

Biofuel finance

Global trends in biofuel finance in forest-rich countries of Asia, Africa and Latin America and implications for governance

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Key points

- Since 2000, US\$ 2.0-2.7 billion has been invested in feedstock cultivation for biofuel in 16 forest-rich countries, mostly in oil palm and sugarcane. An additional US\$ 5.7-6.7 billion has been invested in biofuel production, especially sugar-based ethanol.
- While investments in some countries are driven by domestic policies to reduce fossil fuel imports, most are export driven. Sugar-based ethanol offers more opportunities to capture value added than biodiesel feedstocks which are amenable to export and processing abroad.
- Financing sources for biofuel and related feedstock investments are very diverse, involving domestic and foreign entrepreneurs, state-owned companies, government agencies, public and private banks and institutional investors. Foreign investors play an important role in most forest-rich countries, especially in Africa.
- To sustain growing demand, significant amounts of new investment are anticipated.
- Most investors are not yet effectively addressing sustainability challenges in the biofuel sector because they lack responsible investment policies or they are insufficiently robust. Only a few banks have developed responsible investment policies specifically on biofuels.
- The private financial sector has not yet followed multilateral financial institutions in creating mediation procedures to address grievances of people harmed or potentially harmed by projects financed by their institutions.
- Responsible investment instruments in the biofuel sector need to be based on an internationally agreed set of principles, criteria and indicators which are measurable, reportable and verifiable; should be applied to all forms of private and public finance provided to all companies in the supply chain; and should be strengthened by independent compliance and monitoring processes.
- Governments should stimulate and support private financial institutions to develop and apply sound responsible investment policies and instruments.

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1. Introduction

The global biofuel sector grew considerably in the 2000–2009 period, driven primarily by concerns about fossil fuel prices and availability, a renewed quest by many countries for energy independence and widespread awareness of the need to reduce greenhouse gas emissions (UNCTAD 2009). Global production of ethanol (as a gasoline substitute) increased from 11.0 million tonnes of oil equivalent (toe) in 2002 to 38.4 million toe in 2009, of which 53% was produced in the United States, 34% in Brazil and 4% in Europe (BP 2010). Global production of biodiesel increased from about 2.2 million tonnes in 2002 to a forecasted 19.1 million tonnes in 2010, with an estimated 51% being produced in Europe, 11% in Brazil, 10% in Argentina and 9% in the United States (ISTA Mielke 2010).

While Brazil and Argentina are important biofuel producers, most developing countries do not play a significant role in supplying biofuels to global markets; however, they do increasingly supply feedstocks. At present, 13% of Europe's feedstock demand for biodiesel production is covered by soybean oil imports, while 5% is covered by palm oil imports. Due to growing demand for biodiesel in Europe, China and India, these regions are projected to import increasing volumes of feedstocks from developing countries (MVO 2009; ActionAid 2010).

To finance the expansion of biofuel and feedstock production, large investments are needed. While private investors play a significant role, the sheer volume of capital needed requires large investors such as commercial banks, pension funds, private equity funds and development banks. Without the active involvement of these investors, the recent growth of the biofuel sector would not have been feasible and current growth rates will not be sustained.

As reported by a large number of studies, this strong growth is not without serious problems. Firstly, the carbon dioxide reduction achieved by biofuels derived from various feedstocks can differ and is not always substantial (European Union 2009; GBEP 2009).

The rapid increase in feedstock production for biofuels, in combination with the demand for the same or competing feedstocks for food, animal feed and other purposes, also creates risks for forests, biodiversity and the local population. Competition for scarce agricultural land directly or indirectly leads to deforestation, loss of biodiversity, the violation of traditional land rights and a reduction in food security for large populations (Peskest *et al.* 2007; Cotula *et al.* 2008; Koh and Wilcove 2008; Oxfam 2008; SEI and Hivos 2008; Fischer *et al.* 2009; ActionAid 2010; Burley and Bebb 2010).

Many of the purported ecological and rural livelihood benefits of the biofuel industry have not materialised. Uneven local livelihood impacts are the norm, with customary landowners and small-scale growers producing for emerging industries commonly being the losers (Ariza-Montobbio *et al.* 2010; German *et al.* 2010; Hunsberger 2010).

Investors play a crucial role in the development of the global biofuel sector. As a consequence they share the burden of responsibility to minimise negative social and environmental impacts of the sector. Based on collaborative research by Profundo, the Yale School of Forestry and Environmental Studies and CIFOR (van Gelder *et al.* 2010), this brief analyses the roles played by various groups of investors in the biofuel sector. It focuses specifically on the implications this has for governing investments in feedstock and biofuel production, so as to minimise the negative social and environmental costs associated with feedstock expansion. Following an overview of the methodology, findings on trends in biofuel finance in forest-rich countries of Southeast Asia, Africa and Latin America are summarised. Several instruments for governing biofuel finance are evaluated. Drawing on these findings, this brief highlights key challenges and opportunities in leveraging the potential of private and public investors in addressing key environmental and social sustainability challenges in the biofuel sector.

2. Overview of the research approach

To analyse the roles played in the biofuel sector by various groups of investors, we selected 20 country–feedstock pairs in important forest ecoregions in developing countries: the Amazon Basin; the Congo Basin; the humid tropical forests of Southeast Asia; and the dry forests of Africa, Asia and Mesoamerica. Within each ecoregion a few countries with significant existing or emerging activities in the biofuel sector were selected. In total, 20 case studies emphasising specific country–feedstock pairs were selected (Box 1).

For each country–feedstock pair, research was carried out on:

- companies active in feedstock cultivation and biofuel production, including the scope and scale of activities, country of origin and ownership; and
- the sources of finance for these companies, including foreign and domestic governments, entrepreneurs, institutional investors and banks, and multilateral financial institutions.

A variety of information sources was used, including scientific studies; consultancy and market research reports; government statistics and publications; company websites, annual reports and other publications; articles in the financial media; specialised financial databases; and local media and nongovernmental organisation reports.

Box 1. Focal ecoregions, feedstocks and countries

African dry forests

- Jatropha in Ghana, Madagascar, Mozambique, Tanzania and Zambia
- Sugarcane in Malawi, Mozambique, Tanzania and Zambia

Amazon Basin

- Oil palm in Colombia
- Soya in Bolivia and Brazil
- Sugarcane in Brazil

Congo Basin

- Oil palm in Cameroon, the Democratic Republic of the Congo and the Congo

Humid tropical forests of Southeast Asia

- Oil palm in Indonesia and Malaysia

Other dry forests ecoregions (Mesoamerica, Asia)

- Jatropha in India and Mexico

Based on the data gathered in the 20 case studies, an analysis was made of the types of companies active in different countries and in different feedstock sectors. Investments in feedstocks and biofuel were estimated, and trends in sources of finance and the roles of different groups of investors were analysed. This analysis is discussed in section 3. Additionally, an assessment was made of the effectiveness of different governance instruments that could be applied by investors to minimise negative social and environmental costs associated with feedstock expansion. This assessment is discussed in section 4.

This research approach has some limitations, especially in estimating investments in feedstocks for biofuel. The end-use of the feedstock is often unknown at the moment of investing and actual areas planted with biofuel feedstocks are, in some countries, much smaller than the land areas acquired by investors. Given uncertainties in the growth of biodiesel markets, it remains unclear whether these land areas will all be used to produce biofuel feedstocks. Also, many of the companies involved are not fully transparent about their sources of financing. Despite these limitations, broader financing trends can be discerned, as the study covers a large number of companies in many countries.

3. Trends in biofuel finance in forest-rich countries in Southeast Asia, Africa and Latin America

3.1 Investment volumes in feedstock

For the 20 country–feedstock pairs, we researched investments made by the 10 largest companies in 2000–2009. Not all data was available and we did not research investments by smaller companies. Hence, an investment range was estimated for each case study. These estimates total US\$ 25.2–35.7 billion invested in 2000–2009 in the cultivation of the identified feedstocks (Table 1). As oil palm is a perennial crop requiring large upfront investments in plantation expansion, much more was invested in the six countries with oil palm cultivation than in the five countries with sugarcane. In the two countries growing soya and the seven growing jatropha, investment volumes were much smaller.

On a global scale, only a small portion of the different feedstocks is used for biofuels: 18% of sugarcane, 16% of soya and 4% of oil palm (van Gelder *et al.* 2010), although jatropha is only grown as biofuel feedstock. This means that a large part of the investments in feedstock expansion is not directly linked to biofuel demand. However, in some countries biofuel demand might be a more significant driver of expansion than these average percentages suggest. Decisions about end markets are made at harvest time making it almost impossible to differentiate between investments going to fuel and food markets for most investments in multipurpose feedstocks. Nevertheless, we have used the approximate percentages above to estimate investment volumes in feedstocks for biofuel purposes. For the 20 case studies, we estimate that in 2000–2009, US\$ 2.0–2.7 billion was invested in growing feedstocks for biofuel (Table 1).

3.2 Investment volumes in biofuel

About US\$ 5.7–6.7 billion was invested in producing biofuels in 2000–2009 in the 20 country–feedstock pairs studied (Table 2). This is significantly higher than the investments in growing feedstock. The majority of this capital (US\$ 3.8–4.2 billion) was invested in sugar-based ethanol production in Brazil—an industry which has been in operation for several decades. Significant amounts were also invested in palm-based biodiesel in Colombia, Indonesia and Malaysia, and in soya-based biodiesel in Brazil. In other countries researched, only small or negligible investments in biofuel production have been made. For countries expanding sugarcane production, additional domestic investments in ethanol production are almost nonexistent, while ethanol is increasingly

Table 1. Estimated feedstock investment volumes, 2000–2009 (n = 20)

Feedstock	Number of countries	Total investment (US\$ billion)		Range of investments per country (US\$ million)	
		Total in all countries	Estimated share for biofuel	Total range	Estimated share for biofuel
Jatropha	7	0.2 – 0.3	0.2 – 0.3	3 – 200	3 – 200
Oil palm	6	19.0 – 28.0	0.8 – 1.1	1 – 15 000	0.04 – 600
Soya	2	1.7 – 2.1	0.3 – 0.4	200 – 1800	32 – 288
Sugarcane	5	4.3 – 5.3	0.8 – 1.0	20 – 5000	3.6 – 900
Totals	20	25.2 – 35.7	2.0 – 2.7	1 – 15 000	0.04 – 900

Table 2. Estimated biofuel investment volumes, 2000–2009 (n = 20)

Based on feedstock	No. of countries researched	No. of countries with biofuel investments	Total biofuel investment (US\$ billion)	Range of investments per country (US\$ million)
Jatropha	7	1	0.01 – 0.02	14 – 18
Oil palm	6	3	1.2 – 1.6	150 – 1000
Soya	2	1	0.7 – 0.9	700 – 900
Sugarcane	5	2	3.8 – 4.2	8 – 4200
Totals	20	7	5.7 – 6.7	8 – 4200

traded internationally. For countries producing biodiesel feedstocks (oil palm, soya and jatropha) the situation is less clear-cut. In some countries biodiesel feedstocks will be processed into biodiesel domestically, especially when a large domestic or regional biodiesel market is developing as a result of deliberate government policies (e.g. Brazil, India). For many other countries, especially in Africa, it seems likely that the biodiesel feedstocks they produce (oil palm, jatropha) will be exported directly and processed into biodiesel in foreign consumer markets. This last investment pattern will limit opportunities for developing countries to capture added value.

3.3 Types of companies involved

Different types of companies are driving the expansion of feedstock and biofuel production in the 20 country–feedstock pairs studied. The expansion of sugarcane production in the five countries researched is dominated by existing sugar producers. In Brazil, the sector is already mature and the largest players are domestic—mostly cooperatives and some private companies. In the four African countries researched, the sugar industry is less advanced and foreign producers from South Africa and France are dominant. As sugar and ethanol production are highly integrated, the expansion of sugar-based ethanol is driven mainly by the same companies in all five countries.

Start-up companies only play a significant role in ethanol production in Mozambique.

In Indonesia and Malaysia, the oil palm plantation sector is also very mature. Expansion of feedstock production is driven mainly by existing producers, both domestic and foreign companies.

In Colombia, domestic producers also dominate, but in African countries with an emerging oil palm sector (e.g. Cameroon, the Congo and the Democratic Republic of the Congo (DRC), foreign companies are dominant. Several of these are active in the oil palm industry elsewhere. In the Congo and the DRC many foreign investors originate from other sectors (such as the Chinese electronics company ZTE Corporation in the DRC and the Italian oil company Eni in the Congo).

Palm-based biodiesel expansion is driven mostly by companies active in the oil palm plantation sector, which are now investing downstream. In Indonesia, companies from other sectors also play an important role, such as the state-owned oil company Pertamina. The role of start-ups is relatively small in all countries researched.

This is clearly different from the jatropha feedstock sector, which is a new sector in all seven countries researched

(Ghana, India, Madagascar, Mexico, Mozambique, Tanzania and Zambia). Existing biofuel producers (already active in biofuels elsewhere) and start-up companies dominate. Most of these start-up companies are managed by foreign entrepreneurs; only in Ghana do domestic start-ups play a significant role. Companies from other sectors (domestic oil companies) are important in India. In none of these countries have significant investments yet been made in jatropha-based biodiesel production. Whether these investments will materialise in all countries is also unclear; some countries may develop into exporters of jatropha feedstock to foreign biodiesel producers.

Brazil and Bolivia both have a well-established soya sector. Expansion of soya cultivation in these countries is driven almost exclusively by existing traders, both domestic and foreign (from France, the Netherlands and the United States). With regard to investments in biodiesel, Brazil and Bolivia differ considerably. The soya-based biodiesel sector in Brazil is growing strongly, driven by investments from existing soybean traders, domestic start-up companies and companies from other sectors—such as state-owned oil company Petrobras. In Bolivia, investments in biodiesel are inhibited by government policies that prevent the use of food products for energy uses.

3.4 Types of investors involved

The following groups of investors have financed the development of feedstock and biofuel production in the 20 case studies:

- domestic and foreign entrepreneurs: owning feedstock and/or biofuel companies;
- domestic governments: providing subsidies and investment incentives as well as loans through national development banks, making infrastructure investments and owning companies investing in the biofuel sector;
- foreign governments: providing development aid, (soft) loans or foreign investment incentives, or owning companies which invest abroad;
- domestic and foreign banks: providing loans and assisting companies in issuing stocks;
- domestic and foreign institutional investors: including pension funds, insurance companies and asset managers buying shares and bonds of companies in the sector;
- multilateral financial institutions: providing loans and other investments.

For each case study we analysed the financing in 2000–2009 of the 10 most important feedstock growing or trading companies, as well as the 10 most important biofuel producers using this feedstock (for countries where actual investments in biofuel production have taken place). Based

on a number of criteria (amount of capital, related risk and others), we assessed for each company which group of investors are of high, moderate or low importance. Taking into account the differences in company size, we aggregated these assessments for each case study. Also, accounting for differences in size between the feedstock and biofuel sectors in different case studies, we aggregated these findings for the three regions, for the four types of feedstock grown and the four types of biofuel produced (Table 3).

In the jatropha sector we found the most important investors to be foreign entrepreneurs, foreign governments and foreign institutional investors. Only in India do banks, both domestic and foreign, play an important role, as they are important financiers of the domestic oil companies moving into the sector. The governments of Ghana and Mexico also play an active role, while foreign governments (e.g. Abu Dhabi, Italy, the Netherlands, Sweden and the United States) are important financiers in Mozambique, Tanzania and Zambia. With the exception of Ghana, multilateral financial institutions do not play an important role.

For the two main oil palm producers, Indonesia and Malaysia, domestic governments and entrepreneurs play a very important role. In Indonesia the role of foreign governments and foreign entrepreneurs—particularly from Malaysia—is more important than in Malaysia. Domestic and foreign banks and institutional investors are also important in both countries. In Colombia domestic entrepreneurs are most important in the oil palm sector. In Africa foreign entrepreneurs play a significant role. In Cameroon, Colombia and the Congo the domestic government is important, while in the Congo and the DRC foreign governments, such as China and Italy (via state-owned companies) are financing most plantation expansion.

In the palm-based biodiesel sector, the importance of foreign governments and domestic institutional investors is relatively small and only in Indonesia do multilaterals play a fairly significant role. In financing the Brazilian soya cultivation and soya-based biodiesel sector, the government-owned Brazilian Development Bank (BNDES) is very important. Most of the companies active in this sector are privately owned; therefore, domestic and foreign entrepreneurs also play a significant role. To finance their expansion plans, companies attract loans from domestic and foreign banks. Some of the foreign companies also issue shares and bonds to foreign institutional investors. In Bolivia, the role of foreign governments, entrepreneurs, banks and institutional investors is important. Soya-based biodiesel production in Brazil is financed almost completely by the BNDES.

Table 3. Importance of financial stakeholders

Group of financial stakeholders	By region			Cultivation of different feedstocks				Biofuel production based on different feedstocks			
	Africa	Asia	Latin America	Jatropha	Oil palm	Soya	Sugarcane	Jatropha	Oil palm	Soya	Sugarcane
Number of case studies	12	3	5	7	6	2	5	1	3	1	2
Domestic entrepreneurs	■	■	■	■	■	■	■	■	■	■	■
Foreign entrepreneurs	■	■	■	■	■	■	■	■	■	■	■
Domestic government	■	■	■	■	■	■	■	■	■	■	■
Foreign governments	■	■	■	■	■	■	■	■	■	■	■
Domestic banks	■	■	■	■	■	■	■	■	■	■	■
Foreign banks	■	■	■	■	■	■	■	■	■	■	■
Domestic institutional investors	■	■	■	■	■	■	■	■	■	■	■
Foreign institutional investors	■	■	■	■	■	■	■	■	■	■	■
Multilateral institutions	■	■	■	■	■	■	■	■	■	■	■

■ = high, ■ = moderate, ■ = low

Expansion of sugarcane production in Brazil is financed mainly by domestic entrepreneurs and the government. Companies also attract loans from domestic and foreign banks. In the four African countries, foreign governments play an important role as do foreign banks and institutional investors backing the foreign companies dominating the sector. In Mozambique the government is important; in Zambia domestic entrepreneurs play a significant role; in Tanzania domestic banks are important; and in Malawi multilaterals play a very important role. Because of the high integration of sugarcane and ethanol production, the sugar-based ethanol sector is mainly financed by the same stakeholders investing in sugar production for the food industry.

Taking a regional perspective, we note that in Africa the role of domestic investors is much smaller than in other regions. Domestic governments are less involved than in other regions, but in particular domestic banks and domestic entrepreneurs are strikingly absent. This is in sharp contrast to Asia, where these two groups of investors play a very important role. Much of the feedstock and biofuel development in Africa depends on grants, (soft) loans and investments by foreign governments, foreign

development banks and foreign state-owned companies. Foreign entrepreneurs play a moderately important role in all regions. Foreign institutional investors and banks are very important in Africa and Asia, but not in Latin America, where most companies are either privately or state-owned. Multilateral financial institutions are significant only in a few countries (e.g. Ghana, Malawi).

4. Governing biofuel finance

Large investments are needed to finance the development of the feedstock and biofuel sectors. Investors could play an important role in trying to minimise the negative social and environmental impacts of such investments. We therefore examined three groups of governance instruments that could contribute to enhancing the benefits and reducing the social and environmental costs of biofuel expansion. They include responsible investment instruments applied by private financial institutions on a voluntary basis, and two types of government actions: social and environmental conditions tied to forms of public finance, and government regulations stimulating or helping the private financial sector to apply responsible investment instruments.

4.1 Responsible investment instruments

During 2000–2009, responsible investment instruments have become more widely used in the financial sector by banks, pension funds, insurance companies, asset managers and other financial institutions (UNEP FI 2006; Coulson 2009; Zeller 2010). They are based on a responsible investment policy that formulates social and environmental criteria that investments should meet. These criteria usually relate to the ways in which a company manages its business, the products or services the company offers and the anticipated social and environmental consequences of the operations or products of the company or its suppliers. For the biofuel sector, such instruments have the potential to shape the practices of feedstock growers or processing facilities.

A financial institution will screen investment proposals against its responsible investment criteria. Three types of screening can be discerned (Watchman 2005; Giamporcaro *et al.* 2010):

- passive screening: selecting companies included in a sustainability index;
- positive screening: selecting companies which are 'best in class' in their industry;
- negative screening: excluding companies because of certain products or production practices.

Banks as well as institutional investors can use a combination of different types of screening and can also complement the screening process with other responsible investment instruments. For institutional investors, the two most important instruments are (i) voting in shareholder meetings, and (ii) engaging with management to influence the behaviour of these companies (Gootjes and Herder 2009; Giamporcaro *et al.* 2010). The most important complementary responsible investment instrument used by banks is making loans conditional on certain changes in operations. This conditionality can be formalised in covenants of the loan contract (van Gelder and Taylor 2008).

For responsible investment policies to be effective in leveraging sustainable investments in the biofuel sector, they need to be adopted by a significant number of financial institutions and need to be of sufficient quality. Five factors define the quality of responsible investment policies and the instruments linked to these.

1. **Principles, criteria and indicators in the responsible investment policy must be measurable, reportable and verifiable.** This is a basic precondition to making the criteria effective in guiding the investment decisions of financial institutions. Collective statements undersigned by many financial institutions, such as the United Nations Environment Programme Finance Initiative Statements and the Principles for Responsible Investment, lack clearly defined criteria (UNEP FI 2010; UNPRI 2010). The Equator

Principles, in contrast, are based on detailed and elaborate International Finance Corporation (IFC) performance standards but are not very relevant for the agriculture and biofuel sector (see below). More relevant are the responsible investment policies developed by individual financial institutions, for which the level of detail and measurability can vary considerably. Only a few banks—such as Rabobank (Netherlands) and Standard Chartered (United Kingdom)—have developed responsible investment policies on biofuels or other related sectors that contain measurable, reportable and verifiable criteria (van Gelder and Herder 2010; Rabobank 2010; SCB 2010).

2. **Principles, criteria and indicators in the responsible investment policy must be based on internationally accepted standards.** These can be standards derived from well-documented best practices in an industry, criteria defined in independent multistakeholder certification schemes, or criteria derived from international treaties (van Gelder and Herder 2010). In the case of investments in feedstock production for biofuel, or in biofuel processing itself, the criteria in the responsible investment policies could be based on a number of standards developed by multistakeholder initiatives such as the Forest Stewardship Council (FSC), the Roundtable on Sustainable Palm Oil (RSPO), the Roundtable on Sustainable Biofuels (RSB) and the Roundtable on Responsible Soy (RTRS). Responsible investment policies can use such standards in two ways: they can employ individual criteria from these standards or they can refer to the standard as a whole. In the first case, the financial institution must assess if the proposed investment meets the selected criteria, which can require a costly and labour-intensive assessment process. In the second case, the institution can rely on the verification or certification process of the standard itself.

3. **Mechanisms for internal monitoring and for external compliance must be in place.** Such mechanisms can strengthen the implementation of responsible investment policies by identifying weaknesses in criteria, indicators and procedures. The private financial sector has not yet followed multilateral financial institutions in creating mediation procedures, compliance mechanisms and mechanisms for addressing grievances for people harmed or potentially harmed by projects financed by their institutions (van Putten 2008; O'Sullivan and O'Dwyer 2009; van Gelder and Herder 2010).

4. **Responsible investment policies must be applied to all forms of financing.** Responsible investment policies of specific institutions are generally applied to all the financial services they offer, except asset management services on behalf of third parties, such as private banking and management of investment funds (Perez 2007). The only relevant responsible investment policy that is collective

(the Equator Principles) is confined to project finance over US\$ 10 million, thus limiting its scope. Although the signatories of the Equator Principles represent more than 90% of the global project finance market, project finance is a niche market, accounting for no more than 2% of the total corporate financing market. For agriculture and biofuel feedstock cultivation, project finance is not significant (Thomson One 2010).

5. Responsible investment instruments must be applied to all types of companies active in the biofuel sector, including those cultivating feedstock. If a responsible investment policy requires RSPO certification as a precondition for investments in the palm oil sector, this is only applicable to existing plantations and traders, not to new plantations. This is because the RSPO certifies palm oil and not the palm oil producer. As financial institutions are often asked to finance new plantations before they are established—and therefore long before their palm oil production can become RSPO certified—they cannot always rely on the RSPO certificate in their assessment process. The bank should therefore use checklists, field visits and consultancy services to assess if a planned plantation will meet the RSPO criteria once it is operational (van Gelder *et al.* 2008).

In the 20 case studies, more than 100 different banks were found to have financed one or more companies. About one-third of all banks originate from case study countries, while the majority originated from foreign countries—predominantly Japan, the United States and major western European countries (France, Germany and the United Kingdom). As illustrated in Table 3, these foreign banks are of high importance for biofuel finance in Africa and Asia, and of moderate importance in Latin America. This group of banks shows a strong overlap with the 49 international banks whose social and environmental policies were assessed in a recent BankTrack study. The study found that only 16 had developed some sort of forest policy and nine had developed an agricultural policy. Most of these policies scored low on the first two criteria mentioned above: verifiable criteria and based on international standards. As mentioned, very few banks have developed responsible investment policies specifically for biofuels. No bank has a policy that meets the third criterion mentioned above regarding internal monitoring and external compliance (van Gelder and Herder 2010).

More than 200 institutional investors were found to be involved in our 20 case studies, investing significant amounts in shares and bonds of feedstock and biofuel companies. Only a minority originate from our case study countries, with the majority originating from the United States and Europe. As shown in Table 3, these foreign institutional investors are of high importance for biofuel

finance in Africa and Asia, and of moderate importance in Latin America. Many have signed up to the Principles for Responsible Investment, which now counts 833 signatories with more than US\$ 22 trillion in assets under management. All signatories promise to ‘incorporate environmental, social, and corporate governance (ESG) issues into investment analysis and decision-making processes’ (UNPRI 2010), but to date none of them have developed a responsible investment policy on biofuels and related feedstocks that meets the quality criteria set above.

4.2 Social and environmental conditions tied to public finance

Many governments of industrialised and developing countries are financing the feedstock and biofuel sectors in their own countries through various instruments (Kutas *et al.* 2007; Fenton 2009; Schoneveld and German 2010). These include:

- subsidies and tax breaks to biofuel producers;
- capital grants or cheap loans for infrastructure;
- area payments for growing biofuel feedstocks;
- market price support;
- funding for research and development; and
- domestic investments by state-owned companies.

Governments can also be involved in financing the production of feedstocks and biofuels abroad, especially in developing countries. The following financing mechanisms for such foreign investments can be discerned (van Gelder *et al.* 2010):

- multilateral development banks: loans, private equity investments and technical assistance;
- bilateral development financing and foreign investment loans;
- export credit loans and guarantees; and
- foreign investments by state-owned companies.

Social and environmental conditions could be tied to all forms of public financing for feedstock and biofuel production to minimise negative social and environmental impacts. These conditions, as well as the process of screening possible investments, are very similar to responsible investment policies applied in the financial sector (see section 4.1). First, social and environmental conditions tied to forms of public finance are only effective in leveraging sustainable investments in the biofuel sector if they are adopted by a significant number of governments and if they are of sufficient quality. A set of factors like those in the financial sector also define the quality of social and environmental conditions tied to public finance:

- The conditions for public finance should be measurable, reportable and verifiable.

- The conditions tied to public finance should be derived from internationally recognised standards.
- Mechanisms for internal monitoring and for external compliance must be in place.
- Conditions should be tied to all forms of public finance provided by governments, both in their own country and abroad.

Multilateral development banks such as the World Bank (including the IFC) and the Inter-American Development Bank meet these criteria to some extent. The policies of multilateral development banks—such as the IFC Performance Standards—are applied to all their investments and usually include detailed and measurable indicators, although they are not always sufficiently clear on which international standards are followed (i.e. which certification schemes in the forestry sector) (IFC 2006; IDB 2009; IFC 2010). Furthermore, since the World Bank Inspection Panel was established in 1993, all multilateral banks have developed monitoring, compliance and accountability mechanisms. The recent debate around the IFC's oil palm policy shows that much can be improved in how these mechanisms function (CAO 2009; FPP 2010). However, they do arguably strengthen the implementation of responsible investment policies by identifying ambiguities in the criteria and weaknesses in the procedures (van Putten 2008; Bissell and Nanwani 2009). With the exception of the jatropha sector in Ghana and the sugar sector in Malawi, however, the importance of multilaterals in financing the feedstock and biofuel sectors in our 20 case studies is low.

Domestic and foreign governments are much more important in financing the feedstock and biofuel sectors in most of our 20 case studies. Domestic governments were found to be strongly involved through loans by national development banks (e.g. BNDES in Brazil) and investments by state-owned companies. Foreign governments and foreign state-owned companies also play an important role. These forms of public financing mostly do not meet the quality factors mentioned above. Some domestic governments are working on social and environmental conditions for their investments in the feedstock and biofuel sectors, but no example was found where these conditions were applied by state-owned companies.

Mechanisms for external compliance are often absent. The principles, criteria and indicators that guide government investments in reducing emissions from deforestation and forest degradation (REDD) (e.g. via the Brazilian Amazon Fund managed by BNDES, to which the Norwegian government contributed) can be expected to apply to biofuel investments as well (Amazon Fund 2010; REDD-net 2010).

Some foreign governments are already tying environmental and social conditions to their imports of feedstocks and biofuels from forest-rich countries. The most important is the Renewable Energy Directive of the European Union, which includes a number of environmental criteria (European Union 2009). However, these same conditions have not yet been applied to all investments made by governments of EU countries in foreign feedstock and biofuel sectors. On paper such conditions are often tied to development loans and export credit guarantees (OECD 2003), but practical implementation is sometimes lacking and compliance mechanisms are often absent (FERN 2008; ECA-Watch 2010). Foreign investments by state-owned companies do not yet seem to be covered by any set of social and environmental conditions.

4.3 Government regulations on responsible investing

The practice of private and public financiers applying social and environmental conditions to finance is relatively undeveloped. The role of government regulations in stimulating or helping the private financial sector to apply responsible investment instruments is even more immature. Only in a few countries have relevant initiatives been taken and some initiatives launched:

Stimulating responsible investment among pension funds. Since 2000, the Socially Responsible Investing (SRI) Pensions Disclosure Regulation has required pension schemes in the United Kingdom to disclose in their Statement of Investment Principles the extent to which they take into account social, environmental and ethical issues in their investment policies (Mathieu 2000). While this has stimulated UK pension funds to give more attention to sustainability issues, additional regulations requiring them to report on the implementation of their Statement of Investment Principles are still lacking (Gribben and Gitsham 2006).

Integrating sustainability issues in bank risk management.

How risks are assessed and managed in the global banking sector is determined to a large extent by the Basel Capital Accord II (BCA II) on capital requirements (BCBS 2004). This regulatory framework has been included in the financial legislation of virtually all countries in the world. The BCA II prescribes two credit risk assessment systems by which banks can assign credit risks to their investments, which in turn determine the amount of capital to be reserved by the bank. Social and environmental organisations argue that in the third Basel Capital Accord, which is being prepared by the Basel Committee on Banking Supervision, sustainability criteria should be integrated into the risk assessment process (BankTrack 2010).

In some countries such regulations already exist. Since 2005, Indonesian banks are obliged to take the environmental policies of their customers into account when assessing credit applications. Companies without environmental permits should not be eligible for credits (Bank of Indonesia 2005). In China, the Green Credit Policy was introduced in July 2007. The government has established a 'credit blacklist' of companies that do not meet environmental standards due to their high energy consumption, pollution or environmental risk. The lack of disclosure on environmental issues makes it very difficult to analyse the effectiveness of this policy, but some banks have indeed cut lending to polluting and energy intensive industries (Tracy 2010). The scope of the regulations in both countries is limited: lending to foreign operations is not included and biodiversity risks do not play a large role. To address key environmental and social sustainability challenges in the biofuel sector, broader regulations are necessary.

Corporate social responsibility reporting requirements.

To stimulate financial institutions to invest responsibly, governments can require companies to be more transparent about their social and environmental impacts. Financial institutions can then make more informed decisions when considering investments in these companies. Such regulations exist in France, Malaysia, South Africa and Sweden, although they often fail to cover biodiversity risks (Lydenberg and Grace 2008). Many governments support efforts by the Global Reporting Initiative (GRI) to further develop its sustainability reporting framework, which sets out principles and indicators that organisations can use to measure and report their economic, environmental, and social performance. However, not many countries have made the GRI guidelines mandatory for corporate reporting (GRI 2010).

5. Conclusions

This brief assesses trends in biofuel finance in forest-rich countries of Asia, Africa and Latin America, and the extent to which instruments for governing private and public investments are, or could be, effective in leveraging greater sustainability among biofuel and biofuel feedstock production companies. Findings from our analysis of these investments in 20 country-commodity pairs suggest that most private and public investors are not effectively addressing key environmental and social sustainability challenges, either because they lack sustainability policies or because their policies are of insufficient quality:

- Among the several hundred private financial institutions involved, only a handful have developed responsible investment policies for biofuel investments which contain principles, criteria and indicators that are measurable, reportable and verifiable. Where policies exist, they are not linked clearly to internationally

accepted standards, and they lack transparent and effective internal monitoring and external compliance mechanisms.

- Several dozen public financiers play a significant role in the 20 case studies, through national subsidy programmes, national and foreign development banks, domestic and foreign state-owned companies and multilaterals. Among them, only the multilaterals and a few foreign development banks have developed social and environmental policies that contain principles, criteria and indicators which are measurable, reportable and verifiable. Multilateral development banks have transparent and effective internal monitoring and external compliance mechanisms in place, but they only play a significant financing role in a few case studies. Most other government financiers, especially domestic and foreign state-owned companies, lack both policies and monitoring and compliance mechanisms.
- Only in a few countries such as China, Indonesia, and the United Kingdom do governments have regulations to stimulate or assist private financial institutions to develop and apply responsible investment policies. Most of these regulations are still too limited in scope to have had any measurable effects on investments in the biofuel and related feedstock sectors in our 20 case studies. In countries where most of the financing comes from domestic sources, the domestic government has several options to influence biofuel developments via such regulations.

To realise the potential influence which investors have on minimising negative social and environmental costs associated with feedstock expansion and biofuel production, adoption of effective responsible investment policies by various investor groups needs to be improved. More banks and institutional investors, as well as state-owned companies and government agencies, should adopt responsible investment instruments and the quality of these instruments should be improved. In concrete terms this would mean the following:

- Broad consensus is needed on a set of principles, criteria and indicators that are measurable, reportable and verifiable. These should be derived from international standards, which are of significance in shaping the economic, social and environmental impacts of biofuel and biofuel feedstock production. This set of principles, criteria and indicators could serve as a model for the responsible investment policies of financial institutions, and the conditions which governments attach to public finance. The proliferation of different sets of biofuel standards by various groups of actors represents an important intermediary step but should be followed by convergence into a broadly accepted global standard.
- Independent compliance and monitoring processes for all forms of private and public investments should be

set up or improved, to strengthen the implementation of responsible investment policies.

- Private financiers should apply their responsible investment policies and related instruments to all forms of financing (including loans and other credits, underwriting, private equity and asset management), as well as to all companies involved in the biofuel supply chain.
- Governments—both in forest-rich production countries and in foreign countries—should apply environmental and social conditions to all forms of public financing (subsidies, export credits, development loans and investments by state-owned companies, among others) as well as to all investments in the biofuel supply chain (domestically and abroad).
- Governments—both in forest-rich production countries and in foreign countries—should develop regulations which stimulate or support private financial institutions to develop and apply responsible investment policies.

A wide variety of investors is involved in financing the biofuel sector in forest-rich countries. Enhancing the quality and widespread adoption of responsible investment instruments by private and public financiers is of crucial importance to the environmental and social sustainability of the sector.

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