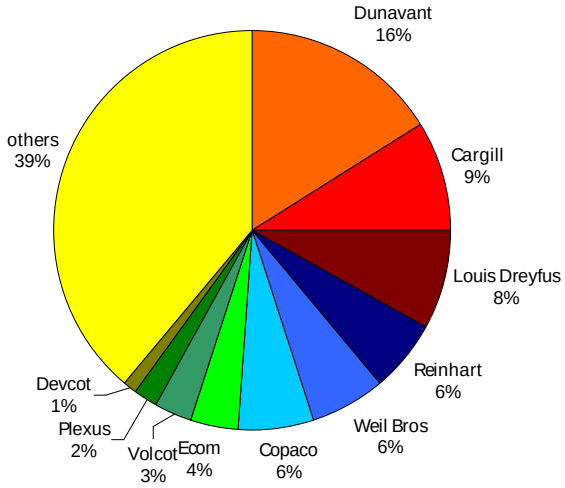
The international banking of cotton is undertaken by relatively few banks, yet in local markets where cotton remains an important commodity to the wide economy, smaller banking operations find it an acceptable risk for their portfolio. Government-backed finance remains crucial, particularly in developing markets (West Africa) where it is harder for bigger banks to manage risks or where they are unwilling to get involved to that degree.

2.1.5 Key players and financiers by region

Merchant operations within the cotton sectors are largely controlled by private companies so estimating market share is largely based on anecdotal evidence. However, figure 2.7 shows that while several companies have comparable market share, no one company dominates the entire system. Similarly, the range of activities within this group is shared between integrated operations (merchandise, ginning and marketing) through to specialist operations (ginner-merchant, merchant, or ginner).

Nearly all of these companies have a global presence across developed and developing markets. Access to finance for most of these companies is relatively easy; they are usually financed by local banks and for trade via a diverse selection of international banks. Some of the bigger banks to the cotton sector include Rabobank International, ABN Amro, BNP Paribas, Soc. Gen., Standard Chartered and Macquarie Bank. Local banks also play an important role in financing major exporters, e.g. in Australia (ANZ, NAB) and in the USA (CoBank, Bank of America). Below we present a breakdown of key players and financiers by region; this is followed by a summary of major traders and end users and their financiers, and other key stakeholders in the sector.

Figure 2.7 Market share by company of global cotton trade[11]



Europe & US

Cotton is usually processed into yarn or fabric and in many cases finished textile products before reaching the European borders. This allows some developing nations (particularly North African countries) to take advantage of preferential trade agreements which ensure access to the European markets. Only a limited number of European companies have invested into offshore processing, typically the focus remains local and geared towards capturing value via branding and product image/quality.

Commercial banks operating within the wider textile sector in **Europe** include; Rabobank International, Credit Agricole, Credit Lyonnais, Societe Generale, ABN Amro, ING, BNP Paribas and UBS.

Cotton within the **US** is a major agricultural industry. Production finance remains highly integrated with the local banks and credit unions although Bank One, Bank of America and Wells Fargo used to be highly involved in providing agricultural finance. More recently farm finance has been provided by input suppliers and merchants, while long term debt is handled by smaller local operations. The textile sector within the US is approaching the end of a long period of structural adjustment as investments have moved to lower cost regions of production, such as Mexico and Asia. This trend will not reverse and for those companies that anticipated this development, access to funding remains relatively easy. Commercial banks operating within the wider cotton and textile sector in the US include; Rabobank International, CoBank, Bank of America, Wells Fargo, Chase Manhattan, GE Capital, Citigroup, Goldman Sachs and Merrill Lynch (excluded from this list are local banks in the individual cotton producing states).

Asia & Middle East

Asia and more specifically, **China**, is a critical link in the cotton textile system. Figure 2.8 provides a summary of the interests of some key financial institutions operating in the region. Local banks will finance production while many international banks are actively pursuing relationships in downstream textile activities throughout the region. China, India and Pakistan all have large home markets but continue to expand their export capacity to maximise scale economies in textile production.

There are literally hundreds of small spinning and milling operations, some which work collectively to supply bigger manufacturers and others that are horizontally integrated in the chain. A recent trend has been the outsourcing of textile manufacturing and assembly to create a break in the chain and thus company image protection due to the ‘sweat shop’ issue that plagues the wider textile sector. As such,

[11] Source: Rabobank International, 2004.

it is somewhat difficult to trace large brand name companies and their banking relationships into the Asian region.

Israel, Syria, Egypt and **Turkey** are key regional cotton producing countries within the Middle East. 'Egyptian' cotton (and similar types/quality produced in Israel and Syria) attracts a considerable price premium based on the quality of the lint produced. Supply is not large and production costs within this region are relatively high. Local banks are key sources of production finance and unless for specific types of lint, trade remains focused on local markets only. Turkey has room to increase the capacity of its cotton sector both in production and processing systems. Access to finance would improve should Turkey be admitted into the European Union; however this remains unlikely in the short term.

Figure 2.8 Institutions financing cotton production in Asia/Pacific and the Middle East

Institution	Country
International banks	
ABN Amro	China, India, Pakistan, Indonesia
Bank of Nova Scotia	China, India, Indonesia
Societe Generale	India
Standard Chartered	Indonesia, Taiwan, Malaysia
UBS	China, Taiwan, Singapore, Australia
Citibank	Singapore, India, Hong Kong
HSBC	Singapore, Hong Kong, China, Vietnam
Local commercial banks	
State Bank India	India
Bank of Punjab	India
Bank of Khyber	Pakistan
Union Bank	Pakistan
Kwangtung Provincial Bank	China
Hang Seng Bank	China, Hong Kong
National Australia Bank, Commonwealth Bank	Australia, New Zealand, South East Asia
Macquarie Bank, Australia and New Zealand Bank	Australia, South-East Asia
Arab Bank Group	Middle East
Gulf International Bank	Middle East
Saudi British Bank	Middle East
Sumitomo Bank	Middle East, Japan
Mitsubishi Banking Corporation	Japan, Middle East
Riyad Bank	Middle East
Development institutions	
Chinatrust Construction Bank	China
Arab National Bank	Middle East
Islamic Development Bank	Turkey and Middle East, Central Asia

Uzbekistan, **Kazakhstan** and **Tajikistan** are all cotton producing countries. In Uzbekistan, agriculture has been semi-privatised since independence in 1991, and the Government of Uzbekistan has "expressed its commitment to promote a voluntary transition of farm management from the public sector to the private sector." The state monopoly on the export of cotton fibre has been lifted and farmers are allowed to export some of their product through specialized agents. Government contracts were introduced for 50% of actual rather than planned production. Prices for cotton in government contracts now approach world market prices. But according to the World Bank, the reforms in Uzbekistan have not yet provided cotton farmers a viable alternative to selling to the state--monopsonistic government procurement remains in place, and there are "significant vestiges of centralised planning for cotton and the rest of its economy". Farmers of the former state and collective farms still control the majority of water and inputs. Uzbekistan now has five cotton corporations which grow, process, package and distribute seeds.

A large proportion of cotton from this region is processed in China or India, thus financing arrangements in those markets is a stronger indicator of relevant parties and institutions. Rabobank International is involved in providing risk management products for cotton in Central Asia. Government involvement in the provision of finance to production remains high via loans, tax concessions, input subsidies and other non-direct finance mechanisms.

In **India**, The Cotton Corporation of India (CCI), a government agency, is responsible for providing price support in all states except in Maharashtra, where there is state monopoly procurement.

Africa

Cotton is produced widely throughout Africa, yet it is most successfully concentrated in the former French colonies of West Africa. Not surprisingly many French banks are still involved in providing finance to these markets yet most of the activity is restricted to trading operations as compared to the financing of on-farm production. Sourcing finance for new projects in Africa remains challenging given the limited certainty of economic and political stability in many cotton-producing countries. Figure 2.9 provides a summary of the interests of some key financial institutions operating in the region

For cost efficiency reasons a large proportion of West African cotton is exported as raw unprocessed lint to more cost efficient textile processing zones (typically Asia). There is limited processing of cotton into finished textiles within Africa and much of what is processed is destined for local consumption. African nations do have preferential access into European and US markets, yet lack the investment and scale of Asian counterparts.

Figure 2.9 Institutions financing cotton production in Africa

Institution	Country
International banks	
Rabobank International	West Africa, trade finance
Standard Chartered	West Africa, South Africa, multiple
Societe Generale	West Africa
BNP Paribas	West Africa
Barclays	West Africa, Sub-Saharan Africa
Local commercial banks	
Bank of Zimbabwe	Zimbabwe
FirstRand Bank	South Africa, Zambia, Zimbabwe
Development institutions	
West African Development Bank	West Africa
Capital for Development (former CDC)	via subsidiary funds in regional markets
African Development Bank	Continental
OPEC Fund for International Development	Continental via mainstream country lending

Americas

Brazil has enormous potential to become a world leader in production of cotton. Production has been negatively affected by seasonality and pest infestations in recent years, which in turn affect the consistency of supply for export inhibiting Brazil's ability to form long lasting relationships with importing countries. The cotton sector remains largely governed by cooperative businesses although merchants including Dunavant, Reinhart, Volcot, Ecom and Cargill have been active for some time.

Again production finance is controlled via local institutions, Banco do Brasil and Banco Sanfra for example with international banks assisting in the provision of risk management and trade finance. International banks active in Brazil include Rabobank International, ABN Amro, Merrill Lynch and Macquarie Bank. Major development institutions include the Inter-American Development Bank.

In other parts of South and Central America production finance has in the past been provided against inputs for small and large farmers. As noted this has increased the risk to the input supplier but appears to be an effective way to ensure product consumption. Security is taken against the incoming crop however given the high proportion of rain-based production of cotton in the Americas this is considered risky. Governments and central banks are also critical suppliers of finance, especially to small landholders.

Traders and end-users

The international cotton trade is effectively controlled by a small number of companies. Even though individual market shares appear small, ten companies control over 60% of the world trade. In countries such as Uzbekistan the government still plays a substantial role in the marketing of raw cotton but in practice act as an intermediary between the farmer and other international merchants such as Cargill or Dunavant. A similar situation exists in China, whereby the Supply and Marketing Corporation (SMC) heavily influences the flow of Chinese cotton from farm to fabric. As such markets deregulate it is expected that the overall market share of the largest traders will rise over time.

In contrast the number of end users of cotton is enormous. Depending upon the quality characteristics cotton will be utilised in industrial lining right through to tailor made business shirts. Other uses include currency, insulation, soap, waterproofing products and tents. The end use will influence the location for processing and consequently the intermediaries capable of providing the finance.

The number of banks and financial institutions involved in this section of the value chain is in practice immeasurable. In conjunction to the traditional banks, venture capitalists and fund managers are involved it the cotton sector from taking a stake in cottonseed companies to refinancing insolvent spinning and manufacturing operations. Finally given the global nature of the textile companies and cross border operations in spinning and manufacturing, companies hold loans in different countries. For these reasons, there is no simple shortlist of banks involved in financing these players.

Other stakeholders

- Branded garment companies e.g. Timberland, Nike, Adidas, Patagonia, Gucci, H&M, Hugo Boss, Benetton, Gap, Levi Strauss, The Limited, Marks and Spencer.
- Mail order companies e.g. Otto (Germany) Neckermann.
- Retailers e.g. Tesco, Asda, Monoprix, Co-op.
- Other relevant companies include Bienestar International (No Sweat Apparel) and Bo Weevil BV. Asian EPZ employers include Pou Chen, Tri-Star, Ramatex and Target.
- NGOs including ICAC, FAO, NCC, WWF (Thirsty Crops), Oxfam, Cleaner Cotton Campaign, Clean Clothes Campaign, Ethical Trade Initiative, UNITE! (Union of Needletrades, Industrial and Textile Employees), Pesticide Action Network (PAN-UK).

2.1.6 Macro issues facing and affecting production

Policy developments play a large role in the global cotton industry – as both a commodity and textile input. One widely expected future trend is the increasing dominance of China in the textile complex, particularly the post-2005 final phase-out of the Multi-Fibre Agreement (MFA). China is however to become a long-term net importer of cotton as demand grows faster than local supply. Another issue for the future is pressure being applied to the current US Farm Bill. Initially it has been challenged by Brazil and others at the WTO and was collectively attacked during Cancun negotiations by West African nations. It is unlikely that there will be any immediate reform in any US programmes heading into an election year, but observers have commented that Brazil has built a particularly strong WTO case for reform. Other trends expected include a fall in production in Uzbekistan, a return to normal production in Australia, a rise in exportable supplies from West Africa, rising consumption in Turkey and a greater role for Brazil in export markets.

2.2 Key sustainability impacts

Sustainable cotton **production** centres around two key themes—the **management of water** and the **management of pests**. This is because, of the major agricultural commodities, cotton is highly water-intensive and, due to a long growing season and fruiting pattern, highly pest-sensitive. 73% of global cotton production comes from irrigated land, and the crop, on just 2.5% of the world's arable land, accounts for 25% of global insecticide consumption. Cotton is rightly associated with ecological crises around water and toxics in semi-arid and water-scarce areas—the Aral Sea, the drying of the Yellow River in eastern China, and pesticide overload on a very wide scale.

Many social issues are connected to these factors—worker poisoning and illnesses from pesticides during application (men) and harvesting (mostly women). Child labour remains a discrete social issue in South Asian and West African production. Biotechnology, especially genetic modification (GM), is another 'big issue' where cotton is at the centre. Transgenic cotton was grown on 7.2 million ha in 2003, representing 21% of the 34 million ha under cotton and 11% of the global GM area.[12] There are two main attributes in GM cotton—insect protection ('Bt' crops such as Monsanto's Bollgard®, containing the gene from a soil bacterium, *Bacillus thuringiensis*) and herbicide tolerance (such as Roundup Ready®). Herbicide tolerance is a benefit to large-scale mechanised farming systems. But varieties of cotton engineered to produce their own bio-insecticide gene are also attractive to small farmers, due to cost savings and reduced health risks from applying insecticides with knapsack sprayers.

As a non-food crop, biotechnology has been a much less controversial feature in cotton production compared to maize, soy and oilseed rape, though cottonseed oil is extracted for human consumption, and the residue, cotton seed cake, is an important animal feed. Loading of the soil with the Bt toxin, and gene transfer to wild relatives ('genetic pollution') may have unanticipated consequences for biodiversity. Furthermore, the large-scale plantings of Bt cotton are placing a huge selection pressure on cotton pests and will inevitably lead to the development of resistant strains that will condemn the technology to same fate as many other non-durable technologies that take a frontal rather than systemic view of crop protection.

So the long-term environmental and social consequences of GM cotton are ambiguous, but so far the market is clear—there are few if any premiums for GM-free cotton.

In **manufacturing**, the **discharge of untreated effluents** into water and soils by the textile industry is the main issue. Liquid effluents from washing, dyeing, and bleaching operations contain organic and inorganic chemicals such as chromium. Discharge of untreated effluents into water bodies lowers dissolved oxygen levels and threatens aquatic life. Worker health and safety is threatened by air pollution in small textile units with risks of lung disease among workers.

The two most significant issues – pests and water management – are remarkably similar across cotton growing regions.

2.2.1 Environmental impacts

In **China** the cotton crop is associated with falling water tables and unreliable surface water in Yellow River region, and reduced water flow in the Yellow River. GM has played a role in reviving production in the Yellow River region, after a crisis of bollworm infestation and associated yield loss and pesticide hazards. But infestations of *Lygus* bugs, red spider mites and whitefly still are requiring large insecticide use even on GM varieties.

India and Pakistan the pesticide treadmill continues to spin – half of national pesticide consumption in both countries is on cotton – leading to insect resistance and insect pressure (bollworms, whitefly,

[12] International Service for the Acquisition of Agri-Biotech Applications (2003) Global Status of Commercialized Transgenic Crops: 2003. www.isaaa.org/Press_release/Briefs30-2003/es_b30.pdf

virus). Consumption of pesticides in Pakistan increased from 665 tons in 1980 to 47,592 tons in 2002 without accompanied increase in yields (Figure 2.10). Counterfeit pesticides are a serious problem.

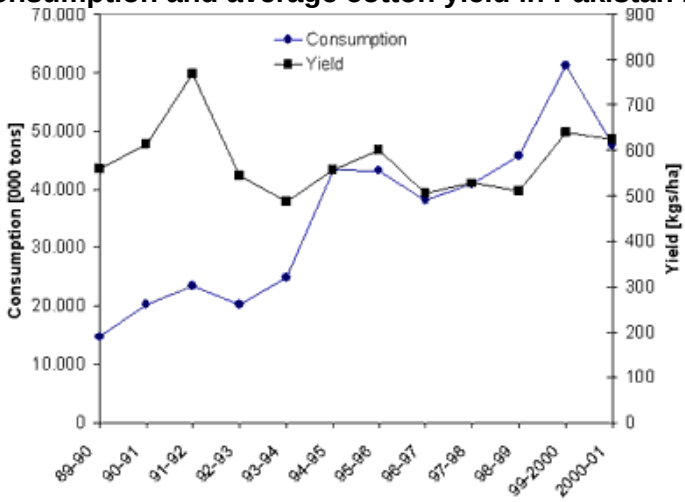
Heavy toxic pesticide use is associated with major impacts on biodiversity, such as birds and fish. Total external costs of pesticide use in Pakistan cotton are estimated at nearly Rp 12 billion (USD 200 million). Irrigated cotton suffers from soil water logging and salinity, and contributes to reduced water flow (eg Indus Delta) and brackish tubewell water in Pakistan.

In the **USA** cotton irrigation is, with livestock production, associated with serious reductions in flow in the Rio Grande basin. Pesticides and defoliants are still associated with worker illnesses. Faced with rising labour costs, the US apparel industry is moving offshore.

Pesticide use in **West African** cotton is associated with insecticide resistance, worker and family exposure to pesticides through cotton weeding and harvest, the application of cotton pesticides to food crops, and the accumulation of residues in animal feed and meat.

In the **Former Soviet Union** especially **Uzbekistan**, improper drainage – which means that 50% of the land has to be "washed " in winter – plus overuse and wastage of water, rising ground water tables, salinisation of soils and development of a hard crust are serious problems. Water diversion and reduced water flow, especially into the Aral Sea, have led to an environmental and social catastrophe. Other problems associated with cotton are the impact of saline drainage effluent on wetlands, reduced quality of drinking water, soil contamination from agricultural chemicals including DDT, and human health problems, including pesticides and salts blown from the Aral Sea bed. Uzbekistan has been an important source of cotton for many years but environmental degradation resulting from monoculture in production and over intense use of resources has now started to directly impact on current productive capacity. Production in Uzbekistan has fallen in the past two years and without considerable new investment in irrigation infrastructure and natural resource regeneration it seems that this will continue over the coming three to five years. Beyond that, the sustainability of production agriculture will become increasingly difficult.

Figure 2.10 Pesticide consumption and average cotton yield in Pakistan 1990-2001[13]



In **Australia** the cotton industry has accounted for almost 10% of all the water used in the country – more water than all of Australia's seven million households put together. Reduced flow in Murray-Darling River basin has impacted wildlife. Improper irrigation is associated with salinity, waterlogging, and groundwater pollution.[14]

[13] Source: Global IPM Facility.
[14] *The Age* 1 October 2002 http://www.theage.com.au/articles/2002/09/30/1033283436065.html

2.2.2 Social impacts

Child labour. Bonded child labour is extensively used in cotton farms in Pakistan. 400,000 girl children (between the ages of 7 –14) are hired to work in cottonseed fields in hybrid cottonseed production in India, out of which 250,000 are employed in Andhra Pradesh. 60% of the girls currently employed in cottonseed fields are school dropouts.

Sweatshop manufacturing. A 'race to the bottom' affects many of the world's 43 million Export Processing Zone (EPZ) workers, with poverty wages and substandard working conditions in apparel manufacturing and widespread evidence of harassment or dismissal of union organizers. International attention has been focused on big brand name companies, as a way of exposing poor practices , although this approach alone is insufficient to address the systemic challenges that face labor practices in the sector.

2.3 Prospects for taking a BMP approach

2.3.1 Which of the key impacts a BMP approach could seek to address

The two key issues of **pest** and **water** management in cotton are both conducive to a BMP approach. Both are win-wins, reducing the cost of production – which has reached very high levels in some countries – and preserving the natural resource base. There is a high level of consensus of what needs to be done; by addressing only two problems through BMPs, the key environmental and social impacts can be dramatically reduced. For instance, water management can reduce withdrawals from rivers and groundwater, protect soil from salinisation, *and* preserve downstream habitats (wetlands, estuaries) from saline drainage water. Pest management can both prolong the effective life of pesticides *and* reduce health hazards of applicators and pickers. But both pest and water management must be applied on an **area-wide** basis to be effective, and this is the challenge of BMP implementation.

Irrigation water management:
Overall efficiency of water use in irrigated cotton is low, with only 20-50% of diverted waters actually reaching the crops. There are two basic means by which water-use efficiency can be improved: either increasing the share of water actually taken up by plants from irrigation water, or producing more crop per unit of water. BMPs include maintaining water deficit conditions in non-critical growth periods, and drip, sprinkler and alternate furrow irrigation. This does not apply to upland cotton e.g. of Brazil, southern India, W Africa and parts of the US.

Water management is also linked to improved soil structure which gives a higher water retention capacity, e.g. from shallow soil cultivation, mulching, low- or zero-tillage, or organic production. Farmers in Israel have reported that cotton grown under organic conditions requires around 30% less water than cotton grown under conventional practices. This could be related to better soil structure and a higher water retention capacity. Improved land management also helps reduce soil erosion, soil compaction and salinity.

Pest and pesticide management:
BMPs are largely aimed at improved pesticide application to reduce the quantity of pesticide missing the target, and improved pest management, through integrated pest management (and GM). BMPs include crop scouting and use of economic thresholds, use of selective insecticides, conservation of natural enemies e.g. through the use of cover crops, and crop rotation. Effective pest management is closely linked to water and fertilizer management – increased general plant health and reduced stress means less pest damage.

2.3.2 To what extent there is agreement on BMPs

There is a high degree of global agreement on BMPs for pest and water management in cotton. The days of suspicion or outright hostility to IPM in the pesticide industry are long over. Social BMPs such as the end of child labour are more controversial; in West Africa, for example, children form an important part of the family labour force during harvest.

2.3.3 To what extent different BMPs would be required for different types of producers and different regions

It is the organisation and governance of the sector – extension, provision of services, inputs, credit, and marketing – which will have overriding impact on both the area-wide implementation of BMPs and the ability to certify producers and produce. The situation is confused by various levels of transition of extension and marketing systems from heavy state control to fully privatised arrangements.

In **Pakistan and India**, a crisis in extension has been acknowledged. On the ground, it is the pesticide company representatives and pesticide dealers who provide the majority of advice. Both private sector and public extension services have a clear bias towards large farmers[15] due to ingrained systems of performance measurement and political patronage. There are low levels of collective farmer organisation. Individual farmers spray at different times, with poor knapsack sprayer equipment and often counterfeit pesticides. Because cotton production requires heavy investment and borrowed capital, smallholders are often highly indebted and are therefore very risk-averse and likely to apply excessive amounts of pesticides to protect their investment. Most financing in India is done through chemical and seed companies, though government annually establishes minimum support prices for cotton. Under these anarchic conditions, where obtaining high quality information and high quality inputs is dependent on farm size and educational status, the area-wide implementation of BMPs is very difficult.

China and the **FSU** are in transition from state control to semi-private systems. In **China**, cotton is sold through government-run procurement stations, though some private cotton dealers have emerged. Dismantling of the government-set cotton procurement price has caused cotton farm incomes to plummet. Extension comes from same place as pesticide sales, with associated problems of vested interests.

In **West Africa** there is still much of the tightly controlled, vertically integrated and paternalistic *encadrement* agricultural system in place, in which seeds, inputs, credit, transportation, ginning and marketing of the crop are handled through a parastatal cotton ginning company. This system has been used throughout Francophone Africa with great success in terms of cotton yield and quality. The parastatals were only been part-privatised in the 1990s compared to the full liberalisation seen in Anglophone Africa. For example, in 1996, the government of Cote d'Ivoire adopted a privatisation plan for its cotton parastatal, CIDT, but the majority of capital shares in the 'privatised' companies' are held by the state, and by the French cotton development parastatal CFDT. Crop production is guided and supervised by technical agents in order to meet specified production quotas and quality standards. The persistence of vertical integration has big implications for area-wide IPM.

In **Turkey**, the gins play an important role in domestic marketing channels. Each year the Turkish Government announces seed cotton support prices prior to harvest at a level below international prices.

In **Brazil**, **Australia** and **USA** large scale producers organised as cooperatives can conduct their own research, such as testing different varieties and production practices for improved yields, fibre quality, disease resistance and weed tolerance, supported by state research and extension infrastructures.

2.3.4 Examples: Where BMPs have already been identified and/or implemented

Integrated Pest Management (IPM)

In Brazil**,** IPM has been adopted by 60% of growers. Pesticide applications have been reduced from 22 to 12 per season, even with new boll weevil pest *Anthonomas grandis* present. As a consequence there

[15] *Davidson AP(2002)* Privatization and the Crisis of Agricultural Extension in Pakistan: *Caveat Emptor. World Bank-ARD.* http://lnweb18.worldbank.org/ESSD/ardext.nsf/26ByDocName/PrivatizationandtheCrisisofAgriculturalExtensioninPakistanCaveatEmptor/$FILE/PakistanDavidson.pdf

have been no major new pest resistance occurrences in the past 20 years. The remaining challenge, according to Sagenmüller/Aventis CropScience, is supplying smaller producers.[16]

The most comprehensive attempt to get IPM adopted in smallholder cotton has been the FAO-EU Cotton IPM programme, a five-year project devoted to implementation of an IPM strategy in Bangladesh, China (Mainland), India, Pakistan, Philippines and Vietnam. This uses the farmer field school system first developed in rice by the FAO, and has financial support from the EU. In India, farmer participatory trial of identified 'best-bet' IPM package in two villages reduced insecticide use by 40% and increased yields by 40%.[17] In China, significant reductions in pesticide application and increase in profitability and conservation of beneficial fauna followed IPM training in Shandong, Hubei and Anhui Provinces.[18] In Pakistan, research trials in Punjab saw insecticide applications reduced from 6 to 2 per season, with economic returns 20% higher.[19]

Organics

World production of organic cotton amounts to 6,000 tons of fiber annually, or about 0.03% of global cotton production. Turkey produces the most at 29%, with the US second at 27% and India third at 17%.

ICM and Integrated Production

In Australia the Best Management Practices Programme is the result of an initial joint research effort involving the CRDC, Land and Water Australia, and the Murray Darling Basin Commission. A BMP manual has been developed which allows self-assessment of farm practices against BMPs, most importantly those having to do with application of chemicals; and an auditing system is managed by Cotton Australia.[20] It is a voluntary risk assessment programme that helps producers document what they need to achieve best practice on their farm. 55% of the 2002-03 crop was produced using the BMP approach. By June 2003, 40 Area Wide Management Groups have been established in cotton valleys to tackle environmental and on-farm issues across catchments. Cotton BMPs include safe chemical storage and handling, reduced chemical usage, minimising erosion, minimising storm impacts, IPM, good communication with neighbours, spray operators and advisers

A series of two audits (each costing AUS 500 plus costs, which may be reduced by grant money) and associated paperwork can lead to certification, followed by periodic surveillance audits looking for continuous improvement. Using the completed self-assessment, the initial audit checks compliance against BMPs and identifies strengths and weaknesses. A second audit (within 14 months) checks compliance against BMPs, and also progress on action plans and areas of improvement identified in the initial audit. Surveillance audits occur thereafter at roughly 18-month intervals.

Cotton Australia lists the longer-term benefits resulting from the BMP process as: access to chemicals, access to water, reduced input costs, lower insurance premiums, better access to finance, tax concessions, government grants for BMP works on farm, premium price for BMP cotton, license to continue to grow cotton, access to new markets, and greater demand for Australian cotton on a world scale. The next step may be ISO14001 accreditation. A new brand of 'BMP' cotton will enable international buyers to acquire 'green' cotton from Australia—a rare example of where agricultural BMPs have been marketed using an ecolabel.[21]

[16] www.sustdev.org/journals/edition.02/download/sdi2_2_1.pdf
[17] www.cottonipmasia.org/India.htm and www.wis.cgiar.org/rwc/shared/asp/projectsummary.asp?Kennummer=2743
[18] www.cottonipmasia.org/Countries/China.pdf
[19] www.cottonipmasia.org/Countries/State%20of%20IPM%20in%20Pakistan%20%202003.pdf
[20] www.cottonaustralia.com.au See also www.iatp.org/labels/envcommodities/appendixII-c.html
[21] www.cottonaustralia.com.au/bmpindex.html

In the USA, BMPs for upland cotton have also been developed by state extension services, including conservation tillage, and cover crops.

In India, contract farming between farmers and mills is being explored as a means of ensuring the application of 'integrated farming' BMPs, in part through securing the availability of certified seed, quality fertilisers and pesticides. This is being tested on an experimental basis in Gujarat, Madhya Pradesh, Andhra Pradesh and Orissa in 103 villages with an area of 3000 ha involving over 3,000 farmers, coordinated by the CCI.

Water management
Low-cost drip irrigation systems can make water savings of up to 80%. Field studies in Pakistan reported by WWF have shown water savings of close to 50% through various furrow irrigation methods compared to flood irrigation.

Dyeing, processing and finishing of cloth.
Primary treatment and secondary eg activated sludge treatment can reduce BOD levels by 94 %.

Apparel manufacturing
The Clean Clothes Campaign and Ethical Trade Initiative have shown that even where breaches of labour laws are frequent such as in the Chinese context, substantive improvements are still possible under certain conditions, but this still represents only a miniscule proportion of the total market.

2.4 Obstacles to the adoption of BMPs

2.4.1 Producer level

Pest Management:
As noted above, building IPM skills among smallholders in order to achieve area-wide ecosystem management has huge scale challenges, with 14 million smallholders involved in cotton production in China; 1.3 million in Pakistan, and 2 million in West Africa, growing cotton is mainly on small plots (Table 1). The huge investments in Australia to achieve BMP adoption and certification by less than 800 growers is a powerful reminder of the scale of the challenge. Community IPM in rice, even though already implemented for 15 years in China, could only reach *1/1400* of the total rice farmers who have the opportunity to Farmer Field School (FFS) training, including developing scientific research methods for farmers.[22] A review of the training figures of the FAO-EU cotton IPM programme in participating countries leads to the same conclusion, that even with the current resources and political will, the logistics of building skills among millions of smallholders, beyond the usual cadre of well-served 'contact' farmers, is an unattainable goal under current extension models. For example, between 2001 and 2003, 7362 farmers were trained in Pakistan, representing 0.6% of the cotton farming population. The challenge increases with a transition from state control of commodities to liberalised market arrangements. But the FFS approach, with the potential for self-sustaining farmer-to farmer linkages, has to be taken seriously as an alternative to the failed trickle-down models of agricultural extension.

Water management
A major obstacle to improved water management in cotton is the absence of community management of irrigation systems or market pricing for water resources. Irrigation infrastructures may also be aging and wasteful. Where water is provided free of charge, as it has been in Uzbekistan (where water charging in only started 2003), there is inevitably a tendency to over-irrigate. Market pricing of water

[22] A recent World Bank report claims that the benefits of the Indonesian FFS in rice have been overstated both in terms of pesticide reduction and yield improvements. G. Feder, R. Murgai, and J. B. Quizon (2003) Sending farmers back to school: the impact of farmer field schools in Indonesia http://econ.worldbank.org/files/25643_wps3022.pdf

resources shifts irrigation water from a social to en economic good. Although effective in stimulating increased water use efficiency[23], charging may put a large additional financial burden on smallholders.

2.4.2 Throughout the value chain

Low prices and lack of market incentives

But the most profound challenge to the adoption of BMPs in cotton is the lack of market incentives. As a non-food crop with a complex chain between farmer, ginnery, apparel manufacturer, brand owner and retailer, there are only very weak signals percolating down to producers demanding more environmentally sound production or processing, other than the micro-niche of organic cotton. A report for the CSIRO in Australia in 2000 states that the study had "not revealed any evidence of market-driven EMS for cotton at this time or in the foreseeable future."[24] The biggest incentives for BMP adoption were very indirect: (a) the value of cottonseed by-product for animal feed could be higher when BMPs ensure minimum pesticide residues; and (b) BMPs could secure cotton producers' right to farm and continued access to water in the future, in a climate of water scarcity and growing criticism of the sector.

Lastly, low cotton prices caused by oversupply may mean that producers do not see how they can start investing in social or environmental improvements until low prices are addressed.

2.5 Preconditions for the successful adoption of BMPs

BMPs have been successfully implemented in cotton production systems dominated by relatively very small numbers of large producers – in Brazil, USA and Australia. These large producers have access to technology, extension advice and perhaps grants to implement BMPs. Furthermore, they see the area-wide benefits of collective action, whereby changes in practices across large contiguous areas can make a profound impact on, for example, the rate of emergence of insecticide-resistant pest species. BMPs in cotton can thus be classic win-wins, as they reduce production costs, increase the effective life of pesticides, and extend the productive life of irrigated soils, and reduce health-associated problems.

For small producers, technical support is weak or absent. And the benefits of collective action are far less tangible, compared to the countervailing individual incentives to apply frequent insurance applications of pesticides and use excessive amounts of irrigation water. There is risk that leveraging wider implementation of BMPs, e.g. through attaching BMPs to crop finance, could entrench the scale advantages of larger and more educated cotton producers. They must be approached in a way that minimises such inequalities, through a combination of farmer organisation and sensitive design and implementation of BMPs.

Farmer organisation – cooperating to compete

BMPs are all about unification of production goals, higher levels of specification, coordination of technology use and improvement of scheduling. If small producers are to compete with larger producers in a chronically oversupplied market, and make successful connections with agribusiness through initiatives such as adoption of BMPs, the organisation of producers is key to making the necessary linkages to the market (e.g. through contract farming), as well as links to the providers of research and advice, and with the state. This can be achieved through top-down vertical integration along the lines of the West African model, or through the bottom-up logic of small farmer economic organisations or new-generation cooperatives. Participation in economic organisations can bring significant benefits when farmers are faced with management requirements, such as the regulations and inspections associated with BMPs.

A certification system adapted to the reality of small producers

[23] Johansson, R C (2000). Pricing irrigation water: a literature survey. Policy, Research Working Paper PS 2449, World Bank.

[24] Heinze KE (2000). Credible Clean and Green: Investigation of the international framework and critical design features of a credible EMS for Australian agriculture. CSIRO. www.clw.csiro.au/publications/ems.pdf

Involvement of producers is key to the development of equitable BMP standards and certification processes, as is the encouragement of group certification or group contracting by groups of small producers to reduce certification and transaction costs.

A non-hostile pesticide industry
The pesticide industry's sales strategy has been seen as an obstacle to IPM, but examples of Aventis in Brazil and other companies show that the industry also can get firmly behind the concept as it is also in their long-term interests. A greater challenge is the manufacturers of generic products, which have huge market shares in India and China but provide little or no technical support in the field. Investing in firms that have sales staff rewarded on service rather than entirely on commission would be a clear first step for the financial sector.

Legal and policy environment for successful contract farming,
Successful farmer collective action requires institutions that enforce contracts impartially and secure long-term property rights.

End of subsidies, market distortions, and trade barriers
In relation to inputs, BMPs rely on proper water pricing and investments in irrigation infrastructure that supports rational use. In relation to outputs, investment in BMPs will be severely curtailed by price distortions caused by dumping of subsidised produce onto world markets and trade barriers. According to Oxfam, every acre of cotton farmland in the US attracts a subsidy of $230. In 2001/02 US cotton farmers received subsidies amounting to $3.9bn.

2.6 Risks of adopting a BMP approach

The key risks of adopting a BMP approach in the cotton sector include the following:

- **Allocation of costs:** Given few, if any, financial incentives for the adoption of BMPs, there is a risk that the burden of any associated costs will fall disproportionately on producers, with little if any compensatory financial return.
- **Exclusion from markets:** If a BMP becomes a market-entry standard, or a means to a premium, there is a risk of any producers that are unable to implement it being excluded from markets. This is potentially particularly significant for small growers who may not have sufficient capacity. Any BMP approach should therefore be appropriate and realistic for both small and large growers, and backed up with necessary extension and support. Current trends are likely to see continued divergence between small numbers of highly educated, highly sophisticated groups organised though self-help and state support as demonstrated by Australia, Brazil and the US, and less organised and resourced sectors elsewhere.

2.7 Strategic Choices

There are a number of strategic choices facing an initiative seeking to promote a BMP-based approach in the cotton sector.

#1 Seek to drive the adoption of BMPs from the supply or demand side?
As discussed, the key cotton BMPs for pest and water management are win-wins when applied on an area-wide basis, and are therefore amenable to supply-side drivers. This has been the case in Australia, stimulated also by a political need to demonstrate stewardship of natural resources. Furthermore, the complexity of the cotton value chain and weak end-user demand for 'green' cotton (other than the tiny organic niche) would seem to weigh against a 'pull' for BMPs from the demand-side. However, more research is needed, especially on the end-user demands for quality and the potential for folding BMPs into contracts for quality cotton production. Important next steps are to investigate (1) the success or otherwise of the Indian experiments with contract cotton farming, and (2) the success or otherwise of the Australian BMP ecolabel in establishing a better market position for Australian cotton exports.

#2 Whether to engage with the macroeconomic/subsidies debate?

This is key. Investment in BMPs in smallholder production such as West Africa will be severely curtailed by price distortions caused by dumping of subsidised produce onto world markets and trade barriers. This is potentially achievable as demonstrated by the position of cotton at the Cancun WTO ministerial, and the financial community could play a catalytic role.

#3 Whether to engage with other parallel initiatives?
The number of existing initiatives where cotton BMPs have been developed into certification systems is extremely limited. Engagement with the Australian programme would be extremely important, to understand the process and lessons learned, and applicability (or otherwise) to smallholder production systems. A broader question is whether the BMPs for apparel manufacturing – such as the anti-sweatshop labels – could be connected to more environmentally and socially sustainable production in the field and ginneries.

#4 Whether to take a regional or a global approach?
Resources should be focused on the hot-spots of mis-management of cotton pest and water management. This is especially important in the transition from state to private control of production and marketing. Central Asia, especially Pakistan and Uzbekistan, is a top priority.

#5 Whether to take an area-wide or fully traceable approach?
A fully traceable BMP system for smallholders over a large area may not be feasible. An area-wide approach, e.g. in which communities and producer organisations contract with ginneries to deliver BMP cotton in return for preferential access to finance and technical service, seems the best way forward, especially when supported by random inspections and spot-checks.

#6 Whether to aim for a system that is visible to consumers or only to processors?
Visibility to processors and apparel brands rather than consumers is the aim in the short and mid term. For brands, this is a form of risk management and CSR rather than a means of product differentiation in the market place.

3 Palm Oil

3.1 The palm oil sector

3.1.1 Production volumes and regions

Palm oil is produced from the oil palm, primarily *Elaeis guineensis*, which originated in West Africa, but has adapted extremely well to other tropical lowland regions. The largest producer of palm oil is Malaysia, accounting for approximately 49% of global production. Indonesia ranks second, accounting for another 36%. Nigeria follows a distant third, with 2.9%. Oil palm plantations exist on a much smaller scale in several other African countries and in Central and South America (e.g., Colombia, Ecuador and Costa Rica). SE Asia is thus by far the main palm oil producing region accounting for in excess of 85% of world production (figure 3.1). This is produced from over of 6 million hectares of plantation (figure 3.2), which represents nearly 80% of the world total oil palm plantation area. Between 1999/00 and 2002/03 Malaysian production of palm oil grew at 8.5% per year, whilst Indonesian production growth outstripped the world average, growing at 14.7% per year

Global consumption of major oils and fats has been increasing over the last few years, driven by growing consumer demand, particularly in the developing world, and increased usage of vegetable edible oils which are replacing animal fats in foods, feeds and other non food applications. Palm oil is the fastest growing segment of the world edible oil production base, growing from less than 6 million MT in 1983/1984 to more than 27 million MT in 2002/2003. In the five-year period 1999/2000 to 2002/2003, palm oil production increased at an average of 9.5% per year. In comparison, the total supply of oils and fats only grew at an average annual growth rate of about 4% in the same period, to a total of 122 million MT. Authoritative projections suggest that world consumption will exceed 40 million tonnes by 2020. This represents an approximate doubling of production. Past trends suggest that per hectare yield growth will be slow, so the great majority of this increased production seems likely to stem from increased area of plantation. About half the expansion is expected to be in Indonesia (which is expected to overtake Malaysia as the world's largest producer by 2007) and much of the rest in Sabah and Sarawak.

Figure 3.1 World production of palm oil by country in 2002-2003[25]

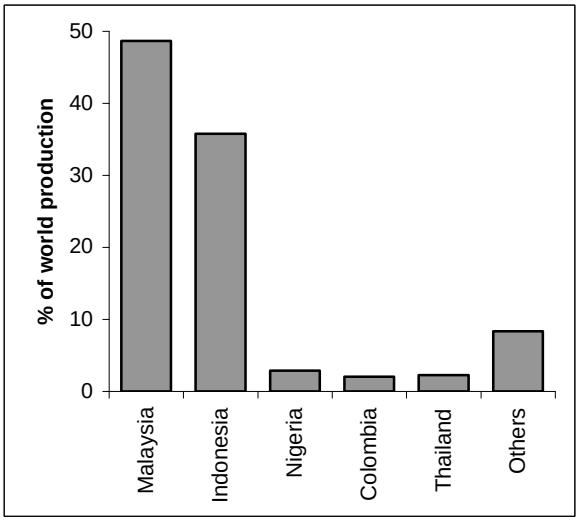
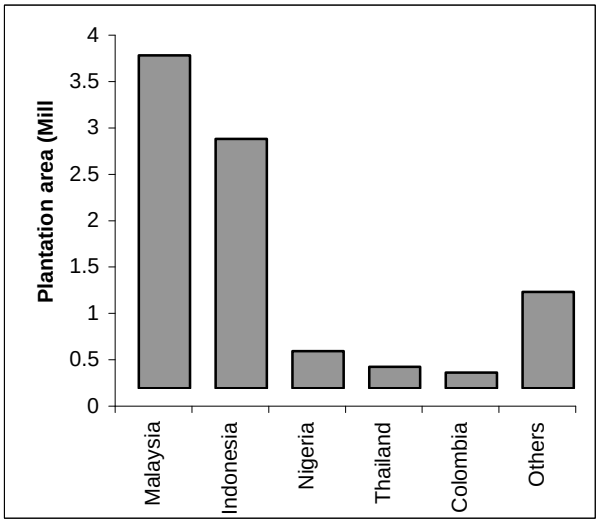


Figure 3.2 Estimated total plantation area[26]



[25] Source: Oil World 2003 Oil World Annual. Mielke, Hamburg.

Oil World forecasts an increase in the mature oil palm planted area of 4.2% p.a. between 2002 and 2005. This is slower than the 6.5% p.a. growth achieved in the previous five years. Indonesia is likely to lead that growth with an increase of 6.5% p.a. whereas Malaysia is expected to increase by 4.7% p.a. In total, Indonesia is forecast to have 2.76 million ha of mature oil palm plantations by 2005 while Malaysia is expected to have 3.68 million ha in that year.

Although a number of countries including India, Brazil, Nigeria, Uganda, the Philippines and Suriname have announced their intention to introduce new or expand existing palm oil plantations through various schemes (public and private), we do not anticipate that the importance of Indonesia and Malaysia as major producing countries of palm oil will change to any significant extent. The major current and future environmental and social impacts of oil palm production are therefore concentrated in SE Asia, and although similar impacts have been reported from other producer countries, the following analysis will therefore focus on the two major producing countries.

3.1.2 The value chain

Crude Palm Oil (CPO) accounts for 21% of the global oils and fats supply, and 26% of the global vegetable oil supply.[27] Figure 3.3 presents the typical value chain. Palm oil is the highest yielding oil crop per hectare. One hectare of oil palm yields 15–30 tonnes of fresh fruit, giving 2 to 7 tonnes of CPO, as well as PKO (Palm Kernel Oil) that is extracted from the kernels.[28] Average production per tree is about 10 to 12 fruit bunches per year, each weighing between 20 and 30 kg. The harvested FFB are transported by truck from the plantation to the mill. Smallholders usually do not have milling facilities and sell their FFB to plantations that do have mills.

At the mill the FFB is processed to CPO. Processing must take place within 24 hours of harvesting to prevent deterioration of the quality of the fruit. Upon arrival at the mill, the FFBs are sterilised under pressure and at high temperatures in wagons. This process also softens the fruit bunches, which facilitates the stripping of the fruits from the bunches. The fruits are then mechanically pressed to extract the oil from the fleshy mesocarp and further clarified and purified to remove moisture, dust, dirt and other impurities. Crude palm oil must then be refined prior to its use as food. Refining removes free fatty acids, colour and odour from the CPO. The result is Refined Bleached Deodorised (RBD) palm oil. RBD is fractionated to produce liquid palm olein and palm stearin fractions. Refinery and fractionation of palm oil into products such as cooking oil, stearin, and shortenings can take place in either the country of origin or the destination country.

The crude oil is usually transported by tanker truck to the seaport. Refined products can be transported in bulk or otherwise (if already packed). Oil is usually stored in bulk storage tanks at the seaport before being transported in tanker vessels to the port of destination. Here it is stored, usually in large tanks, before being transported once again to refineries for further processing, mostly for food purposes, but also to producers of calf milk replacements and the cosmetics, detergents and chemical industries. A small part of the crude oil is transported to the animal feed industry. Further processing of the oil takes place at the refinery. Refined products are transported to customers (wholesalers, retail chains, food processors). Bulk shipping requirements for palm oil may make product segregation and chain of custody very difficult to maintain.

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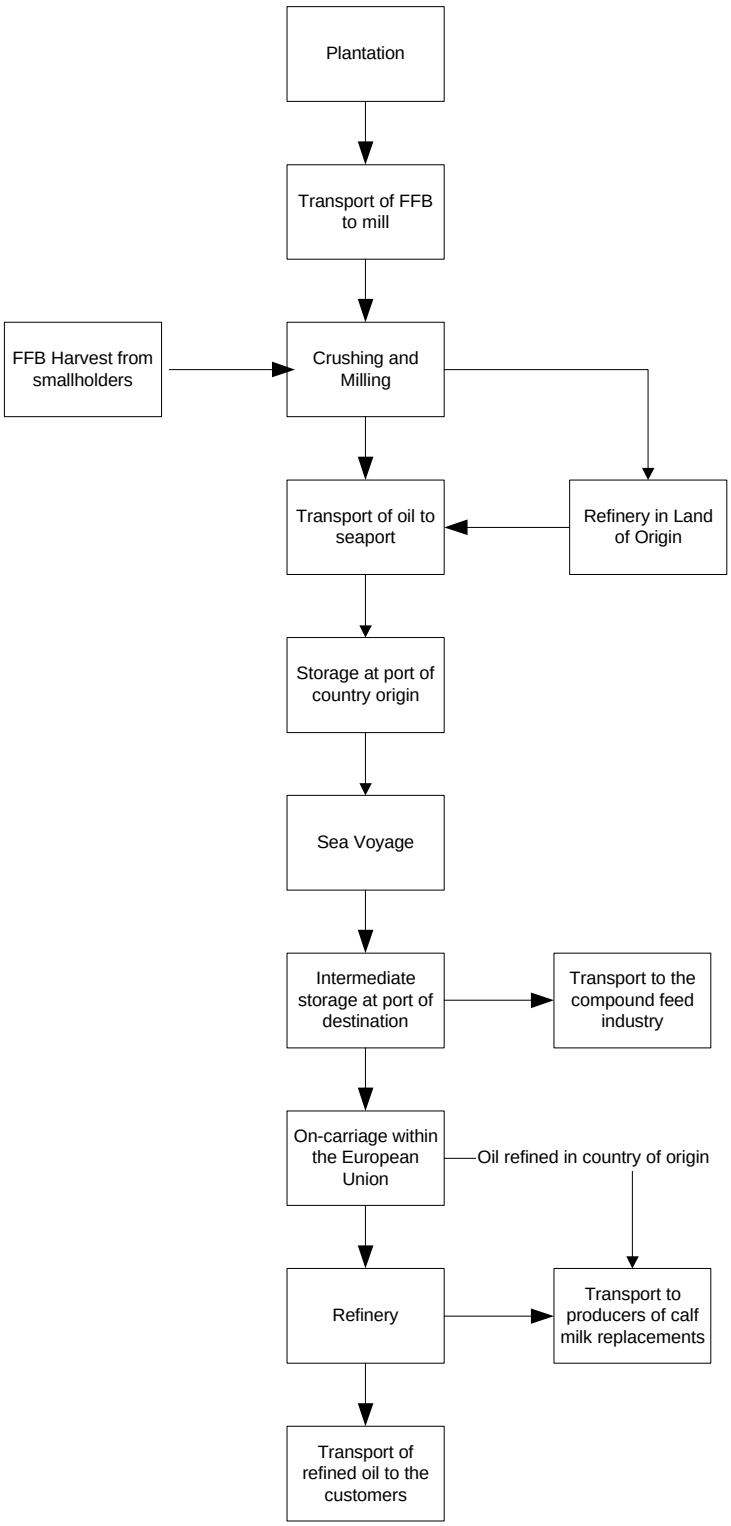
[26] Oil World 2003 *op cit* gives data on mature plantation area - the mature area accounts for around 80-90% of the total area planted, since there are also newly planted and replanted stands. Figure 3.2 uses a conservative figure of 90% for the estimates.

[27] In comparison, soybeans yield 0.4 to 0.5 tonnes per hectare, and account for 25% of global oils and fats supply and 31% of global vegetable oil supply.

[28] In this analysis 'palm oil' refers to CPO.

Figure 3.3 Palm Oil Value Chain



3.1.3 The different types of producers

There are three broad modes of production: small semi-natural groves, smallholders (with areas of 2-40 ha) and medium to large industrial plantations, ranging in size up to 10,000 ha or more. Smallholdings and industrial plantations (either private or state-owned) supply most global production and almost all export demands. Groves predominate in Africa, but as they supply negligible palm oil to world trade, these will not be considered further. In South America, there is a mix of smallholders and medium to large plantations. In Asia, large plantations are the dominant model, but smallholders still represent a significant proportion of production.

The oil palm is unusual for a tropical crop in that a large and expensive mill is needed to deal with the fruit bunches within a few hours of harvesting. Mills are usually an integrated part of large plantations and these process fruit both from the core plantation and outlying smallholders. Oil extraction rates are high and quality is usually controlled to produce high-grade oil suitable for further refinement.

Large plantations involve mass, even-aged, regularly spaced plantings of relatively uniform stock, typically produced by a specialist nursery. Agronomic inputs vary, with the most intensive usually on large plantations. Productivity of plantations is high (typically 15 t/ha of fresh fruit bunches in Ivory Coast, 20-30 t/ha in Malaysia and Indonesia), with somewhat lower average production on smallholdings. The most responsible plantations give consideration to environmental and social aspects of their activities, in addition to production.

Smallholders account for 30-40% of the total area of planted oil palm in Malaysia and Indonesia, but only 20-30% of the output. The necessity of processing harvested fruit brunches rapidly means that independent smallholders can only grow oil palms if there is a processing mill nearby. Smallholders are therefore usually dependent on the processing capacity of the larger plantation companies. Larger plantations often offer assistance to smallholders (e.g., planting material, credit guarantees) and recover the costs during the first few years of production. In addition, smallholder associations exist in many producer countries and in some cases smallholders schemes are organised through government development agencies (for example, FELDA in Malaysia is responsible for approximately 18% of all plantations).

The structure of the palm oil sector differs considerably in Malaysia and Indonesia. While more than one third of Indonesia's palm oil area is managed by smallholders, this only accounts for 11% of the area in Malaysia. In Malaysia, the government owns a substantial part of the plantation area (31%), compared with 16% in Indonesia.

3.1.4 Financing requirements within the sector

As the palm oil industry is a major source of foreign currency due to the high level of trade in the sector, the palm oil industry is viewed as a very important and strategic industry in the main producing countries. As a result, the larger palm oil companies and value chain players have significant economic and political influence, and rarely have difficulty accessing credit facilities or financial services with financial institutions. The financing of Indonesian and Malaysian Palm Oil Sectors is relatively straightforward, and sophisticated financial structures are not yet used widely by the industry.

Production: Financing requirements of palm oil plantations depends on factors such as the size of the plantation (particularly smallholder vs. large plantation), whether it is an existing plantation or a new project, whether there are government funds involved (e.g. the smallholders scheme in Indonesia), and existing banking relationships. Also, the political climate in the country is of importance, in particular in Indonesia. But in broad terms, financial requirements may be divided into two overall categories: short term financing (i.e. working capital) and long term agricultural investment financing (e.g. for setting up the plantation, infrastructure projects etc.).

Financing a new oil palm plantation is a long-term investment, as palm is a perennial crop. Normally the palm trees will start yielding three years after planting, with a peak yield at about eight years of age. Production may continue until the palm tree is 20-30 years old. Consequently, there will be no cash flow in the years of establishment and maturing of the oil palms. Furthermore, setting up a commercial plantation generally requires investments in land (possible clearing), setting up a nursery, germination and care of seedlings, planting of young trees, and often a construction of an oil mill. Close proximity to an oil mill is a prerequisite due to the fact that FFBs must be processed within 24 hours. Training of personnel and massive infrastructure projects including arranging for roads and transport and the development of an area for housing, schools and medical care must often be deployed. The level of investments naturally depends on the size and type of a plantation, as a number of these requirements will not be applicable to smallholders. It should be noted that in several producer countries, at least part

of the cost of establishing plantations is raised through selling timber from the forest which the plantations replace.

Processing: The primary processors of palm oil are the millers that extract the CPO from the FFB. Mostly this group of processors are the property of the large-scale commercial plantations – they would not be stand-alone companies. Yet, only plantations with sufficient production of FFB will have a mill, which and most smallholders deliver to a larger plantation's mill within 24 hours' transport from their plantations. The refiners of CPO, on the other hand, may be the property of the plantation or could be independent. Not all plantations have a refinery, e.g. due to the required scale of CPO supply, and not all CPO is refined in the country of origin. In Indonesia, the majority of exports are CPO (unrefined palm oil), while Malaysia has a large developed refining sector; consequently the majority of Malaysia's exports is RBD (Refined Bleached Deodorised) palm oil.

Refiners and further processors of palm oil are also installed in the end user markets, primarily China, India and the EU. These will refine and process CPO, but due to the fact that RBD imports may have a certain quality loss due to transport and storage, large volumes of RBD are also refined in the country of destination.

As 77% of the global palm oil supply is exported (2002/2003), and palm oil is a commodity traded on the world market, the majority of this sector is highly exposed to world market prices. Also, due to the high degree of substitutability between edible oils, palm oil prices are also interrelated with prices of the other three major oils; soybean, rapeseed and sunflower. Consequently, revenues are very volatile – the price of CPO was $240 in January 2001 while it is $553 at the end of February 2004. In December 1994, it was at its peak of $719.

Term loans are a common form of financing the industry for the purposes of project financing for establishing greenfield plantations, capital expenditure finance for building or upgrading crushing and refining plants, or trade commodity finance to facilitate the trade in palm oil worldwide. All major global banks participate in financing the palm oil industry in Indonesia and Malaysia, including large domestic mainstream and smaller specialist Government agricultural banks. The following points highlight some of the practical issues influencing the operation of foreign banks in the Malaysian and Indonesian Palm Oil Industry.

Local Knowledge and Presence: Financial institutions with strong linkages to the grass roots of plantation companies and which have specialist knowledge of the industry are ideally positioned to finance the Palm Oil production sector. International banks often do not have sufficient local presence or knowledge to be sufficiently aware of management practices, or to influence the customers to manage environmental and good agricultural practice issues appropriately. To ensure that all issues relating to development, operation and ongoing management, some banks are utilising the services of specialist industry consultants to provide expert industry opinions on the quality of various palm oil plantation companies, before applications for financing are approved. In Malaysia, the existence of such specialist consultants is quite common, but in Indonesia, access to similarly qualified consultants is more difficult. Programs to facilitate the training of such locally based consultants would be extremely beneficial to the industry, and would greatly assist the banking sector in the assessment of the operational management practices of individual credit applicants in the Palm Oil Sector.

Customer Selection: For financial institutions operating in an environment such as Indonesia, decisions to finance Palm Oil companies rely heavily on the relationships fostered with senior executives and the management capability, and track record of the senior management team. Trust is a very important element of the relationship and in many respects can dictate the final decision to finance. All financial institutions seek to pursue the best players as they represent lower credit risks. However, from an industry perspective, restricting finance to only a relatively small number of players with acceptable levels of industry practices, would in all likelihood would limit the ongoing growth of an industry which is a key plank in the Government's economic growth strategy. This provides a potentially powerful point of leverage with governments.

Significance of smallholders: A considerable share of the plantation area of both Malaysia and Indonesia is operated by smallholders. Smallholders do not represent a target sector for international banks, or domestic banks for reasons of lack of creditworthiness and limited deal sizes and the risk premiums applied to lending products are too high for a smallholder to accommodate. Many large plantation companies provide (or provide access to) loans that cover oil palm planting and the early years before production commences, but the terms of such finance is varied and are reportedly not always equitable. An effective approach may thus be to encourage the banking sector to add support to other initiatives that target the smallholder level.

Government Schemes for smallholders: Oil palm production does not receive significant, direct subsidies in the main producer countries. However, considerable government assistance has been given to smallholders as part of the drive for rural development. In Malaysia, Government Schemes have been instrumental in assisting the development of smallholder oil palm producers: FELDA; The Federal Land Development Authority was established in 1956 for the purposes of developing land to facilitate the improved economic situation of the rural poor in Malaysia. FELDA is one of the largest players in the production of Palm oil in Malaysia and representing more than 1.1 million hectares of palm plantations. FELDA is also responsible for arranging finance of various types on behalf of its members. FELDA has grown into a well-organized force in the Malaysian Palm Oil Industry, and in conjunction with other supporting bodies is well positioned to influence the plantation sector to improve the best practice adoption. The Indonesian government has also given considerable support to smallholder schemes, including low cost financing. In addition, government regulations include a guaranteed minimum benchmark price for FFB to be paid by private or state owned mills to smallholders. The sustainability of this program was placed under considerable pressure after the Asian economic crisis and since this time the benefits of this have been weakened considerably.

3.1.5 Key players and financiers by country

As noted above, the structure of the Indonesian and Malaysian sectors differ somewhat at the production level (figure 3.4). With respect to processing, the Malaysian government has pushed for investments in downstream processing like refining, fractionation and oleochemicals, while Indonesia has not focused on this. This is also reflected in different export profiles; the majority of Malaysian exports are processed palm oil products while Indonesia primarily exports CPO, as well as having a large internal demand for cooking oil derived from palm oil. As a result, the Indonesian government has attempted to ensure a stable domestic supply of cooking oil. In December 1997, the Indonesian government introduced a ban on palm oil exports in order to stabilise the price of local cooking oil. The export ban was subsequently lifted in April 1998 and replaced with an export tax on palm oil products. The initially imposed level of 60% was gradually reduced to 10% by July 1999 under an agreement between the Indonesian Ministry of Finance and the International Monetary Fund as part of the restructuring package for Indonesia. Self-sufficiency is no longer a concern and as such export taxes on palm oil have been reduced further to the current 3% level.

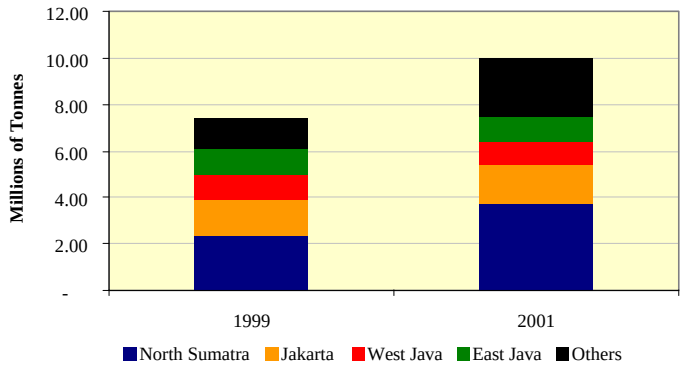
Figure 3.4 Plantation ownership, production and milling capacity in Indonesia and Malaysia in 2002[29]

Plantations	Indonesia		Malaysia	
Government	0.5 mln. Ha.	16%	1.1 mln. Ha.	31%
Private	1.6 mln. Ha.	50%	2.1 mln. Ha.	58%
Smallholder	1.1 mln. Ha.	34%	0.4 mln. Ha.	11%
Total	3.2 mln. Ha.	100%	3.6 mln. Ha.	100%
FFB Production	~50 mln. MT	n.a.	67.7 mln MT	n.a.
Crushing Mills	289 Mills	n.a.	362 Mills	n.a.
Milling Capacity	46.5 mln MT FFB	n.a.	71.2 mln MT FFB	n.a.

[29] Sources: MPOB, MDEX, Malaysian Agricultural Index, 2001/02

As a result of Government incentives, Indonesia's edible oil refining sector expanded by 35% between 1999 and 2001 to 70 mills with an installed capacity of approximately 10 mln. MT of CPO. The most significant capacity growth was observed in North Sumatra (figure 3.5).

Figure 3.5: Indonesian Domestic Edible Oil Refining Capacity 1999 and 2001[30]



As noted above, Malaysia's government has been instrumental in fostering the development of the palm oil sector by encouraging local players to take advantage of value adding opportunities. Consequently, Malaysia has a well-established palm oil processing sector. At the end of 2002 there were 46 refineries with an installed capacity of 16 million. MT of CPO a year. Due to the low level of palm oil consumption relative to production in Malaysia, it is likely that refining capacity will reach an overcapacity situation. Besides incentives, the Malaysian government imposes an incremental export tariff starting at 10 % on crude palm (with a duty-free quota), while RBD exports have 0% duty. Consequently Malaysian exports are focused on processed palm oil products rather than CPO.

Examples of major players are:
Malaysia: MPOA, Golden Hope, Kumpulan Guthrie, Sime Darby, Felda, and United Plantations.
Indonesia: Astra Agro Lestari, London Sumatra, Minimas Plantations (Guthrie), Bakrie Sumatera, Apkasindo (Producer group), Socfindo, Sarana Agro Nusantar, Arlinto Perkasa Buana, Selektani, Orang Tua, PTPN (Government owned plantation companies).

Financing of production and trade activities is provided by a large number of parties, ranging from local and international banks to the World Bank and its associated groups. Government funding is additionally very important on the production side. In particular the Malaysian government is very active in export financing as a mean to promote Malaysian palm oil. Recent examples of this are loans to Egypt and Russia in return for buying Malaysian palm oil. Both Malaysia and Indonesia are also engaged in reciprocal deals with e.g. China, in which China receives palm oil and in return supplies locomotives to Malaysia or Chinese rock phosphate to Indonesia. Domestic financial support is for instance given through smallholder schemes, granting cheap loans to farmers.

Examples of institutions engaged in financing recent projects in the sector (2003 and 2004) are provided in figure 3.6. As the palm oil industry is continuously expanding outside Asia – especially the Malaysian – an ever-increasing number of local and international banks will become engaged to some extent. Examples of new markets where Malaysian companies invest in production are DR of Congo, Venezuela and Suriname. Examples of countries where they expand into processing are particularly the EU, India and China through acquisitions, JVs and new plants.

[30] Source: Malaysian Derivatives Exchange, 2002.

Figure 3.6: Institutions financing palm oil production: recent loan facilities[31]

Country	Institution	Company/Project	Project Value
	Development Institutions		
Uganda	JV partners / IFAD (World Bank Group) / Ugandan Government	JV ADM, Wilmar, Josovina (Asia) and BIDCO (Kenya)/Palm plantation development programme Bugala Island with >2,000 farmers	$155million: IFAD $19.9 million, the government $12.3 million, and the JV $120 million.
Indonesia	The International Finance Corporation (World Bank Group)	Verdaine Investment Ltd/To acquire, rehabilitate, and further develop Indonesian palm oil plantations	$14 million
Indonesia	The International Finance Corporation (World Bank Group)	Indonesia/Subsidiary of Verdaine (P.T. Sahabat Mewah Dan Makmur)/Rehabilitation of plantation	$12 million
	Local Commercial Banks		
Malaysia/ Russia	Negara Bank	Vneshtorgbank/to finance Malaysian palm oil purchase	$50 million
Malaysia	Bank Industri & Teknologi Malaysia Bhd.	Palm Energy Sdn. Bhd (part of Kwantas)/construct a biomass-based power plant in Sabah	MYR20 million ($1=MYR3.80)
Malaysia	Aseambankers Bhd (plus possible others)	Golden Hope Plantations Bhd. and Island & Peninsular Bhd. (P.IPS) will restructure their property and plantation businesses	n.a.
Malaysia	Various	IJM Plantations Bhd/expand the size of its oil palm plantations and boost milling capability	60 to 80 million MYR ($1=MYR3.80)
Malaysia	Export-Import Bank of Malaysia Bhd	Kulim re-lends to its subsidiary PT Multrada Multi Maju/ part-finance the development & construction cost of the first phase of a 40-tonne-per-hour palm oil mill	US$5.5 million (US$1 = RM3.80)
	International Banks/Institutes		
Malaysia/ NL	Citigroup plus syndicate	IOI Corp. /finance acquisition of refiner in the EU (Loders)	EUR230 million
Indonesia	Rabobank plus syndicate:	Kumpulan Guthrie Bhd/refinance existing borrowings and for operational financing	$40 million
	Government Funds		
Malaysia	Malaysian Government	Smallholders' Oil Palm Replantation Easy Loan Scheme - to be paid back in 10 years	RM350 million

Traders and end users

While the production of palm oil is highly concentrated in Indonesia and Malaysia, trade of palm oil is a worldwide business. However, the majority of trade is within Asia, and in particular India (18% of world trade), China (12%) and Pakistan (17%), and also to the EU (17%). The amount of palm oil being traded with individual countries in the Americas and Africa is negligible. New markets for palm oil such as Russia, Egypt and the US are emerging, though still at relatively small volumes.

In contrast with soybean processing, which is dominated world-wide by the multinationals ADM, Cargill, and Bunge, processing of palm oil (outside Indonesia and Malaysia) is in the hands of many different players, including multinationals such as Cargill and ADM, and local companies in the various import regions. In the palm oil sector the multinationals do not have a dominant position. JVs are quite common, in particular in Asia, where for instance ADM, Wilmar, and COFCO are engaged in numerous

[31] Source: Articles on Factiva and internet.

different plants in different company combinations. In particular Malaysian palm oil groups are not limited to JVs but are also acquiring processors abroad, e.g. in the EU (the Netherlands), and by this means are setting up integrated supply chains from plantation to end user level. Examples of larger palm oil refiners besides the groups already mentioned are Anglia Oils (part of Aarhus Olie), Liberty Oil Mill, Adani Wilmar (JV Adani and Wilmar), Unimills (part of Golden Hope), Loders Croklaan (part of IOI), Fuji Oil, and Karlshmans.

End users of palm oil are firstly producers of margarines, shortenings, cooking oils etc., such as Unilever and Vandemoortele, and secondly the users of such products. These are primarily found in the bakery business, confectionery, ice cream, snacks, the noodle industry and sectors using frying products. Examples of these are Cadbury Schweppes, Kellogs, Danone, Kraft, Unilever, Uni-President, and McCain. Consumers also use palm oil products directly as cooking oil or fat, often in blends. In addition to food uses, palm oil is also found in non-food products, in particular in oleochemicals, cosmetics, detergents, but also increasingly in biodiesel. ICI with the subsidiary Unichema, KAO, Cognis, Croda International, and P&G USA are examples of such companies in export markets.

Given the range of companies involved in the trade and end-use, the number of banks engaged is considerable. Providing a short list of banks financing (parts of) this sector is therefore not feasible. To illustrate this, a couple of examples of financers of recent syndicated loans to a few of the end users (source: Bloomberg) are listed below:

Uni-President: Bank of Taiwan, BNP Paribas Group, Chang Hwa Holdings, Chinatrust Commmercial Bank, E Sun Commmercial Bank, Hua Nan Commmercial Bank, Land Bank of Taiwan, Standard Charter, Shanghai Commmercial Bank, Ta Chong Bank.
Kellogs: ABN AMRO, AIB Debt Management Ltd, Bank of America, Bank One NA, Barclays, Citigroup, Bank of Tokyo Mitsubishi Ltd, BBVA Securities, Fifth Third Bank, Unicredito Italiano, Rabo Securities, Scotia Capital, HSBC Bank, WestLB, Wells Fargo Bank.
Kraft: ABN AMRO, BNP Paribas, Dresdner Bank, Credit Suisse, Deutsche Bank, Citibank, JP Morgan, Banco Espirito Santo, Lehman Brothers, ING, HSBC, NAB Capital Markets, BBVA Securities, Den Norske Bank, Société Générale.

Other stakeholders

- The Round Table on Sustainable Oil Palm may emerge as a key global body facilitating new sustainability initiatives.
- NGOs including WWF; AIDEnvironment, Greenpeace, Friends of the Earth, Sawit Watch (Indonesia); World Rainforest Movement Plantations Campaign; Global Response 'Stop Financing Destruction in Indonesia' (targets American audiences, urging them to lobby Citigroup about their role in supporting the Indonesian oil palm company Lon Sum); Environmental Investigation Agency (campaign to save Orang Utans and Indonesian forests); Rainforest Action Network 'Stop Citigroup' Campaign (now succeeded, less active in oil palm at present); Birdlife International (campaign on Sumatra's Rainforests plus major initiative about to start, which focuses on the policies of international donors and investors who support the oil palm sector).

3.1.6 Macro issues facing and affecting production

Substitutability: The world has a high demand for edible oils that must be met from some source. A key aspect of the edible oils market is that more than one oil is often suitable for a given end-use. For many of the bulk end-uses it is both technically feasible and affordable to switch to an alternative if the preferred oil becomes too expensive. This makes the market acutely competitive. The total global production of the eleven main edible oils is about 95 million tonnes per year. Recently soy has supplied the largest share (32%) with palm oil a close second (26%), although palm oil is likely to surpass soy in the near future. Adding rapeseed and sunflower oil encompasses more than 80% of the total. Global consumption has shown high and sustained growth, which is predicted to continue as a consequence of both population growth and increasing per capita consumption of edible oil.

The price of soy oil tends to set the price standard for its competitors, including palm oil. This is partly because soy has had the largest share of the market. It is also because soy meal for animal feed forms over 80% by weight and over 60% by value of the soy crop, so soy oil is in some ways a by-product. World soy production is concentrated in the USA, Brazil and Argentina.

Subsidies: Palm oil production does not usually receive significant direct subsidies in most palm oil producer countries, which therefore perceive subsidies for other oils (especially soy, rape and sunflower in the US and EU) as a severe example of unfair competition.

Food Safety: Global consumer markets worldwide are becoming more and more aware of where food is produced, the way it is produced and what processes and practices have been adopted to deliver food to a market ready state, and as a result society is demanding higher levels of food safety performance from food value chains. Acknowledging the rising importance of food safety issues in the industry, and that food safety will be a precondition for market access in the future, the Netherlands Ministry of Agriculture, Nature and Food Quality has undertaken an initiative to assist the Malaysian and Indonesian Palm Oil Industry to improve food safety performance and to better understand the underlying factors affecting food safety risk. Food safety issues in palm oil relate largely to the danger of contamination during storage and transport (for example, diesel contamination of palm oil occurred in Indonesia in 1999, referenced in paper presented by Unilever 2001).

Consumer issues: Alternative opinions over the healthiness of palm oil versus competitors (e.g. soy, rapeseed) affect markets. EU retailers and some food processors avoid GMOs, giving some advantage to palm oil over oils such as soy in this market.

3.2 Key sustainability impacts

3.2.1 Environmental impacts

The key negative environmental impacts associated with palm oil production are described below. For each, an indication is given as to whether they occur as a result of establishing new plantations (E), of managing existing ones (M), or both (E/M). The order of this list is not intended to reflect an assessment of priority, for two reasons: Firstly, although there are numerous case studies and other sources identifying impacts, there are currently no assessments of how common (or severe) each of the impacts is over a wide geographical range. Secondly, it is likely that the severity of each impact will differ between production locations. Nevertheless, all have been reported as significant in one or more instances.

- **Forest conversion** (E) – establishment of oil palm plantations is significant factor in lowland tropical deforestation in some countries/provinces although note complex interaction with logging, other land uses and national policies[32]. No clear consensus in industry/NGOs about what forest (if any) is suitable for conversion - but potential to develop one. Even if the predicted doubling of demand for palm oil over the next 20 yrs turns out to be an over-estimate, further considerable expansion in area will still occur and therefore forest conversion will remain a major issue.
- **Clearance techniques** (E/M) – use of fire causes serious smoke haze, CO_2 emissions and damage to neighbouring forests/farms. Commonplace until recently, but zero-burning techniques are now well developed and have been widely adopted in Malaysia and by the more reputable companies elsewhere. Note recent ASEAN treaties on the issue[33], because of the trans-boundary effects of haze.
- **Choice of site & soil type** (E) – prime sites now rare and planting on marginal and fragile soils is increasing. These include: deep peats (vulnerable to drying, oxidation, subsidence, CO_2 emissions, fire and alterations to local hydrology), riparian areas (flooding and erosion), and steep slopes (erosion). National regulations in most producer countries exclude planting on certain soil types/slopes, but these may not always be sufficient and are not always implemented.
- **Soil loss** (E/M) – current best practices can control erosion adequately but are not always applied - erosion worst in establishment phase whilst canopy open, unless cover crops are established rapidly.
- **Soil fertility** (M) – heavy harvest off-take needs to be replaced by recycling of organic material and other milling waste products and use of chemical fertilisers. Technology well understood and adopted by progressive companies – the challenge is wider adoption.
- **Use of pesticides and herbicides** (M) **–** Integrated Pest Management (IPM) the ideal approach[34] but overuse of pesticides widely reported. Similarly, herbicide use can be minimised through cultural techniques. Complexity of IPM may limit uptake, particularly with smallholders.
- **Biodiversity on plantations** (E/M) – little effort is taken to plan plantations to maximise biodiversity or manage sites to increase on-site diversity but many measures could be tested or applied. Best practice yet to be defined.
- **Water management** (M) – concerns over drainage (particularly of deep peat soils) and unsustainable irrigation.
- **Emissions and pollution** (M) – significant innovations have been made in reducing CO_2 emissions and effluent emissions, or are available from other sectors. Techniques for management of toxic waste available.

[32] Casson, A. (2000) The hesitant boom: Indonesia's oil palm sub-sector in an era of economic crisis and political change. Occasional Paper No. 29, CIFOR, Bogor, Indonesia.

[33] The ASEAN Secretariat will shortly release its 'Guidelines for the implementation of zero burning'.

[34] Corley, R. H. V. and Tinker, P. B. (2003) *The Oil Palm*. Fourth edition. Blackwell Publishing, Oxford, UK.

3.2.2 Social impacts

The oil palm sector plays a major role in the economics of both Malaysia and Indonesia, as well as a few of the smaller producers. This expansion is seen by many as an enormously positive development, since it brings great economic wealth, employment and rural development to the producer countries whilst supplying cheap foodstuffs and other products to the global marketplace. Whilst acknowledging these undoubted benefits, there are also some negative social impacts that have been associated with oil palm:

- **Competing land claims** (E)[35] – as with other large-estate plantation crops, disputes arise with previous land users/owners who are often disadvantaged groups with high dependency on natural resources. Issues include loss of farmland and loss of access to forest resources for use and sale. Particularly severe problems in Indonesia where national and local tenure systems conflict.
- **Large-scale social transformation** (E) – the establishment of one or more large plantations or smallholder schemes in a disadvantaged rural area can have dramatic social implications. Some of these impacts are positive: companies point to greatly improved infrastructure, employment and social services. Critics point to the negative impacts, including loss of previous livelihoods; increased dependence on a single source of income; suddenly altered relationships between different groups in the society; increased levels of debt; and influxes of migrant workers.
- **Terms of trade for smallholders** (M) – smallholders have weak bargaining power and usually depend on a single buyer (logistics and debt ties). There are widespread reports of low prices or refusal to buy at all at times of low demand.
- **Social justice/grievance procedures** (E/M) – dispute resolution essential but sometimes poorly done - reports of violence, false imprisonment, inappropriate use of police/military etc. Protestors also break law, escalation can occur.
- **Workers rights and conditions** (M) – case studies exist showing lack of regard for national and international laws - migrant workers and women are especially vulnerable - lack of collective bargaining, health and safety lapses etc.
- **Welfare provisions for workers** (M) – employees and out-growers depend on nucleus estates for many services - sometimes exemplary, but in other cases lacking.

[35] One regional study reported that all 81 oil palm plantations in South Sumatra had experienced land dispute problems with local communities. This accounted for 11% of the total area of the plantations (Kartodihardjo, H. and Supriono, A. (2000). The impact of sectoral development on natural forest conversion and degradation: the case of timber and tree crop plantations in Indonesia. Occasional Paper No. 26, CIFOR, Bogor, Indonesia). Case studies of land disputes from several countries are given in the World Rainforest Movement's "Bitter Fruit of Oil Palm" (http:www.wrm.org.uy).

3.3 Prospects for taking a BMP approach

3.3.1 Which of the key impacts a BMP approach could seek to address

A BMP approach could potentially improve all of the key negative environmental and social issues associated with palm oil production. However, resolution of several of the issues goes above and beyond the scope of BMPs. These include some of the major issues caused by development of new plantations, such as forest conversion, competing land claims and large-scale social transformation, all of which are also dependent on reform of land-use planning processes and other governmental instruments.

Environmental impacts:

- **Forest conversion (E):** BMPs could partially address this issue (e.g., through more rigorous EIAs), but wide uptake of (or incentives for) BMPs would be necessary to prevent less scrupulous oil palm companies converting forest that a company following BMPs had forgone. However, even development and widespread application of BMPs within the oil palm sector would potentially result in transferring the problem to other sectors (e.g., other agricultural sectors, plantation forestry) without similar requirements. Ultimately, development and/or implementation of improved land use planning/zonation by governments would be required to secure critical forest areas. It should be noted that there is a great deal of land in both Malaysia and Indonesia that is already severely degraded[36], much of which would be suitable for oil palm cultivation. Land allocation policies and tax incentives could potentially focus plantation development towards these areas and reduce the pressure on forest lands.
- **Clearance techniques (E/M)**: Could (and is) being addressed by BMPs – the techniques are well known and could easily be applied by large plantations. Note the development of 'Guidelines for the implementation of the ASEAN policy on zero burning.' Smallholders (particularly in Africa) might be reluctant to change their traditional practise of burning.
- **Choice of site & soil type (E)**: BMPs could address this - planting on appropriate soils and topography is a basic aspect of plantation establishment, and adoption is to the advantage of all plantations with any medium or long-term pretence to produce palm oil sustainably, because marginal lands have higher production costs and lower yield. Note that there are some issues that need to be resolved regarding the suitability and sustainability of certain soil types (e.g. deep peat).
- **Soil loss (E/M):** Could be addressed by BMPs – it is a basic aspect of plantation management, techniques are well understood, and adoption is to the advantage of all plantations with any medium or long-term pretence to produce sustainable palm oil.
- **Soil fertility (M)**: Could be addressed by BMPs – it is a basic aspect of plantation management, techniques are well understood, and is necessary to sustained yield. Smallholders face the problem that harvested material is exported to the processing mills and the 'waste' (e.g., empty fruit bunches) would need to be returned to maintain soil organic matter content.
- **Use of herbicides and pesticides (M)**: Could be addressed by BMPs – though the complexity of IPM may limit uptake, particularly with smallholders.
- **Biodiversity on plantations (E/M):** Could be addressed by BMPs - although best practice has not yet been established, retention of natural vegetation in uneconomic areas (e.g. steep slopes) or in compliance with legal requirements (e.g. riparian protection zones) provides a starting point for conservation planning in plantations. Biodiversity conservation is likely to only be practical for large plantations as smallholders will have little option or capacity to plan or manage for increased biodiversity.

[36] Estimates suggest that there may be 11 million hectares of long-degraded *Imperata* grassland in Indonesia and 1 million in peninsular Malaysia: Hardter, R., Woo, Y. C. and Ooi, S. H. (1997) Intensive plantation cropping, a source of sustainable food and energy production in the tropical rain forest areas in southeast Asia. *Forest Ecology and Management* 93: 93-102; Casson, A. (2000). *The hesitant boom: Indonesia's oil palm sub-sector in an era of economic crisis and political change*. Occasional Paper No. 29, CIFOR, Bogor, Indonesia. Furthermore, much expansion in the past ten years in both Peninsular Malaysia and Sabah has been on areas already cleared for cocoa and rubber plantations, and similar sites are still available in some regions.

- **Water management (M):** Could be addressed by BMPs – drainage and irrigation techniques are well developed.
- **Emissions and pollution (M)**: Could be addressed by BMPs – techniques available, mostly affects plantations rather than smallholders (except chemical disposal).

Social Impacts:

- **Competing land claims (E):** Could be partially addressed (mitigated) by BMPs – good practise already implemented by the most responsible oil palm companies as well as companies from other agricultural/industrial sectors, but there is variations in the scope and methodologies used. However, reforms to regulations or planning processes (or their implementation) by other agencies (e.g., governments) would be required to avoid such problems in the first place.
- **Large-scale social transformation (E):** Could be partially addressed by BMPs – managing the consequences of social transformation is attempted by responsible companies. However, reforms to regulations or planning processes (or their implementation) by other agencies (e.g., governments) would also be required to mitigate such problems.
- **Terms of trade for smallholders (M):** Could be addressed by BMPs – some companies have equitable and transparent mechanisms.
- **Social justice/grievance procedures (E/M):** Could be addressed by BMPs – dispute resolution procedures are well developed for several natural resource sectors. Does not apply to smallholders.
- **Workers rights and conditions (M):** Could be addressed by BMPs – well established in national laws, international guidelines etc. May be more difficult to apply with smallholders and contract workers.
- **Welfare provisions for workers (M):** Could be addressed by BMPs – well established in national laws, international guidelines etc.

3.3.2 To what extent there is agreement on BMPs

All of the key environmental and social impacts are listed because of reports of at least occasional severe problems with these areas. This in itself implies that there is no consensus, because some or many players in the industry are failing to implement management practises that would avoid or mitigate these impacts. However, for many of these impacts there is at least some consistency amongst BMPs suggested and implemented by the more reputable companies, associations and in the literature. We can therefore regard these BMPs as being agreed by responsible players, rather than there being a 'consensus' amongst stakeholders.

Environmental impacts:

- **Forest conversion (E):** No clear agreement within the industry or from environmental NGOs about which forests it is acceptable to convert.
- **Clearance techniques (E/M)**[37]: BMPs widely agreed, implementation inconsistent. Use of fire is illegal in both Indonesia and Malaysia (although there are reports that fire is still often used to clear forest in Indonesia) and there is general agreement that it should not be used (except in exceptional circumstances, e.g., where there is high risk of outbreaks of *Oryctes* beetle). In Africa, it is traditional for smallholders to clear using fire, but as they contribute little to world trade, and are usually required to have controlled burning licences, this is perhaps less of an issue.
- **Choice of site & soil type (E):** BMPs partially agreed. Even within the industry, there is doubt as to the long-term sustainability of planting on deep peat soils[38], due to subsidence, oxidation, micronutrient, etc. Laws in Indonesia do not permit planting on peat greater than 3 m deep, but it is still done (note also potential contradictions with provincial laws allowing conversion of these sites).

[37] This and other of the main agreed management techniques can be seen in publications such as: Corley, R. H. V. and Tinker, P. B. (2003) *The Oil Palm.* Fourth edition. Blackwell Publishing, Oxford, UK; and Turner & Gillbanks, 2003, *Oil palm cultivation and management.* 2nd Edn. ISP, Kuala Lumpur.

[38] For example, Sargeant, H. J. (2001) *Oil Palm Agriculture in the Wetlands of Sumatra: Destruction or Development?* Forest Fire Prevention and Control Project Dinas Kehutanan Propinsi Sumatera Selatan. European Union and Indonesian Government Ministry of Forestry.

NGOs also point out the wider impact of planting on deep peat – as this requires drainage, it increases fire risk and can disrupt the hydrology of areas outside the plantation. There are different opinions as to the degree of slope on which oil palm should be planted.

- **Soil loss (E/M)**: BMPs widely agreed. Techniques for minimising soil loss are well understood. This involves establishing cover as rapidly as possible in planted areas, sound road construction, etc. Such techniques are implemented by responsible companies.
- **Soil fertility (M):** BMPs widely agreed. Techniques for maintaining soil fertility are well understood. This involves returning organic harvesting 'waste' to the plantations, use of N-fixing leguminous ground cover, fertilization, etc. Such techniques are implemented by responsible companies.
- **Use of herbicides and pesticides (M):** BMPs partially agreed. Pesticide and herbicide use is minimised through Integrated Pest Management systems (IPM). Many of the techniques are understood, but are complex and require considerable situation-specific adaptation, which means that smallholders may have difficulty in implementing them. IPM is used by most responsible industrial plantation companies.
- **Biodiversity on plantations (E/M):** No agreed BMPs. Very little consideration is given to maximising biodiversity on plantations (e.g., maintaining samples of native ecosystems and the habitats of rare species). There is little clear and definitive guidance on this from academics and NGOs.
- **Water management (M):** BMPs widely agreed. Techniques for maintaining the quantity and quality of water are well understood (and often subject to legal requirements). This involves careful planning of drainage and irrigation, maintenance of riparian buffer zones, treatment of mill effluent, etc. Such techniques are implemented by responsible companies.
- **Emissions and pollution (M):** BMPs widely agreed. Techniques for minimising emission and pollution understood (and often subject to legal requirements). This involves treatment of mill effluent, efficient burning of fuel in mills, responsible disposal of pesticide containers etc. Such techniques are implemented by responsible companies.

Social impacts:

- **Competing land claims (E):** BMPs partially agreed. Legally required procedures vary greatly but it is implicit in the granting of tenure that the state is not aware of any valid competing claims for the land. Reputable companies recognise that it is often not sufficient to rely on the state's procedures and try to ensure that their land rights have been granted in as fair a way as possible, taking account of competing claims to parts of the estate. Formal procedures for identifying competing land claims and for addressing compensation are reflected in many of the codes of practice but the scope and methodologies of these vary.
- **Large-scale social transformation (E):** BMPs partially agreed. Best practice in this area is not always clearly articulated; nevertheless several of the existing codes of practice do consider these issues, through, for example, containing provisions for minimising the impacts on vulnerable groups, spreading the benefits to local communities etc.
- **Terms of trade for smallholders (M):** BMPs widely agreed. Many companies provide (or provide access to) loans that cover oil palm planting and the early years before production commences, as well as technical assistance to smallholders. Best practice also involves providing the smallholders with a fair, transparently set market price for their produce and some guarantee that at least part of their crop will be bought from them irrespective in fluctuations in demand. There are reports of some companies exploiting their bargaining power to offer very low prices to smallholders especially where there are not strong collective bodies defending their interests.
- **Social justice/grievance procedures (E/M):** BMPs widely agreed. Reputable companies aim to resolve all protests through peaceful means in full accordance with national laws and relevant international treaties, using standard grievance procedures. These should include an explicit policy that they do not condone or encourage human rights abuses either by their own staff or by the local police and military.
- **Workers rights and conditions (M):** BMPs widely agreed. Best practices on worker's rights and working conditions are set out in various international conventions (specifically, one or more of the ILO conventions), as well as in national laws. These different sources vary widely in their scope and

level of requirements. Responsible companies take these issues very seriously and report that they are proud of their performance. Several of the codes of practice (Section 3.4) make some provision for workers' rights.

- **Welfare provisions for workers (M):** BMPs widely agreed. Services that are considered essential by a company aiming for best practice include schools, health centres/clinics, places of worship and purpose-built housing with appropriate electricity and sanitation.

3.3.3 To what extent different BMPs would be required for different types of producers and different regions

The basic technical aspects of oil palm production are similar throughout the tropics. It is therefore possible to develop generic BMPs across regions (see the following section), although there has to be room for adapting these to take into account differences in the legal requirements, social and environmental circumstances between countries.

There may, however, need to be variations in BMPs according to production systems. Large plantations have the capacity to make considerable investments in infrastructure, technical and management expertise, planning and operations. This means that, given a commitment to change, they are likely to be able to adopt a wide range of BMPs covering complex social and environmental issues. The needs and possibilities for smallholders are different. This is because:

- Some of the key environmental and social impacts do not apply to smallholders. These include many of the social issues (e.g., workers rights, large-scale social transformation, immigration) and also some environmental ones (e.g., emissions from processing mills).
- Smallholders are not in a position to exert an influence on other key impacts. These include several environmental impacts such as forest conversion, biodiversity in plantations, choice of site. These impacts could potentially be addressed by core plantations, smallholder associations, development agencies, etc.
- Compared with industrial plantations, smallholders are less likely to be able to access technical knowledge, finance and other capacity for investing in BMPs. This means that any BMPs would have to be expressed in terms appropriate to smallholders, be part of a package of training and extension and require less exacting, simplified performance. Again, the role of core plantations, smallholder associations and development agencies would be critical.

3.3.4 Examples: Where BMPs have already been identified and/or implemented

Migros Criteria for Oil Palm Plantations: MIGROS is the largest supermarket chain in Switzerland and has a strong commitment to high standards of environmental and social audit management. MIGROS developed its Criteria for Oil Palm Plantations in co-operation with WWF Switzerland, which were published in February 2002. The MIGROS criteria set out a generic baseline defining the standards MIGROS wishes suppliers to meet. The criteria are generic, but also provide guidance for interpretation at a national level. This is done prior to an audit by an expert team with inputs invited from interested parties including environmental and social NGOs, local and national government and industry representatives. The team usually comprises the team leader, technical, environmental and social specialists. Local interpretations usually refer to local best management practice guidelines where available. 2nd party verification.

Unilever Sustainable Palm Oil Good Agricultural Practice Guidelines: Unilever developed its four principles of sustainable agriculture and 10 sustainable agriculture indicators following a workshop in 1998. The Sustainable Oil Palm Good Agricultural Practice (GAP) Guidelines were developed on the basis of these principles and indicators and published in September 2002. The guidelines were developed using research and cultivation experience in Malaysia, Indonesia and West Africa. They were produced in consultation with scientists and specialists, including members of the Unilever Sustainable Agriculture Advisory Board, which comprises individuals, specialists in agricultural practices and representatives of NGOs. Unilever has implemented its GAP guidelines through pilot projects in its oil palm plantations in Malaysia (now sold) and Ghana, though the development and incorporation of local indicators into plantation management practices. The impacts of the

implementation in the plantation are monitored internally. There is some question as to how this programme can be implemented through independent producers/suppliers.

Round Table on Sustainable Palm Oil: This is a collaborative effort by leading players in the industry, together with WWF. The aim is to establish broad consensus on the main social and environmental issues associated with oil palm and then to design and implement a programme of action. A central principle is the belief that, given sufficient commitment to improving and adopting best practice within the industry, oil palm cultivation can continue to develop whilst at the same time preventing or minimising most of the serious negative impacts reported in the past. The Round Table had its first meeting in Kuala Lumpur in August 2003 and is beginning work on elaborating criteria for sustainable oil palm production.

Pacific Rim Palm Oil Environmental and Social Handbook: Pacific Rim Palm Oil (PRPOL) is an independent organisation with backing of the CDC (formerly Commonwealth Development Corporation) which owns three plantations in Papua New Guinea and two in Indonesia. PRPOL's Environmental and Social handbook, published in September 2002 provides a summary of PRPOL's approach to environmental and social commitments and activities.

Rabobank criteria for financing oil palm plantations: In order to prevent the bank being associated with poor management of oil palm plantations in Indonesia, Rabobank developed a set of criteria to determine the conditions under which it would finance palm oil plantations. Rabobank asks customers to provide periodic environmental and social impact reports. Where doubts exist about compliance, the bank can commission independent experts to assess compliance. Prior to approving a request for financing a Rabobank employee assesses environmental impacts of the proposed project. Agencies such as CIRAD (Centre de Cooperation Internationale en Recherché Agronomique pour le Developpement) are also used for monitoring. If clients do not meet the criteria, Rabobank can potentially terminate its financing of a project.

Financial services to oil palm plantation companies; proposed screening of potential clients by financial institutions: Many financial service institutions use policies and guidelines to inform their investment decisions. However, in 2001 four major Dutch commercial banks – ABN AMRO, Rabobank, ING Bank and Fortis Bank – introduced specific principles in relation to the financing of oil palm plantation development in Indonesia The four basic principles to which the client must adhere are (1) not to be involved in burning forestland; (2) not to clear tropical rainforest; (3) to respect the rights and wishes of local communities; (4) to respect Indonesia's law and relevant international conventions. The documentation suggests that compliance with the criteria should be evaluated by an external, independent auditor and that a system to ensure continued compliance with the criteria is developed. However, it is acknowledged that the various financial institutions will require different approaches. It is not clear to what extent the proposed screening criteria and monitoring requirements have been agreed or implemented by the banks.

Environmental Guide for the Oil Palm Agro-industry Subsector (Fedepalma/Ministry of Environment, Colombia): The Environmental Guide was produced by the Colombian National Federation of Oil Palm Growers (Fedepalma) with support from the Colombian government in May 2002. It provides a background to the relevant national legislation, a description of the main activities involved in oil palm cultivation (including land preparation, nursery practice, plantation management, replanting and management of natural areas) and guidelines for identifying and dealing with environmental impacts of plantations and mills. The objectives of the guide are to help oil palm producers in Colombia improve their environmental management and implement clean technologies in their plantations. (Environmental guides are also being produced for other agro-industrial sectors in Colombia).

Malaysian Palm Oil Association: The proposed sustainable environmental charter is aimed at a different level from the other initiatives described. The charter aims to set out the responsibilities for safeguarding the environment, which members of the MPOA would sign up to. The requirements of the

charter need more detailed development by individual companies before being implemented in practice. The MPOA has proposed to carry out a survey of best management practices in the industry and to compile and document them for use by industry. The proposed charter would also commit members to adoption of best management practices established in the industry. The MPOA suggested at the Seminar that member organisations may in future be encouraged to go for a voluntary certification scheme on a phased BMP approach.

Sustainable Agriculture Network (SAN): Standards for oil palm are under consideration.

ISO 14001: Increasingly being applied in the sector, especially to mills. All PNG plantations are now ISO 14001 compliant.

Equator Principles: This is an industry approach to assist financing institution in determining, assessing and managing environmental and social risk in project financing. The Principles[39] have been adopted by twenty banks, some of which finance oil palm development; they apply only to projects with a total capital cost of US$50 million or more. The Principles commit signatory banks to reviewing customers' requests for project financing against a selection of WBG safeguard policies and environmental guidelines and to only providing direct loans where compliance with these can be assured over the course of a loan and an appropriate Environmental Assessment has been carried out. Oil palm plantations and mill development might require the completion of a detailed Environmental Assessment.

3.4 Obstacles to the adoption of BMPs

There are currently at least eight NGOs working with or campaigning against oil palm producers or investors in plantations. This provides a strong pressure for environmentally and socially responsible oil palm production. At the same time, many companies and producer associations are actively developing and/or implementing BMPs (see the previous section). However, several obstacles exist to the wider development and implementation of BMPs, as follows.

3.4.1 Producer level

Lack of financial incentives to implement BMPs: The edible oils market is highly competitive. In particular, oil produced from soy can be used for many of the same end-uses as palm oil. This means that price concerns dominate the palm oil sector and social and environmental concerns are seen by many as secondary. Consequently, those BMPs that confer an economic advantage by lowering production costs or increasing production per unit area of land are more the ones that are already best known and implemented. Conversely, there will need to be direct financial incentives to encourage the adoption of BMPs that may cause a short-term increase in costs or decrease in production. These are assessed below:

- **Forest conversion (E):** Disincentive for BMPs – forgoing clearance of some types of forest land would potentially cost plantation companies access to timber felled and sold during clearance, access to suitable sites, etc.
- **Clearance techniques (E/M)**: Incentive for BMPs – clearance techniques that avoid fire have been found to be perfectly commercially viable.
- **Choice of site & soil type (E):** Incentive for BMPs – selection of soils and topography suitable for oil palm is essential to reducing management costs and ensuring economically viable yield of palm oil. However, this may also cause a short-term loss, particularly in view of the complex relation between the timber industry and clearance for oil palm.
- **Soil loss (E/M)**: Incentive for BMPs – minimising soil loss essential to ensuring a high yield in the long-term.
- **Soil fertility (M):** Incentive for BMPs – maintaining soil fertility is essential to long-term yield.
- **Use of herbicides and pesticides (M):** Incentive for BMPs – Integrated Pest Management has been shown to be effective in the long-term. However, it is a complex approach, that requires

[39] Details can be found at www.equator-principles.com

knowledge of the pest's life cycle, a monitoring system, establishment of economic thresholds for action and selective control measures. This means that smallholders find adoption difficult and even large plantations may need several years before they accomplish a satisfactory working system.

- **Biodiversity on plantations (E/M):** Disincentive for BMPs - maintaining samples of natural vegetation, restoration of degraded habitats etc, is likely to be seen as costly, particularly if it means that potentially productive parts of plantation land can not be planted with oil palm. Also note the interaction between the timber trade and oil palm production in some producer countries.
- **Water management (M):** Partial incentive for BMPs – long-term advantage to sustainable water management, but initial costs may be incurred (e.g., retaining riparian protection zones). Note also that aspects of water management are covered by legal requirements in many countries, and that responsible companies accept the necessity for such measures.
- **Emissions and pollution (M):** Partial incentive for BMPs – one aspect of reducing emissions is increasing the efficiency of fuel use, which should be advantageous. Other aspects may cause initial costs (e.g., improving effluent treatment facilities, developing SOPs for toxic chemical management). Note also that these are covered by legal requirements in many countries, and that responsible companies accept the necessity for such measures.
- **Competing land claims (E):** Long-term incentive for BMPs - companies can become mired in prolonged and acrimonious disputes with local communities, even if they believed that they had acquired the land legally.
- **Large-scale social transformation (E):** Partial incentive for BMPs – several of the existing codes of practice do consider these issues, through, for example, containing provisions for minimising the impacts on vulnerable groups, spreading the benefits to local communities etc. Such measures recognise the long-term benefits of operating plantations within a stable social setting.
- **Terms of trade for smallholders (M):** Long-term incentive for BMPs – although it is recognised by responsible players in any industry that terms of trade with smallholders are an important aspect of sustainability, there will be a short-term cost for producers that are not currently complying with best practice.
- **Social justice/grievance procedures (E/M):** Incentive for BMPs – avoiding serious breakdowns in social justice reduces reputation risks and sometimes damage to plantations caused by protestors.
- **Workers rights and conditions (M):** Incentive for BMPs – it is recognised by responsible players in any industry that workers rights and conditions are basic to long-term economic stability and profitability, as well as being governed by national laws and international agreements.
- **Welfare provisions for workers (M):** Incentive for BMPs – it is recognised by responsible players in any industry that workers rights and conditions are basic to long-term economic stability and profitability, as well as being governed by national laws and international agreements.

Competition with other oils: A key aspect of the edible oils market is that more than one oil is often suitable for a given end-use. For many of the bulk end-uses it is both technically feasible and affordable to switch to an alternative if the preferred oil becomes too expensive. The price of soy oil tends to set the price standard for its competitors, including palm oil. Maintaining low production costs is therefore key to the continued profitability of palm oil producers. This is exacerbated by subsidies: palm oil production does not usually receive significant direct subsidies in most palm oil producer countries, which therefore see subsidies for other oils (especially soy, rape and sunflower in the US and EU) as a severe example of unfair competition.

Smallholders: Approximately one-third of the palm oil entering the world market comes from smallholders. As outlined in previous sections, the needs and possibilities for smallholders are different to those of large plantations, as some key environmental and social impacts do not apply to smallholders and they may have limited influence over, or capacity and technical knowledge to implement, others. Overcoming these differences is likely to involve collaboration with organisations that can assist smallholders (including smallholder scheme organisers, associations, development agencies and core plantations) as well as careful consideration of what is reasonable to expect of smallholders and how that should be structured and communicated.

3.4.2 Throughout the value chain

Limited proportion of direct supplier-buyer relationships: Palm oil is typically transported, mixed, bulked, traded, refined and processed several times before it is used to make a final product. This means that there are difficulties in tracing palm produced from a particular plantation. As a consequence, it is difficult to reward individual plantations that follow good environmental and social practise, and, conversely, to exclude or otherwise penalise those whose performance falls below those requirements. These problems are not insurmountable, but are likely to result in increased costs. For example, Migros (see section 3.3.4) currently pays a premium for palm oil from plantations that are assessed and compliant with their requirements, as well as additional costs to cover the increased logistics necessary to maintain a separate supply chain.

A related issue is that sustainable palm oil production is the common interest of a wide range of players, essentially producers, processors, traders, retailers and financial institutions that invest in oil palm. However, many of the BMP initiatives so far developed deal just with production, without considering financial incentives to improve sustainability (although note, for example, the Rabobank criteria and screening guidelines produced by four Dutch banks). Experience from other natural resource sectors has shown that uptake of complex BMPs concerning social and environmental practise is slow without clear market signals. In the absence of mechanisms that provide direct financial incentive, adoption of BMPs is likely to be confined largely to those companies who are already leading the field.

Lack of visibility at consumption level: Palm oil is used in the manufacture of many products, including margarine, cooking oil, snacks, cakes, cosmetics, detergents, soap, paint, chemicals and animal feed. Outside Africa, it is rarely retailed as a product in its own right. As one constituent amongst many in such end-products, it is concealed, and therefore public awareness and ability to discern between products using palm oil produced in different ways is likely to be limited. This may in turn limit the ability of civil society to lever greater adoption of BMPs. Nevertheless, with increasing pressure from NGOs (see Section 3.1.5) and with financial service institutions beginning to question manufacturers and retailers of palm oil containing products[40], there may be greater leverage in the future.

3.5 Preconditions for the successful adoption of BMPs

For palm oil, a number of the initiatives identified earlier have already started the process of agreeing BMPs, identifying key players and points of leverage. What remains is further work on creating incentives for the adoption of BMPs once they have been agreed, and engaging non-sector players in relation to some of the impacts that cannot be addressed by BMPs alone.

- **Developing BMPs:** Although many plantation companies and other major players already have a clear idea of what constitutes BMPs, there is by no means universal agreement on these. In addition, for several key environmental and social impacts, no agreement as to what constitutes best practice exists. BMPs will therefore have to be developed, with wide ranging input from different stakeholders to ensure widespread buy-in. These should include producers (both large plantations and smallholders); supply chain interests (including traders, processors, manufacturers, retailers and investors); environmental interests (e.g. ENGOs) and social interests (including plantation workers and their representatives and local communities impacted by plantations or NGOs representing them). The Roundtable on Sustainable Palm Oil is currently starting to consider such a process for developing criteria for sustainable oil palm management.
- **Incentives for uptake:** Uptake of BMPs is unlikely to be widespread in the absence of clear market signals to producers. Engaging other parts of the supply chain (including traders, manufacturers, retailers and investors) is therefore a pre-condition to widespread adoption of BMPs. Some mechanisms that are directed at players other than primary producers already exist (e.g., Rabobank criteria, Dutch banks screening principles) and others may begin to do so (e.g., the Roundtable on Sustainable Palm Oil). Increased and sustained demand-side pull for BMPs could

[40] For example, ISIS Asset Management & ProForest (2003). *New risks in old supply chains: Where does your palm oil come from?*

be stimulated through development of responsible procurement policies and fulfillment of CSR commitments. Providing consistent financial incentives to BMP adoption remains a priority.

- **Engagement of non-sector players:** Oil palm plantation companies work within frameworks provided by laws, regulations and government processes and resolution of several of the key environmental (e.g., forest clearance) and social impacts (e.g., conflicting land claims) cannot be achieved by oil palm BMPs alone. In most countries, the clearance of forest for oil palm takes place in the context of enormous and complex changes in land-use. There is much confusion in the debate over the extent to which oil palm is the 'cause' of forest conversion. Forest clearance commonly happens in cases where no subsequent land-use is planned (oil palm or otherwise), because the income from timber and pulpwood is sufficient attraction on its own. It can be argued that some or all areas cleared for oil palm might eventually have been deforested anyway for some other reason. The fact that many lie in areas designated by the government for conversion supports this argument. It is also supported by the observation that many companies have requested oil palm concessions but after the logging phase have shown no interest in establishing plantations[41]. The picture is further complicated by the fact that oil palm plantation companies are often part of larger business groups, sometimes including timber companies. This emphasises the point that BMPs that are aimed at reducing forest clearance by the palm oil sector may in practise have little effect if wider issues are not also addressed. Solution to these problems will also require reform of land-use planning procedures or implementation of existing ones.
- **Smallholders:** Engagement of smallholder scheme managers associations, development authorities, core plantation managers and NGOs will be necessary to implement BMPs dealing with some of the over-arching environmental and social issues as well as providing the training, education and extension necessary to enable smallholders to implement others.

3.6 Risks of adopting a BMP approach

The risks of adopting a BMP approach for palm oil include the following:

Making palm oil uncompetitive: Despite subsidies, production costs for substitute oils remain higher than for palm oil, especially because they have relatively low production per hectare. However, competing edible oils have some advantages that are rapidly eroding this difference. One is that production is highly mechanised, so labour inputs are low and prices are less vulnerable to increasing wage levels. A second is that productivity per hectare has shown sustained rapid increases over the past twenty years, especially for soy, due in part to the adoption of genetic modification (GM) technology and in part to huge research efforts in the developed world.

Given this background, the oil palm sector sees both its current market share and future growth as being highly vulnerable to changes in prices, especially in Malaysia where production costs are somewhat higher than in some other palm oil exporting countries. This sharpens the concerns of both the industry and the governments of producer countries over the potential costs of changing their environmental and social practices.

As discussed in preceding sections, many negative impacts have been attributed to the oil palm sector. Significant impacts are also reported for other edible oils, especially soy (see chapter 4). Crops in the temperate zone (rapeseed, sunflowers, some soy) are less connected with ongoing loss of forest and other natural habitats (since deforestation happened long ago in most of these areas). For the same reason, loss of land by local communities is also less of a current concern. Nonetheless, these and other forms of temperate agriculture are implicated in severe and continuing biodiversity losses due to intensification and heavy use of pesticides and fertilisers.

[41] See: Potter, L. and Lee, J. (1998) Tree planting in Indonesia: trends, impacts and directions. Occasional Paper no. 18, CIFOR, Bogor, Indonesia; FWI/GFW (2002) The state of the forest: Indonesia. Forest Watch Indonesia, Bogor, Indonesia and Global Forest Watch, Washington DC. Interestingly the same fact has been used by some conservationists to support the argument that oil palm is driving deforestation. This is true from one point of view – money invested in one of these bogus oil palm projects may end up being used for cut-and-run logging – but it does not support the argument that buying palm oil products funds deforestation.

At least some of the BMPs necessary to address key environmental and social issues associated with palm oil production are likely to result in increased production costs, at least in the short-term (see Section 3.4.1). If oil palm is treated in isolation, there is therefore the risk either that there will be little uptake of BMPs or that it will shift the competitive advantage to other edible oils and hence simply transfer these problems to those other crops and countries.

Exclusion from markets: Decreased competitiveness of oil palm would also have wider implications. All the major oils contribute to the economies of the producer countries roughly in proportion to the total value of production (excluding subsidies). Some satisfy significant domestic markets that would otherwise be fed by more expensive imports; others contribute to export incomes. The levels of employment, particularly rural employment, are often significant; in this regard oil palm stands out because it is currently less mechanised and so more labour intensive. For example, oil palm plantations employ about 1 person per 10 hectares. This means that a 30,000 ha plantation will directly employ 3,000 people, with many times that number supported directly or indirectly by the plantation. By comparison, soy cultivation employs approximately 1 person to 160-200 ha, and so a similar-sized area of soy would directly employ 150-190 people[42].

Smallholders: As discussed above, unless BMPs appropriate to smallholders are developed and appropriate institutions engaged to implement them and/or provide extension work, many smallholders are likely to find difficulty in implementing BMPs. This presents a risk that smallholder production would begin to be excluded from export markets. In many areas, smallholders close to plantations prefer to plant oil palm for several reasons: it can provide a long-term income, the intensity of labour inputs is flexible and not too great, and the crop is both productive and relatively disease resistant. In spite of the various reports that the terms of trade for smallholders are sometimes less than ideal (see previous sections), there is great demand amongst smallholders to be included within such schemes in many regions. Exclusion of smallholders from the market would therefore potentially undermine the preferred livelihoods of millions of rural people in tropical countries.

Allocation of costs: Given few, if any, financial incentives for the adoption of BMPs, there is a risk that the burden of any associated costs will fall disproportionately on producers, with little if any compensatory financial return.

Continuing lack of incentives: There is a risk that producers continue to have any incentive to change practices given the macroeconomic situation. Any investment in promoting BMPs is likely to be wasted without creating sufficient incentives for adoption.

Not tackling the worst producers: As with any voluntary mechanism, there is a danger that a BMP approach simply recognises existing good practice of responsible growers rather than tackling the worst practices of irresponsible growers.

3.7 Strategic Choices

A number of strategic choices need to be made by any initiative seeking to reduce the negative environmental and social impacts associated with palm oil production through a BMP-based approach.

#1 Whether to focus on the development of BMPs?

There are a number of independent BMPs or similar for oil palm (see Section 3.3.4). These have been produced for specific situations and none has wide buy-in. The Round Table on Sustainable Palm Oil[43] is currently developing proposed criteria for sustainable oil palm. It is intended that the final criteria will be developed through a multi-stakeholder participatory process. At the current time, this represents the

[42] E.g., Fearnside, P. M. (2001) Soybean cultivation as a threat to the environment in Brazil. *Environmental Conservation* 28: 23-38; and Corley, R. H. V. and Tinker, P. B. (2003) *The Oil Palm*. Fourth edition. Blackwell Publishing, Oxford, UK.

[43] See: http://www.sustainable-palmoil.org

best opportunity for developing BMPs that have a broad support base, from different sectors of the supply chain as well as from civil society. Engaging and collaborating with such initiatives would have reputational, managerial and institutional implications, and care would need to be taken to ensure that the goals of an existing initiative are complementary. But failing to engage with these initiatives runs the greater risk of diluting energy and commitment among industry stakeholders, and of failing to develop an authoritative set of BMPs and agenda for implementation.

#2 Whether to explicitly address smallholder issues through BMPs?
It is not clear how suitable a formal BMP approach is for smallholders. The technical and financial capacity of many smallholders is comparatively limited and so there is a real risk that they might be excluded from markets if complex BMPs are demanded from them. One approach would be to develop specific BMPs for smallholders. Alternative (or supporting) activities include developing and implementing training programmes on basic environmental and social and production issues, working with associations, development agencies, smallholder scheme managers and core plantations to address some of the wider environmental and social impacts. As most smallholders are dependent upon the processing capacities present in large plantations, there exists considerable potential for making the financing arrangements of large plantations conditional upon extension, financing, training, fair pricing and increased technical capacity of the smallholders that supply their mills.

#3 Whether to support development of purchasing guidelines?
Experience from other natural resource sectors suggests that, without financial incentives, it is unlikely that the uptake of BMPs will extend much beyond those companies who are already committed to economic, social and environmental excellence. The Round Table on Sustainable Palm Oil may decide to include criteria for palm oil purchasers (e.g., by demanding a year-on-year increase in the proportion of palm oil coming from plantations that fulfil the requirements of the criteria they are developing, or who have a time-bound commitment to do so). If this is the case, then this could be further stimulated through encouraging purchasers of palm oil to join the Round Table. If the Round Table chooses not to include such guidelines, serious consideration will need to be given to seeking to drive uptake of BMPs through the demand side. Options include levering purchasing commitments from key players (perhaps in fulfilment of existing CSR commitments) and supporting demand-side initiatives.[44]

#4 Whether to roll out investment criteria?
Investment opportunities represent an important financial stimulus to changing production practises. The proposed screening for financial services produced by four major Dutch banks has not to date been fully implemented, is limited to Indonesia and entails only four of the key environmental and social issues. Encouraging adoption and implementation of these amongst other financial service institutions, or linking them to BMPs or criteria for oil palm management would potentially provide a powerful stimulus to adoption of BMPs. As noted earlier, an important enabling condition for wider adoption of responsible investment criteria (particularly in Indonesia) includes increasing the in-country capacity for independent assessment of palm oil companies.

#5 How traceable should 'sustainable' palm oil be?
How does the market reward producers who apply BMPs? A future BMP initiative should consider the pros and cons of working with existing markets rather than investing in alternative supply chain structures or ensuring full chain of custody traceability. Several options exist, ranging from:

- ***certification and segregation*** of sustainably-produced palm oil. This provides the best guarantee that any oil really does come from a plantation implementing BMPs, but runs the risks of losing the benefits associated with commodity markets and incurring the costs of establishing and monitoring a dedicated chain of custody within traditional complex supply chains;

[44] For example, the UK Government's Department for Environment, Food and Rural Affairs is considering demand-led initiatives to encourage sustainability in commodities, see DEFRA '*From Principles to Action: Applying the Product Sustainability Toolbox.*' Advisory Committee on Consumer Products and the Environment, Third Report. February 2004.

- an ***area-wide approach***, where production areas are targeted for BMP adoption and so the entire production of the area can be mixed and bulked. This allows most of the benefits associated with the commodity markets to be maintained, but without rigorous control, runs the risk of unsustainably produced palm oil entering into the 'sustainable' oil;
- a ***'pool'*** system, where a buyer pays the premium to the sustainable producer, but without taking physical delivery of oil from that producer. Instead, the producer's oil would be bulked with others in the normal way, and the buyer would buy from the 'pool' as usual (a mechanism analogous to that used in buying 'green' electricity in the UK). This has not yet been implemented for any commodity and may provide insufficient stimulus for widespread BMP adoption.

#6 Whether to aim for a system that is visible to consumers or only to processors?
As noted above, palm oil's lack of visibility at consumption level means that a consumer-facing initiative would be a significant challenge. If a BMP initiative did aim for a certified, traceable approach, experience from other sectors suggests that it may make more sense for labels to be targeted at buyers and processors rather than consumers.

#7 Whether to provide equivalent support to soy BMPs?
Any action regarding BMPs for oil palm may influence the competitiveness of palm oil against soy. Several important environmental and social impacts have been reported for soy and so targeting one of these crops rather than the other could potentially transfer problems to another crop and other countries rather than resolve them. In addition, the palm oil sector is already sensitised by the perceived advantage given to soy through subsidies and would be less likely to engage with initiatives if equivalent processes were not being undertaken for soy. This is recognised by WWF, who are campaigning on edible oils (not just palm oil) and who are involved in Roundtables for both palm oil and soy.

#8 Whether and how to engage governments?
Some of the most serious environmental impacts of oil palm involve issues wider than can be addressed by individual plantation companies, or by the sector as a whole. These include forest conversion, competing land claims and large-scale social transformation. Solutions to these problems include BMPs, but also require input from, for example land-use planning procedures, legal requirements and the implementation of these. Similarly, provision of tax incentives could provide a powerful stimulus for establishing plantations on land that has long been degraded, and for maintaining conservation set-asides and riparian protection zones within plantations. The possibilities for enabling governments in producer countries to reform their procedures and regulations and the way that these are implemented will need to be explored. Analogous processes are being undertaken by the proposed by the EU's Forest Law Enforcement, Governance and Trade Action Plan (FLEGT) to tackle the problem of illegal logging, which includes governance reform, institutional strengthening and negotiations.

4 Soy

4.1 The soy sector

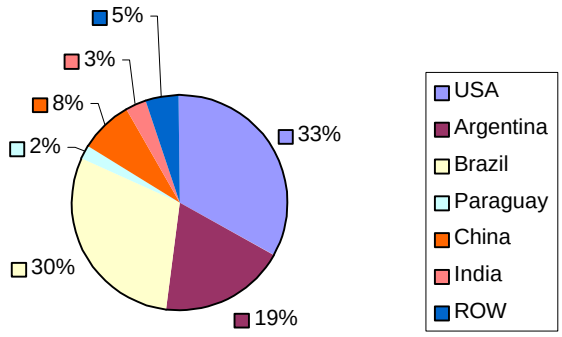
4.1.1 Production volumes and regions

Soybeans were first grown as a crop in China 5000 years ago. The first shipment occurred in 1804 when a Yankee clipper, returning from China to the US, carried a cargo of soybeans as ballast. The first commercial crop of soybeans was planted in 1929 to provide beans for soy sauce. Soybean is now an essential and dominant source of protein and oil with a multitude of uses in both human food and animal feeds and with numerous industrial applications. Soy is an annual crop, now grown widely on all continents (figure 4.1), mostly in temperate zones. Most soybeans are crushed to produce soymeal (e.g. for animal feed) and soy oil. However, a small percentage is used directly in food consumption, primarily in Asia.

Figure 4.1: Top 10 soy producers, consumers, exporters & importers (basis average 1997/02)[45]

	Production		Consumption		Exports		Imports	
Rank	Country	"000T	Country	"000T	Country	"000T	Country	"000T
1	USA	74.746	USA	44.165	USA	26.009	EU15	16.543
2	BRAZIL	35.999	BRAZIL	21.928	BRAZIL	11.852	PRC	8.108
3	ARGENTINA	23.860	ARGENTINA	17.122	ARGENTINA	4.626	JAPAN	4.875
4	PRC	15.000	EU15	16.160	PARAGUAY	2.195	MEXICO	3.418
5	INDIA	5.194	PRC	15.450	CANADA	726	TAIWAN	2.365
6	PARAGUAY	3.140	INDIA	4.492	PRC	217	INDONESIA	1.103
7	CANADA	2.519	MEXICO	3.873	BOLIVIA	134	BRAZIL	835
8	EU15	1.331	JAPAN	3.772	URUGUAY	36	ISRAEL	602
9	INDONESIA	1.185	S-KOREA	1.169	VIETNAM	34	ARGENTINA	446
10	BOLIVIA	1.105	BOLIVIA	1.105	HONGKONG	16	IRAN	375

Figure 4.2. Global soybean production in 2003 (million metric tonnes)[46]



The USA has been the world's largest producer of soybean for many years, with South America recently becoming a dominant producer, followed by China and India (figure 4.2). Most of the soybean grown in the USA is cropped in rotation with corn on prime agricultural land in the US 'corn belt'. The states of Iowa, Illinois and Minnesota are the largest producers. Production in the USA is expected to remain stable. Soybean production in Brazil, Argentina, Paraguay and Bolivia is rapidly increasing.

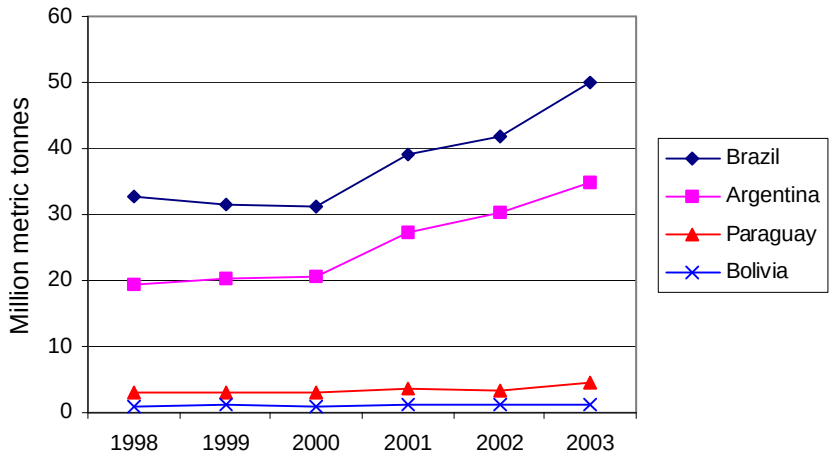
[45] Source: Rabobank International.
[46] Source: USDA. Based on total production of 202 million tonnes.

Brazil is likely to surpass the USA in the next few years as the world's largest producer. Brazilian output currently represents about 27% of global production; Argentina 18%; and Bolivia and Paraguay approximately 3% between them. China produces about 8% of the world's soybean but is a net importer. India produces about 2% of the world's soybean, and exports soymeal, primarily to Asia.

The production of soybeans is migrating from North to South America, due to cost competitiveness and the large potential for further acreage growth (figure 4.3). South American countries enjoy a large production cost advantage compared to the US, especially in relation to land costs. This competitiveness has been further boosted by the recent devaluations of the Argentine and Brazilian currencies. Additionally, improvement in yields, particularly in Brazil, and the adoption of GM soybeans in Argentina has allowed production to double in the last 10 years. The USA is expected to continue as an important player because of its large domestic demand for soybean meal and oil, its large crushing capacity, its efficient logistical infrastructure and both direct and indirect farm support.

Production in South America is strongly geared to export. In 1999 Brazil exported 65% of its soymeal production and 38% of its soy oil. Brazils domestic demand for meal and oil is also growing, but this is less true of Argentina. The biggest export markets for soymeal are the EU and China. Exports of soymeal from South America to the EU and China have grown dramatically over the last 5 years. The USA is still the worlds leading exporter of un-processed soybean, but exports far less meal and oil than Brazil and Argentina, and consumes correspondingly more of these products. It currently exports about 37% of its soybean production. Its major customers for unprocessed soybean are the EU, China, Japan and Mexico.

Figure 4.3 Growth in South American soybean production since 1998[47]



4.1.2 The value chain

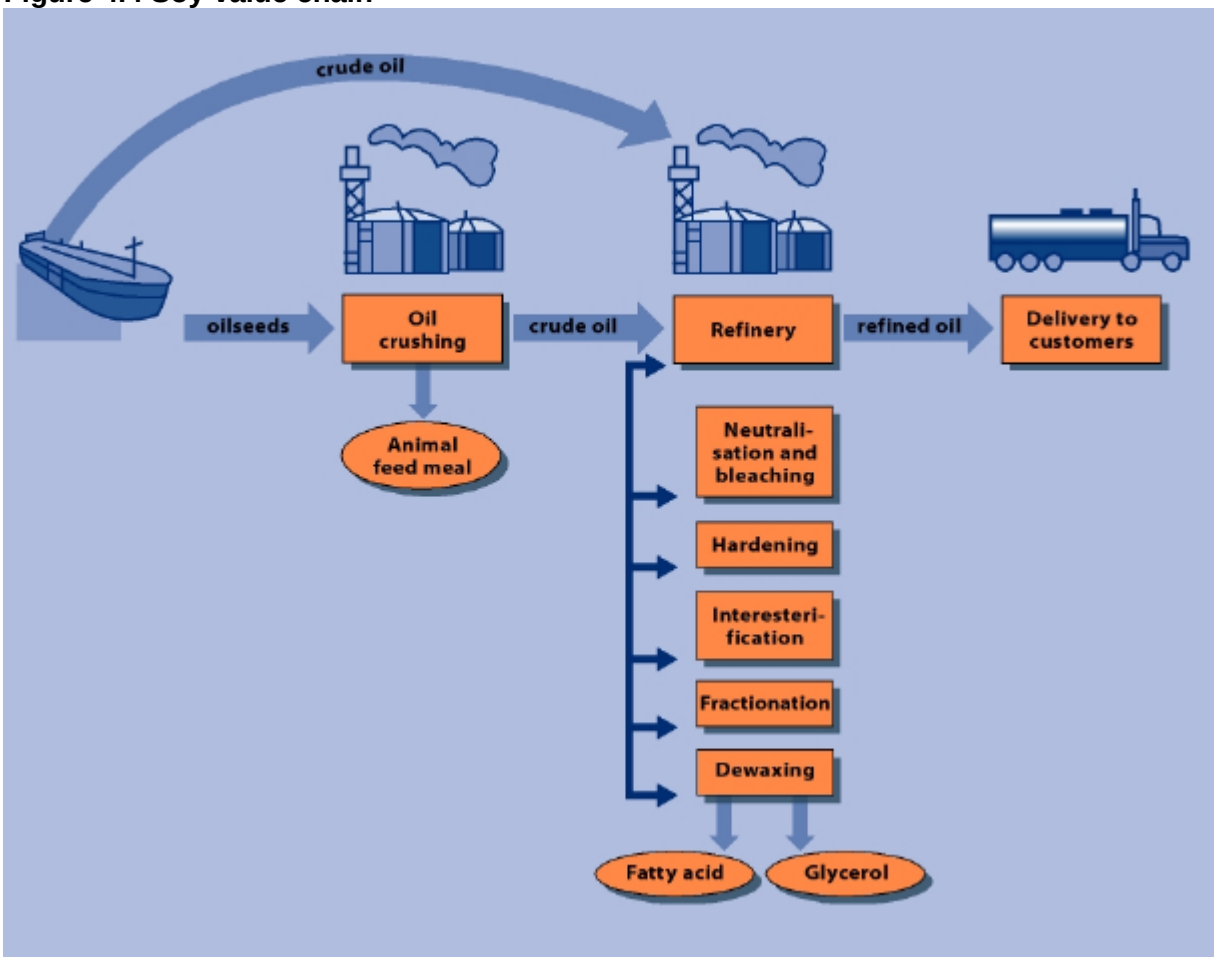
Figure 4.4 presents a typical soy value chain. Once the crop has been harvested, it is sold to a trader or collector, who collects the soybeans, stores them if necessary and sells them on to the crushing or processing industries. There are also increasing instances of crushing companies purchasing directly from the producer, sometimes through contract farming arrangements. At a global level there are a limited number of oilseed traders but competition between them is fierce. These global traders are also active in crushing and in the trade of oil and meal as this allows them to exploit price differentials within the oilseed complex (seeds, meals and oils) given that they can alternate between selling unprocessed beans, or oil and meal as prices change.

[47] Source: Dros 2003 *Accommodating growth: Two scenarios for soybean production growth*. AIDEnvironment / WWF.

The USA was the largest crusher in the world, but recently the volume of soybeans crushed in South America (Brazil and Argentina combined) has exceeded that of the US. The crushing of soybeans in China is increasing rapidly as a result of the growth of protein requirements for the animal feed industry. New investments in crushing capacity in the former Soviet Republics is realigning crushing capacity in Europe, reflecting higher import requirements of soybeans into the CIS republics as well as the CEEC countries. In the EU and its immediate surroundings, crushing capacity is shifting from west to east, as new capacity is constructed in the CEEC countries that will shortly join the EU. China has recently become the world's largest importer of soybeans, ahead of the EU with estimates for the current crop year exceeding 25 M tonnes.

During the crushing process the soybeans are cleaned, cracked, dehulled and rolled into flakes. This ruptures the oil cells for efficient extraction. After removal of the soybean oil, the remaining flakes are processed into various edible soy protein products or used to produce protein meal for animal feeds. Soybeans yield 70-80% meal when crushed, and the majority of revenues are derived from meal. The fact that there has been sustained demand for protein meal has driven soybean production in particular in Brazil and China where demand growth for protein meals is high. In most countries soybean meal is used as a protein supplement in animal feed, although in China and Japan it is also used extensively as fertiliser and soil conditioner. Demand for it is dependent on livestock populations as well as on the price of competing animal feed ingredients, in particular cereals. Soybean oil is the co-product from crushing. It can also be seen as a main product in view of its higher overall value. Most soy oil is destined for human consumption, in particular cooking oils, margarines and shortenings in the baking industry. The market for soy oil for non-food applications is small but growing, mainly because the high prices of petroleum have aroused interest in fuel uses of vegetable oils, including soy oil.

Figure 4.4 Soy value chain



4.1.3 The different types of producers

Soybean is not a subsistence crop and is generally grown on a large scale with extensive mechanisation and low labour inputs. In the Americas, soybeans are mostly grown on large-scale farms (1,000 to 3,000 ha), whereas there are some small-scale producers in Asia.

4.1.4 Financing requirements within the sector

Financing requirements for soy crop **production** can be broadly divided into two categories: short term crop financing (working capital), and long term agricultural development financing (e.g. for infrastructure projects, irrigation, etc.). Short term crop financing is required for farmers to purchase inputs (e.g. fertiliser, agrochemicals) required to produce their crop. Such finance is an activity primarily for domestic banks whereby the farmers provide security via a mortgage over land or equipment.

In the case of large farms or estates in South America, finance can be channelled to farmers through the crusher. This allows international banks to participate in the short-term financing requirements of farmers. The relationship between crusher and grower is close, even in the event that the crusher is based overseas. Additionally, there is a trend for crushers to provide certain social benefits (e.g., schools, medical/first aid facilities) that can be accessed by growers and the processor's staff.

Longer term financing of projects, designed to have a lasting impact on the size or efficiency of agricultural operations (e.g., development of new crop land, establishment of new irrigation schemes) in developing and emerging markets, often tends to be driven by international, regional or national development banks rather than the private sector, given the risk/reward profile of such projects and their time frame.

Processors also have both short- and long-term financial requirements. Working capital is required in order to buy the soybeans and process them into oil and meal. Longer-term finance is required for such investments as capacity expansion, updating of factory technology, or for acquisitions.

Large scale and profitable processors are well equipped to raise funds for working capital from local or international commercial banks on the basis of their own creditworthiness, even without issuing a corporate guarantee to a bank. Another alternative for powerful players is to issue short-term debt via commercial paper in order to raise funds for working capital.

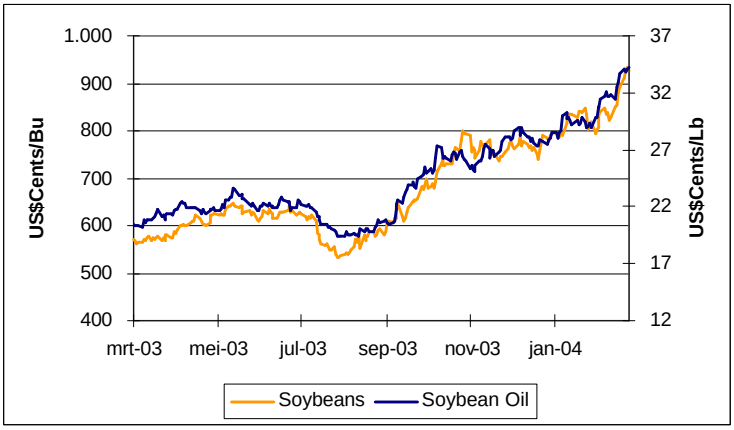
In some developing and emerging markets, crushers may not be financially robust enough for commercial banks (local or international) to accept such corporate guarantees. This particularly applies in markets with heavy import duties for processed products e.g. India. However, in such cases there are generally alternative means of providing working capital via pledging assets to the bank. These assets may be soy meal or oil stocks, as well as receivables from creditworthy clients of the crusher. The main risks facing the crushing industry are interest rate, currency and underlying commodity price risks. The industry has highly developed risk management practices. The Chicago Board of Trade (CBOT) houses one of the most efficient (and liquid) futures contracts in the world, often referred to as the soybean complex. This quotes online prices for soybean, soybean meal and soybean oil for up to two years in advance. Since the CBOT is increasingly becoming a global reference for the soybean complex, there are plans to broaden delivery points also outside the USA (e.g. in Brazil and/or Argentina).

Longer-term financing does not present significant problems for the large crushers that are part of large international conglomerates such as ADM, Cargill, Bunge and Louis Dreyfus. And even for domestic crushers, access to finance with tenors[48] over 1 year is feasible. However, it should be noted that the recent rapid price increase of the soybean complex (soybeans, soy meal and soy oil) has caused most traditional banks to increase the availability of credit in countries where production or consumption has grown rapidly. As such the rapid production increase in Brazil and Argentina and the strong increase in import requirements in China resulted in record high working capital requirements for active players in

[48] The length of time until a loan is due.

the soy industry. Figure 4.5 illustrates the extent to which the prices of soy and soy products have rapidly increased over the last year, mainly as a result of lower output in the Americas and record demand for soybeans and products in Asia, in particular in China.

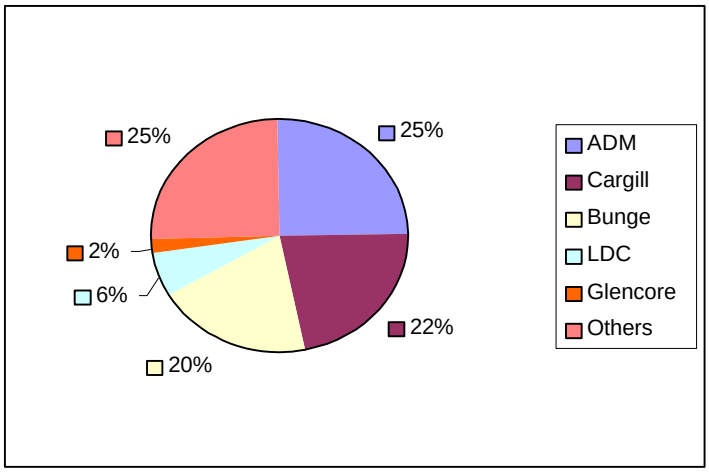
Figure 4.5 CBOT prices soybeans/oil, 2003-04[49]



4.1.5 Key players and financiers by region

As stated above, soybean growing increasingly takes place on large estates, a trend which is driven by the crushing industry being highly concentrated. The five largest crushers (ADM, Cargill, Bunge, Louis Dreyfus and Glencore) account for more than 75% of global crushing and are typically highly integrated large-scale producers (figure 4.6). Domestic or local crushers in the various production regions undertake the remaining 25%. But even the latter typically operate large-scale crushing facilities in order to capture sufficient economies of scale. As in any commodity setting, logistics continue to play an important role in lowering procurement costs and give larger companies a competitive advantage over smaller ones.

Figure 4.6 Global crush capacity by company[50]



USA

As the world's largest soybean producer, the United States is also the largest crusher and user of soy meal and oil. Within the US oilseed crushing business, soybeans account for 92% of the processed volume, followed by cottonseeds and sunflower seed crushing. As such, soy crushing drives the US oilseed crushing industry. Furthermore, in contrast to other agribusiness sectors, the US oilseed crushing industry is relatively exposed to volatility and competition from world trade. A weakening

[49] Source: Bloomberg.
[50] Source: Rabobank International estimates.

demand for oil meals together with the expansion of soybean production in South America may pose a threat to the US farmer who may turn to alternative crops.

The main crushers in the US are ADM, Cargill and Bunge. Generally speaking, access to finance for most of these companies is easy, and they are usually financed by major home-country banks. Among this group, the leaders are probably Citibank, Bank of America, Bank One, Standard Chartered, CoBank ABC and JP Morgan Chase & Co. Union Planters Bank, SunTrust Bank, Northern Trust, Mellon Bank are also active in the soy business.

Brazil

Soybean will continue to dominate Brazil's agricultural mix for the foreseeable future. However, in recent years crushing in Brazil has stagnated somewhat, in contrast to Argentina, where it has doubled. Brazil has managed to capture increasing demand for soybeans, especially in Europe and China. Argentina, by contrast, is attempting to increase domestic oilseed production in an effort to halt the rapid rise of soybean imports. Countering this is Brazil's soybean growing and marketing experience, (characterized by consistent, good yields); US weather-related price rallies; and a weakening currency favouring dollar-denominated exports.

The dominance of international crushers in Brazil is relatively low as more than half of the crushing capacity is in domestic hands. The Brazilian company Amaggi is the largest crusher in the country and continues to expand. This means that Brazilian banks are heavily involved in the soybean industry. Global players operating in Brazil are first and foremost Bunge, followed at a distance by Cargill and ADM. Louis Dreyfus is also present in Brazil, although less dominant here than in Argentina.

The leading banks involved in the soybean industry in Brazil are Banco Ribeirao Preto, Banco Europeu, Brasil Sudameris, Itau Bank, Banco Espirito Sancto, Banco Santos de Brasil and Bradesco Bank. In addition, most large US and European banks are directly or indirectly active in Brazil, as are many specialised financial service companies.

Argentina

The most active multinational companies in the crushing sector are Cargill, Bunge, Dreyfus and Glencore, but domestic players also remain significant. Soy production, crushing and exports are continuing to increase. Indeed, Argentina has overtaken Brazil as the largest exporter of soy oil and meal in South America. Argentine farmers have been very quick to adopt genetically modified soybeans and the cultivated area for these varieties now exceeds 90% of the total area planted to soybeans. This gives Argentine farmers a cost advantage (as do their lower average crushing costs in comparison with Brazil), but means that they do not benefit from access to the EU market.

Leading banks active in soy crushing in Argentina are Banco Nacion and Banco de Rio, which is a subsidiary of Banco Santander in Spain. In addition, most large US and European banks are directly or indirectly active in Argentina, as are many specialised financial service companies.

Europe

While US soy crushers are shifting capacity to South America, western European crushers are increasingly turning towards Eastern Europe and Russia. Until recently, European crushers have had the reliable alternative of increasing rapeseed supplies, and feed producers can rely on rapidly expanding soy meal supplies out of South America. This trend is likely to continue as the EU will be enlarged by 10 new member states in 2004 and as feed production is further curtailed in the EU-15.

Leading banks involved in the European soy industry are BNP Paribas, WestLB, Credit Lyonnais, Commerzbank AG, SocGen, HSBC, ABN-AMRO, ING, Fortis and Rabobank. KBC Bank, Standard Chartered, Deutsche Bank, DZ Bank, Credit Suisse, Credit Agricole, IntesaBci are also active in the EU soy business.

Asia

Rapid growth in crushing in Asia is mainly driven by Chinese consumption. As a result of an internal policy favouring local crushers through tariff differentiation, there has been a shift in crushing capacity from the US to China. This has led to a rapid increase in import requirements of beans – in 2004 this is set to be in excess of 25 million tonnes. The key players in China's vegetable oil industry are vertically integrated and located near major ports or close to big urban zones. The large multinational crushers are mostly active in the domestic market through joint ventures with local groups, e.g. ADM is closely linked with Wilmar.

The main banks actively involved in financing the soy industry in Asia are the global trade finance banks like Fortis, Standard Chartered, HSBC, SocGen and Rabobank. Local banks involved in financing the processing industry are the big four Chinese banks (Bank of China, Industrial & Commercial Bank of China, Agricultural Bank of China and the Construction Bank of China). The Development Bank of Singapore, and Thai banks such as Bangkok Bank, Thai Farmers Bank and Krung Thai Bank, also finance domestic trading companies.

Traders and end users

Crushers: Soybeans and related products are traded to a large extent by local exporters and/or regional distributors and there are few companies that could be described as global soy traders. However, global crushers do trade large volumes of beans, meal and oil themselves mainly as a result of their strong origination network. The number of banks involved with these large players is enormous. In practical terms, large, well-capitalised companies with dominant positions in their own markets are attractive customers for banks. This means that it is difficult to provide an exhaustive list of banks involved with these companies. In addition, most of the local and national players – and many international traders – are privately owned, which makes it difficult to obtain reliable data.

Refiners: Most of the oil produced needs to be refined for further application in food production. The large multinationals such as Cargill, ADM and Bunge are to a large extent forward integrated. Despite the fact that the refining industry has undergone a process of consolidation, the market is still divided between global players (e.g. Saipol, Aarhus Olie, Unimills, Karlshamn and Unilever), and family-owned refining and bottling companies, each with a distinct regional focus. The latter are often financed by local banks, or international banks with a local presence.

Further processing: Little data is available on companies that further process soy meal, but it is clear that a large proportion is used directly or indirectly (through the compound feed industry) for the production of animal protein. Only a minority is used by the food and chemical industries. The compound feed industry tends to be regionally structured, but there are a few large players active in the industry that are forward integrated to a large extent. Land O Lakes Farmland (US), Charoen Pokphand (Thailand), Tyson Foods (US), Cargill (US) and Zen-Noh co-operative (Japan) are among the top 5 companies active in this sector. The current trend in the industry towards further integration within the value chain from feed to food may lead to larger companies being established in the near future.

Other stakeholders

- Seed companies: Monsanto; EMBRAPA (Brazilian government agriculture research and development organisation) has been active in the development of improved seed for Brazilian farmers.[51]
- NGOs including AIDEnvironment, Cordaid, WWF, Friends of the Earth, Greenpeace.

[51] Companies in other sectors may become key stakeholders in the future, even though their interest is not yet significant. For example, Dupont is involved in work to use agricultural raw materials, including soy, to produce fibres, paints, etc. If this emerging technology takes off, such companies may be key soy stakeholders in the next one or two decades.

4.1.6 Macro issues facing and affecting production

Trade restrictions and subsidies: Trade in oilseeds is free relative to most other agricultural commodities but many countries impose import duties, especially on vegetable oils and to a lesser extent on oilseeds and meals. Governments have been withdrawing from direct intervention in domestic markets (for example the EU15 and the US). In many other countries state trading agencies regulate the domestic market. Nevertheless, US government subsidies for domestic soybean production have expanded rapidly since 1996 to provide a financial safety net for US farmers. A perceived effect of these has been to maintain pressure on South American farmers to expand their production capacity and lower their costs. These subsidies, which include export assistance, have led to knock-on effects on the price of other oil seeds. The long-term decline in the price of vegetable oil is believed by some to be due to over production in the soy sector.[52] The latest Farm Bill (2002) in the USA has been favouring corn in order to increase ethanol production, and there has been a partial migration by farmers from soy to corn.

GMOs: Oilseeds were early targets for genetic engineering and much of the early research was taken on rapeseed and soybeans. The US, Argentina and Canada have been the leading adopters of GM crops. Genetic modification has been controversial in a number of important consuming countries with some countries having restricted access for GM products to their markets. This has hindered trade both directly, through requirements for safety certificates and indirectly through food processors reformulating their products and/or excluding GM sources. Sales of US and Argentinean soybeans to the EU15[53] and China have declined significantly as a result. The range of measures includes import restrictions on sanitary and phyto-sanitary grounds, and the introduction of technical requirements such as product labelling and traceability. New EU legislation re-affirming a commitment to labelling of GMOs and GM derived products (EC Regulation 1830/Sept 2003) is likely to further depress US and Argentinean soybean imports to the EU. Brazil, where the growing of GM soybean was illegal, had enjoyed preferential access to EU and Chinese markets. However, the ban was lifted in September 2003 amid considerable controversy, and the use of GM soybean is now legal. It remains to be seen how this will affect Brazilian exports.

Investments in Brazil and Argentina: Soybean exports have increased as a result of large investments in Brazil and Argentina more than offsetting lower US exports. Brazil is still the second largest producer (after USA) but will soon be first if current growth continues. The Avanca Brazil programme has greatly facilitated the development of the export market through improved transport links. There has been a substantial increase in the proportion of soybeans and soybean oil traded internationally over recent years, as crushing in the country of destination has risen. Destinations are widespread. Oversupply is thought to be a problem, although current global demand for soymeal remains strong, fuelling continued growth in the sector.

There has been massive **growth in Chinese soybean imports** over the last 10 years (by 1000%, according to the Corn and Soybean Digest, 1 March 2002), accounted for by growth in livestock production in China.

[52] Rao, V. (2003) in: *Globalisation and its impact on the palm oil industry. Proceedings of an International Planters Conference 2003*.

[53] China had also imposed restrictions on the import of GM soybean (in 2001), which temporarily affected US exports, but these restrictions have now been eased (as of February 2004).

4.2 Key sustainability impacts

The major social and environmental impacts of soy production are described below. The order of this list is not intended to reflect an assessment of priority, for two reasons: Firstly, although there are numerous case studies and other sources identifying impacts, there are currently no assessments of how common (or severe) each of the impacts is over a wide geographical range. Secondly, it is likely that the severity of each impact will differ between production locations. Nevertheless, all have been reported as significant in one or more instances.

4.2.1 Environmental impacts

Forest and savanna conversion: Expansion of cultivation into forest areas is regarded by WWF as a major threat to biodiversity, especially in the drier savanna areas of the Brazilian centre west (the cerrado ecoregion) in the states of Piaui and Mato Grosso. The cerrado is home to around 10,000 species of plant of which 4,400 are endemic to central Brazil as well as endangered animals such as the maned wolf, the giant armadillo and the giant anteater. The cerrado is one of the least protected ecosystems in Brazil. For example, only 7 of the 37 Nature reserves in Mato Grosso are demarcated and policed by the state environment agency (FEMA).[54] The southern margins of the Amazon rainforest are also threatened by the expansion of soybean agriculture. Greenpeace claim Amazonian forest clearance increased 40% between August 2001 and August 2002 as a direct result of soybean farming. Soybean farming has been cited as a major cause of clearance of 795,000 hectares of forest in Mato Grosso in 2002, helping the soybean area grow by 18% to 4,500,000 ha.

The low cost of real estate has stimulated rush to acquire land. Irregular land transfers are reportedly common in the three key states of Brazil (Piaui, Mato Groso and Amazonas) but especially so in Piaui. There is also an apparent lack of land use planning and agro-environmental zoning in this area. Environmental impact assessments are required for clearances over 1000 ha, but it has been reported that some producers sub-divide the legal holding of farms to circumnavigate this regulation. The Forest law states that 35% of all landholdings in the Piaui cerrado should be protected in their natural state. However this legislation is poorly enforced, due to a combination of Environment Agency (IBAMA) personnel limitations and the rapid pace of land ownership change and agricultural expansion.

The development of soybean varieties that will perform well in higher rainfall tropical areas of the Brazilian north west is will make the cultivation of these areas more economically attractive and may well lead to increased forest conversion within the Amazon basin. In Mato Grosso, yields of soybean have increased from 2.4 tonnes/ha in 1995 to 3.1 tonnes/ha in 2003 thanks to research by the Brazilian government agricultural research corporation EMBRAPA.

The majority of Argentina's recent expansion in soybean agriculture has come through the use of readily available agricultural land. However, the Argentinean government has set aggressive targets to further expand the agricultural area in order to bring about another dramatic increase in soybean production for export. It is thought this will come at the expense of areas of the forested Chaco biome (in the north) and the remaining Atlantic forest in Missiones. These biomes, together with the remaining Atlantic forest of Paraguay are now highly threatened. One estimate predicts that they may have disappeared completely by 2010.[55]

Clearance techniques: It is considerably easier to clear savanna lands for agriculture than forest. Initial clearing involves two crawler tractors dragging a heavy chain between them, which strips out most native vegetation. Wood waste must be collected and manually cut for burning or transport, and roots are cleared manually to facilitate machine planting. Fires resulting from agricultural clearance of savanna areas affected 1.2 million hectares of rainforest land in the northern Amazonian state of

[54] Bickel and Dros 2003 *The impacts of soybean cultivation on Brazillian ecosystems*, WWF.
[55] Dros 2003 *Accommodating Growth: Two scenarios for soybean production growth*. AIDEnvironment/WWF

Roraima in 1998. Clearance of forest margins causes drying in the exposed forest, increasing the risk of fire.

Soil Erosion: Soil erosion arises from poor soybean cultivation practice and inadequate provision of riparian buffer zones. Erosion reduces the fertility of the soil and pollutes water courses with sediment. Conservation tillage practices can combat the erosion risk, but are not suitable on all soil types. The practice of reduced or zero-till cropping can reduce soil erosion, but is dependent on the heavy use of herbicide.

Chemical use: Conventional soybean cultivation also requires heavy pesticide use, and with inadequate attention paid to erosion and runoff, pesticide contamination of watercourses is reportedly commonplace.[56]

GM Soybean: The use of GM Roundup Ready Soya (RRSB) promises to lower production costs by decreasing the total amount of herbicide used on the crop by 20%. For this reason, it has quickly become very popular amongst South American farmers who wish to maintain low production costs. However, RRSB can only be sprayed with Roundup, increasing the farmers' dependence on this chemical herbicide and its producer (Monsanto) who also provide the RRSB seed. The combined cost of the seed and the herbicide can become a significant burden to farmers once they are committed to its use. Various ENGOs (e.g. Greenpeace and FoE) have raised concerns about the environmental impact of GM crops and their safety for human consumption. Soya production in the US and Argentina is heavily dependent on GM technology.

The use of GM soybean remains a controversial issue. The EU has recently re-affirmed a commitment that all imported GM food or feed products should be labelled, to facilitate consumer choice. It remains likely that EU buyers will continue to demand GM free ingredients and meat fed on non-GM feed and that there will be a premium market for non-GM soybean.

4.2.2 Social impacts

Changing land use: Large-scale expansion of industrial soybean farming in subtropical areas of northeast Brazil has driven peasant farmers into more marginal areas and may indirectly contribute to increased forest conversion. Although this issue involves a complex set of inter-related factors, this is certainly one of the major social impacts cited for the recent expansion of soybean cultivation.

Land ownership: Land distribution is highly inequitable in Brazil. The large expansion of soybean cultivation in South America is believed to have contributed significantly to this problem. For example, while the number of large farms in Mato Grosso has steadily increased, the number of smallholdings fell from 23,900 in 1980 to 9,800 in 1996.[57]

Labour issues: Soybean is not a subsistence crop. It is generally grown on a large scale with extensive mechanisation, low labour inputs and high inputs of pesticide and herbicide. The expansion of soybean agriculture into subsistence farming areas inevitably results in a loss of rural employment and urban migration. While the initial clearance of land can be relatively labour intensive, cropping soybean in Piaui requires about one worker per 200 ha. Working conditions can be extremely poor for casual labourers clearing, cutting and preparing land for planting. Workers were paid $1.70 a day, or $0.27 for cutting a stacked cubic metre of wood. Some instances of slavery have been reported by the state government in Piaui.[58]

[56] Bickel and Dros 2003, op cit.
[57] ibid.
[58] ibid.

4.3 Prospects for taking a BMP approach

4.3.1 Which of the key impacts a BMP approach could seek to address

The key issues that the development of BMPs could address are:

- Forest/Savanna conversion and rational land use.
- Clearance techniques.
- Reduction of soil erosion.
- Minimising chemical use and pollution
- Fair terms, conditions and wages for farm labourers.
- Provision of appropriate protective equipment for farm workers.

The environmental and social issues listed above apply to both GM and non-GM soybean. Growing RRSB under BMPs that address the above issues may have far fewer negative environmental consequences than growing non-GM soybean on converted forest land. There are legitimate concerns about the use of GM crops, but while BMPs could specify the use of non-GM seed, this decision should be reached through the consensus of a wide range of stakeholders. It should be based on the best available scientific information about the negative (and positive) effects of growing GM RRSB, in the context of other environmental and social issues.

The potential improvements that BMPs could bring include the following:

- Reduced conversion of high conservation value areas to soya without compromising South America's potential to lead the global soybean export market. Dros (2003) claims production levels in Brazil could be maintained if existing degraded land was used in the place of newly converted lands. This would also reduce the need for new infrastructure development in frontier areas preventing further indirect deforestation.
- Rehabilitation of existing degraded land through the use of soybean in rotation with pasture and other crops will lead to higher overall productivity in these areas.
- Higher levels of on-farm biodiversity conservation and landscape diversity. Adequate zoning and rational land use, together with rigorously enforced regulations on conservation and non-intervention zones should facilitate a much higher level of on farm biodiversity conservation. Riparian buffer strips and erosion sediment traps can also be used to increase connectivity in the landscape.
- Soil conservation measures give both improved water quality and long-term productivity benefits through the maintenance of soil fertility.
- Improved labour relations and higher levels of training and competency amongst workers. This can have several indirect impacts that can lead to increased productivity, including higher levels of motivation amongst workers; fewer incidences of sickness and injury associated with dangerous working practices; and fewer incidences of labour disputes and associated lost production time.

4.3.2 To what extent there is agreement on BMPs

With the exception of reduced tillage and organic standards[59], there has been limited development of improved management practices in soybean farming. In South America attention to date has been focussed on rapidly expanding the available land base for short-term gain with relatively little development or implementation of the long-term sustainability of farming practices. As an annual agricultural crop, there are many generic agricultural BMPs that could be adopted by soy producers. In addition to these, proposed BMP approaches for soy are likely to include:

Forest conversion: There is little agreement on acceptable levels of forest loss. However most environmentalists are in agreement that all four habitat types mentioned above are associated with important high conservation values. The Amazon is well known to be of immense global ecological

[59] cf. University of Minnesota BMP recommendations for tillage and corn/soybean rotations.

value, and both the Atlantic forest and cerrado ecosystems are listed as biodiversity hotspots by Conservation International (CI). The extent of the threats and the limited extent of these two ecosystems should guide any BMP approach to set 'acceptable impacts' at very low levels.

- **Zoning and rational land use:** This implies the identification of lands that should be protected and those that can be used for soybean. The concept of HCVF may prove useful in the zoning and identification of areas to be protected. Dros (2003) has suggested existing degraded pasture land in Brazil and Argentina can be made profitable through responsible land use, reducing the pressure on forest or savanna ecosystems. One encouraging advance in this area is a project under the G7 pilot program that combined GIS-based zoning and legislation to guide land use planning in Mato Grosso.
- **Assessments of environmental impact:** Some form of assessment should be mandatory before any existing native vegetation is cleared to create new agricultural land. It will be necessary to develop generic survey techniques that can be easily and cheaply applied, even on small scales, to determine the conservation values that are important.

Conversion techniques:

- **Use of fire** The use of fire should be avoided or carefully controlled in areas contiguous with any form of natural vegetation. This will apply to most areas of Amazonia, where only 20% of any forested estate is available by law for conversion and most new agricultural land is carved out of existing forest.

Soil erosion/degradation:

- **Conservation tillage** Conservation tillage techniques are widely used in Brazil and the USA to reduce soil erosion. Various techniques have been developed to plant seed without removing post-harvest residues or disturbing the soil. Most of these techniques are specific to soil types. Adoption of conservation tillage practices may go hand in hand with the use of GM RRSB
- **Rotational Cropping:** Rotational cropping of soybean on pasture improves the quality of pasture land (through the input of nitrogen from soybean) which could increase the land's productive life span and enable higher cattle stocking levels.
- **Riparian buffer zones:** Riparian buffer strips and sediment traps have the combined effect of preventing eroded soil entering water courses in runoff, and providing some valuable wildlife habitat within an agricultural land use matrix.

Reduced chemical use and pollution:

- Adoption of agricultural techniques that minimise the use of pesticides (e.g., IPM) and herbicides;
- Adoption of guidelines for the safe disposal of toxic chemical wastes

Management of large-scale social transformation:

- Provisions for minimising the impacts on vulnerable groups, spreading the benefits to local communities, etc.

Labour terms and conditions:

- **Contracts:** Most Brazilian farms own land and machinery, but labour is hired on a casual basis. Farmers should be encouraged to provide contracts for all employees which include provisions that are consistent with international norms (e.g. appropriate ILO conventions)
- **Term and conditions:** Farmers should take appropriate actions to ensure they provide fair wages and are not using child labour.
- **Training:** Appropriate training for all personnel carrying out hazardous
- **Appropriate protective equipment** should be available to labourers at the place of work to cover all potentially hazardous operations, such as woodcutting, burning, and pesticide application.

4.3.3 To what extent different BMPs would be required for different types of producers and different regions

Environmental and social impacts that are caused by soy cultivation (rather than by expansion of the soy-producing area) are to some extent in common with other annual crops produced by intensive agriculture. These include issues such as soil erosion, over-use of pesticides, workers' terms and conditions, etc. It is unlikely that BMPs dealing with these issues would be applicable in both the USA and South America, unless regional adaptation of generic BMPs was allowed to take into account the different social, agricultural and environmental circumstances of these regions.

Land conversion is an important issue in all South American producer countries, but not an issue in North America. The native vegetation types that are threatened by the soybean expansion are different in their composition and perceived environmental value. While the disappearance of the Amazon is something that will sensitise most people, the threats to the Brazilian cerrado savanna, the Argentinean Chaco, or Paraguayan Atlantic Forest are less emotive. For this reason BMPs should emphasise that important conservation values may be present in all of these areas. Individual land holdings need to be evaluated on a case-by-case basis.

4.3.4 Examples: Where BMPs have already been identified and/or implemented

Given the priority issues identified above, thinking on new BMPs focuses on the three major environmental impacts associated with soybean production in South America: forest conversion, conversion techniques and land degradation. Issues such as chemical use, soil erosion, terms and conditions for workers etc are not specific to soy cultivation and could readily be adapted from BMPs for other crops and from international norms (e.g. ILO conventions for social issues). For example, pesticide use could be minimised by adoption of integrated pest management (IPM) systems that could be easily applied to soybean in South America.

Two initiatives that may lead to the development of BMPs are at an early stage of development:

- Development of a Roundtable on Sustainable Soy – this is expected to include leading producers, supply chain interests and NGOs including WWF. This is a parallel development to the Roundtable on Sustainable Palm Oil.
- Exploratory meetings in relation to Brazilian production, between Maggi, IFC, TNC and WWF.

4.4 Obstacles to the adoption of BMPs

4.4.1 Producer level

Obstacles at the producer level relate to cost, knowledge and awareness, and the regulatory and institutional environment.

- **Land pricing**: Clearance of virgin lands occurs because this land is considerably cheaper than existing agricultural or pasture land ($20 per hectare in some areas of the Brazilian north west). Existing agricultural land is likely to be ten times more expensive. Attempts to improve the long-term sustainability of land use will be undermined without changes to land pricing.
- **Low cost of conversion of virgin land**: Clearance of land is attractive because the cost of clearance can be offset with revenue from timber or fuel wood sales. Restricting access to a significant portion of these areas will necessarily impose a greater financial burden on farmers wishing to expand their existing landbase. Similarly, setting aside the required conservation areas (e.g. 35% of total in Piaui, Brazil, 80% in Amazonia) within an existing estate has an obvious production cost. This cost also applies to any measures that would oblige farmers to leave non-intervention areas around watercourses and increase the width of field margins. There are costs associated with assessments of environmental or social impact, especially where experts in particular fields are required to have input. Assessments of biological values are typically difficult and require expertise, and the lengthy consultation processes associated with assessing social impacts can be both time consuming and expensive.
- **Short-term financial horizons:** Soybean agriculture can deliver a rapid return for limited investment. The importance of short-term economic gain may divert attention from measures that can secure a return over a longer period. The low cost of virgin land also undermines attempts to emphasise the benefits of long-term sustainability.
- **Relative cost of different conversion techniques**: Burning areas of degraded forest or savanna vegetation is the traditional way to clear land in much of South America. It also has the benefit of the rapid delivery of mineral nutrients to the soil (ash) which can give dramatic short term yield increases. However, experience from elsewhere suggests that mechanical clearance is economically viable and helps to maintain long-term soil fertility. Forgoing the use of fire would is

therefore likely to be seen by many producers as imposing a higher financial cost on clearing operations, which may not in fact be the case.

- **Cost of soil conservation techniques**: The initial cost associated with approaches to soil conservation such as terracing is only offset in the long term through maintained soil fertility. However, the adoption of conservation tillage to reduce soil erosion should not carry a short-term financial penalty (the main reason why this approach is common in Brazil) and has direct financial benefits in the long term through the maintenance of soil fertility. Similarly, adopting crop rotation practices to maintain soil fertility in the long term has double benefits: higher average yields and reduced inputs of chemical fertilizer. However, these practices require investments in machinery and more advanced farm management. On poor soils, short-term yield increases through fertilizer applications are very financially attractive. Discounting future benefits discourages lower input agriculture geared towards long-term sustainability (i.e. crop rotations). Land pricing, tenure security and market conditions all have influence on this. Short-term fluctuations in market prices can cause farmers to gamble with long-term sustainability.
- **Cost of improved labour terms and conditions**: Improved conditions for labourers (e.g. provision of appropriate protective equipment, improved training etc) will incur a cost to farmers, but may also have longer-term benefits in terms of employee productivity.
- **Lack of awareness of conservation value**: One of the key obstacles to the uptake of more responsible management practices on soy farms may be the limited awareness of conservation values that *other* people place on biological habitats like the Cerrado or the Atlantic Forest. These are designated as global biodiversity hotspots, of immense conservation importance, yet this status is not reflected in conventional land use choices. There is also a lack of awareness of how to assess land for the presence of conservation values, and thus how to zone land use appropriately.
- **Regulatory capacity**: The lack of institutional capacity to regulate the agricultural sector is commonly cited as a problem in Brazil and Paraguay. Forest laws that specify only a limited percentage on land may be converted (e.g. 20% in Amazonia) are poorly enforced. This reflects the economic and political power wielded by the industry, and the practicalities of policing these vast frontier areas. External donor support building institutional capacity to monitor and regulate may be necessary.
- **Lack of fiscal incentives for rehabilitation:** Existing forest/virgin land is regarded a low value commodity. It is often thought to be 'in need of development', and it has remained cheap to acquire. So cheap that the 20% rule in Amazonia may even have increased the speed of conversion, as companies acquire ever-larger concessions to make up for the area which cannot be farmed. Tax reforms that make it easier to acquire and rehabilitate degraded land would help ease the pressure on virgin areas. The tax system could be a much more effective instrument to encourage sustainable practices.
- **Government guidance**: Governments have a responsibility to publicise and inform. The Brazilian government has undergone a process of identifying areas of high biodiversity and conservation importance.[60] The information exists to begin more rational land use planning, but the importance of the conservation of these areas needs to be publicly acknowledged by all stakeholders. Guidance for baseline assessments, monitoring and land use planning should be available from government.

4.4.2 Throughout the value chain

- **Agreement of BMPs**: at present, there are no widely accepted BMPs for soy production.
- **Limited proportion of direct supplier-buyer relationships:** Soybeans (and their products) are typically transported, mixed, bulked, traded, refined and processed several times before they is used to make a final product. This means that there are difficulties in tracing soy produced from a particular farm. As a consequence, it is difficult to reward individual farms that follow good environmental and social practice, and, conversely, to exclude or otherwise penalise those whose performance falls below those requirements. These problems are not insurmountable, but are likely to result in increased costs.

[60] Probio & Directoria de Conservacao da Biodiversidade SBF-MMA-Brazil 2003.

- **Incentives**: Uptake of BMPs, particularly when they are likely to impose increased costs on production, is unlikely to be widespread without clear market signals. A mechanism of supporting uptake of BMPs through encouraging the players throughout the supply chain (e.g., who might commit to buy an increased proportion of soy produced according to BMPs each year) would help stimulate adoption of BMPs. The market premiums currently paid for GM-free soybean are a working example. Where incentives are used, there are associated questions relating to the verification that soybean has been produced in accordance with BMPs.
- **Lack of consumer visibility of the major processing companies**. Soy products are used in the production and manufacture of many products and soy is not always visible to the end consumer. This is particularly the case when soy meal is used for animal feed – the role of soy is one step removed from the final customer. Public awareness and ability to discern between products using soy produced in different ways is therefore likely to be limited. This may in turn limit the ability of civil society to lever greater adoption of BMPs. Nevertheless, with increasing pressure from NGOs and with from financial service institutions, there exists potential for greater leverage in the future.

4.5 Preconditions for the successful adoption of BMPs

There is already some tension between North and South American growers, and between South American growers and the EU. This is often connected to market access and free trade issues. South American growers are unhappy with the subsidies provided to N American growers, while N American growers are sceptical of management practices in the south. The debate surrounding the illegal use of RRSB seed became particularly vitriolic, with N American growers claiming the Brazilians were reaping financial rewards from the illegal growing of RRSB with the tacit support of the Brazilian government.

Questions remain about the role played by import tariffs (in the EU) and agricultural subsidies (in the US) in driving the current rapid expansion of soybean agriculture in South America, and associated land degradation. Brazil in particular has pursued export markets in the EU and China as its main vehicle for economic growth, and is aware that future success depends on its continued increase in productive area. Increasing productive area is the quickest and cheapest way for Brazil to gain market share and maintain a competitive edge over the US as current trade rules make the export of processed products less profitable While the macro-economic issues are beyond the scope of BMPs, the uptake of BMPs may be conditional on international trade issues.

There is the potential that any initiative coming from ‘the north’ could be seen as further efforts to undermine the competitiveness of south American growers, at a time when they are gaining the ascendancy. This would severely reduce the uptake of such practices. It is therefore essential that BMPs emphasise productivity gains and reduced costs at the farm level through better planning, training, etc.

General preconditions to improving the environmental and social impacts of soybean production include:

- Improved institutional regulatory capacity (possibly through donor support).
- Tax reform to decrease the attractiveness/availability of virgin lands
- Increased political accountability and transparency with balanced consideration of environmental social and economic issues.
- Improvement of land use planning, zoning and the enforcement of existing conservation regulations.
- Increased awareness, amongst all stakeholders, of existing national and regional definitions of high priority conservation areas or HCVF.
- Development of widely agreed BMPs
- Pressure from the major processor companies to improve management practices
- Market incentives for responsible producers; clear market signals to producers and possibly a BMP compliance auditing scheme.

One of the key problems in the soybean sector is the lack of consumer visibility of the major processing companies. These companies are the major industrial stakeholders and have considerable influence on

growers. Due to the nature of the commodity, these companies are not in the public eye (cf. oil industry or chemicals). Increased consumer visibility of the major processing companies through NGO campaigns in the USA and EU may be necessary to initiate the involvement of these industrial players.

4.6 Risks of adopting a BMP approach

Risks to growers: Soybean agriculture has been a rich vein of economic growth for members of the farming community in South America. It is probable that some BMPs will lead to increased production costs, at least in the short term, especially where there is a requirement to assess environmental impact. If there is no market premium for sustainably produced soybean, there is the possibility that growers would seek to offset profit losses by engaging in exactly the activities that BMPs are seeking to reduce. This may manifest itself in a drive to expand the land base, to reduce the labour force or reduce wages, or to increase the reliance on mechanisation and chemical inputs.

Substitution by other edible oils: The edible oils market is extremely competitive, and one in which soy oil currently enjoys a dominant position. The soybean industry in South America is in a position to wield significant political influence, and is likely to lobby strongly against any measures that it perceives could damage its market share. Furthermore, any initiative that targets management practices in soybean production, should consider the impacts this may have on management practices across the edible oils sector. An initiative that makes the production of soybean more complex or costly may stimulate investment into the unsustainable production of other edible oils (e.g. palm oil), unless equivalent actions are developed for that crop.

Further tension between North and South: Current environmental concerns are focused almost exclusively on land conversion in South America. While the growing of soybean in North America is not without environmental impacts, these are more readily controlled through generic agricultural BMPs. The weight of new environmentally orientated BMPs for soybean will fall disproportionately on the south, which may further aggravate the existing ill feeling related to trade issues.

Costs associated with certification: In order to check compliance with BMPs, some form of verification may be necessary. If there is a market premium associated with the use of BMPs, this may cover the cost of verification auditing, but it becomes important to segregate certified products from non certified. This has cost implications for the processing industry, which would be required to segregate production from certified farms. It also has implications for the commodity markets, as it may reduce liquidity.

GM Debate: The experience in Europe, India, Brazil and elsewhere shows that GM is an emotive issue and certain stakeholders are likely to lobby strongly against the use of GM RRSB. Not addressing the use of GM crops may be seen by these stakeholders as a failure to deal with one of the major issues connected with the growth of soybean. However, it could be argued that there are other more pressing environmental concerns and there is a risk that the BMP discussion could be drawn into a debate about the ethics of GM and loose its focus on forest and savanna clearance. Nevertheless, if the proposed BMPs deliberately avoid addressing the issue of GM crops, any requirements to reduce chemical use, or move towards organic practices would still bring GM into the spotlight. While this will please many ENGOs, there are powerful agribusiness interest groups that will resist any requirements to reduce the use of GM soybean.

4.7 Strategic Choices

#1 Whether to support the development of BMPs?
As yet there has been no development of widely agreed BMPs for soybean in South America. However, several of the major industrial players may come under pressure from environmental NGOs and their own CSR commitments to develop BMP criteria. Any such initiatives should be supported.

#2 Whether to support stakeholder engagement through existing processes?
WWF is in the process of setting up a Roundtable on Sustainable Soybean. The roundtable process is a way to bring together the various stakeholders and to combine the best features of individual approaches. It also has the advantage of keeping all stakeholders abreast of ongoing developments in the field and prevents issues from becoming overly politicised, if the process remains equitable and open to different perspectives. Engaging with this initiative provides one option for moving forward and needs to be considered alongside other approaches.

#3 Whether to encourage buyers to adopt purchasing guidelines?
Criteria for sustainable production can be broadened to include purchasing guidelines encouraging buyers to demand that products meet best practice. Such guidelines could include the recommendation that buyers seek to increase the proportion of soybean coming from farms that meet the best practice criteria. Encouraging buyers to join a roundtable process may be the best way to leverage such commitments.

#4 Whether to encourage the adoption of BMPs into investment criteria?
Investment represents an important means of changing management/production practices. If financial sector players accept BMPs, they can be used as a screen for investments, providing a powerful stimulus to the growers. BMPs can also be integrated into screens for pre-finance to third parties.[61]

#5 How traceable should sustainable soy be?
There may be significant benefits to growers in North America who are able to supply certified GM free soybean. However, the dominance of GM soybean production means that when the soybean is bulked for processing or shipment, its identity and its premium are lost. Processors are unwilling to invest in segregating GM and non-GM soybean. The same issue of traceability applies to soybean produced on farms subject to BMPs. Any future initiative would need to consider the advantages and disadvantages of taking a segregated, area-wide or pooled approach (see 1.1 for further discussion on this issue).

#6 Whether and how to engage with governments?
Some of the most serious environmental impacts of soy production involve issues wider than can be addressed by individual companies, or by the sector as a whole. These include forest conversion and large-scale social transformation. Solutions to these problems include BMPs, but also require input from, for example land-use planning procedures, legal requirements and the implementation of these. The possibilities for enabling governments in producer countries to reform their procedures, regulations and the way that these are implemented will need to be explored.

[61] For example, IFC finance provided to the Brazilian company Amaggi requires Amaggi to apply IFC guidelines and policies as a screen for the availability of pre-finance to third parties. If this approach can be linked to auditable BMPs, this offers significant opportunities for reaching growers through key points of influence within the value chain.

5 Sugar

5.1 The sugar sector

5.1.1 Production volumes and regions

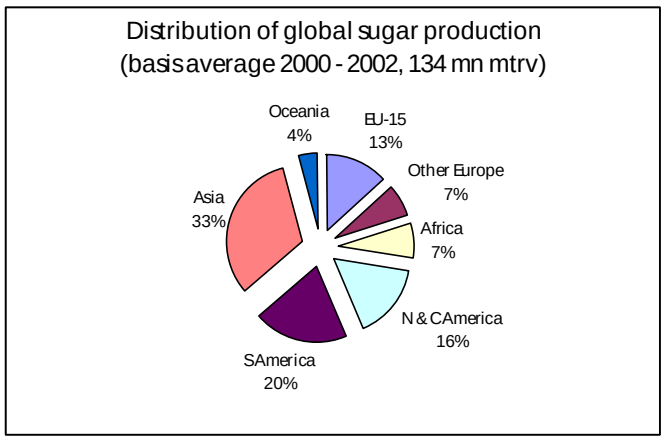
Around 130 countries in the world produce sugar. However, global trade accounts for 30% of world production; most sugar is consumed and/or processed into semi-finished or finished products in the country where it is produced (see figure 5.1). India and the USA are the first and fourth most significant producing countries. However, the most significant exporters are Brazil, the EU, Thailand, Australia and Cuba, with India ranked only eighth and the USA remaining outside the top ten.

Figure 5.1: Top 10 sugar producers, consumers, exporters & importers (ave. 99/00 – 01/02)[62]

	Production		Consumption		Exports		Imports	
Rank	Country	('000 mt rv)	Country	('000 mt rv)	Country	('000 mt rv)	Country	('000 mt rv)
1	India	19,985	India	17,336	Brazil	10,153	Russia	5,148
2	Brazil	19,498	EU	14,315	EU	6,100	EU	1,800
3	EU	17,795	Brazil	9,378	Thailand	4,021	Indonesia	1,730
4	US	7,830	US	9,124	Australia	3,624	Japan	1,525
5	China	7,800	China	8,758	Cuba	3,049	Rep. Korea	1,512
6	Thailand	5,926	Russia	6,667	Guatemala	1,304	US	1,394
7	Mexico	5,120	Mexico	4,551	South Africa	1,234	Malaysia	1,247
8	Australia	4,883	Indonesia	3,624	India	1,063	Canada	1,181
9	Cuba	3,829	Pakistan	3,379	Colombia	985	Nigeria	981
10	Pakistan	2,963	Japan	2,336	Turkey	599	China	941

On a regional basis (see figure 5.2), Asia is the world's leading producer. Production in industrialised countries (mainly represented by Europe, the US, Japan and Australia) accounts for around 28% of global production. Asia is also the world's leading consumer and importer of sugar. South America is the world's leading region in terms of exports (owing to Brazil's pre-eminent position as an exporter), while Russia's position as the world's leading importer means that Europe (non-EU) is the second most important importing region after Asia. The leading suppliers to Russia are Brazil, Cuba and Thailand. Currently, EU imports are almost exclusively provided by members of the ACP (African, Caribbean & Pacific) group of countries. Major suppliers within this group are Mauritius, Guyana, Fiji and Swaziland. These imports are granted preferential access and high prices. Major suppliers to Japan are Australia, Thailand and South Africa. Major suppliers to Indonesia are Thailand, Brazil and (less regularly) India. The US also operates a system of preferential access to its sugar market, favouring a selection of specified producers (including Dominican Republic, the Philippines, Northeast Brazil, Guatemala and Australia). Mexico also enjoys preferential access under the NAFTA agreement.

Figure 5.2: Regional distribution of global sugar production



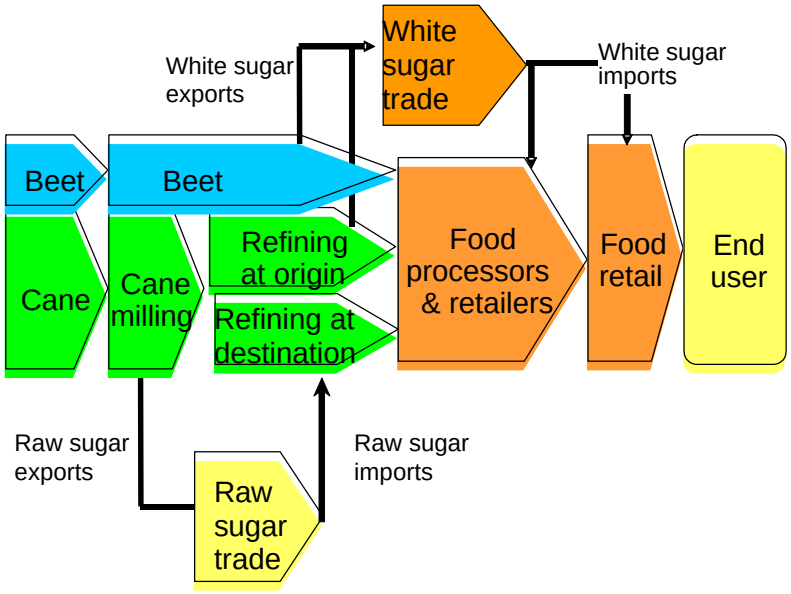
[62] Source: Rabobank International.

Future trends in the regional share of production will depend in part on developments in sugar policy around the world. Bearing this in mind, it is likely that Brazil will maintain and quite possibly further boost its dominance on the world market, owing to its distinct competitive advantages. Significant reform of EU sugar policy is a real possibility; if this takes place, it will do so slowly, but the effect will be to boost EU imports and diminish EU exports. The beneficiaries of increased imports are likely to be the countries involved in the "Everything but Arms" agreement, which are due to enjoy duty-free access to the EU sugar market by 2009. Beneficiaries of reduced EU world market exports are likely to be the world's other major exporters, among them Brazil & Thailand.

5.1.2 The value chain

Owing to the great diversity of sugar industry structure and practices around the world, there is no "typical" stereotype to which most industries conform. A simplified value chain diagram is presented in Figure 5.2; the following notes highlight key processes and the diversity within them.

Figure 5.2: Sugar Value Chain



Sugar is an unusual commodity in that it is **produced** from two significantly different crops – sugarcane in the tropics and sub-tropics, and sugar beet in temperate zones. Cane accounts for about 70% of global production. Sugar cane is a "semi-perennial" crop; once planted, it is harvested for several years in succession before being dug up and new material planted. Sugar beet, by contrast, is an annual crop that requires crop rotation in order for plant diseases to be kept at bay. Sugar cane is therefore suitable for plantation culture. Sugar beet has to be part of a (typically) 3 to 5 year crop rotation plan.

Processing of cane and beet is a capital-intensive business. Factories generally operate for part of the year, as beet and cane are both perishable following harvest. If beet or cane is supplied by private farmers, growers are generally paid on the basis of (i) the price of sugar and (ii) the quality of raw material they deliver. Most industries have detailed guidelines governing the grower-processor relationship. Sugar is produced in a variety of forms. Beet processing results in the direct production of refined white sugar. However, a range of sugar qualities can be produced from cane. Raw sugar is effectively a semi-processed product; it has to be refined before being fit for human consumption. Around 55% of global sugar trade is accounted for by raw sugar, which is refined on arrival at destination. However, cane mills can also be equipped to produce low quality white sugars (so-called "plantation whites") and refined sugar. While there are key players at country and possibly regional levels, there are no true global players; the industry is (at the global scale) fragmented. The buying of

raw sugar and installation of refinery capacity in third countries is becoming more common, e.g. in Saudi Arabia. It is reported that there is a growing market in sugar derivatives to create biochemical compounds such as nematicides.

As stated previously, two-thirds of sugar is consumed and/or processed into products in the country where it is produced, and **international trade** accounts for only around 30% of global production. Both raw sugar and white sugar are traded internationally. Raw sugar is handled and transported in bulk, while white sugar is handled and transported in 50 kg bags. The price at which sugar trades on the world market is indicated by the New York No 11 futures contract (raw sugar) and the LIFFE No. 5 contract (refined sugar). Both are highly volatile, and bear little relation to production practices, as many transactions are speculative rather than linked to actual commodity trade. The two are ultimately linked because several major exporters can choose whether to export in raw or white form, but in the short term the difference between the two (the so-called "white premium") is also volatile.

In industrialised countries, processed food products and drinks account for 70-80% of sugar **consumption**. Thus the major buyers of sugar from processors are food processing companies such as confectioners, bakers and beverage manufacturers. In developing countries this is not the case, and direct (table-top) consumption accounts for the bulk of consumption. The bulk of consumption growth is in the developing world and is driven mainly by population growth.

5.1.3 The different types of producers

As a "semi-perennial" crop, sugarcane is suitable for plantation culture. Farm size and ownership vary enormously from country to country. In India, Thailand and Mexico, cane is produced by smallholder farmers, each cultivating as little as a hectare or two. In Brazil, cane is usually produced on large estates operated by the mills themselves. Contract farming schemes involving large numbers of small farmers have been successful complements to estate production in Kenya and Swaziland. In South Africa there is a large dichotomy in the competitiveness of land-rich commercialised agricultural systems versus smallholders. In Queensland, where over 95% of Australia's sugar is produced, most of the 6500 farms are owned and operated by family partnerships. Beet farming is usually carried out on private family farms, with farmer co-operatives significant in the USA and EU.

5.1.4 Financing requirements within the sector

Finance is extremely important in the sugar business, for production, processing and trading. The production of sugar is costly and seasonal, creating the need for crop financing and working capital finance. Financing requirements for sugar crop **production** can be broadly divided into two categories: short term crop financing (working capital), and long term agricultural development financing (e.g. infrastructure projects, irrigation).

Short term crop financing is required for farmers to purchase the inputs (e.g., fertiliser, agrochemicals) required to produce their crop. Such finance is primarily or wholly provided by domestic banks. In the case of large farms or estates, this is straightforward. However, in industries where cane is supplied by a large number of small growers, this can be more problematic, both from an administrative angle (one mill may have thousands of growers each cultivating only a hectare or two) and from a credit perspective (such growers often have little collateral to offer banks against any loan).

In practice, the administrative problem is often addressed by channelling finance to farmers via the processor. For banks, this means dealing with one client rather than (in the most extreme cases) thousands. The relationship between processor and grower is close, and growers usually have a contract with the processor to supply beet or cane. Moreover, in developing economies, it is often the case that the processor provides certain social benefits (e.g., schools, medical/first aid facilities) that can be accessed by growers and the processor's staff.

From the credit perspective, farmers may be able to provide some security to banks via a mortgage over land or equipment. However, as stated above, farmers will generally produce cane on contract to a

mill, and often this contract is an adequate security for a bank. Nevertheless, there are many industries where the vast number of growers and the lack of development in the private banking sector mean that the government or the industry has to become more actively involved in the delivery of crop finance to growers. For example, the South African Sugar Association has a model scheme for the financing of small growers who lack the resources to obtain conventional bank finance.

Longer term financing of projects designed to have a lasting impact on the size or efficiency of agricultural operations (e.g. development of new crop land, establishment of new irrigation schemes) in developing and emerging markets often tends to be driven by international, regional or national development banks rather than the private sector, given the risk/reward profile of such projects and their time frame.

As with growers, sugar **processors** are a diverse group, with a minority growing their own cane. Some are highly exposed to world market prices (thus revenues are very volatile), while others operate in markets that are well protected from the world market. Processors also have both short- and long-term financial requirements. Working capital is required in order to purchase cane or beet from growers over the processing campaign and to finance the cost of inputs required to turn this raw material into sugar. Longer-term finance is required for capacity expansion, updating of factory technology, acquisitions, etc.

Large-scale and profitable processors may well be able to raise funds for working capital from local or international commercial banks on the basis of their own creditworthiness, by issuing a corporate guarantee to a bank (usually the loan agreement will contain certain covenants or conditions). Another alternative for powerful players is to issue short-term debt via commercial paper in order to raise funds for working capital.

In developing and emerging markets, companies may not be financially robust enough for commercial banks, whether local or international, to accept such corporate guarantees. However, in such cases there are generally alternative means of providing working capital via pledging assets to the bank. These assets may be sugar stocks, or receivables from creditworthy clients of the processor.

The need to manage risks (interest rate, currency, sugar prices) also provides banks with opportunities to provide services to sugar processors, who may well have to sell part of their output outside their own market, thus creating exposure to exchange rate risk and (possibly) world market price risk. Banks can address the potential threat to revenues posed by these risks via the provision of risk management instruments such as futures, options and swaps.

Longer-term financing presents more problems for processors. Local banks may not have the capacity to provide such finance, while international banks may not be keen to finance over long tenors for commodity businesses, which are traditionally viewed as volatile/cyclical. As a result, in the case of developing and emerging markets especially, there is again a role for international, regional and local development banks/institutions to play in project finance. Such loans usually require the support of the host country government, and may well entail a substantial equity injection from the beneficiary.

International **traders** require financing in order to be able to buy sugar in one location, transport it to another country and deliver it to a buyer. Finance is required to bridge the gap between paying for the sugar and receiving payment in turn. Trade finance is generally provided by international banks.

5.1.5 Key players and financiers by region

The level of influence of the banks over production methods and hence the adoption of BMPs is hard to assess. Often a country's domestic sugar industry is a major contributor to the agricultural economy, which means that local or state-owned financial players support the industry (with varying degrees of leverage) when international banks would be unwilling to do so. There are therefore many players involved with sugar financing. Below we present a breakdown of key players and financiers by region;

this is followed by a summary of major traders and end users and their financiers, and other key stakeholders in the sector.

European Union, USA and Australia

Figure 5.3 displays the main beet sugar players in the European Union, ranked by their sugar quota. In addition to these companies, the UK's Tate and Lyle is also a significant player (on a par with British Sugar & Nordzucker). However, Tate and Lyle produces refined sugar from imported raw sugar in the UK and in Portugal, so does not appear in this figure. Figure 5.4 displays key players in the US, and figure 5.5 displays major players in Australia. Generally speaking, access to finance for most of these companies is straightforward, and they are usually financed by major home-country banks. Among this group, the leaders are probably Fortis, Rabobank and Royal Bank of Scotland. In Australia, ANZ and NAB are major players.

Figure 5.3: Major EU sugar players by quota share

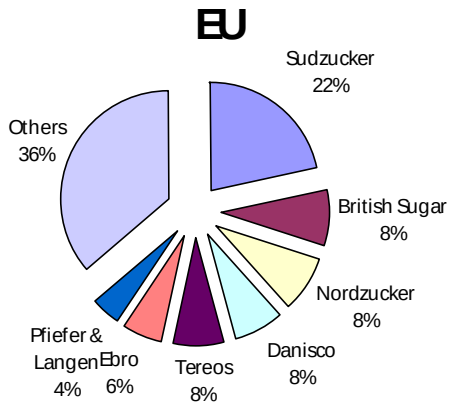


Figure 5.4: Major US sugar players by share of output

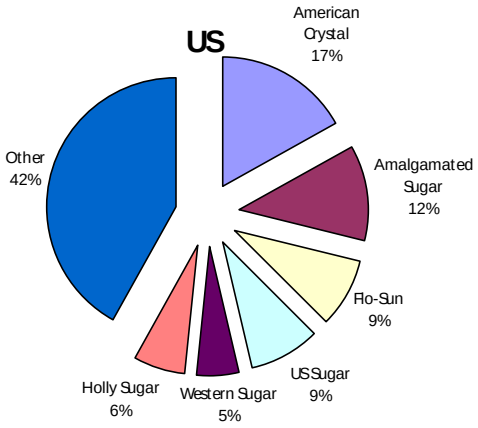
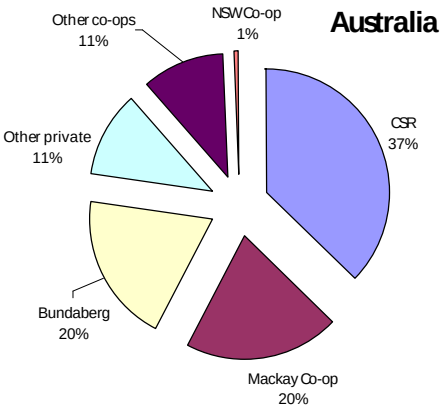


Figure 5.5: Major Australian sugar players by share of output



Eastern Europe and Former Soviet Union

Sugar companies expanding activities in eastern Europe/FSU have been able to access a combination of development institution finance and commercial bank finance. For example, the UK's HSBC financed Greek state-owned sugar concern Hellenic Sugar's expansion in Serbia. Meanwhile, Italian sugar producer SFIR has been able to obtain EBRD finance in connection with its sugar activities in Serbia. Elsewhere, Azersun's sugar factory project in Azerbaijan has reportedly been discussing loans with

ABN Amro and Dresdner Bank. Probably the leading international bank in the region is Raffeisen Bank of Austria.

Asia

The Asian region is enormous, and generalising about the importance of banks within the region is hazardous. However, the private banks that are most commonly involved with the sugar sector in the region are Standard Chartered and ING. Major Australian banks such as ANZ and NAB are also likely to be significant players. Figure 5.6 provides a summary of the interests of some other key financial institutions operating in the region.

Figure 5.6 Institutions financing Asian sugar production

Institution	Country/company/project
Development Institutions	
Islamic Development Bank	Indonesia (Egypt technical co-operation); Saudi Arabia (sugar imports)
Industrial Development Bank of India	India (multiple)
Industrial Finance Corporation of India	India (multiple)
IFC	India (Balrampur Chini)
Land Bank of the Philippines	Philippines (multiple; crop loans)
Local Commercial Banks	
ICICI	India (multiple)
Vietcombank	Vietnam (Nghe An)
Siam Commercial Bank	Thailand (multiple)
Bangkok Bank	Thailand (multiple)
Bank of Ayudyah	Thailand (multiple)
International Banks/Institutions	
Merrill Lynch	India (Balrampur Chini)
HSBC	India (Balrampur Chini)
Ernst & Young	India (Dhampur Sugar debt restructuring)
Standard Chartered	Vietnam (Nghe An)
Woori Bank	Vietnam (Nghe An)
Citibank	India (Sakthi Sugars)

There are approximately 450 sugar mills in **India**, many of which are operated either by state governments or by co-operatives. Many are also in poor financial condition. As a result, state banks and development institutions are major financiers of the Indian sugar sector. Among these institutions are the Industrial Finance Corporation of India (IFCI), which is majority-owned by the public sector, and ICICI Bank, formerly a development bank but now a quoted company. The IFC has also been active in the sector, extending a US$15m loan to the Balrampur Chini sugar company. Within India there are a number of larger, private, well-managed, dynamic sugar companies, such as Balrampur Chini, Thiru Arooran, Bajaj Hindustan, Dhampur Sugar, Sakthi Sugars, Triveni and SIEL (Shriram Industrial Enterprises Ltd). Such companies have access to international finance and financial services. Examples include Citibank's support of Sakthi Sugars' new venture in Orissa state, and the purchase of equity stakes in Balrampur Chini from the majority shareholder by Merrill Lynch and HSBC.

Thailand is also a major player in Asian sugar production. The largest milling group is the Thai Roong Ruang group, and other leading sugar producers are Mitr Phol, Wang Kanai and the Kwang Soon Lee Group. Almost all of the banks in Thailand serve the sugar industry with the exception of DBS Thai Danu and Kasikorn Bank. The leading banks in Thailand are Krung Thai Bank (government), Thai Military Bank (government), Siam Commercial Bank (private), Bangkok Bank (private) and Bank of Ayudyah (private). An important point to note in the case of Thailand is that bank lending to the sugar sector may not be voluntary, but may instead be made compulsory by the government.

Elsewhere in Asia and the Middle East, the Islamic Development Bank is an active financier of sugar production and trade, while in the **Philippines**, the Land Bank finances cane growers.

Africa

Africa is not a major sugar producing region. However, many African countries have a sugar industry that contributes to domestic supply, and a few (South Africa, for example) are significant in global terms. For commercial banks, financing African sugar production is a challenge. For international banks, country risk is clearly an issue, as is the creditworthiness of some companies. However, in general terms Standard Bank and Barclays are probably the major players among international banks involved with the sugar sector. At a national level, outside South Africa the capacity of the domestic banking system is often also limited. For this reason, international, regional or local (state-owned) development banks are involved in financing African sugar projects. In South Africa, Land Bank and the Development Bank of South Africa, together with the World Bank, have been looking at a new mill project targeted at raising the participation of the black community in the nation's sugar industry.

Africa's leading sugar companies, **South Africa**'s Illovo Sugar and Tongaat-Hulett (part of Anglo American plc) are financed by a number of large international banks. In October 2003 newswires reported that Illovo Sugar had secured a syndicated loan from a group of banks led by FirstRand Bank, ABSA, Bank of Tokyo-Mitsubishi, Barclays, Rabobank, Nedcor and RMB. In an earlier deal to finance the purchase of **Zambia** Sugar, the company obtained finance from a group of banks including Fuji Bank, Standard Bank and RMB. Standard Chartered Bank has also been reported in the press (August 2003) as a lender to Zambia Sugar. Figure 5.7 provides a summary of the interests of some key financial institutions operating in the region.

Figure 5.7 Institutions financing African sugar production

Institution	Country/company/project
Development Institutions	
OPEC Fund for International Development	Sudan (Kenana Sugar); Uganda (Kinyara Sugar)
European Investment Bank	Cameroon (Sosucam); Mozambique (Maragra)
Islamic Development Bank	Egypt (sugar imports); Uganda (Kinyara Sugar)
Development Bank of South Africa	South Africa (Makatini mill project)
Land Bank	South Africa (Makatini mill project)
African Development Bank	Swaziland (Komati dam)
PTA Bank	Zambia (Consolidated Farming); Uganda (Kinyara Sugar)
Local Commercial Banks	
Nedcor	South Africa (Illovo)
ABSA	South Africa (Illovo)
FirstRand Bank	South Africa (Illovo)
Mauritian Commercial Bank	Mozambique (Marromeu)
International Banks/Institutions	
Rabobank	South Africa (Illovo)
Barclays	South Africa (Illovo)
Fuji Bank	Zambia (Illovo)
Bank of Tokyo Mitsubishi	South Africa (Illovo)
Standard Bank	South Africa (Illovo)
Salomon Smith Barney	South Africa (Anglo American/Tongaat Hulett)
Old Mutual plc	South Africa (Anglo American/Tongaat Hulett)

In **Uganda**, the rehabilitation of the Kinyara sugar factory was achieved with funding from a consortium comprising the Islamic Development Bank, Kuwait Fund, OPEC Fund, Saudi Development Fund, PTA Bank, Uganda Development Bank, East African Development Bank and the African Development Bank. In **Mozambique**, the rehabilitation and expansion of the sugar industry has been encouraged by loans from the Development Bank of Southern Africa. Commercial banks (Standard Corporate Merchant Bank, Mauritian Commercial Bank) have also been involved, as well as local Mozambican banks. The European Investment Bank has also lent money to finance development in the Mozambican sugar industry. Other European Investment Bank loans to African sugar producers include EUR 15 million to Societe Sucriere du Cameroun (Sosucam) for the rehabilitation of the N'Koteng sugar complex in **Cameroon**, including rehabilitation of 7700 hectares of rain-fed sugar cane plantation and refurbishing the factory. Other financial players involved with African sugar producers include the Aga Khan

Development Fund (which operates a sugar mill in **Burkina Faso**) and the OPEC Fund for International Development (loan to **Sudan**'s Kenana Sugar).

Latin America and the Caribbean

Brazil is the dominant sugar producer in this region. The major players are highlighted in figure 5.8 (bearing in mind that Copersucar and Crystalsev are marketing groups of independent mills – Cosan is the largest single sugar and ethanol company). Local banks are major players in financing production (Banco do Brasil, Bradesco, Unibanco, Itau, Safra and Banco Rural). The largest international players are BancBoston and HSBC, though many more are present (e.g., ABN Amro, which owns Banco Real; Rabobank; Macquarie is particularly active in the marketing of price risk management products to sugar mills).

Figure 5.8: Major Brazilian sugar players by share of cane output

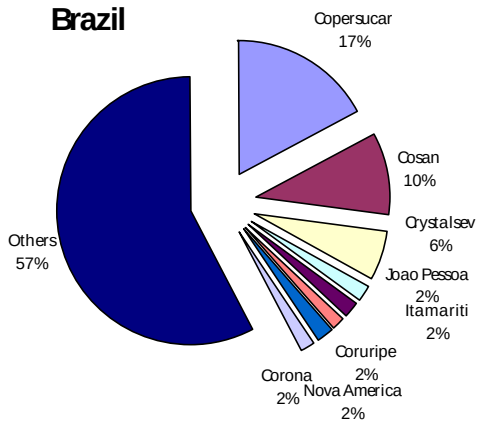


Figure 5.9 Institutions financing sugar production in Latin America and the Caribbean

Institution	Country/company/project
Development Institutions	
Caribbean Development Bank	Guyana (irrigation & industry expansion)
Development Bank of Jamaica	Jamaica (crop replanting)
IFC	Guatemala (Pantaleon); Colombia (Riopaila); Peru (Laredo)
Inter-American Development Bank	Argentina (small cane growers)
Local Commercial Banks	
Banco do Brasil (government)	Brazil (multiple)
Unibanco	Brazil (multiple)
Itau	Brazil (multiple)
Banco Safra	Brazil (multiple)
Banco Rural	Brazil (multiple)
Mercadorias y Valores	Colombia (Incauca, la Cabana)
International Banks/Institutions	
KBC Bank (Belgium)	Jamaica (sugar industry debt restructuring & rehab.)
Banc Boston	Brazil (multiple)
HSBC	Brazil (multiple)
ABN Amro (Banco Real)	Brazil (multiple)

Elsewhere in South America, Mercanicas y Valores arranged financing for **Colombian** mills Incauca and La Cabana on the basis of forward contracts for exports. IFC made a US$15m loan to Empresas Agroindustrial Laredo, a **Peruvian** sugar mill acquired by Colombia's second largest sugar producer Manuelita. In **Guyana**, the Caribbean Development Bank is committed to lending the state-owned Guysuco US$28m for industry factory expansion and upgrading and the extension of irrigation facilities on cane land. In **Jamaica**, Belgium's KBC Bank has extended credit to the sugar industry (with a government guarantee) for rehabilitation of mills and debt restructuring. The Development Bank of Jamaica is also involved in a programme to finance cane replanting in Jamaica. Elsewhere in the

region, in the mid-1990's the IFC became involved with **Guatemala**'s Pantaleon and Concepcion, while the Inter-American Development Bank recently provided a facility to assist **Argentina**'s smallholder cane growers. Figure 5.9 provides a summary of the interests of some key financial institutions operating in the region.

Traders and End Users

Sugar production and processing tend to be local or regional operations; there are hardly any companies that could be described as global sugar players. This is in stark contrast to international sugar trading, and to the production of major sugar-containing food products. A small number of large **trade houses** handle a large share of total international sugar trade (E D & F Man, Cargill, Sucden, Louis Dreyfus, Tate & Lyle International). Likewise, the world of **food processing** – particularly sugar-containing products such as soft drinks and confectionery – is dominated by a number of large companies (Nestlé, Unilever, Coca-Cola, PepsiCo, Cadbury Schweppes, Mars, Hershey, Kraft, Chupa Chups, Haribo, Perfetti van Melle).

The number of banks involved with these large players is enormous. In practical terms, large, well-capitalised companies with dominant positions in their own markets are very attractive customers for banks. This means that it is impossible to provide a shortlist of banks involved with these companies. For example, a scan of recent syndicated loans to major food industry players revealed the bank participation summarised in figure 5.10.

Figure 5.10 Financiers of selected food processing companies

Unilever	UBS, Deutsche Bank, BNP Paribas, Banca di Roma, Bank of America, Bank One, DG Bank, Fortis, Hypovereinsbank, KBC Bank, NAB, Rabobank International, West LB, Westpac and others.
Nestlé	Citigroup, Banco Santander, ABN Amro, Barclays, BNP Paribas, HSBC, ING, Societe Generale, UBS and others.
Cadbury Schweppes	ANZ, Bank of China, Bank of Sumitomo Mitsui, BBVA, Danske Bank, J P Morgan, Wachovia Bank, HSBC, Svenska Handelsbank, Toronto Dominion, Royal Bank of Scotland, Deutsche Bank.
Hershey	Bank of America, Citibank, Mellon, Sumitomo Mitsui Bank, UBS and others.

Other financial institutions involved with the quoted companies within this group are fund managers. Again, the list of participants is enormous, since companies such as Unilever, Cadbury Schweppes and Nestlé are members of one or more major indices that serve as benchmarks for investment managers. As a result, their shares tend to be widely held.

Other stakeholders

- International Sugar Organisation (charged with administering the 1992 International sugar agreement)
- National grower & miller federations
- International Federation of Agricultural Producers (IFAP)
- National multistakeholder programmes e.g. CRC Sugar, Australia.
- NGOs including WWF ('Thirsty Crops'; WWF Sugar Initiative); Fairtrade Foundation (Fairtrade standards); organic certification bodies; CAFOD, ActionAid and Oxfam (subsidies); IISD/UNCTAD Sustainable Commodity Initiative.

5.1.6 Macro issues facing and affecting production

World market characteristics: In real (i.e. inflation-adjusted) terms, world prices are on a long term declining trend, forcing players with exposure to the world market to reduce costs at the same rate in order to maintain margins. On top of this long-term trend, shorter-term imbalances in global supply and

demand have forced prices to low levels, exacerbating the pressure on players with world market exposure.

Protection and policy distortions: Sugar is a highly political commodity. Unlike many other agricultural commodities, it is produced both in the developing world and in the industrialised world. This makes the issue of trade in sugar complicated. In addition, because it is highly capital intensive, many countries implement policies designed to insulate domestic sugar industries from the world market in order to provide a more favourable environment for investing in growing and processing. Industrialised countries (the EU, the US, Japan) all operate highly protective sugar policies that provide domestic players with sugar prices far above world prices and keep world market sugar out of the domestic market. In addition, the EU is also a major exporter of sugar, something that some observers claim is purely a result of the high prices prevailing on the domestic market. For this reason, Brazil, Australia and Thailand have recently requested a WTO panel to look into EU sugar exports. However, the fortunes of the sugar industries in a number of developing countries (ACP, EBA) also hinge on the future of EU sugar policy in particular. These include Swaziland where sugarcane comprises over half of agricultural output, and Mozambique, where sugarcane is the single largest source of employment. Many of these industries only survive thanks to their access to this high-priced market. Left to compete at world market price levels, few are equipped to survive. More generally, the level of support provided by individual governments to their sugar industries affects the level of world market prices when the countries in question are major players. If domestic support measures mean that producers become insensitive to world price levels, it is hard for the price mechanism to correct problems of oversupply. Exacerbating this problem in the case of sugar is the semi-perennial nature of sugar cane as a crop, and the effect of volatile exchange rates on the transmission of price signals from the world market (dollar-denominated) to growers in exporting countries.

Future developments: Achieving major changes in any agricultural policy is a slow and hazardous business. However, even in a more liberal trade environment, the world sugar market would probably remain volatile; export availability will still be concentrated in relatively few countries, and the weather and fluctuating exchange rates will always add a degree of uncertainty to the picture. Moreover, owing to the pre-eminence of Brazil as an exporter to the world market, the pressure on world market prices is likely to be sustained, maintaining the long term downward trend in real world market prices.

5.2 Key sustainability impacts

Significant sustainability impacts in the sugar sector occur both at production and processing levels. They inevitably differ between beet and cane production, and can vary considerably between locations, depending on local circumstances. However, there is a reasonable level of consensus on the key impacts of the sector as a whole. The order of the following list is not intended to reflect an assessment of priority, for two reasons: Firstly, although there are numerous case studies and other sources identifying impacts, there are currently no assessments of how common (or severe) each of the impacts is over a wide geographical range. Secondly, it is likely that the severity of each impact will differ between production locations. Nevertheless, all have been reported as significant in one or more instances.

5.2.1 Environmental impacts

The main environmental impacts for both cane and beet relate to water consumption, water pollution, and soil impacts. In addition, cane harvesting can be associated with air pollution. In comparison with many other commodity crops, pesticide use is relatively low, and chemical application is mainly restricted to herbicides.

- **Water consumption and reduced water flow:** This is associated particularly with the growing of cane, and also in the processing of both cane and beet. Sugarcane is a deep-rooted crop and uses a lot of water; it is extremely sensitive to soil water deficits. In many areas, it is usual for 100% of water demand to be provided by irrigation, although in other areas (e.g. KwaZulu-Natal in South Africa) it is rain-fed. Even in areas where sugar cane is not irrigated, the crop can have a great impact on river flow as it reduces run-off from the catchment into rivers and draws heavily on ground water resources. A recent study of irrigated agriculture in selected river basins of high importance for biodiversity for WWF ranks sugar as the third 'thirstiest' commodity crop, typically requiring 1,500-3,000 litres per kg of crop. Ecosystems impacted by reduced water flow caused by sugarcane include the Indus Delta in Pakistan, the Godavari River Basin in India, and the Konya Closed Basin in Turkey. Sugar processing involves many stages that require water; beet processing can consume significant amounts of water given the quantity of soil that remains attached to the roots at harvest.
- **Water pollution:** The impacts of water consumption on ecosystems are generally coupled with water quality and effluent run-off problems, whether the crop is irrigated or rainfed. Watercourses can be polluted by agrochemicals and sediments; in some cases these impacts can extend to downstream ecosystems. These issues are prominent in the Everglades in the USA, and examples have been cited elsewhere, e.g. Australia and South America. Australian sugarcane production is located on a narrow coastal strip in close proximity to the Great Barrier Reef. Water pollution is also a noted impact of cane and beet processing. Here the main pollutants are water-borne organic matter and solids, which can affect groundwaters, rivers and wetlands. Sugar mills generate about 1,000 litres of wastewater for per tonne of cane crushed. Sugar mill effluent from both cane and beet has a high BOD (Biological Oxygen Demand); effluents are also high in suspended solids and ammonium. Example: three sugar factories next to River Nyando in Kenya led to decline in quality of source of drinking water to many families on its way to lake Victoria, and nutrient over-enrichment of Lake Victoria.
- **Air pollution from pre-harvest burning of cane:** Burning of cane to speed harvest causes air pollution and increases erosion. Burning can be avoided by harvesting green cane, a practice which has spread from Cuba to Brazil and Australia – it also improves soil fertility, reduces use of herbicides, and provides more residue for use as fuel, animal feed or raw material. But cutting green cane manually is much harder work than cutting burnt cane. Furthermore, burning the cane helps to clear the cane of snakes (where they are a problem) before the cutters move in. For the most part, green cane harvesting tends to be mechanised rather than manual, and cannot therefore be implemented by all industries owing to issues of cost, suitability of terrain etc.
- **Air pollution and solid waste from processing cane:** Most sugarcane mills use bagasse (fibrous waste produced during the milling of cane) as fuel in boilers, which produces particulate matter, nitrogen oxide and sulphur. While this has the environmental benefit of using renewable energy, if

pollution control equipment is not installed, fly ash escapes to the atmosphere and can affect the population with irritation in eyes, nose, throat and lungs, and can damage crops. Lime sludge and press mud are important solid waste generated by sugar mills (lime is used for purifying sugarcane juice; impurities from sugarcane juice are either vacuum filtered or press filtered and removed as press mud). Solid wastes are also generated from pollution control facilities.

- **Soil impacts:** Soil erosion has been associated with both beet (where fields are left bare over winter, exacerbating loss to wind and water erosion) and cane growing (particularly where cane is cultivated on slopes). Beet harvesting can also cause a significant removal of soil with the roots. Declining soil quality is associated with both cane and beet production, due to soil compaction, loss of organic matter, salinisation and acidification. Given that sugarcane is grown as a monoculture, loss of soil fertility can be a problem.

5.2.2 Social impacts

The social impacts associated with sugarcane production are among those common to many tropical commodities, particularly related to income, employment and labour conditions.

- **Low prices and development outcomes:** Sugar production plays a key role in the economies and employment of least developed countries. Low domestic or export prices have knock-on effects on field and production labour. Where production is predominantly small-scale, e.g. India, Thailand and Mexico, producers are particularly at risk of disruption to their subsistence portfolio.
- **Poor working conditions:** Working in sugarcane plantations can be backbreaking work with very poor wages. There may be significant exposures to agrochemicals, especially herbicides, although this is less of a problem than with many other commodity crops.
- **Child labour and indentured labour:** According to the ILO and the Central Bureau of Statistics there are 1.9 million child labourers in Western Kenya but the number of child labourers could be as high as 5 million. Child and bonded labour is also reported to be a significant issue in the Dominican Republic (labourers from Haiti); and in sugar fields and processing factories in Maharashtra, India.

5.3 Prospects for taking a BMP approach

5.3.1 Which of the key impacts a BMP approach could seek to address

A BMP approach could feasibly seek to address all the key environmental and labour issues listed above, in relation to growing, harvesting and local primary processing (see examples below). The roots of those social issues that are related to incomes and prices are more systemic, and are likely to be beyond the scope of a BMP approach, unless this includes conditions relating to fair trade. However, even then, barriers remain at the macro political level in terms of subsidies and quotas (see section 5.5 below).

- **Water consumption and reduced water flow:** Use of appropriate irrigation system (furrow irrigation vs. overhead or trickle systems) correctly calibrated to soil type and scheduled correctly; green cane trash blanketing to slow water movement and retain moisture at roots; tailwater recycling. With respect to processing, recycling water in cane mills and beet factories;
- **Water pollution:** For farming, tailwater recycling to minimise run-off and trap sediments, nutrients and chemicals; with regard to processing, UNIDO report from Mexico that water consumption can be reduced by 94% with production losses below 10% with the right controls. Waste water can be pre-treated through screening/settling of wastes or using bio-filters, as encouraged by WWF with the Zambian sugar industry in its work to restore 50,000ha of the Kafue Flats by lowering nutrient levels and therefore reducing the growth and spread of water hyacinth.
- **Air pollution from pre-harvest burning of cane:** Burning can be avoided by harvesting green cane, a practice which has spread from Cuba to Brazil and Australia – it also improves soil fertility, reduces use of herbicides, and provides more residue for use as fuel, animal feed or raw material. But cutting green cane manually is much harder work than cutting burnt cane. Furthermore, burning the cane helps to clear the cane of snakes (where they are a problem) before the cutters move in.
- **Air pollution from processing cane:** Installation of emission reduction systems for boilers that use bagasse.
- **Solid waste from processing:** Recycling and reuse of mill mud and boiler ash from mills can provide plant nutrition and soil improvement benefits.
- **Soil impacts:** Terracing on slopes, reduced tillage.
- **Low prices and development outcomes:** Fairtrade trading conditions; outgrower schemes (e.g. facilitating smallholder access to irrigable land near sugar processing plants, financing and extension assistance).
- **Poor working conditions and worker welfare:** Commonly agreed labour standards and principles, e.g. non-discrimination; freedom of association and collective bargaining; reasonable pay and conditions; and occupational health and safety. For plantations, welfare services may include schools, health centres/clinics, places of worship and purpose-built housing with appropriate electricity and sanitation.
- **Child labour and indentured labour:** Strategies to eliminate indentured labour and worst forms of child labour and to ensure access to education alongside a safe working environment for children where child labour is necessary.

5.3.2 To what extent there is agreement on BMPs

There appears to be little disagreement in terms of BMPs, as long as there is sufficient flexibility built in to any BMP to allow for local needs and variations. The most contentious issues remaining are at the macroeconomic and political level, with respect to subsidies, oversupply and dumping. While there remains little progress on these structural issues, attention is focused away from environmental, labour and terms of trade issues.

5.3.3 To what extent different BMPs would be required for different types of producers and different regions

The global spread of sugar production means that it is more useful to analyse environmental and social impacts by crop and production system rather than by production region. Clearly, different sets of BMPs

would be required for cane and beet production and processing. Generally, BMPs for beet production simply need to be in line with good practice for temperate, mechanised agriculture within a crop rotation system, with some specific elements e.g. in relation to soil loss at harvest. BMPs for cane are more likely to be crop-specific. Furthermore, differences in topography, climate, water availability and farm size will inevitably mean that the severity of environmental and social issues – and the choice of solutions – will be locally specific. For example, river basins identified as being critical for biodiversity are likely to need stricter BMPs than other regions. A forthcoming review for WWF[63] provides a comprehensive overview of the environmental impacts of sugar production and measures to reduce these impacts. It notes that many of the impacts of the cultivation of sugar crops in any one place are significantly influenced by local conditions, such as soil type and climatic factors. It suggests that guides to BMPs must therefore develop recommendations based on site-specific considerations, and combine these with more widely applicable, generic recommendations.

One key factor defining the appropriateness of some BMPs in sugarcane is the level of mechanisation. This relates particularly to employment and labour issues, but also some environmental impacts. For example, green cane harvesting (which eliminates air pollution from burning) tends to be mechanised rather than manual, and cannot therefore be implemented as easily by all producers owing to issues of cost, suitability of terrain etc. In addition, processes for implementing and administering BMPs may differ according to farm size, to ensure cost-effectiveness. However, the sustainability issues in relation to sugar cane are relatively homogeneous and it is reasonable to suggest that a standard set of BMPs would be broadly appropriate for different types of producers in different regions, as long as some flexibility was maintained at the implementation level to suit local circumstances and the scale and mode of production.

5.3.4 Examples: Where BMPs have already been identified and/or implemented

Initiatives that have sought to implement BMPs in relation to one or more of the key issues include niche market certification schemes, national sectoral guidelines for BMPs, outgrower schemes and support for small-scale growers, and industry association codes of practice.

Certification schemes

Fairtrade: Fairtrade standards have been developed by Fairtrade Labelling Organizations International for cane sugar. In line with usual Fairtrade practice, separate protocols exist for hired labour situations and small farmers' organisations[64] – although even for the latter, standards on labour conditions are applicable if the organisation employs a considerable number of workers. The standards for hired labour situations do not include any specific standards related to sugarcane beyond the generic Fairtrade standards, whereas for small farmers' organisations there is a specific protocol describing standards for cane sugar. Both protocols include measures related to social development, economic development, environmental protection and labour conditions. The environmental conditions have a minimum requirement equivalent to national and international legislation regarding the use and handling of pesticides and other hazardous chemicals, protection of natural waters, virgin forest and other ecosystems of high ecological value, erosion and waste management. They exclude the use of certain pesticides. They also have a 'progress' requirement that producers should implement a system of Integrated Crop Management and producers are encouraged to work towards organic certification. In addition to these generic standards, the cane sugar protocol includes specific 'trade' standards, as follows:

- Product characteristics (polarisation and humidity).
- Long-term and stable business relationships, confirmed by exchange of binding Letters of Intent not later than three months prior to harvest and renewed annually.
- Credit facilities provided by the buyer of up to 60% of the minimum value of the contract.

[63] Cheesman, D. (forthcoming) *The Environmental Impacts of Sugar Production*, review prepared on behalf of WWF, CABI Bioscience, Egham. Further reviews are being carried out at national level e.g. in India and Pakistan.
[64] These are understood as those producers that are not structurally dependent on permanent hired labour, managing their farm mainly with their own and their family's labour-force.

- Minimum FOB prices (US$480/MT for raw sugar; US$520/MT for white sugar; US$650/MT for whole raw sugar; plus a premium of US$120/MT for certified organic sugar being sold as such).[65]

Third-party processing arrangements must assure a transparent product flow from sugarcane to sugar and a fair processing agreement, guaranteeing producers a major part of the prices generated through Fairtrade sales.

Organic: Despite the costs and risks involved in conversion to organic production, world output of organic sugar has experienced rapid expansion from only a few thousand tonnes in the mid-1990s to around 50,000 tonnes in 2000.[66] Brazil is the world's leading producer of organic cane sugar. Organic cane has been produced in the following regions:
Africa: Madagascar, Malawi, Mauritius
Asia: Philippines, India[67]
South America: Argentina, Bolivia, Brazil, Colombia, Paraguay
Central America: Costa Rica, Dominican Republic (and there are reports that Cuba plans to convert one mill and estate to exclusively organic production)
North America: USA

National sectoral guidelines

Australia: The Australian Canegrowers Council has approved a Code of Practice for Sustainable Cane Growing, in collaboration with the Cooperative Research Centre for Sustainable Sugar Production, a joint venture representing the growing and milling sectors of the sugar industry, public research, research organisations and universities. As well as providing technical advice on best practice in relation to fertiliser use and water use efficiencies, the Code includes recommendations related to:

- Developing new land – ensuring suitability of land for cane production; developing a farm plan; leaving uncleared areas and stream bank vegetation; drainage systems and protection of wetlands.
- Established farms – developing a farm plan; vegetation management; soil and fertiliser management; irrigation (furrow irrigation, overhead irrigation, green cane trash blanketing, tailwater recycling, irrigation scheduling, treating wastewater); drainage; weed, pest and disease control (integrated pest management; rat control; feral animals); fire management; timing of operations and notifying neighbours; use and storage of fuel and dangerous goods; waste management; on-farm monitoring.

Interestingly, BMPs are promoted as a means of reducing growers' potential legal liability. The Canegrowers Council encourages growers to adopt the BMPs included in the Code of Practice as a means by which they can comply with their environmental duty under the Environmental Protection Act 1994, noting that "growers who have followed this code will have improved prospects of successfully defending any legal actions brought against them in relation to environmental harm". Furthermore, the Australian Sugar Industry Act includes provision for land assigned to sugarcane production to have environmental conditions attached, and for such allocations to be revoked if the conditions are not met.

South Africa: The South African Sugar Association (SASA) has drawn up a set of 'Standards and Guidelines for Conservation and Environmental Management in the South African Sugar Industry', which are widely regarded as the most comprehensive and progressive set of environmental BMPs available for sugar production.[68] It is promoted in the form of a manual for growers, with advice and

[65] Country-specific conditions exist for sugar from Paraguay and Malawi, where sugar is exported by private sugar mills not belonging to FLO Certified Cane Producers and where there is no minimum FT price.
[66] Although this signifies significant growth, it should be noted that this figure still represents under 0.5% of total production.
[67] It has been reported that organic production would start on 50% of Karnataka's area under cane; other major cane growing states like Maharashtra and Tamil Nadu have also started to switch production (International Sugar Organisation 2001 *Organic Sugar – Niche Product in the Mainstream Market*, from an article by Sergei Gudoshnikov, Economist, International Sugar Organization, published by FO LICHT International Sugar and Sweetener Report, Vol 133 No 22 of 24th July 2001).
[68] They have, nevertheless, attracted some constructive criticism from local environmental organisations for still not going far enough on the management of existing biodiversity assets, identifying and managing economically marginal areas, and reducing impacts on freshwater resources. A more fundamental criticism is that very few

technical information on environmental issues, management practices and legislation. The manual includes information and recommendations related to:

- Field Practices – soil conservation (land use planning; waterways; terracing; tillage; trashing; strip harvesting and replanting; storm water drains); cane extraction (road siting; construction and maintenance); land preparation (tillage; row alignment, etc.); planting (varieties; strip planting, etc.); weed, pest and disease control; use, storage and disposal of agrochemicals; harvesting operations; burning and trashing; crop nutrition; fire protection.
- Water – protection of wetlands and watercourses; irrigation (registration and licensing; efficient and appropriate application; water quality; salinity; irrigation supply; water storage); drainage.
- Air Pollution (cane burning)
- Soil – soil identification; soil depth and loss; erodibility; moisture content; physical and chemical properties; nutrient levels; toxic levels of heavy metals; soil compaction.
- Traffic regulations and cane spillage
- Facilities for employees – employee village sites (accessibility; water supply; depth of water table); employee village management (water supply; sewage; rubbish disposal; recycling; hygiene training; sport and recreational facilities); employee village design and other facilities; employee environmental education.
- Farm pollution and litter control; pollution and safety issues in relation to farm workshops and organic fertiliser storage.
- Management and use of natural resources, cultural assets and public recreation facilities – identification and management of flora and fauna; public recreation facilities; wildlife management; access control; information and education.
- Environmental management systems audits
- Environmental structures in the sugar industry.
- Relevant international conventions and local legislation.

Outgrower schemes and support for small-scale growers

Tanzania: The Kilombero Sugar Company, owned by South African company Illovo Sugar Ltd, has developed a community development programme based on the expansion of sugar cane outgrowers. The company leases land to a newly formed 'Kilombero Community Trust', which acts as a conduit for external funding. Grants for infrastructure are provided by the Swiss Agency for Development and Cooperation, and the company has entered into a partnership with the IFC to provide capacity building to the local community to develop SMEs that provide supporting services.[69]

South Africa: South African sugar companies and established farmers have developed various initiatives in line with the national political goals of black economic empowerment and supporting emerging growers. Illovo Sugar Ltd and Tongaat-Hulett Sugar Ltd, in collaboration with Ithala Development Finance Corporation, launched a project in 1996 that releases land owned by the two sugar companies and provides finance for black commercial farmers. Small-scale suppliers to a mill in KwaZulu-Natal have created a cooperative that is supported by neighbouring commercial farmers who act as mentors and advisors, a model that may be replicated elsewhere.

Industry Association Codes of Conduct

Europe: In 2003 the European Sugar Industry body CEFS signed a joint code of conduct with trade unions setting out voluntary minimum standards on human rights, education/training, health and safety, labour relations, fair pay, working conditions, restructuring and business relationships.[70]

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growers are implementing the BMPs, and that SASA does not have the capacity to encourage their use. It is suggested that applying an environmental management system and certification could go some way to resolve this (pers. comm. Damian Walters, Mondi Wetlands Project).

[69] www.illovosugar.com.

[70] www.cefs.org/en/responsab/welcome.htm.

5.4 Obstacles to the adoption of BMPs

5.4.1 Producer level

- **Fluctuating and declining prices:** World prices are volatile and on a long-term declining trend, currently exacerbated by shorter-term imbalances in global supply and demand. Some producers and processors are exposed to sugar price risk. Countries such as Brazil, Thailand, China and India have increased their production by at least 1 million tonnes in the last year. Also contributing to declining prices are the subsidies provided to European producers and the competitiveness advantages of Brazilian exporters over other cane producers. Australian sugarcane farmers report that low prices are leading to a prioritisation of productivity gains over the reduction of land and water degradation.
- **Lack of financial incentive to implement BMPs:** Against this background of intense competition and declining prices, growers are unlikely to adopt BMPs unless this contributes to productivity or reduced costs. Some BMPs will inevitably incur greater costs, at least in the short-run. For example, the Mauritius Sugar Syndicate notes that organic cane yields are markedly below those of conventionally grown cane with an average 20 per cent drop in yields. But there are indications that productivity improves in the long-term – according to Brazilian producers of organic sugar, the productivity of Sao Francisco's plantation already exceeds that in the traditional growing regions of the Sao Paulo state. Other BMPs may result in direct efficiency gains through minimising inputs, e.g. IPM. But many of the potential savings will only result where there is a cost associated with poor practice (e.g. prohibitive water pricing).
- **Small-scale production:** The existence of many small-scale growers is a barrier to adoption, given that smallholders are less likely to be able to access technical knowledge, finance and other capacity for investing in BMPs. Dissemination efforts and technical support are therefore likely to be necessary. Prospects for using the processor-grower relationship for such activities are a possible way forward here, but this remains relatively unexplored. The extent to which a pro-poor mechanism can be incorporated into value chain and financing arrangements could be crucial.
- **Level of mechanisation:** Some BMPs are associated with mechanised production systems. For example, green cane harvesting tends to be mechanised rather than manual, and cannot therefore be implemented by all industries owing to issues of cost, suitability of terrain etc.

5.4.2 Throughout the value chain

- **Limited proportion of sugar traded:** Only about 30% of sugar production is traded internationally. Thus, attempts to change production practices need to take into account domestic as well as international markets, where points of leverage may be quite different. It is notable, however, that some proportion of domestic sugar consumption will be accounted for by multinational food and drink manufacturers, with respect to whom the most useful point of leverage may be at corporate rather than national or local level anyway.
- **Limited proportion of direct supplier-buyer relationships:** Relationships between growers and end users range from direct business-business relationships, outgrowers and contract growing, informal arrangements with small producers, to commodity exchanges. In the case of commodity exchanges and informal buying relationships, there is less scope for traceability and market signals for the implementation of BMPs.
- **Global fragmentation of processing:** While there are key players at country and possibly regional levels, there are no true global players within sugar processing. This makes intervention at the otherwise influential processing level more difficult. The emergence of refinery capacity in third countries (away from the location of production) may reduce further the perceived connection between sourcing policies and social and environmental impacts of production.
- **Lack of visibility at consumption level:** In industrialised countries, 70-80% of sugar consumption is in processed food and drinks. This means that most sugar is 'invisible' to consumers, and is not bought as a discrete product, thus reducing scope for consumer-led pressure through the value chain. Where products are closely identified with sugar and can be produced with other

'sustainable' ingredients (e.g. Fairtrade or organic chocolate), there is more scope for consumer-led pressure.

5.5 Preconditions for the successful adoption of BMPs

Identifying and gaining widespread agreement on BMPs should be relatively straightforward, given that the key social and environmental impacts, and their solutions, are generally accepted. The real issue is that of incentives. Preconditions for creating the incentives for the adoption of BMPs include:

- **Reforming the political and macroeconomic framework:** As noted above, while there remains little progress on the structural issues of subsidies, oversupply and dumping, attention is focused away from environmental, labour and terms of trade issues. Depressed prices and squeezed margins at the production level reduce the scope for investment in BMPs.
- **Identifying and creating points of leverage:** There are currently few market or regulatory signals that provide clear messages to growers that they should adopt BMPs. There is a need to identify existing points of leverage, and where necessary, create further ones. Possible points of influence worth exploring further include the following:
  - **Processors:** It is notable that sugar millers have considerable influence over those growers who sell them sugarcane, which may possibly be harnessed to change production practices.[71]
  - **Response to legislation:** As in Australia, BMPs can be promoted as a defence for sugar growers against future liability with respect to environmental legislation.
  - **Threat of future legislation:** Perkins (2004) notes that several parties in Southern Africa have expressed interest in producing and selling sustainable sugar, in part to prevent legislation that would require a licence to grow sugar.
  - **Traders & buyers' ethical and environmental codes of conduct:** Where buyers are high-profile multinational companies who have developed codes of conduct in order to protect their brand value, there may be scope for extending this influence up the supply chain. For example, Tate & Lyle's Business Code of Conduct states "We will give strong preference to dealing with commercial partners who demonstrate their commitment to the principles of this code by accepting compliance as a contractual requirement". Given the small number of large trade houses that handle a large share of the total international sugar trade, and the few large companies that dominate sugar-rich food and drink sectors such as soft drinks and confectionery, this approach is worth exploring further.
- **Getting buy-in from stakeholders:** The overriding precondition to creating incentives for the adoption of BMPs in the sugar sector is gaining a commitment from the many players within the sector. The fact that campaigning groups' attention has been focused on the political and macroeconomic debate means that there has been little pressure on commercial sugar players to recognise and adopt BMPs. There are now opportunities to build engagement in alliance with two parallel initiatives, both planning to drive action on BMPs in relation to sugar, possibly eventually within a broader agricultural stewardship council that would also cover other priority commodities such as palm oil and cotton. These are the WWF Sugar Initiative (cf. Perkins 2004) and the IISD/UNCTAD Sustainable Commodity Initiative. Both initiatives have expressed interest in exploring the possibility of partnership with the IFC/WWF-US initiative, and there has also been some initial discussion between the two.

5.6 Risks of adopting a BMP approach

The key risks of adopting a BMP approach in the sugar sector include the following:

- **Allocation of costs:** Given few, if any, financial incentives for the adoption of BMPs, there is a risk that the burden of any associated costs will fall disproportionately on producers, with little if any compensatory financial return.
- **Beet/cane split:** Given that the environmental and social issues associated with beet and cane respectively are so different, any attempt to introduce BMPs that are relevant only to sugarcane is likely to exacerbate a sense of unfairness on the side of cane producers who already feel that they

[71] Perkins 2004 Sweeter Partnerships? How can WWF engage internationally to achieve its freshwater objectives in the sugar sector?

have to compete unfairly with subsidised beet producers. If a focus on BMPs for cane is likely to tilt the market in favour of sugar beet and therefore OECD cane production (e.g. Australia), the employment and development arguments in favour of LDC cane production will need to be brought into the picture.

- **Exclusion from markets:** If a BMP becomes a market-entry standard, or a means to a premium, there is a risk of any producers that are unable to implement it being excluded from markets. This is potentially particularly significant for small growers who may not have sufficient capacity. Any BMP approach should therefore be appropriate and realistic for both small and large growers, and backed up with necessary extension and support.
- **Compounding existing competition:** BMPs have the potential simply to increase the existing dichotomy between those who can compete at current world market prices (e.g. Brazil) and those who can't. Where growers go out of business or no longer have the resources to invest in sustainable production, this may have negative social and environmental impacts that outweigh the benefits of implementation of BMPs elsewhere.
- **Continuing lack of incentives:** There is a risk that producers continue to have any incentive to change practices given the macroeconomic situation. Any investment in promoting BMPs is likely to be wasted without creating sufficient incentives for adoption.
- **Not tackling the worst producers:** As with any voluntary mechanism, there is a danger that a BMP approach simply recognises existing good practice of responsible growers rather than tackling the worst practices of irresponsible growers.

5.7 Strategic Choices

There are a number of strategic choices facing an initiative seeking to promote a BMP-based approach in the sugar sector.

#1 Seek to drive the adoption of BMPs from the supply or demand side?
As noted above, there are various possible points of leverage for the adoption of BMPs, including actual or threatened legislation; processors; traders and buyers. A key decision is whether BMPs are promoted through direct engagement with and support of producers, or indirectly through the supply chain or the financial community. The former is more likely to encourage a sense of ownership and buy-in from producers, although it is less likely to create the level of incentive that the latter may create.

#2 Whether to engage with the macroeconomic/subsidies debate?
Without addressing the contentious debate on subsidies, price and oversupply, any initiative may be seen at best as irrelevant and at worst counter-productive, in the sense that any investment in BMPs could be an additional and unrewarded cost. But engaging in this debate also has the potential to divert attention away from production practices.

#3 Whether to engage with other parallel initiatives?
As noted above, there are moves to develop two parallel initiatives on similar ground – the IISD/UNCTAD Sustainable Commodities Initiative, and the WWF Sugar Initiative. Engaging and collaborating with either of these initiatives would have reputational, managerial and institutional implications, and care would need to be taken to ensure that the goals of each initiative are complementary. But failing to engage with these initiatives runs the greater risk of diluting energy and commitment among industry stakeholders, and of failing to develop an authoritative set of BMPs and agenda for implementation.

#4 Whether to take a regional or a global approach?
The dispersed nature of sugar production and lack of global players at the production level (as opposed to trading and manufacturing) means that it would be very difficult to hold a dialogue at global level that involved all relevant stakeholders. The regional focus of the financial community's interventions at project level adds to the sense that a global approach would be over-ambitious. But many of the social and environmental issues apply similarly to cane production in all regions, and there is considerable

scope for shared learning – not to mention unnecessary duplication. Likewise, the question of whether an initiative should take account both of cane and beet production needs to be explored in depth.

#5 Whether to take an area-wide or fully traceable approach?
In order to establish recognition in the market for sugar grown according to BMPs, certification and segregated chains for sustainable commodities may be necessary. A future BMP initiative should consider the pros and cons of working with existing markets rather than investing in alternative supply chain structures or ensuring full chain of custody traceability. Several models exist, ranging from:

- *certification and segregation* of sustainably-produced sugar. This provides the best guarantee that any sugar really does come from a producer or processor that implements BMPs, but runs the risks of losing the benefits associated with commodity markets (scale and efficiency) and incurring the costs of establishing and monitoring a dedicated chain of custody within traditional complex supply chains;
- an *area-wide approach*, where production areas are targeted for BMP adoption and so the entire production of the area can be mixed and bulked. This allows most of the benefits associated with the commodity markets to be maintained, but runs the risk of unsustainably produced sugar entering into the 'sustainable' sugar;
- a '*pool*' system, where a buyer pays the premium to the sustainable producer, but without taking physical delivery of sugar from that producer. Instead, the producer's sugar would be bulked with others in the normal way, and the buyer would buy from the 'pool' as usual (a mechanism analogous to that used in buying 'green' electricity). This has not yet been implemented for any commodity and may provide insufficient stimulus for widespread BMP adoption.

#6 Whether to aim for a system that is visible to consumers or only to processors?
As noted above, sugar's lack of visibility at consumption level given that most sugar consumption is in processed food and drinks means that a consumer-facing initiative would be a significant challenge. If a BMP initiative did aim for a certified, traceable approach, experience from other sectors suggests that it may make more sense for labels to be targeted at buyers and processors rather than consumers.

5.8 Further reading

Australian Canegrowers Council (1998) *Code of Practice for Sustainable Cane Growing in Queensland*, at www.canegrowers.com.au/environment/codeofpractice.pdf

Cheesman, D. (forthcoming) *The Environmental Impacts of Sugar Production*, review prepared on behalf of WWF, CABI Bioscience, Egham.

International Sugar Organisation *Sugar and the Environment* (Survey of relevant environmental legislation), 12 November 2001, ISO, London.

Perkins, R. 2004 *Sweeter Partnerships? How can WWF engage internationally to achieve its freshwater objectives in the sugar sector?* Dissertation for the Postgraduate Certificate in Cross-Sector Partnership course.

South African Sugar Association (2002) *Standards and Guidelines for Conservation and Environmental Management in the South African Sugar Industry*, available at www.sugarindustrydev.co.za/pdf/enviro.pdf

Sustainable Commodities Initiative at www.iisd.org/trade/commodities/sci.asp

Sustainable Development Commission 2003 *Sustainability of Sugar Supply Chains (including a report from the Natural Resources Institute to the Sustainable Development Commission)*, SDC, London.