



THE ECONOMICS OF
LAND DEGRADATION

ELD Business Brief



OPPORTUNITY LOST:

**Mitigating risk and making
the most of your land assets.**

**An assessment of the exposure of
business to land degradation risk
and the opportunities inherent in
sustainable land management**





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June 2013



Executive summary

The private sector has an important role in the management and use of land. Land serves as an essential asset for various industries either directly or indirectly through e.g. raw material availability, human resources or brand image. Degraded land is an under-performing asset which incurs expenses or losses. Utilising sustainable land management practices is an opportunity for the private sector through e.g. improved yields, new business opportunities or ensuring current operations.

This scoping document evaluates (on a general level) the risk of land degradation on various industry sectors and discusses the impacts of land degradation on businesses using seven industry sectors as examples. Moreover, the document shows examples of successful business cases which turn land degradation to a business opportunity, mitigate the negative impacts caused by the industry or improve raw material availability by ensuring sustainable land management practices.

According to a simple risk analysis, land degradation poses significant risks and opportunities to the following industries: basic resources (including e.g. forestry, mining), food and beverage, construction and materials, industrial goods and services (including transportation and packaging), personal and household goods (including e.g. consumer electronics, tobacco and clothing), utilities and leisure and travel.

At least one example from each industry sector is represented. These cover various aspects of risks and opportunities caused by land degradation. The cases demonstrate the benefits of the mitigation of land degradation, such as cost reductions, a secured supply of raw materials and utilities, opening of new benefits and business opportunities and a guaranteed licence to operate.

In the current situation, the business awareness of land degradation was found to depend on the company's distance from land in value chain and on the type of business operation in question, with businesses in direct contact with land being most sensitive to land degradation. For these sectors (e.g. food and beverage, leisure and travel, and basic resources), land is a key asset and managed with normal business tools.

Other business sectors, such as industrial goods and services, utilities, construction and materials, and personal and household goods, are more distant from land, and deal with land degradation through suppliers, focusing on raw material price and availability. Land is also mostly not seen as a "core business", which leaves it in a peripheral role in standard calculations and toolkits. Risk analysis for supply chains and new investments is where land comes closest.

The ELD initiative should continue assisting companies to assess land degradation risks to their business, the primary targets being businesses in direct contact with land. For that purpose, and as first steps, we recommend awareness raising and the development of a toolkit integrating land degradation issues into standard protocols. Moreover, there are data gaps concerning e.g. project information and project level financial data to be filled.



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Introduction

This is a scoping document for the Economics of Land Degradation (ELD) Initiative on the risks and opportunities land degradation poses for businesses. The objective is to identify businesses that are likely to be at risk as well as to provide examples of good practices and actions. An initial view on matching company drivers and ELD goals is also given.

1.1 The challenge of land degradation

Land degradation can be described as a reduction in the land capacity to provide ecosystem goods and services over a period of time. Land degradation includes both natural and human-induced causes such as improper land management.

The most important type of land degradation is erosion caused by water and wind. Relevant, but definitely smaller are chemical and physical degradation (Figure 1).

The extent and financial importance of land degradation in Europe

Figure 2 illustrates the actual ongoing land degradation over the past 20–30 years, taking into account biomass, soil, water, and biodiversity in Europe. Despite being considered somewhat controversial, the map is used in this report to illustrate the extent of land degradation. It can be seen that the most severe land degradation occurs in areas where there is agricultural production or high pop-

FIGURE 1

Estimates of the global causes of land degradation (%)

Source: Odeman, 1994

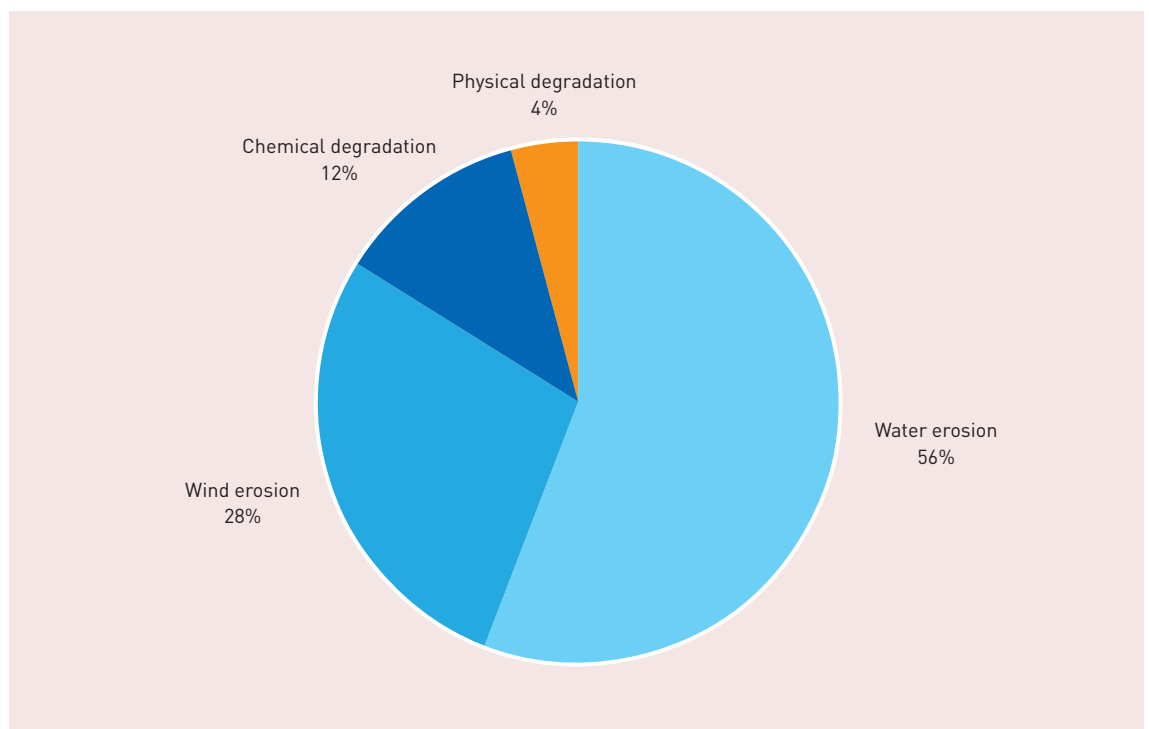
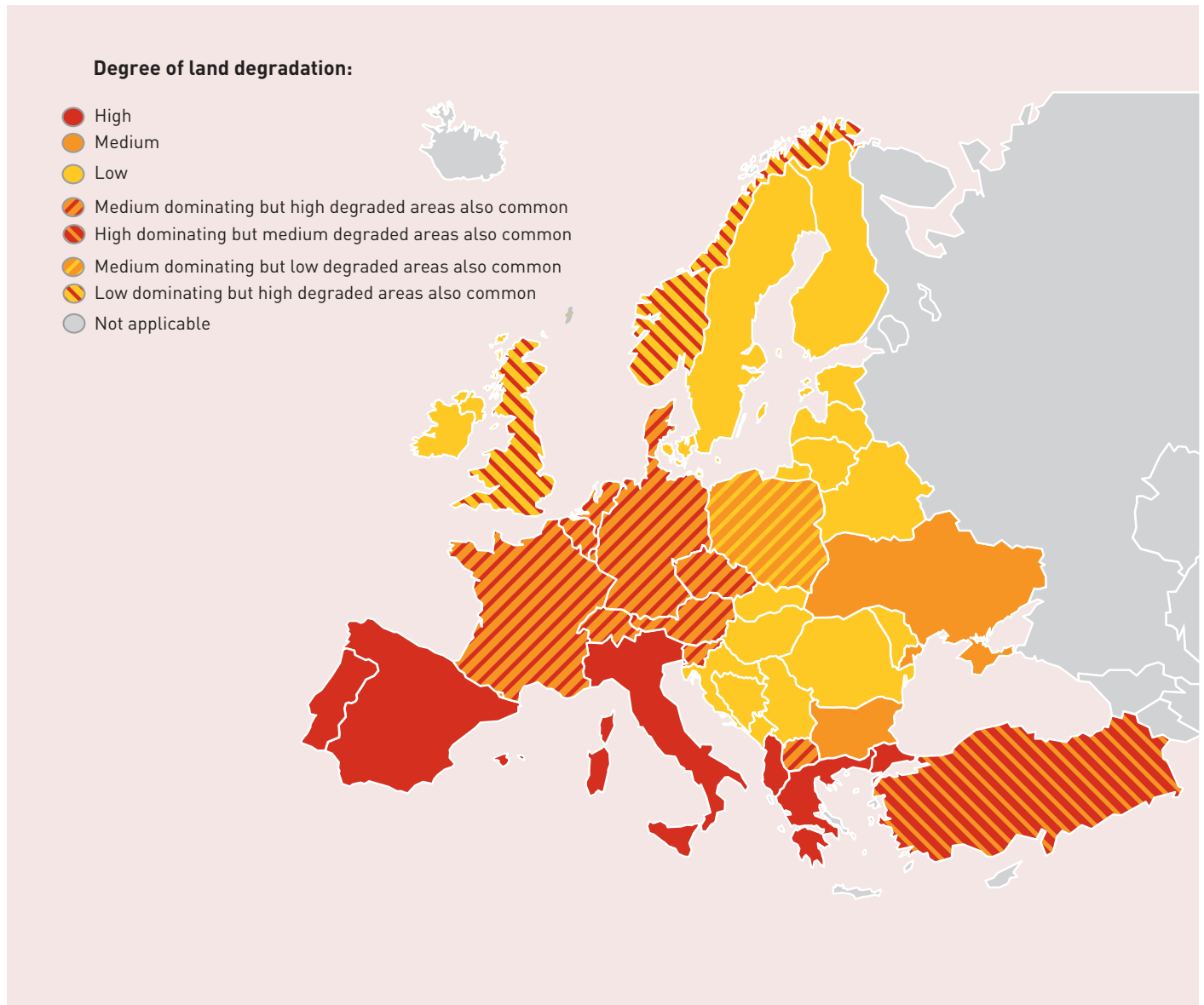


FIGURE 2

Land degradation in Europe, considering biomass, soil, water and biodiversity

Source: Pöyry, based on information provided in LADA Technical report n. 17: Global Land Degradation Information System



ulation density (marked red in Figure 2). This implies that both businesses and people in these areas are or will soon be affected by the consequences of land degradation.

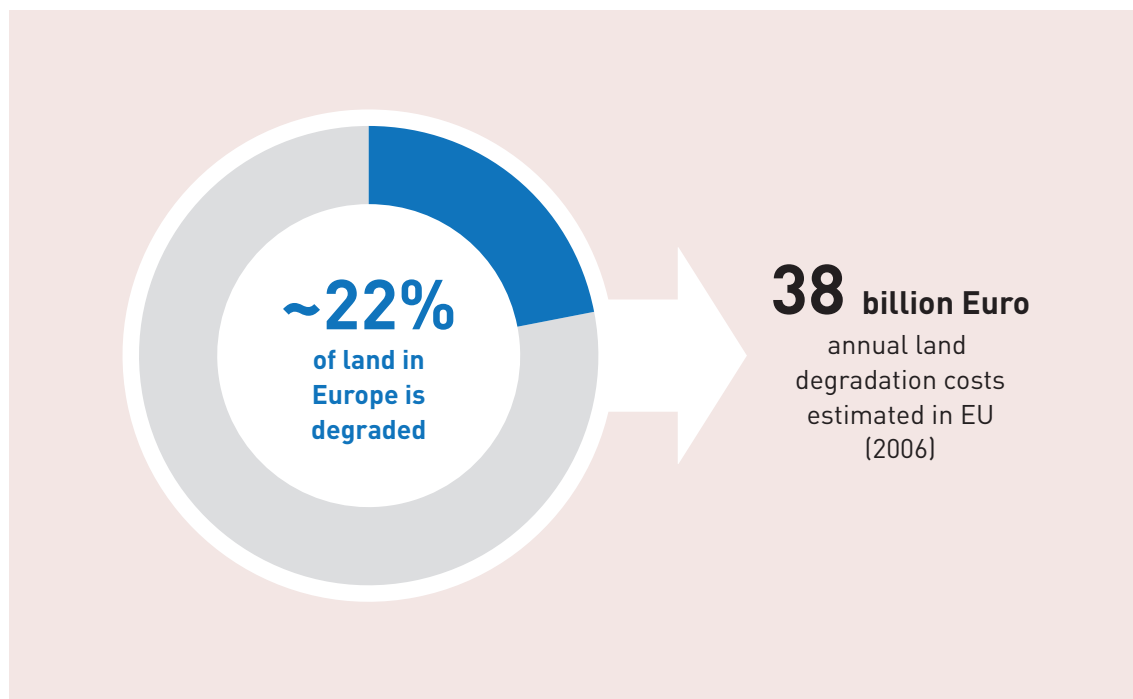
In total, about 117 million hectares or about 22%¹ of the land area is estimated to be degraded in the European Union (EU). The associated approximate annual costs have been assessed at 38 billion Euro², the largest costs deriving from contamination and

erosion (Figure 3). As a comparison, the GDP of Latvia was 37 billion Euro in 2012 and the land used for agriculture in EU is about 101 million hectares³. In addition to the land use within the EU, the EU “virtually imports” through various agricultural products an additional 34 million hectares of land⁴. However, the contribution of the EU consumption to land degradation outside the EU has not been quantified.

FIGURE 3

Example of the extension of land degradation and the related costs in the EU and globally

Source: *Global environmental Outlook 3, United Nations Environment Programme, 2002;* Montaranella L., *European Commission, Joint Research Centre, Institute for Environment and Sustainability. 2006*



Even though Europe has one of the highest levels of land degradation of the total area, the highly degraded soils are found especially in semi-arid areas, areas with high population pressure and regions undergoing deforestation such as India, China or Brazil.

On a global scale, the World Economic Forum has estimated that approximately 60% of the earth's ecosystem services have been degraded in the last 50 years. For example, since 1900, over 50% of wetlands have been lost and the global forest area has diminished by 40% during the past 300 years. Annual economic losses due to deforestation and land degradation are estimated at 1.5–3.4 trillion Euro in 2008. That equals 3.3%–7.5% of the global GDP in 2008⁵.

The ELD Initiative

The Economics of Land Degradation (ELD) is an initiative for a global study on the economic benefits of land and land based ecosystems. The initiative highlights the value of sustainable land management and provides a global approach for analysis of the economics of land degradation. It aims to make economics of land degradation an integral part of policy strategies and decision making by increasing the political and public awareness of the costs and benefits of land and land-based ecosystems.

The vision of the initiative is to transform global understanding of the value of land and to create awareness of the economic case based on both market and non-market values for sustainable land management in preventing the loss of natural capital, preserving ecosystem services, combating climate change and addressing food, energy and water security. More information about the ELD initiative can be found at www.eld-initiative.org/.

FIGURE 4

Example of the extension of land degradation and the global costs

Source: *The Economics of Ecosystems and Biodiversity (TEEB), Interim Report 2008*

**1.2 Business and land degradation****The company as a subject**

In scoping business needs around land degradation, a possible approach is to treat a company as an organism living on resources. A company, any company, has basic needs: it needs inputs such as raw materials, labour and information, it has a production process, a decision-making process and goals and it produces outputs.

Land degradation touches companies insofar as

- any of their inputs are linked to land – which is always the case, if you go deep enough;
- any of their outputs are connected to land on the markets – an acceptability question;
- any of their production processes have links to land – which is again always the case, if you go deep enough;
- their decision-making process includes land degradation as a consideration – which is not the case for most companies;

- their goals translate to a link to land degradation – which is again always true, if you go deep enough.

All sectors and companies are not equally closely connected to land: for example an advertising agency in Europe, the connection may be through client accounts with companies linked to land, or the land footprint of their extensive electronic equipment, full of rare metals. However, in what follows, we do a preliminary ranking of sectors as to sensitivity to land degradation, so as to have relevant cases to analyse.

Having land degradation as a standard part of the business toolkit and decision-making mind-set is also a question of habit and a changing world, and in our opinion a change of attitude is necessary for pure business success. Often companies have a data collection system linked to the EHSQ (Environment, Health, Safety and Quality) system which provides the warehouse for information to authorities and internal actions. Whether data on land in the value chain is gathered is a matter of company policy



which is probably not very common in all parts of the value chain.

The greatest problem at the moment is the decision-making time horizon: in a recession, longer term initiatives not seen as core business tend to lose out. When considering the risks and potential wins, land issues need a longer horizon.

Business drivers

The severe consequences of improper land management in the past have demonstrated how land degradation can affect the local economy in worst case scenarios. Examples include desertification resulting in poverty and hunger in some areas in Africa or the salinization of the Aral Sea surroundings. The latter, including the decision to introduce large scale cotton production in Uzbekistan, Tajikistan and Turkmenistan, are examples where a legacy decision has already shown its results: diminishing agriculture production in the area and limiting

future growth. Examples like these illustrate how important good land management practices are both for the communities and companies in order to ensure future businesses and business profitability.

A couple of decades ago land degradation risks and opportunities might not have been a very well-understood priority for all businesses. There is however an increasing interest in land degradation related issues among both small and large private companies. This interest is due to increased sustainability concerns and also a result of companies seeing economic benefits and new opportunities in reducing land degradation.

The private sector plays an important role in the management and use of natural resources; it often provides access to e.g. water supply, but also consumes resources in order to produce goods and services. Land is an essential asset for many companies either for their daily operations or indirectly through impacts felt through the industry value

chain. For any company involved, degraded land can be seen as an under-performing asset. Consequently, there can be potential to be realised by for example adopting improved land management techniques and practices and by reaching the full potential productivity of land assets. Furthermore, land degradation induced changes e.g. in the cost and availability of resources have a direct impact on the cost structure and profitability of a company. Equally, in the global business environment, the connections between different industrial sectors and raw materials mean that a company’s brand and business may suffer even from an indirect exposure to land degradation through other operators in the value chain.

Land as a rising target of acquisition

Since the world is not static, as opposed to what planners would like, global balances are constantly in flux. Labour costs in China were the great attractor; now, Indonesia and Vietnam have a labour cost advantage, and Mexico is about on the Chinese level – and there will be consequences, since many companies have been constantly seeking the lowest cost environment.

For land, many parts of the world suffer from a lack of usable land and companies or investors with a direct linkage to land have an interest in pursuing new directions. Land prices e.g. in Brazil have constantly risen, and land acquisitions are also not very easy due to legislation, very divergent rules and strict competition from farmers e.g. cattle farmers, sugarcane farmers, soy farmers, eucalyptus planters and landless small farmers.

Africa is large and contains some of the richest soils in the world (along with some of the least friendly soils such as the formerly forested area known as Sahara). This means that Africa has become of interest to companies as a means of expanding land holdings, securing land with possibilities for yield improvement and also blocking competitors.

However, the short-term return on investment is not necessarily inspiring, but establishing a plantation, and waiting up to ten years for it to mature is normal forest business with normal decision-making methods. When dealing with forest, the horizon has to be longer, there are no quick wins. But, it is only a small part of the value chain which is active in this “Business as Usual” mode. For most of the chain, the issues are still too far away from the core business and time horizon.

T A B L E 1

Summary of business drivers: Productivity and raw material availability

Driver for business: preventing loss of future growth and current business

The Aral Sea and cotton examples are high-level state decisions, but illustrate one cardinal fallacy: a decision on land management that both threatens current business and prevents growth plans.

On a company level, this might be akin to

- managing land asset so that its productivity will be reduced;
- in the value chain, neglecting measures to ensure upcoming raw material availability.

What are the business risks of land degradation?

Land degradation may affect businesses either directly or indirectly, through environmental, economic and social factors, targeting inputs, outputs or processes. Moreover, the risks that businesses are faced with throughout their value chain are multiple and connected to each other.

In this chapter the risks and business impacts of land degradation are assessed from two directions: (1) the negative: business and profitability risks, and (2) the positive: potential gains and missed opportunities.

2.1 Negative: Risks to business

Land degradation risks include reduced productivity, decreasing raw material availability, political instability and social problems such as health problems, poverty, abandonment of fields and migration and regulatory and legal ramifications. A strict taxonomy of risks would not be very readable; instead, we attempt below to place risks in a business context by briefly discussing the risks and their potential impacts.

Reduced productivity

Human-induced land degradation that leads to reduced productivity can be caused by unsustainable land management practices, air or water pollutants, solid waste or erosion. These affect the physical viability of the land and the environment in terms of changes to the ecosystem as well as chemical and biological balances. These may in turn increase the amount of toxins and diminish the availability of nutrients and water in the soil, ultimately reducing the productivity of the land. This can have impacts on the provision and quality of inputs for the food and beverage industry among others.

Bottom line:

Reduced productivity has a direct impact on the bottom line, starting from the value chain actor closest to the land and spreading onwards in the chain through mostly prices and shortages. ■

Decreasing raw material availability

Decreasing raw material availability may be a result of infrastructure development, deforestation, agricultural intensification or a change in biodiversity. The last named may, in addition to unsustainable land management, in turn be a consequence of soil erosion, and environmental pollution. Besides availability, also the raw material quality can be affected as is the case in water pollution.

Insufficient raw material availability may cause loss of profits for all businesses producing or using raw materials as well as indirectly affect the profitability of other industries due to changes in the value chain. As an example, the lack of a rare earth metal important for electronics due to mining closures for environmental reasons may, apart from increasing the price, induce substitution with another metal or compound which is more expensive, harder to get – and leads to more land degradation.

Bottom line:

Decreasing raw material availability has a direct impact on the bottom line. Increasing market prices and e.g. mill closures due to lack of components are examples of mechanisms whereby impacts occur. ■

Political instability and related social phenomena

Political instability and related social phenomena associated with land degradation is a wide concept including for example health problems, poverty, abandonment of fields and migration as well as risk of losing licence to operate.



Health problems are indirect consequences of land degradation. Polluted land and water, insufficient water supply (e. g. due to a reduced capacity of land to retain water as a result of soil erosion), and insufficient raw material availability reduce the well-being of local communities possibly resulting in health problems and affecting any industry via its workforce. Poverty among farmers and loss of human capital on the other hand may be a consequence of reduced productivities on the fields. Both health problems and poverty may force local people to abandon their fields and migrate. Also educated people, who have the opportunity to choose, tend to migrate to larger cities. This leaves rural companies with a less educated workforce.

For companies, the support of governments, civil society and local population is important for successful operation. Political disturbance can be a serious risk for a company. Avoiding political disturbances and obtaining a social license to operate brings companies to the area of diplomacy, where many feel quite uncomfortable.

An example of the importance of political and social stability can be seen in the food industry in terms of the obvious linkage between land degradation and food crises. The New England Complex Systems Institute in Cambridge has received great attention through a series of scientific papers, where it claims that a single factor, food prices, can be used to predict riots. In the 2011 paper “The Food Crises and Political Instability in North Africa and the Middle East” (arXiv:1108.2455v), Marco Lagi, Karla Bertrand and Yaneer Bar-Yam warn of a possible crossing point to high impact instability and rioting in 2012–2013. In August 2011, MIT Technology Review wrote, in reference to this research, “If we don’t reverse the current trend in food prices, we’ve got until August 2013 before social unrest sweeps the planet, say complexity theorists”.

Bottom line:

Political instability is a purely destructive factor for sustainable businesses, and the negative impacts on business of recent instability in North Africa and the Middle East are a very visible indication. ■

Regulatory and legal risks

The last item, regulatory and legal risk, deals with items such as pricing and compensation regimes and market-based instruments to address the threat to ecosystems and land degradation. Taxation and quotas are among the possibilities.

Emission Trading (ET) is a model that has, as it is very well known, been applied in the US as sulphur dioxide cap-and-trade, and foremost in the EU for carbon dioxide emissions. Politically, the future of emission trading in the EU is now very much at cross-roads, and it is here unnecessary to speculate on the political solution that finally emerges.

Water Emissions Trading (WET) or Water Entitlements and Trading Activity (WET) are names for the corresponding activity for water, with initiatives also in China. Obviously, land degradation can have an impact on both carbon dioxide emissions and water quality: polluted groundwater and changes in soil capacity to bind carbon are examples. However, a Land Degradation Trading scheme, if it were introduced, could not be fully analogous with ET and WET: what exactly is traded would have to be defined differently, e.g. as a basket of land areas with certain key indicator accounting. Outright taxation on land being degraded would legally be an easier model.

However, in the short term, politically, the greater likelihood of moves on the land front deal with purpose of land use (agro vs. wood vs. other use) and the sustainability criteria for biomass produced on the land – and of course the ILUC (Indirect Land Use Change impacts of biofuels) debate.

Bottom line:

Regulation and financial instruments for land degradation are likely in the mid-to-long term, but the current political risk and impact on the bottom line deals more with raw material availability and cost. If a certain land use pattern is defined as e.g. unsustainable for the production of biofuels, this has a direct impact on raw material costs, production costs and volumes. ■

2.2 Positive: Potential gains in business and missed opportunities

Depending on the business strategy chosen, the risks of land degradation as mentioned above might lead to missed business opportunities due to inefficient operations and lack of market access and market premium, but also to potential gains due to new market opportunities and diversification of inputs and processes as well as to potential gains, even in company value, from brand and image goodwill.

Operations improvement

Inefficient operations which include inefficient land use or management practices resulting in lower productivity or overusing utilities, such as water and electricity, erode the cost competitiveness of businesses. A concrete example is also additional costs in sewage plants and dams due to the removal of soil sediments related to erosion. A purely physical risk also exists: Land degradation may make many areas more vulnerable to natural disasters.

Usually inefficient operations are easy to change as part of improving general business practices or cutting costs. Especially in a tighter business climate, cost cutting and operations improvement are very much on company agendas. The question is, whether companies then think far enough in the value chain, if they lack direct land assets and contact.

Bottom line:

For companies close to land, land management is part of the asset balance and bottom line. For those further removed, it is mostly not seen as core business, and the impact on the bottom line comes from “outside normal calculations”, via raw material costs, availability and market problems. ■

TABLE 2

Summary of business drivers: operational improvement**Driver for business:** operational improvement

In times of poor economy and tough competition, cost cutting and operational improvement is the focus for many if not most companies across sectors. Reducing raw material use and cost is a standard item. Thus, if the company sees land management as part of its core business, it is very likely to engage in productivity raising exercises. Again: the whole chains in the sectors do not see land, at least yet, as their “core business”, which leaves it out of normal calculations. Companies do pressure their suppliers for lower prices, which of course is an incentive for land management.

**New market opportunities and diversification of inputs and processes**

In some industries, standards, labels and certifications are requirements for certain market access. Some examples of the existing standards, labels and certificates which address some of the features of land degradation are listed in the Table 3. There are currently no labels or certificates which focus purely on land degradation, but ISO is developing a new standard for the 14 000 standard family around land degradation and desertification⁶. In the markets where brand owners or retailers demand a

proof of sustainable operations before approving the product or raw material, a lack of these product qualities can be regarded as a missed business opportunity. On the other hand, companies may be successful in creating new niche markets or grow their market share through the standards, labels and certifications. Also, in some industries customers are willing to pay a premium for sustainably produced goods and services, which represent a potential gain for the business. Companies may also use standards, labels and certifications to meet insurance criteria or obtain development permits from regulatory bodies.

TABLE 3

Examples of standards, labels and certifications that consider some sustainability issues related to land degradation

Name	Short description
<p>The EU Eco-label for tourist accommodation</p> <p>Geographical coverage: EU</p>	<p>Service providers need to prove that they have limited water consumption, reduced waste formation and that they favour the use of renewable raw materials which are less hazardous to environment.</p> <p>More information: www.ec.europa.eu/environment/ecolabel</p>
<p>Forest Stewardship Council (FSC), a certification scheme for forest management</p> <p>Geographical coverage: Global</p>	<p>Certified organisations need to e.g. avoid negative impacts on water quality and quantity; protect rare and threatened species and their habitats; identify and protect representative sample areas of native ecosystems and/or restore them to more natural conditions.</p> <p>More information: www.ic.fsc.org/</p>
<p>Leadership in Energy and Environmental Design (LEED)</p> <p>Geographical coverage: originally USA & Canada, now global</p>	<p>LEED is a suite of rating systems for the design, construction and operation of buildings, homes and neighbourhoods. Buildings can earn credits across several categories (e.g. Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality) and qualify for various levels of certification depending on their total score.</p> <p>More information: www.usgbc.org/leed</p>
<p>Responsible Jewellery Council</p> <p>Geographical coverage: Global</p>	<p>RJC members commit to a standard on responsible business practices for diamonds, gold and platinum group metals. The Standard addresses e.g. human rights, labour rights, environmental impacts, mining practices, and product disclosure in the supply chain.</p> <p>More information: www.responsiblejewellery.com/</p>
<p>Organic certification</p> <p>Geographical coverage: Global</p>	<p>Organic certification is for anyone involved in the food production value chain, e.g. suppliers, farmers, processors and retailers.</p> <p>Certification requirements vary from country to country, but in general they involve a set of production standards for growing, storage, processing, packaging and shipping of agricultural goods. Organic certification requires also e.g. taking biodiversity more into account than legislation.</p> <p>More information: www.ec.europa.eu/agriculture/organic/splash_en</p>
<p>The Nordic Ecolabel for paper products</p> <p>Geographical coverage: Nordic Countries</p>	<p>Nordic Ecolabel signifies e.g. that a paper product fulfils requirements concerning forest management, emissions, energy and chemical use and waste disposal in the manufacture of pulp and paper.</p> <p>More information: www.nordic-ecolabel.org</p>
<p>Green Seal for Cleaning Products for Household Use</p> <p>Geographical coverage: US</p>	<p>Green Seal for Cleaning Products for Household Use requires e.g. that the product shall not be toxic to aquatic life; organic ingredients shall exhibit ready aquatic biodegradability; the product shall not contain more than 0.5% by weight of total phosphorus; and the product shall not contain substances that contribute significantly to the production of photochemical smog and tropospheric ozone.</p> <p>More information: www.green Seal.org</p>

Green-labelled products have witnessed a steady growth over the past years. For example the global market for organic products in 2010 was estimated at around USD 59 billion, more than double the value from 2003⁷.

With growing populations and increasing demand for goods and services, the need for land (especially arable land) is increasing, driving up the land value. However, if land is improperly managed and degraded, it loses its resale value – thus reducing the return of investment to companies. Yet another factor of interest to consider is that the most severe land degradation occurs in developing regions, i. e. regions with new and expanding markets. This, obviously, can dampen or even stop companies’ strategic growth plans.

Potential gains related to land degradation refer to new market opportunities and diversification of inputs and processes (see example in Figure 10). Companies developing or supplying technologies that enable sustainable or more efficient land management, cleaner technologies and products or more efficient manufacturing processes are just examples of companies which might have new market opportunities due to land degradation.

Brand and image goodwill

For a company sustainability is not only a way to ensure future business or improve efficiency of operations, but also a way to improve its brand image and thus get a marketing advantage that might translate into higher market shares or a price premium paid by consumers. In a value chain, the usual method of operations when one part of the chain has problems, e.g. linked to land management, is that stakeholders put pressure not only on the problematic part, but also on the other parts of the value chain, resulting in pressure being “reflected” from several directions, as if by mirrors. The brand consultancy Interbrand does the globally most recognised “Top 100 brands” valuations annually. In 2012, Coca-Cola topped the list, with an estimated brand value of USD 77,839 million (an increase of 8% from 2011). You cannot directly sell a brand’s value, but the value plays a role e.g. in stock market prices and company valuations – which do not directly play into the bottom line, but most certainly into shareholder value.

Bottom line:
 A high brand value mostly translates to higher stock price, and image is, at least for some consumers, transferred from product brand to consumer. ■

T A B L E 4

Summary of business drivers: Image and markets

Driver for business: Image and markets
In a consumer society, high status or responsible actions are transferred from seller to consumer. Different components of image sometimes conflict: it is likely that Apple’s high “wow” image has helped it to survive environmental and social image problems better than any other company (e.g. supplier Foxconn worker suicides). But, without the Apple magic, the hit from land degradation problems can be hard.

Which sectors are exposed to land degradation risks?

3.1 Methodology for the risk assessment

In order to identify sectors which are heavily exposed to land degradation risks, a simple rating exercise was carried out, utilising the risk categories identified in Chapter 2 and including the development of simplified risk criteria and rating of various industries against these criteria. Industries with the highest risk were chosen for further analysis presented in Chapter 4.

The risk criteria were developed from the long list of risks as follows:

- Impact of land degradation on the availability of key raw materials and utilities (business inputs);
- Impact of land degradation on operations and workforce availability (business inputs and production processes);
- Impact of land degradation on product quality, sector image and brand reputation (business outputs), with associated loss of profit;
- Impact of land degradation on investments and expansion (business goals and decision-making processes).

The level of risk was considered taking into account the interaction between two dimensions:

- The exposure of typical companies in the sector to land degradation risk due to the nature of the markets and value chains;
- The severity of risks likely to be faced by individual companies in a sector.

As industry sectors, those identified in the Industry Classification Benchmark (see Annex 1), were utilised. The industry sectors were given ratings from one to three for each risk criterion, with one being a low level of risk and an unclear impact of risk, two being a medium level of risk and a clear impact of risk, and three being a high level of risk and a severe

impact of risk. The ratings were based on various sources mentioned in the end of the report as well as Pöyry experience.

3.2 Low, medium and high risk business sectors

Based on the evaluation, low, medium and high risk business sectors were identified (Table 5)

- High risk (rating >14): Companies in these sectors are likely to be exposed to land degradation and the risks for business profitability (short and long term) are likely to be significant. The high risk sectors include basic resources, food and beverage, construction and materials, industrial goods and services, utilities, personal and household goods, and leisure and travel.
- Medium risk (rating 10–14): Companies in these sectors are likely to be exposed to land degradation and the risks of diminishing profits may be significant.
- Low risk (rating <10): Companies in these sectors are likely to be exposed to land degradation, but it is unclear how, if at all, land degradation risks may affect the companies in these sectors.

Finally, five rating scenarios, using different weightings on the risks, were made in order to see whether or not it would affect the results. It could be concluded that the weightings did not affect the results significantly as the previously identified high risk industries remained at the top of the list.

This rating is just one example of possible rating of industries affected by land degradation – with different assessment criteria the list of sectors could be very different. The identified high risk industries are mainly industries that are in close connection with natural resources and are likely to experience significant direct and indirect effects if land is degraded. The medium risk industries and low risk industries include sectors which experience simi-

T A B L E 5

Sectors and their level of risk

High risk	<ul style="list-style-type: none"> - Basic resources (e.g. forestry, papers, metals) - Construction and materials - Food and beverage - Industrial goods and services (e.g. transportation, packaging) - Leisure and travel (e.g. airlines, hotels, restaurants) - Personal and household goods (e.g. consumer electronics, tobacco, clothing, footwear) - Utilities (water, electricity)
Medium risk	<ul style="list-style-type: none"> - Chemicals - Health care (e.g. equipment, services, pharmaceuticals) - Insurance - Oil and gas - Real estate - Retail
Low risk	<ul style="list-style-type: none"> - Automobiles and parts - Banks - Equity/Non-Equity Investment Instruments - Financial services - Media - Technology (e.g. software and computer services, technology hardware and equipment) - Telecommunications

lar risks, but not throughout the industry (some companies could have high risks, but on the other hand others could have low risk, this is applicable especially in sectors such as real estate, health care, banks, insurance, financial services). This rating excludes situations where e.g. severe local land degradation forces people move out and thus all local businesses are affected. Case examples on how companies are affected by land degradation can be found in each of the sectors.

Industry sector analysis: Case studies and new business opportunities

4.1 Generic status quo and needs for improvement

The identified preliminary set of high risk level business sectors – basic resources (including e. g. forestry, metals and mining), food and beverage, construction and materials, industrial goods and services, utilities, personal and household goods, and leisure and travel – is in the following discussed, using the same formula – an introduction elucidating and the risks and opportunities of land degradation relevant for the industry, a demonstration using a relevant case study, and an extraction of the business model for the case.

CAVEAT Business models

There is no widely approved way of categorising business models. Hence, the “business school way” of writing stories which are not easily applicable elsewhere needs improvement. For the business models here: they are all part of cutting edge leadership efforts adapted to local conditions. No financial data is available. Thus, it is impossible to benchmark them for impact – or give specific recommendations on the best model to choose.

Decision-making (vastly over) simplified

It is obviously impossible to take

- very different sectors such as mining and personal goods
- the full spectrum of companies, from global leaders to local laggards

and claim that there is a universal rule of thumb that makes it possible to know what a company will do and on what basis. However, as this is a scoping study for a commencing initiative, an oversimplification may be permitted, and useful for the cases to follow.

In Figure 5, an oversimplified matrix of current, expected decision-making is shown. The dimensions are:

1. Company distance from land in value chain;
2. Type of business operation: new investment or current business.

For a company in direct contact with land (e. g. owning its fields, plantations or concessions), land is a key asset and is managed with normal business tools. A new investment has to have a payback time, Return On Investment (ROI) and Internal Rate of Return (IRR) that meets the company’s criteria for new investments or operations management. However, the time horizon is longer than for most other assets: Land is not a fast-moving good or service.

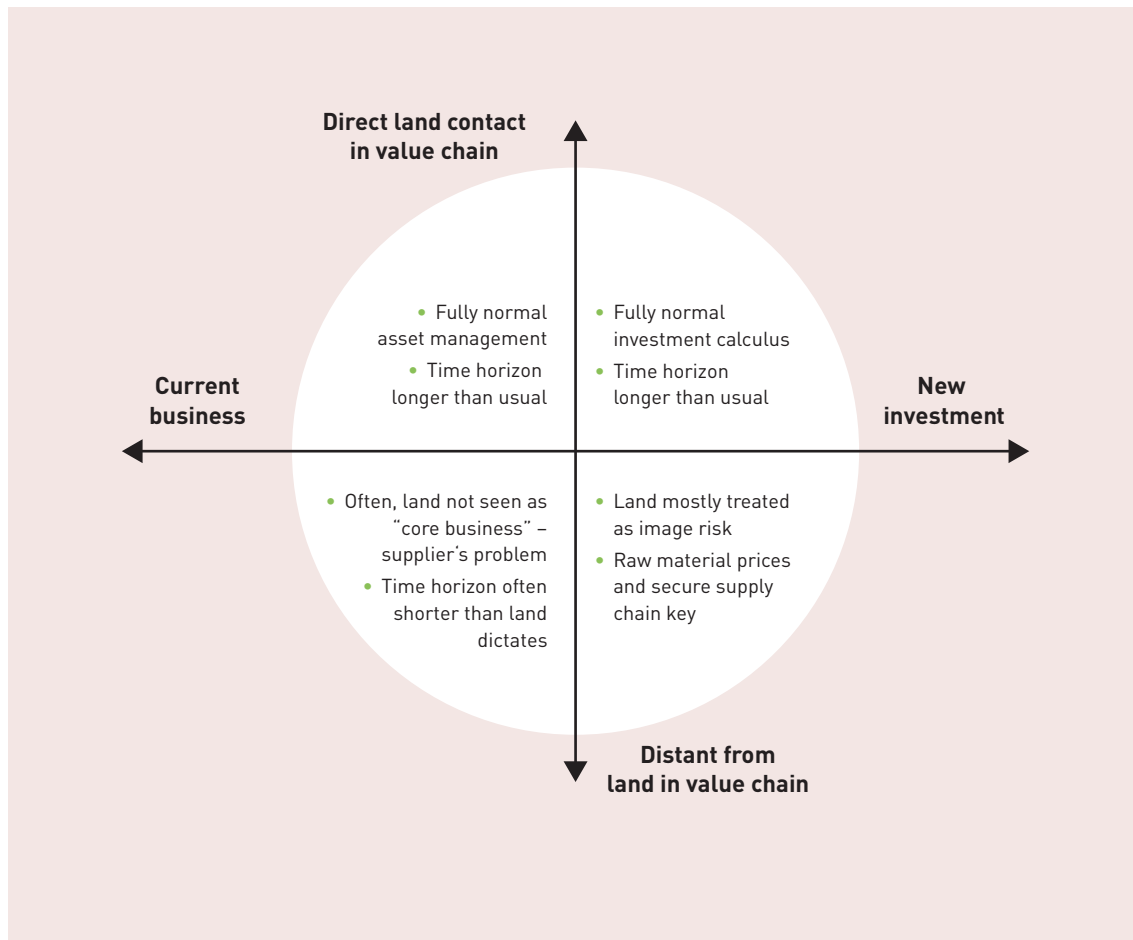
For a company distant in the value chain from land, the issue is different. The idea of supplier pressure is strong: the focus is on the raw material needed, not the means another part uses to produce that raw material. Thus, raw material price and availability are the factors looked at. Image, brand and market risk are dealt with by the marketing and environmental/CSR (Corporate Social Responsibility) departments. The more acute the risk or greater the publicity for a land-related case, the greater the chance of a special action item related to land. Otherwise, suppliers are assumed to deal with any land-related issues. Land is also mostly not seen as a “core business”, which leaves it out from standard calculations and toolkits. Risk analysis for supply chains and new investments is where land comes closest. Risk analysis methods vary from e. g. Monte Carlo to regular company-wide risk matrix exercises. The skill and knowledge of the people involved determines how great a role land degradation-related risks play.

Bottom line:

Unless a company is a leader in value chain thinking, it is unlikely to have a standard procedure for assessing land degradation risks to its business – unless it is directly connected to land. For the followers, a toolkit integrating land degradation issues into standard protocol, a popularised business concept and enough other companies joining the thinking are needed. ■

FIGURE 5

Simplified matrix of land degradation-related decision-making



A toolkit integrating land degradation issues into standard decision-making

All companies cannot be leaders; everyone cannot develop a standard toolkit for everybody else. The basic options are:

- A government-mandated tool (e.g. EIA, Environmental Impact Assessment);
- A business-born initiative (most business concepts and tools);
- A public-private partnership with strong company involvement across the value chain.

The first option, naturally, has a great impact as mandatory, but does not necessarily change actual company core thinking.

For company-driven toolkits, World Business Council for Sustainable Development (WBCSD) offers good examples. The Global Water Tool (GWT), launched in 2007, is an example with a pedigree. The key questions GWT answers have direct counterparts in land degradation:

- How many of my sites are in extremely water-scarce areas? Which sites are at greatest risk?
- How much of my total production is generated from my most at risk sites?
- How many of my employees live in countries that lack access to improved water and sanitation?
- How many of my suppliers will be in water-stressed regions in 2050?

Bringing together companies, non-corporate expertise and suitable bodies of national or international organisations is, most likely, a way to go for increasing land degradation awareness and calculus.

A popularised business concept

Management is influenced by fashion: Concepts such as “reengineering the corporation”, “balanced scorecard” or “shareholder value” have had a surprisingly profound impact on corporate thinking. Which leads to a conclusion: Land degradation is in need of a (best-selling) business concept. Dealing with value chains in transition, incorporating a longer horizon, establishing a terminology and a methodology.

4.2 Basic resources – forest industry and metals and mining industry

Risks and opportunities of land degradation

The main land degradation risks and opportunities associated with basic resources vary depending on

the specific industry. In the pulp and paper industry there are direct risks related to for example reduced availability and increased cost of raw materials, mostly wood and water, reduced productivity due to interruptions in optimised raw material flow and loss of license to operate.

The actual type of land-use used for raw material production determines the type and extent of land degradation. Wood production has been the foremost territory for discussing sustainable procurement – including reduced impact logging and mitigation of deforestation. The road of forest certification to the current status of general active acceptance among major players and co-existing certification standards has been quite long. According to FAO statistics, 10% of the world’s total forests have been certified. Looking at production forests, 30% have been certified (394 mill. ha). Given the area of forests, complicated ownership patterns and global variations, this is an impressive number.

The pulp and paper sector is also water and energy intensive which makes the industry highly dependent on resource availability and price levels. Strong land degradation could severely harm business operations and profits for example through decreased yield in fibre produced, which leads to higher prices and, at worst, standstills at mills.

There are a number of recent examples of pulp and paper industry related conflicts e.g. in China, Argentina and Uruguay, where the local people and NGOs have questioned and challenged the license of the industry to operate based on perceived poor land use, land management and potential pollution issues. The disputes have led to delayed construction of the mills, wide NGO demonstrations against the companies and to an official complaint to the United Nations Human Rights Council.

The main direct land degradation risk of the metals and mining industry is the loss of the license to operate. The risk is significant, since in the past the metals and mining industry has been responsible for causing severe land degradation through its operations. Today, a proof of sustainable operations and actions against land degradation are often required to gain social acceptance to operate.

The indirect risks of land degradation on metals and mining companies include poverty and health

TABLE 6

Summary of business drivers: License to operate

Definition: License to operate

“License to operate” is here defined as a company having

- a) a record of **actual** market-acceptable behaviour
- b) a consumer **perception** of acceptable behaviour
- c) no “**Achilles’ heels**”, i.e. sensitive issues that are topics of NGO campaigns
- d) in the **locale where activity is pursued, no business-preventing argument with local authorities or political players**

which all-in-all makes it possible to be present on the markets without harm to the business. Item d) differs in that it may not be harmful at all on the markets where the products are sold, or in the value chain, but it is a showstopper hurdle for production.

problems leading to reduced availability of workforce and acceptability of operations. These are often due to environmental pollution, especially water pollution. Water pollution and water scarcity may also affect the metals and mining companies operations since they rely on high volumes of water. Some examples of severe incidents include the Baia Mare cyanide spill in Romania in 2000, which polluted waters and killed large numbers of fish in Hungary and Yugoslavia and the 2010 incident in Hungary where the dam failure of a bauxite mine resulted in human losses, injuries and flooding of towns. After the incident in Hungary, the company MAL Hungarian Aluminium faced a fine of 472 million Euros for environmental damages.

Besides risks there are also opportunities, such as improvement of inefficient operations (e.g. by reducing the amount of electricity and water the company uses for its operations) which results in both cost reductions and risk mitigation. Another important opportunity is the improvement of brand image. Good brand image and sustainable practices can assist in gaining a license to operate when future investments and expansions are considered.

The Fibria case

The pulp and paper company Fibria has participated in a programme which secures the raw material supply, improves local livelihoods and preserves environment and sustainability in rural areas. The programme provides incentives for landowners to plant eucalyptus as a part of agroforestry. The production model opens up new business opportunities for rural producers, provides environmental education and includes measures for the preservation of environment and harmonising of animal husbandry, food production and forestry practices.

In addition, Fibria has dedicated 36% of its total land area to conservation purposes, while the rest is utilised for the production of wood for pulp. With the help of these measures, Fibria has achieved better public acceptance within the local communities (Figure 7).

In the Fibria case, the business model is built on collaboration, multiple stakeholders, securing raw material supply and image gain (Figure 6).

FIGURE 6

The Fibria case: Business model

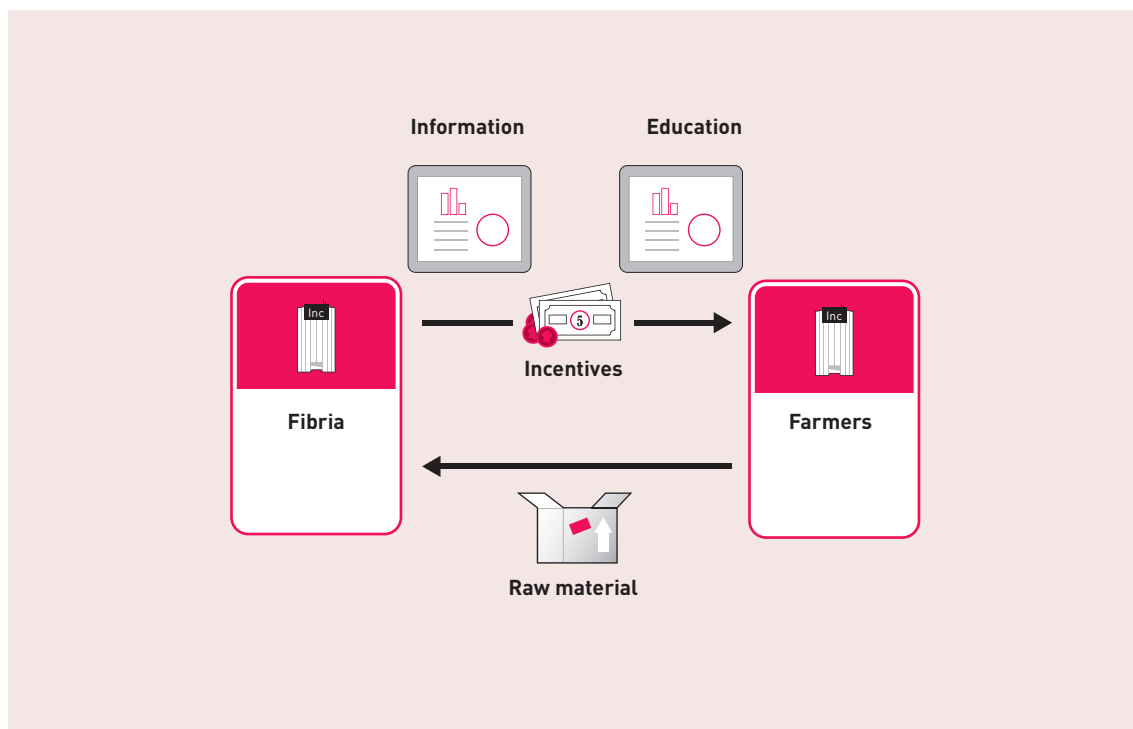


FIGURE 7

The Fibria case

FIBRIA

Year:
ongoing

Type of risk:
Opportunity cost: Market access
Business and profitability risk: Acceptability in local community and by clients and end-users

Industry area for which the risk is relevant:
Forest industry

Case description:
Fibria's forest plantations are located in important areas in terms of nature conservation. To reduce the impact of its plantations on these valuable environments, Fibria is carrying out various initiatives and projects, including restoration of degraded land to natural forests, preservation of environment and sustainability in the countryside through the Forest Reserves programme.

Key features common for other Businesses
Biodiversity protection and restoration through collaborations with other companies, non-governmental organisations and local communities



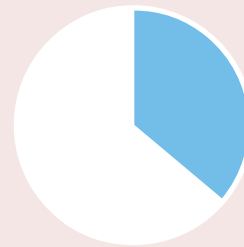
● Location of operation

Opportunities

- The acceptance of local communities and customers towards plantation-based pulp can be improved by committing to the conservation of biodiversity.
- Ensured raw material availability and future business.

Financial relevances

- The Forest Reserves programme provides incentives for farmers to engage in agroforestry which preserves environment and sustainability in the countryside and provides raw material for Fibria. The project involves farmers in seven different states and represents a total area of almost 115,000 hectares.



36 %

of the land owned by Fibria is dedicated to conservation purposes.

115,000 ha
of area is involved in the Forest Reserves program.

Over 3,863 individual contracts

TABLE 7

Summary of business drivers: expanded definition of “core business”

Driver for business: expanded definition of “core business” into value chain management

Fashions vary; sometimes companies aim to master the whole value chain, other times they have a highly distributed thinking as the norm. The latter is the case now. This means that very few companies in very few value chains who are not in direct contact with land see it as a “core business”. This means that it is just an extraneous factor, included through raw material cost and availability – and market considerations especially for brand owners. This is why there is a clear division in thinking at the moment: on the other hand those who deal with land directly use the normal business toolkit for land management and investments, and on the other hand those further in the chain mostly act as a CSR initiative to win brand value and market acceptability, and the normal toolkit is not applicable.

The Newmont Ghana case

The US-based mining company Newmont has shown an example of how the land degradation effects can be mitigated and how a local business community can be supported through land restoration practices in Ghana (Figure 8). By supporting education in the local community, Newmont has been able to restrict the growth of a weed plant which disturbs local agricultural practices and bio-

diversity, make business out of the plant and through that offer services to the local mining industry.

The Newmont business model is built on collaboration with locals, education, image gain and indirect business gain through the strengthening of the supply chain through creation of local services for the mining industry (Figure 9).

FIGURE 8

The Newmont Ghana case: restoring land, biodiversity and local communities

Newmont Ghana: Ahafo Mine

Year:
ongoing

Type of risk:
Opportunity cost: Brand image
Business and profitability risk: Acceptability in local community, license to operate, future investments

Industry area for which the risk is relevant:
Basic resources: Mining

Case description:
The mining industry causes severe land degradation for the local community, affecting for example their agricultural land and water. In Ghana, Newmont addresses erosion issues for example through educational demonstrations while at the same time assisting farmers near their mine to find a beneficial use for the invasive York tree, which is a nuisance to agricultural production.

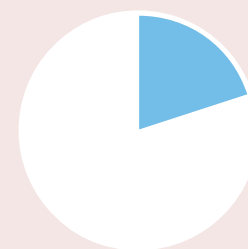
Key features common for other businesses:
There are various options to mitigate land degradation impacts and engage local communities to develop new services.



● Location of operation

Opportunities
<ul style="list-style-type: none"> Newmont has worked hard to ensure that the positive impacts of mining are maximised and negative impacts are minimised. It serves as a good example and is thus more accepted as a partner for other communities in new investments.

Financial relevances
<ul style="list-style-type: none"> Newmont contributes 0.75 Euro per ounce of gold produced and 1% of net profits from the Ahafo mine to the NADeF, which supports human resources development, infrastructure development, and natural resource protection programs.

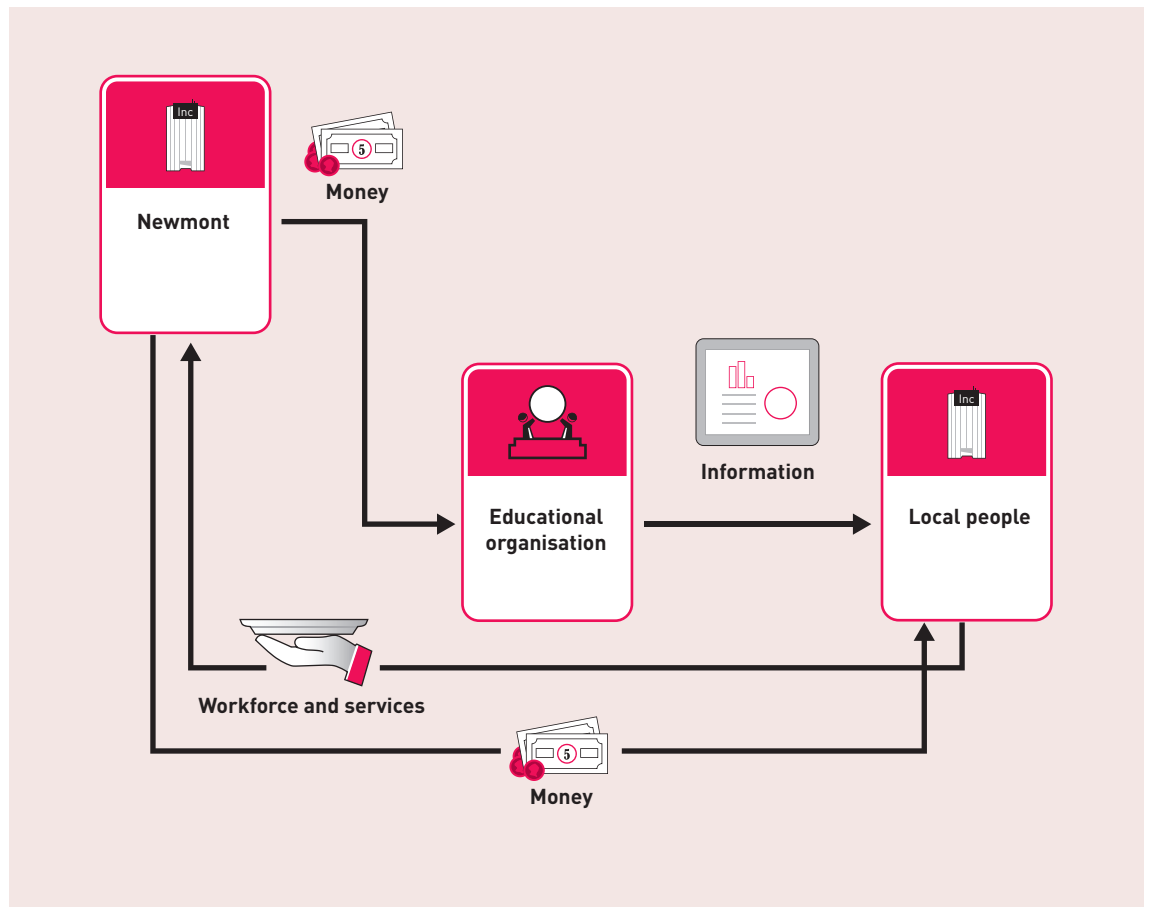


20%
of the Newmont gold reserves were located in the Ahafo Mine in 2007.

278,186
trees have been planted in Ghanaian communities through Newmonts programme.

80,000 seedlings
The company has established a tree nursery with over 80 000 seedlings in Techire.

FIGURE 9

Newmont Ghana case: Business model**4.3 Food and beverages****Risks and opportunities of land degradation**

For the food and beverage industry all the identified risks and opportunities are relevant. In the upstream part of the value chain issues such as land use change, environmental pollution, soil erosion and nutrient loss may lead to reduced productivity. These, in turn, may affect the food and beverage companies in terms of increasing raw material prices and decreasing availability of raw materials. The food and beverage companies are also faced with risks regarding losing the license to operate. In their home in Western markets, the food and beverage companies are urged by stakeholders, especially NGOs, to provide a proof of sustainable operations. Locally, in developing countries, similar demands on local benefits appear in different parts of the world. In cases where local people also act as customers, maintaining good relationships with

the local community may have direct effects on a company's income.

If land degradation is not managed properly the food and beverage industry can experience significant decrease in profits. For example, the improvement of water use and irrigation systems can reduce water consumption, save costs and result in better managed soil erosion. Operating more efficiently could also increase yields while reducing costs, resulting in larger income for both farmers and companies, thus ensuring local welfare and future business.

Sustainability of operations at the beginning of the value chain may greatly affect the end use markets. In this, the industry might use labels and certifications, such as UTZ Certified or Rainforest Alliance certificates, for market access and market premiums. These labels and certifications can also be used to build strong brand image and to get market-

ing advantage, which is especially important in business to consumer (B2C) industries. Food and beverage companies are characterised by extensive product development and fierce competition, and therefore there is an opportunity cost of not being first on market with the newest, most sustainable operations and products.

The Coca-Cola and Jain Irrigation case

The Coca-Cola and Jain Irrigation case is a good example of what can be achieved by partnering

with your suppliers or other companies within the value chain. Coca-Cola partnered with Jain Irrigation which is a large supplier of mango pulp for Coca-Cola and a producer of irrigation systems. By supporting the education of local farmers, they plan to educate 50,000 mango farmers in utilising more efficient agricultural practices which would double their production and enhance their income. At the same time, they would ensure raw material availability in a growing market (Coca-Cola) and sell their irrigation technology to the farmers (Jain Irrigation) (Figure 10).

FIGURE 10

Case Coca-Cola and Jain Irrigation Systems

Project Unnati: Coca-Cola India and Jain Irrigation Systems

Year:
2011 – ongoing

Type of risk:
Opportunity cost: new market
Business and profitability risk:
Raw material availability

Industry area for which the risk is relevant:
Food and beverage

Case description:
Despite India contributing 55 % of the world’s mango production, the productivity is one of the lowest in the world. Farming is important for several communities, but improper land management and soil erosion cause problems. Project Unnati is engaging mango farmers in the state of Andhra Pradesh to adopt ultra-high-density plantation practices leveraging drip irrigation which improve the yields with 100 % in a sustainable manner.

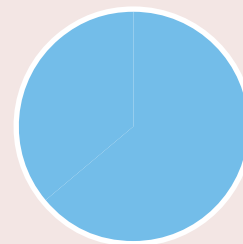
Key features common for other businesses:
Partner up with e.g. leading technology providers to support initiatives together.



● Location of operation

Opportunities
<ul style="list-style-type: none"> • Coca-Cola India: Opportunities to ensure raw material availability in a growing market • Opportunities for the irrigation system provider and mango pulp supplier, Jain Irrigation Systems, to sell irrigation systems and ensure raw material for processing

Financial relevances
<ul style="list-style-type: none"> • The companies invest 1.5 million Euro (0.75 million each) in the development of the concept and in educating about 50,000 farmers. • Farmers invest around 1050 Euro/acre in cultivation and irrigation systems.



100 %

larger yields for the mango farmers and faster start of production

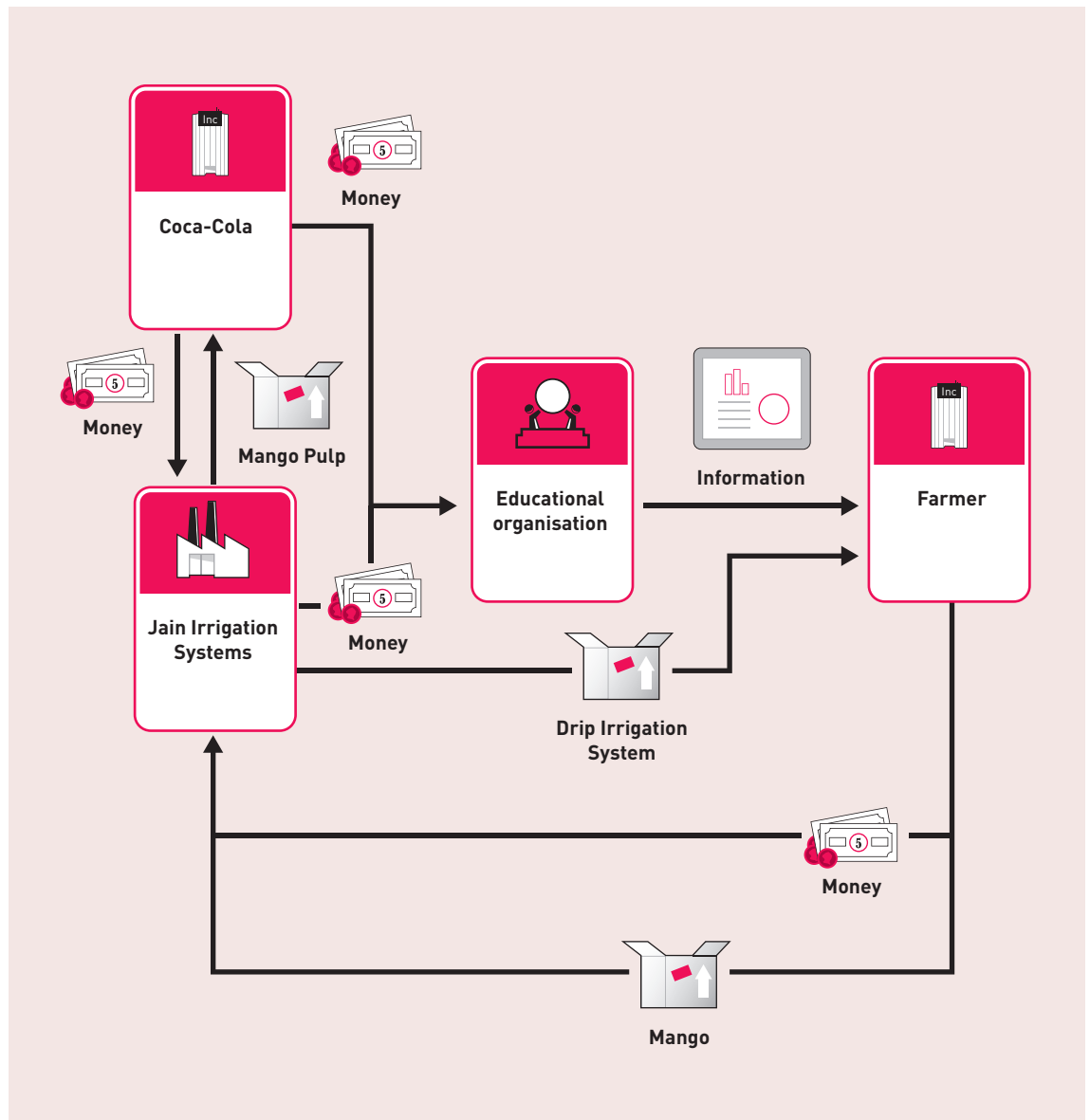


60 %

of the mango pulp needed for Coca-Cola India drink Maaza is sourced from Chittoor region.

FIGURE 11

Coca-Cola and Jain Irrigation Systems case: Business model



The Coca-Cola/Jain business model is built on collaboration with locals and in the value chain, education, image gain, securing supply and direct business gain through improved land productivity (Figure 11).

The Sustainable oil palm development on degraded land in Indonesia case

A good example of how degraded land can be recovered for agricultural use is the case of sustainable oil palm development on degraded land in Indone-

sia. In this case, NGOs, local authorities and governments are examining the possibility of using previously degraded land for palm oil production. This could both help the environment and improve the livelihood of local people (Figure 12).

The Indonesian palm-oil-on-degraded-land case is built on collaboration with locals and in the value chain, technology transfer and education, image gain, securing supply and direct business gain through improved land productivity.

FIGURE 12

The Sustainable oil palm development on degraded land in Indonesia case

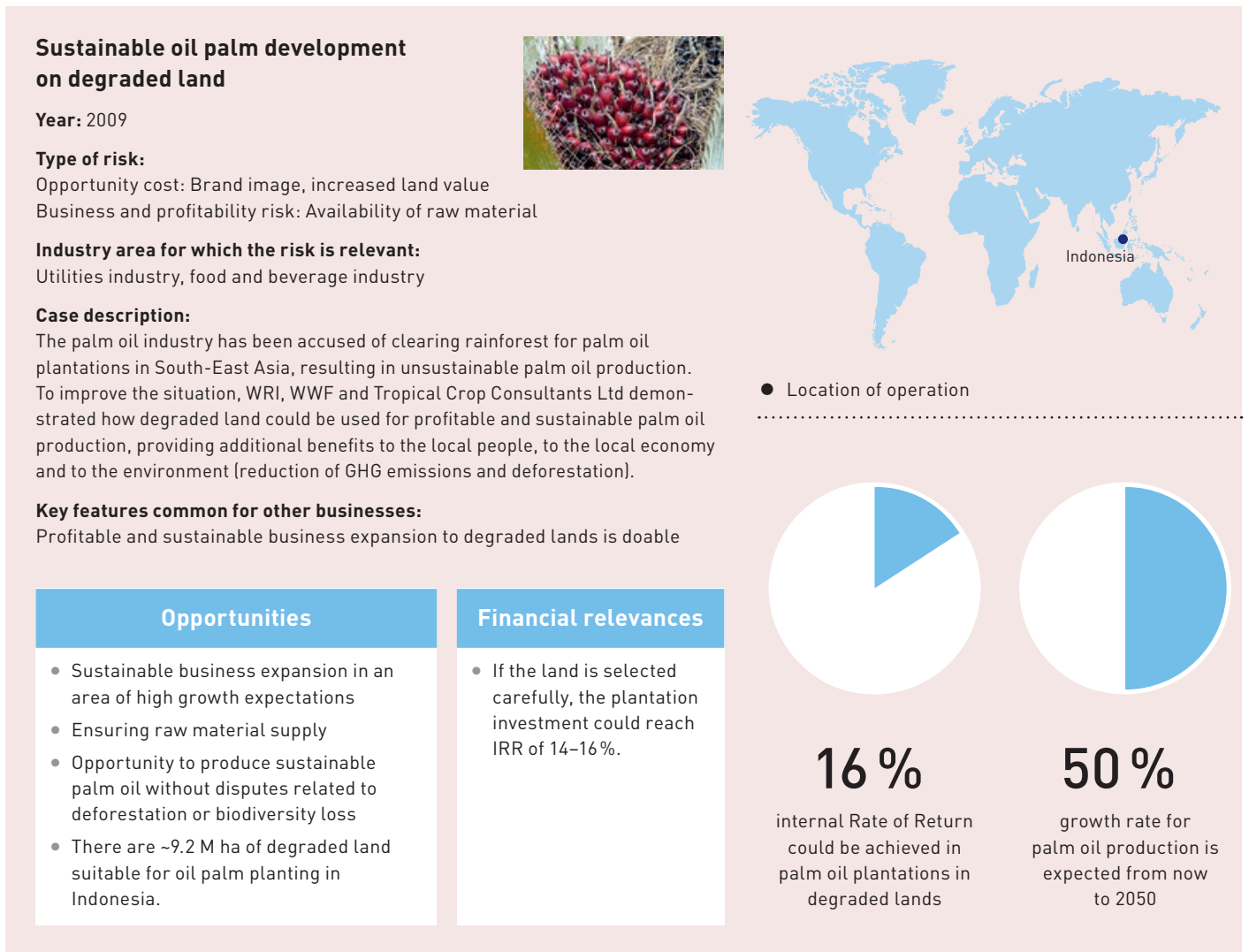
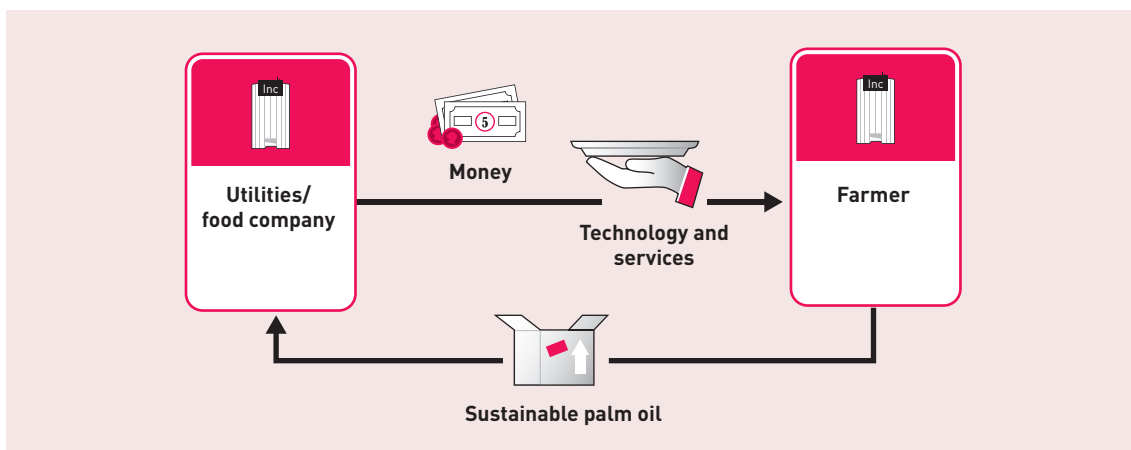


FIGURE 13

The Sustainable oil palm development on degraded land in Indonesia case: Business model



4.4 Construction and materials

Risks and opportunities of land degradation

The effects of the construction industry are usually restricted to the limited area of a single construction site. However, on a global scale the impact is more significant as expanding cities (megacities or Ω megacities⁸) transform productive agricultural land into various forms of urban infrastructure needed to support the needs of inhabitants.

The construction industry can also be affected by land degradation through the price and availability of basic raw materials (e.g. wood or metals), and these effects may transfer to downstream players of the value chain. (The relevance of land degradation for basic raw material production is described more closely in the Chapter Basic resources.)

Ecologically sustainable construction materials are yet to receive worldwide attention even though energy efficient or climate neutral housing and sus-

FIGURE 14

The Holcim and Ambuja Cements case

Sustaining the Ecosystem for Water, Wildlife and Community in India: Holcim / Ambuja Cements

Year:
ongoing

Type of risk:
Opportunity cost: Brand image
Business and profitability risk: License to operate

Industry area for which the risk is relevant:
Construction and materials

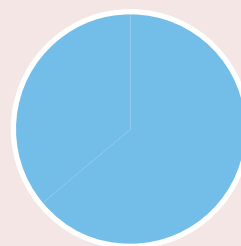
Case description:
In Gujarat, India there have been water scarcity and salinity issues for several years, affecting both local people and industries. Ambuja Cements now undertakes rehabilitation activities at all its sites, with the objective of mitigating the impacts from the withdrawal of limestone and water from the area, both of which are required for cement manufacturing.

Key features common for other businesses:
Partnering along the value chain and with local communities, natural resource management experts, non-governmental organizations and local authorities to achieve common goals for both industry and the community.



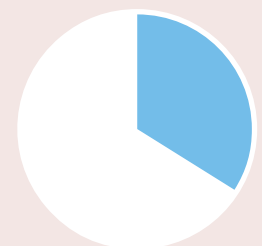
● Location of operation

Opportunities	Financial relevances
<ul style="list-style-type: none"> • Ensure raw material availability • Ensure license to operate, increase wellbeing of local people and thus ensure availability of workforce 	<ul style="list-style-type: none"> • 5.3 million Euro have been invested on water resources projects in Ambuja Cements site in Gujarat. Of this the government accounted for 3.5 million Euro. • In 2011, Ambuja Cements became water positive, which helped strengthen relationships with all local stakeholders, thus guaranteeing license to operate in the future.



> 100 %

Ambuja Cements became water positive by over 100% in 2011.

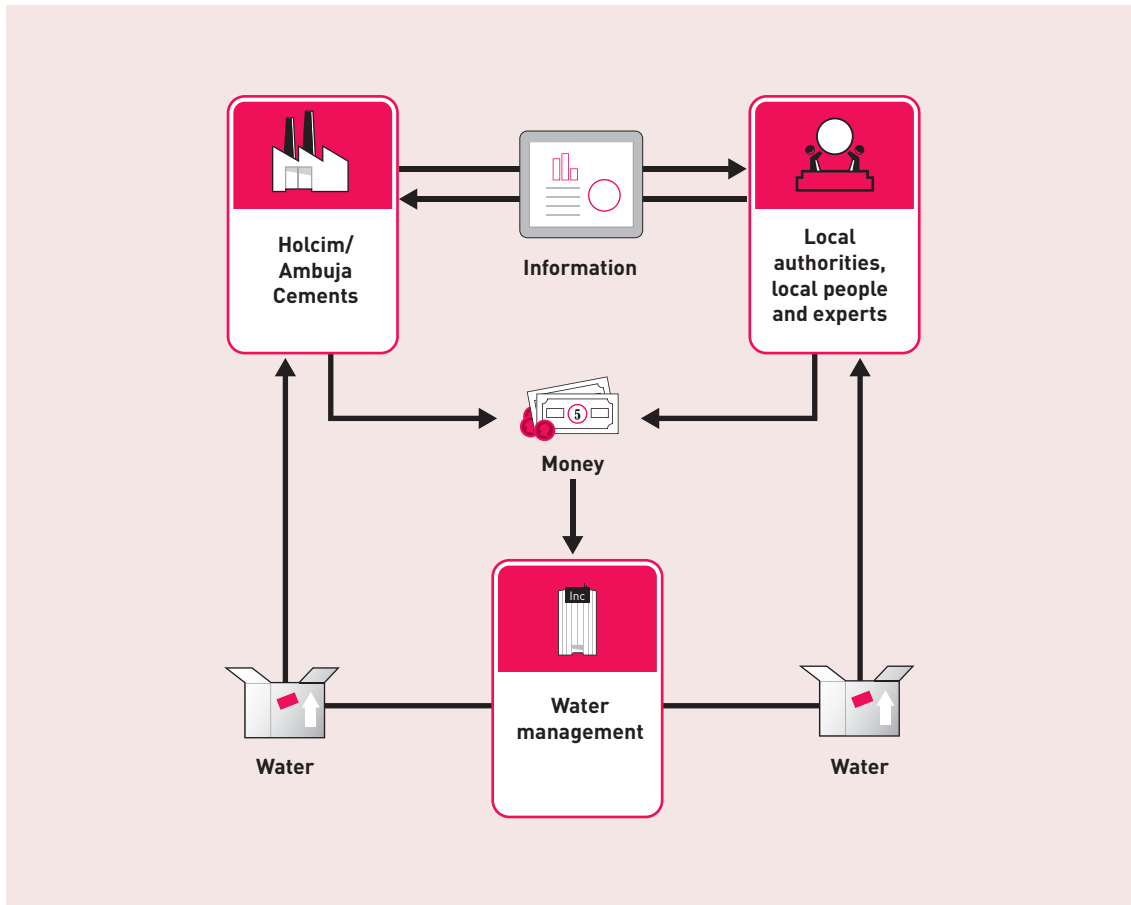


34 %

is Ambuja Cements share of the total investment.

FIGURE 15

Holcim and Ambuja Cements case: Business model



tainably sourced raw materials, especially wood, have been discussed in the western countries.

The Holcim and Ambuja Cements case

The case of Holcim and Ambuja Cements is a good example of cooperation between local authorities, local people and experts to increase the availability of utilities for the local community and at the same time ensure future business. In Gujarat, India, Ambuja Cements undertakes rehabilitation activities at all its sites, with the objective of mitigating the impacts from the withdrawal of limestone and water from the area. The company is also enhancing the local biodiversity, by for example planting trees and sustaining local livelihood, by employing local people in rehabilitation activities. The outcomes of these projects have helped Ambuja Cements strengthen relations with local stakeholders, including villages

and local authorities, while at the same time ensuring future raw material availability.

The Holcim/Ambuja case is built on collaboration between players in the value chain and locals, on land remediation for environmental and productivity reasons and securing supply of raw materials (Figure 15).

4.5 Industrial goods and services

Risks and opportunities of land degradation

Industrial goods and services comprise a very large range of operations. Most of the sectors are, however, dependent on resources produced by the basic resources industry and thus indirectly affected by land degradation (see chapter 4.2).

Pollution derived spoilage of land and/or water affects all industrial goods and services practices. Unsustainable practices related to pollution can result in losing a license to operate or extra costs related to cleaning or restoration. However, industrial practices related to environmental pollution have globally greatly improved.

Land degradation is an important issue in waste and disposal services. The waste management sector can significantly reduce the pollution of ecosystems and process waste into valuable raw materials. Reducing land degradation through proper waste management could be seen more as an opportunity and new resource than a risk or cost.

Even though industrial goods and services is a business to business market (B2B), environmentally well-performing products may gain a preference (a market advantage, guaranteed market access or even a premium) over others. Superior environmental performance is also often closely related to cost efficiency, especially in packaging, transport and waste management.

The Michelin case

Sometimes the mitigation of land degradation can also ensure future operations. This is the case with the tyre manufacturer Michelin. It has worked together with local authorities in Almeria, Spain, to

preserve land and local biodiversity at a Michelin testing track and in Cabo de Gata Natural Park. With actions such as planting trees, directing rain-water, and constructing green barrier slopes, Michelin has received a licence to operate and improved its brand image. Preserving the local environment is essential for Michelin, too, since specific environmental conditions are required for tyre testing (Figure 17).

The Michelin case is built on collaboration with locals and image and environmental gain. License to operate is present in a new way: Michelin does not need the raw material from the area, but it needs the specific service made possible by the conditions in the area. Thus, Michelin is also securing its supply chain services for testing (Figure 16).

4.6 Utilities

Risks and opportunities of land degradation

The utilities sector consists of companies engaged in producing and delivering electric power, natural gas, water and other utility services, such as steam and cooled air. Within this sector, the risks of land degradation may materialise in the form of declined raw material availability. Water in particular is a concern for both energy and water production since it cannot be replaced and it is needed globally in high quality, steadily and in large volumes.

FIGURE 16

Michelin case: Business model

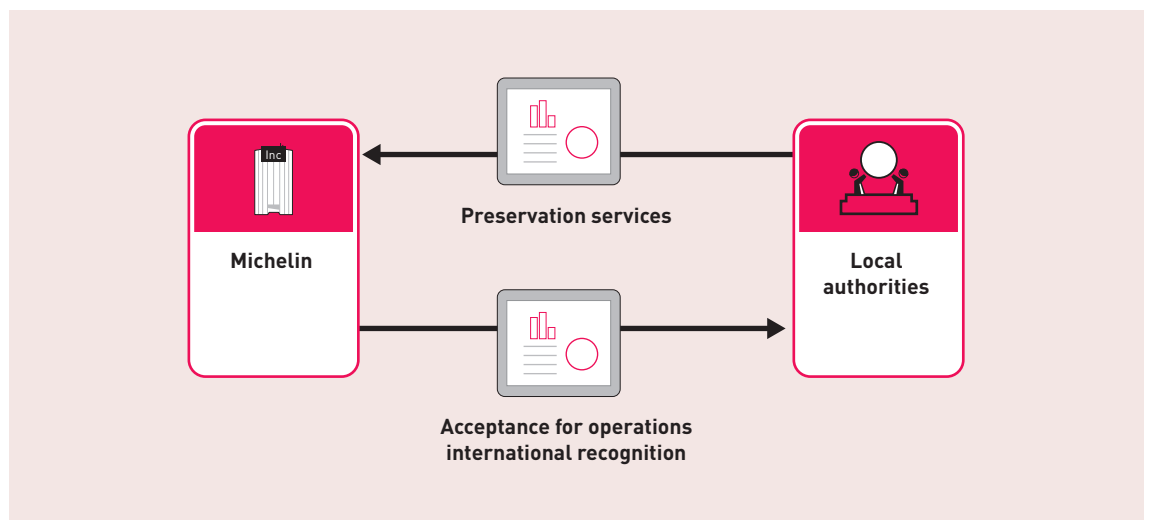


FIGURE 17

The Michelin case: protecting ecosystems while testing tyres

Protecting ecosystems while testing tyres: Michelin

Year:
1987 – ongoing

Type of risk:
Opportunity cost: reduced value of land, brand image
Business and profitability risk: License to operate

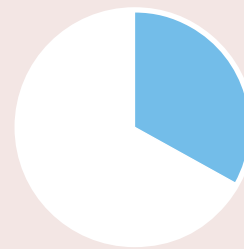
Industry area for which the risk is relevant:
Transportation, Automotive

Case description:
In order to ensure customer satisfaction and safety, Michelin evaluates the performance of its products on test tracks in extreme conditions. One of the tracks is located in the desert area, in Almeria, South Spain. To ensure the testing conditions, Michelin helps to preserve the area. The project includes restoring the area with e.g. green barriers on slopes, channeling pipes for rainwater, plating trees and shrubs to stop desertification and reserving parts of the area for nature conservation.

Key features common for other businesses:
Sustainable land management to ensure future business



● Location of operation



33%
of the testing area in Almeria was reserved for nature conservation in 1987.

200 mm
It rains less than 200 mm a year in Almeria ensuring very specific conditions.

20 M km
Each year more than 20 million km are driven in the area.

Opportunities

- Ensuring future sustainable business in the area and preserving testing conditions
- Improving brand image world wide as the project has become internationally recognised

Financial relevances

- In order to ensure customer satisfaction and safety, Michelin must evaluate the performance of its products on test tracks. Each year, on more than 100 kilometers of tracks, 250 vehicles drive more than 20 million kilometers testing tyres.

In water production, land degradation can cause an extra burden to the industry making it more difficult to provide potable water or water for various industries. Unsustainable practices in wastewater treatment may in turn contribute to land degradation.

Energy production may also be highly affected by land degradation and contributing to it. Raw material availability can be compromised by land degradation, endangering the production. On the other hand, the energy sector and related extractive industries may also be responsible for land degrada-

tion through various raw material sourcing practices (fossil fuel extraction, embankment, biofuel production, uranium mining and risks related to nuclear waste).

Sustainable energy, with a clear price premium, offers an opportunity for energy companies to differentiate their products and to improve their brand image.

The EDIA case

The EDIA case is a good example of how multiple purposes can be combined when ensuring the operations of various industries at the same time. A demonstration project managed by EDIA shows how building a dam in a dry and partially degraded area can change the business of many local entrepreneurs, stop decertification and social degradation of an area.

The building of a dam for the creation of hydro-power has benefited the local community by ensuring a steady irrigation water supply for agriculture

and thus raw material for the agro industry, more jobs for the local people living in the area as well as promoted tourism. The project covers now around 79,000 ha and has a goal of reaching 170,000 ha in the second phase of the project. The area of land now used in agriculture serves as a buffer zone against desertification and through offering livelihood to local people has diminished the social degradation of the area. The area is constantly monitored to ensure sustaining biodiversity, surface water and ground water qualities in the area.

The project has created over 20,000 jobs in the area. The investment is funded about 50% by the EU

FIGURE 18

The EDIA case

Alqueva Multipurpose Project – EDIA & partners

Year:
ongoing

Type of risk:
Opportunity cost: new market, increased value of land

Industry area for which the risk is relevant:
Utilities (travel and leisure, agriculture)

Case description:
Alentejo is one of the most underdeveloped regions in Portugal and it has severe desertification problems. In the Alqueva Multipurpose Project, managed by EDIA and including several partners, a dam was built with the goal of fighting desertification, ensuring water supply to people and industries in the region, developing tourism and producing electricity.

Key features common for other businesses:
Sustainable land management to combat land degradation and enter new markets



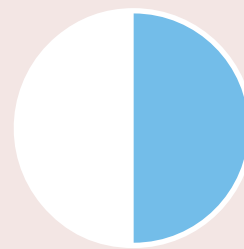
● Location of operation

Opportunities

- Acceptability of new investment
- Improvement of local livelihoods e.g. agriculture, tourism

Financial relevances

- The investment up to 2010 has been approx. 1.8 billion Euro and the total project is expected to cost 2.6 billion Euro. Both the state and community funds contribute to the investments. EDIA has been a manager of the project, but has no own investments in the project.



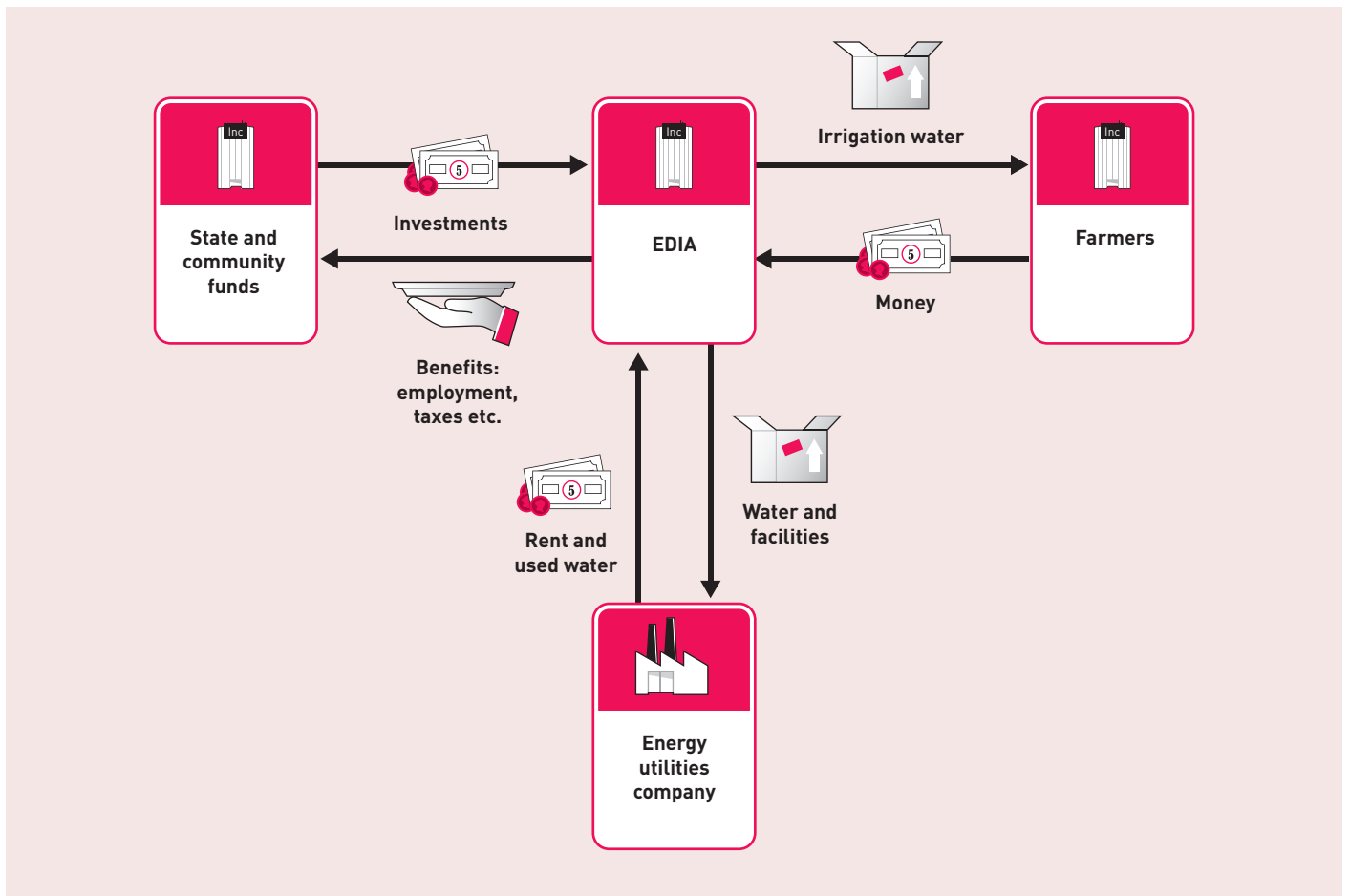
50 %
of the investment was received from EU funds.

2.6 B Euro
is the total estimated investment of the project.

350 GW/h/y
is the total electricity capacity of the hydroelectric plant of the Alqueva dam.

FIGURE 19

EDIA case: Business model



and 50% by state guarantees (Figure 18). It has been estimated that each euro invested in the project generates 4,45 Euro for the national economy.

The EDIA business case is built upon collaboration between players of the area combining utilities, leisure and travel and food and feed industries in a new way. Land remediation is done for both environmental and productivity reasons and the supply of raw materials are secured at the same time for many operators (Figure 19).

4.7 Personal and household goods

Risks and opportunities of land degradation

The relevance of the opportunities and risks related to land degradation varies by the type of personal and household goods.

Any production using bio-based materials (e.g. cosmetics, clothing and accessories, furnishing, footwear, personal products and tobacco) can be highly affected by land degradation and its effects on reduced productivity and raw material and workforce availability. This can be seen e.g. in apparel production which is clearly the largest user of cotton and wool. Both cotton and wool production have contributed significantly to land degradation and resulted in the abandonment of large areas due to drought, salination, overgrazing or overuse of water resources. This has also resulted in restrictions to wool and cotton production in some areas. The consequences may be seen in the availability and price of cotton and wool and even in their competitiveness against other materials.

In addition, the opportunity costs can be significant. Inefficient operations have led to severe problems within for example the semiconductor manu-

facturing sector where poor pollution control measures have resulted in water pollution causing severe problems in certain areas. Silicon Valley, for all its glamour, has suffered from uncommonly severe environmental problems of this type.

Improved market access, opening of new markets, product differentiation and premiums are significant opportunities in certain personal and household goods markets including cosmetics and clothing, where ecologically branded products play a significant role.

The L'Oréal, BASF and Yamana case

The cosmetics producer L'Oréal, together with BASF and Yamana, has worked to ensure the sustainable production of Argan oil in Morocco. The Argan forests act as a natural barrier against desertification, preventing erosion and protecting water resources. The more efficient production of Argan oil is beneficial for all players in the value chain whilst at the same time protecting the vulnerable natural habitat (Figure 20).

FIGURE 20

Case L'Oréal, BASF and Yamana: responsible sourcing of Argan oil

Development of Argan oil sourcing: L'Oréal, BASF and Yamana

Year:
2008–2010

Type of risk:
Opportunity cost: Brand image, reduced value of land
Business and profitability risk: Raw material availability

Industry area for which the risk is relevant:
Personal and household goods

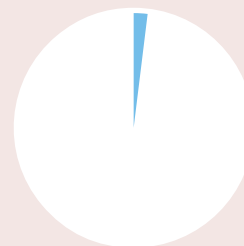
Case description:
The Argan tree is endemic to southern Morocco, largely found on the Souss plain bordering the Sahara desert. It acts as a natural barrier against the advance of the desert, preventing erosion and protecting water resources. A programme for the sustainable sourcing of Argan oil was set up to build a long term relationship with the farmers, and to ensure the traceability and quality of the raw material. The programme also sought to ensure long time production through reducing desertification and soil erosion.

Key features common for other businesses:
Partnering along the value chain to ensure raw material availability and sustainability



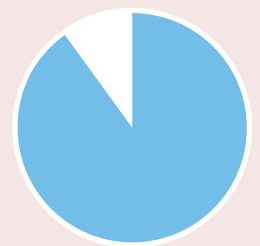
● Location of operation

Opportunities	Financial relevances
<ul style="list-style-type: none"> Ensuring raw material availability with improved yields and increase wellbeing of local people resulting to increased attractiveness of the local livelihood Ensuring long term production possibilities in the area 	<ul style="list-style-type: none"> Argan cultivation produces products and income for 3 million people. Argan oil is one of the rarest oils due to its small and very specific growing areas.



2%

The Argan forest ecosystem only covers 2% of Morocco and the forest is declining by 1% per year.

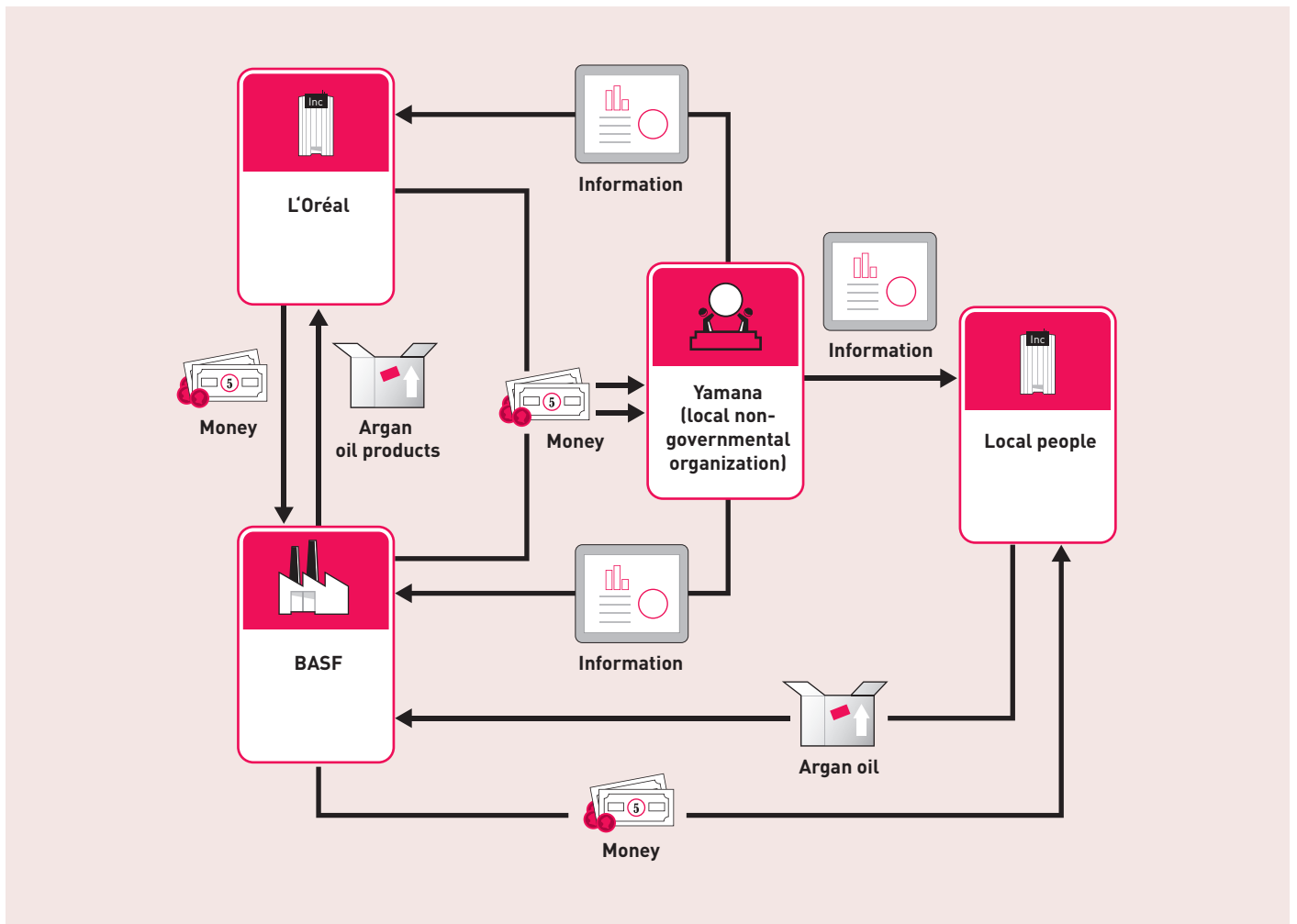


90%

The Argan forest is the major source of income for 6% of the rural population and it makes up 90% of the economy in the areas of native Argan stands.

FIGURE 21

L'Oréal, BASF and Yamana case: Business model



The L'Oréal/BASF/Yamana case stands for a platform of advanced collaboration in the value chain and with locals, and for image and environmental

gain giving license to operate. However, it is also a longer term secure supply chain project for a needed raw material (Figure 21).

TABLE 8

Summary of business drivers: ensuring raw material crucial to value/supply chain

Driver for business: ensuring raw material crucial to value/supply chain

Be it a large component (e.g. ore) or a specific essential item (e.g. a chemical compound needed in cosmetics), ensuring raw material availability includes measures with direct or indirect control of the raw material – “soft power” in the case of a CSR-oriented effort.

Soft power is a concept developed by Joseph Nye of Harvard University to describe the ability to attract and co-opt rather than coerce, use force or give money as a means of persuasion. Nye coined the term in a 1990 book, *Bound to Lead: The Changing Nature of American Power*. He further developed the concept in his 2004 book, *Soft Power: The Means to Success in World Politics*

4.8 Leisure and travel

Risks and opportunities of land degradation

Land degradation over time is directly affecting the leisure and travel industry, especially when future investments are concerned. There are numerous examples where land degradation has reduced the attractiveness of a travel destination. Increased poverty, reduced biodiversity, health problems, migration towards towns and abandonment of villages all contribute to reducing the attractiveness of tourist attractions.

On the other hand, there is a vicious circle: Land degradation deters tourists, and yet tourists often contribute to land degradation in places with high tourist density and sensitivity to degradation (e.g. natural parks). However, the problems are often focused in small areas and thus easy to control by improving the infrastructure and guiding travellers to be cautious and considerate.

Ecologically conscious travelling services or green travel services are a growing segment especially in western countries. Many people are looking for sustainable travel agents and want to be sure that the local environment is not harmed.

FIGURE 22

The Whistler Blackcomb case

Whistler Blackcomb

Year:

1992 – ongoing



Type of risk:

Business and profitability risk: ensuring current and future business

Industry area for which the risk is relevant:

Travel and leisure

Case description:

Whistler Blackcomb ski resort was faced with severe environmental pollution in 1992 as a result of an oil spill due to poor operations management. The spill pollution demanded extensive cleaning and work to avoid such incidents in the future. However, the incident made the company focus on the restoration of the polluted area and on other sustainability projects in order to ensure future business. The company works to limit erosion due to tourism. The measures also protect drinking water and fish habitats.

Key features common for other businesses:

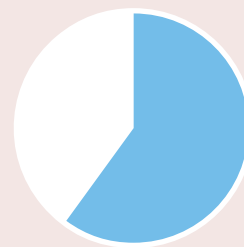
Severe land spoilage can result in finding new more sustainable operating opportunities.



● Location of operation

Opportunities
<ul style="list-style-type: none"> • Ensuring future business • Improving brand image and getting a marketing advantage • Cost savings

Financial relevances
<ul style="list-style-type: none"> • So far over 1.1 million Euro has been spent to protect and enhance the natural areas. • The sustainability programs have returned over 560,000 Euro in savings via improved efficiency and employee and guest satisfaction.



> 60 %

Whistler Blackcomb has reduced its waste generation by over 60% since 2000.

0

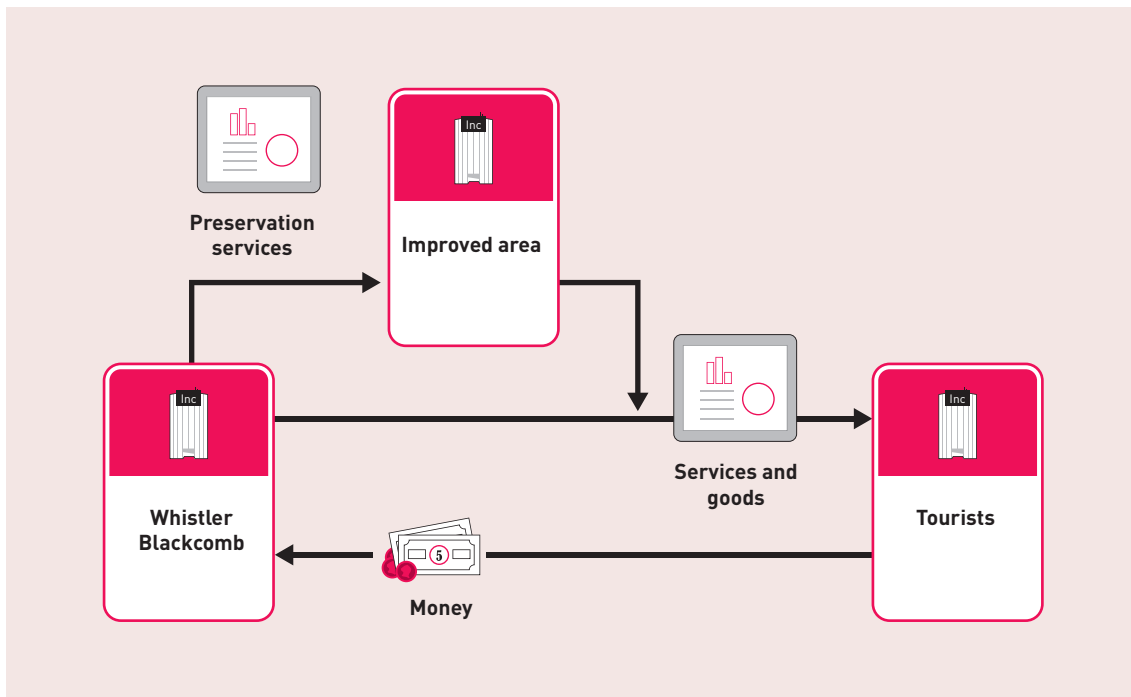
Whistler Blackcomb aims at 0 waste, 0 carbon and 0 net emissions.

103 projects

The company's habitat improvement team has completed over 100 projects since 1997.

FIGURE 23

The Whistler Blackcomb case: Business model



One of the most significant impacts of land degradation is the reduced value of land. Leisure and travel industry often invests in infrastructure, hotels, restaurants, etc. Land degradation may affect the value of this infrastructure and cause even more severe problems for the local economy.

The Whistler Blackcomb case

The Whistler Blackcomb case is a good example of how environmental pollution can affect a company and how one can turn sustainable development into a successful business. The ski resort Whistler Blackcomb was faced with severe environmental pollution in 1992 requiring extensive cleaning and investments. Since then, the company has worked to restore the polluted area and to develop its own activities to have a minimal impact on the environment. By doing this, the company has improved its brand image, ensured future business in that location and reduced costs (Figure 22).

The Whistler Blackcomb case makes a virtue out of a necessity. In the business model, the company ensures its necessary functionality (analogous to raw materials), builds environmental image and brand and protects the environment (Figure 23).

The Ecuador Tree People case

An example of a company that has turned reforestation into a business is the Ecuador Tree People. The company offers tours where one learns about the environment and gets to participate in reforestation activities (Figure 24).

The Ecuador tree people business model is a slightly modified subset of the Whistler Blackcomb case: there is no necessity to survive driving it, but the player builds images and sells its product through protecting the land. This is the opposite of a vicious circle, a virtuous circle: the more the environment is improved, the better the company brand and sales (Figure 25).

FIGURE 24

The Ecuador Tree People case

Making business out of land restoration: The Ecuador Tree People

Year:
ongoing

Type of risk:
Opportunity cost: Market opportunity, brand image

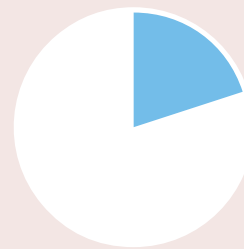
Industry area for which the risk is relevant:
Travel and leisure



● Location of operation

Case description:
As interest in local travelling and eco travelling increases, there are more and more companies offering services which combine ecological benefits and tourism. The Ecuador Tree People offers reforestation tours in different areas, in Andes, Ecuador. Tourists combine trekking in the area, getting knowing the local livelihoods and get to learn about the environment, enjoy it and take part in reforestation activities.

Key features common for other businesses:
Land restoration is seen as a business opportunity both in engaging tourists to the local environment preservation and restoring the environment to ensure future business.



20 %

One tour offered is in Ecuador's cloud and humid coastal forests, which contains approx. 15-17% of the world's plant species and nearly 20% of its bird diversity.

14 days

The company also offers longer Amazon conservations tours.

10 000 trees

Last year tens of thousands of trees were planted.

Opportunities
<ul style="list-style-type: none"> The company has developed business out of land restoration benefitting the eco-tours immediately and the whole area in the future through biodiversity benefits etc.

Financial relevances
<ul style="list-style-type: none"> Tourists pay to be part of reforestation activities organized by the company. Tours cost 90-300 Euro per person and last for 3-4 days.

4.9 Summarising the situation

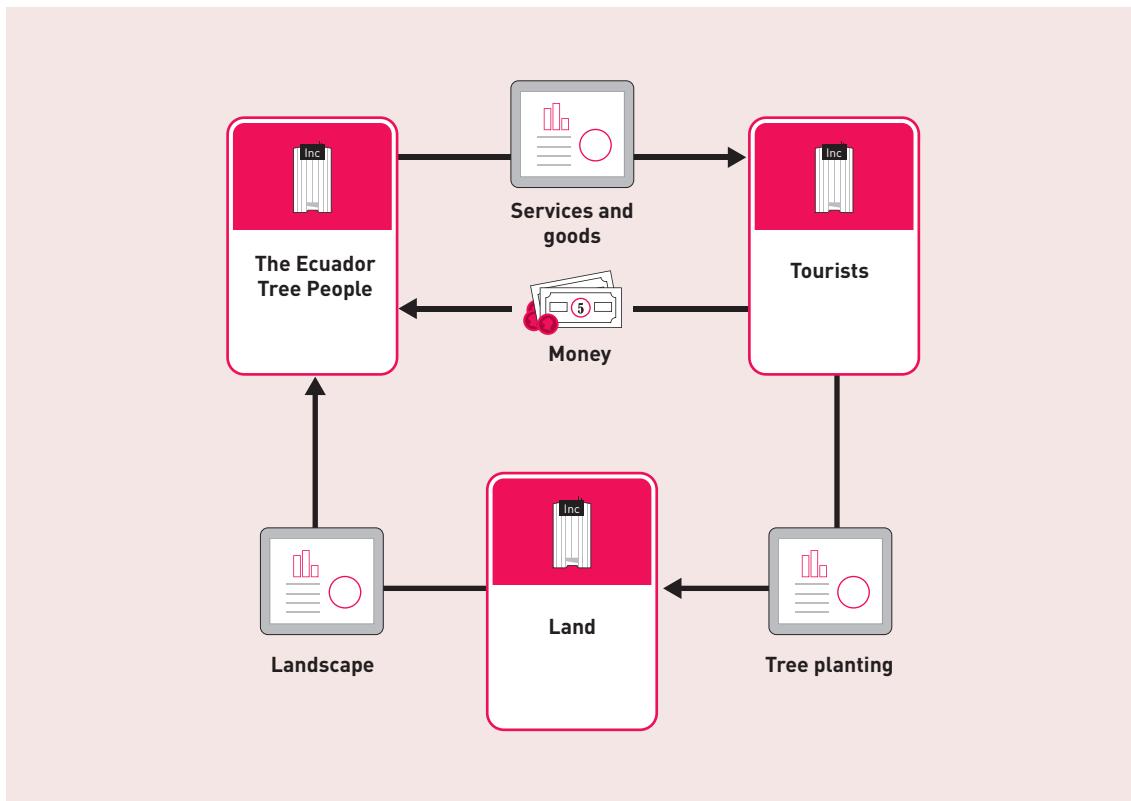
All the business cases discussed in the previous chapters are summarised in Table 9. The most common risks addressed in the cases are the risks of political instability and related social phenomena which also include the licence to operate. Risks of decreasing raw material availability and reduced productivity are the second most common risks addressed. Regulatory and legal risks are not as

common in these business cases, or their connection to the case is not very straightforward.

All business cases are connected to corporate sustainability practices supporting the brand and image goodwill of the companies involved. Some of the cases also provided new market opportunities and most of them improved operations. However, it seems that in the corporate communications and in the media, the contributions to brand and image

FIGURE 25

The Ecuador Tree People case: Business model



are more pronounced than the aspect of operations improvement.

Figure 26 on the other hand summarises the business models connected to each case. The analysis leads to three major clusters; namely service building, ensuring operating environment and securing the supply chain.

The service building cluster focuses on new markets or ensuring the provision of services in mining and travel. The ensuring operating environment cluster is driven by ensuring the functionality of daily operations in utilities, industrial goods and construction. The third cluster secures the supply in food, forest and personal goods. Overall, this shows clearly how business models transcend business sector borders in each of the clusters.

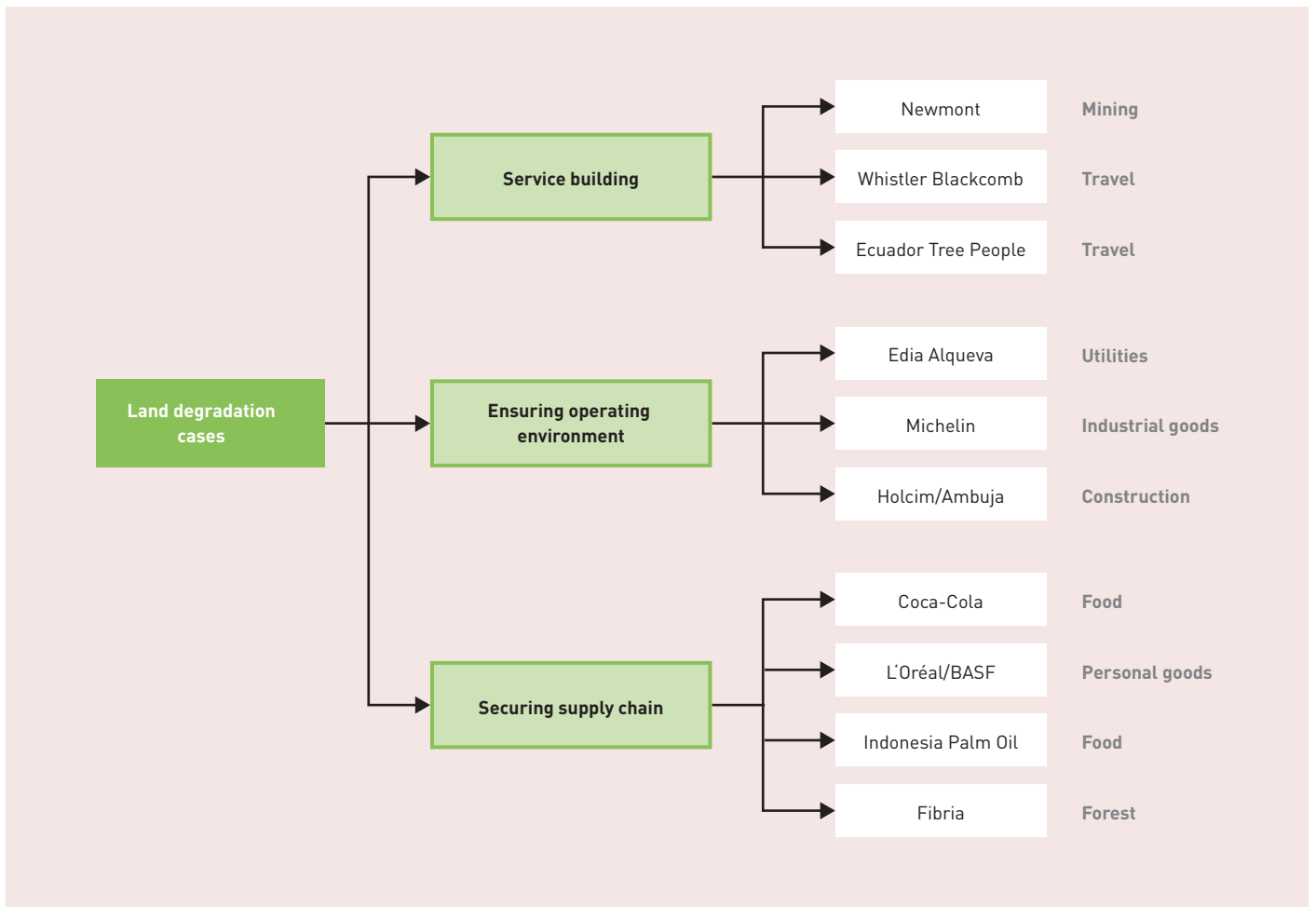
TABLE 9

Summary of the presented business cases

Case	Risks to business				Potential gains and missed opportunities			
	Reduced productivity	Decreasing raw material availability	Political instability and related social phenomena	Regulatory and legal risks	Operations improvement	New market opportunities	Brand and image goodwill	
Alqueva	✓	✓	✓		✓	✓	✓	
Coca-Cola and Jain Irrigation Systems	✓	✓	✓		✓	✓	✓	
Fibria	✓	✓	✓		✓		✓	
Holcim/ Ambuja Cements	✓	✓	✓	(✓)			✓	
L'Oréal	✓	✓	✓		✓		✓	
Michelin			✓	(✓)			✓	
Newmont			✓	(✓)	✓		✓	
The Ecuador Tree People			✓			✓	✓	
Whistler Blackcomb	✓				✓	✓	✓	

FIGURE 26

Summary of triggers for action in the presented business models



Conclusions and recommendations

5.1 Summary of findings

Deforestation and land degradation are major global issues resulting in economic losses equalling 3.3–7.5% of the global GDP. The Economics of Land Degradation Initiative (ELD) has successfully communicated these consequences, highlighting the declining yields and limitations in the availability of raw materials. The remaining question is whether the various actors involved consider these risks severe enough to warrant private sector initiated actions – or joint public-private partnerships.

This paper identifies seven industrial sectors – basic resources, food and beverage, construction and materials, industrial goods and services, utilities, personal and household goods, and leisure and travel – as the most important actors in the context of land degradation. Depending on the location where they operate, they may face considerable risks from land degradation, varying from reduced productivity, decreasing raw material availability, and political instability and related social phenom-

ena. On the other hand there are also potential gains and missed opportunities identified in the cases which include operations improvement, new market opportunities and brand image (Table 10).

Extractive and resource intensive industries can naturally contribute to land degradation, but also be important actors in reversing the trend. In order to act, the industries need

- to be informed of the magnitude of potential gains and returns on investment associated with more sustainable practices for both the shorter and longer run;
- to be informed of good practices for land use and management, and showcases illustrating the action by peer companies, as well as potential gains and returns on investment;
- to be motivated to care by increasing awareness and encouraging cooperation and

TABLE 10

Summary of business risks, potential gains and missed opportunities

	Risks and business impacts of land degradation
Risks to business	Reduced productivity
	Decreasing raw material availability
	Political instability and related social phenomena
	Regulatory and legal risks
Potential gains and missed opportunities	Operations improvement
	New market opportunities
	Brand and image goodwill

- to realise the opportunities which in many cases outweigh the risks.

There are successful cases from various industries all over the world where businesses reduce the risks or benefit from the opportunities related to land degradation. Based on these cases, it can be concluded that:

- Mitigation of land degradation can help in providing a utility with high quality fresh water needed equally for the operation of a business and for the local population. An example of this is provided in the Holcim Cements case.
- Mitigation of land degradation ensures the future supply of essential or unique raw materials for a business. Examples include the projects by Coca-Cola & Jain Irrigation Systems and L'Oréal, BASF & Yamana. Both projects involve local farmers, industrial suppliers and brand owners.
- Mitigation of land degradation may bring along completely new benefits. An example of this is the Newmont Ghana Case, where a gold mine initiated a mitigation project which – as a side effect – also encourages the formation of new local businesses and provision of services to the mine.
- Mitigation projects may also help to get the licence to operate for businesses, as shown in the cases of Fibria and Michelin.
- Degraded land is sometimes an underperforming asset, as shown in the Sustainable oil palm case. Moreover, the case also demonstrates that palm oil can be produced sustainably in South-East Asia.
- Inevitable or voluntary restoration activities can bring along new business opportunities as shown in the cases of Whistler Blackcomb and the Ecuador Tree People.
- It is likely that the need for land and improved land management will increase in countries with new and expanding markets (e.g. India, China). This offers market opportunities especially for technology providers.

In the current situation, the business awareness of land degradation depends on the company's dis-

tance from land in value chain and on the type of business operation (new investment or current business).

- For a company in direct contact with land (e.g. owning its fields, plantations or concession), land is a key asset and managed with normal business tools. A new investment has to have a payback time, Return On Investment (ROI) and Internal Rate of Return (IRR) that meets the company's criteria for new investments or operations management. However, the time horizon is longer than for most other assets: Land is not a fast-moving good or service.
- For a company distant in the value chain from land, the issue is different. The idea of supplier pressure is strong: the focus is on the raw material needed, not the means another part uses to produce that raw material. Thus, raw material price and availability are the factors looked at. Image, brand and market risk are dealt with by the marketing and environmental / CSR (Corporate Social Responsibility) departments. The more acute the risk or greater the publicity for a land-related case, the greater the chance of a special action item related to land. Otherwise, suppliers are assumed to deal with any land-related issues. Land is also mostly not seen as a "core business", which leaves it out from standard calculations and toolkits. Risk analysis for supply chains and new investments is where land comes closest.

Based on the case studies, the identified triggers for action were financial, including securing the supply chain, ensuring the operating environment and building of new service offerings.

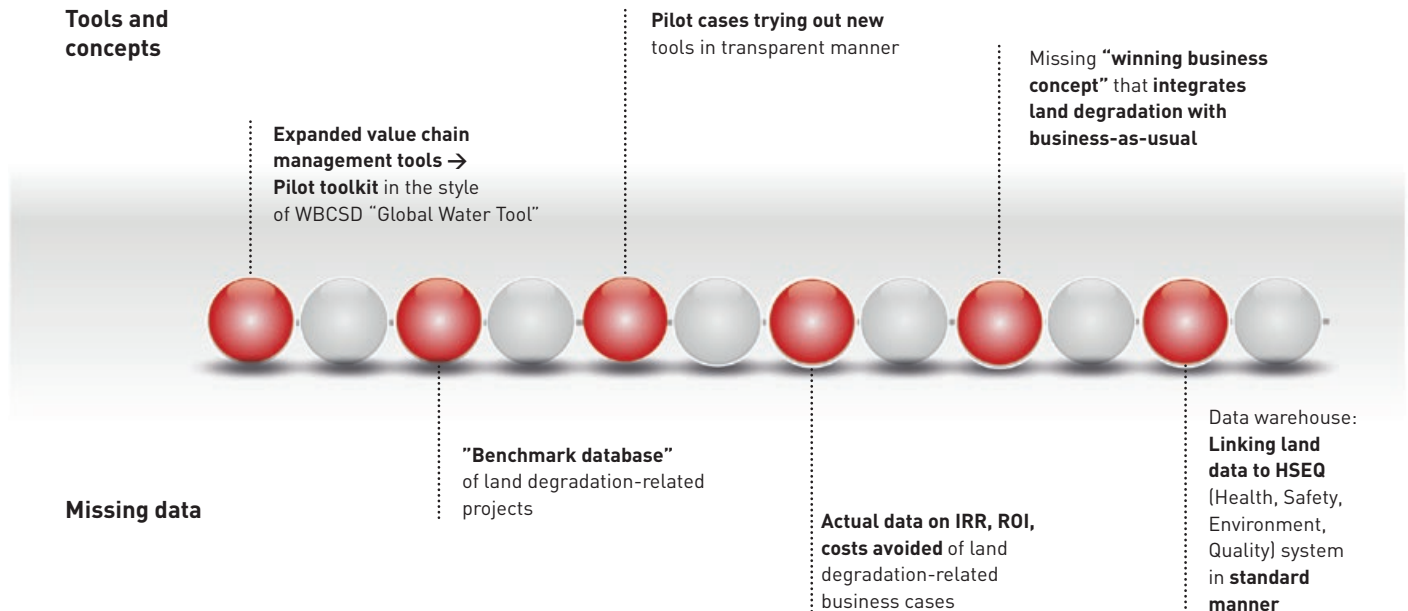
5.2 Next steps

The ELD should continue assisting companies to assess land degradation risks to their business. For that purpose, we recommend awareness raising, a toolkit integrating land degradation issues into standard protocols, and a popularised business concept. Moreover, there are data gaps concerning for example project information and project level financial data to be filled (Figure 27).

In practical terms, the recommended next steps for the ELD Initiative would be:

FIGURE 27

Gaps: Tools, concepts and data



- Approach selected companies from the food and beverage, leisure and travel, and basic resources sectors;
- With the help of these partner companies, prepare even more detailed case studies which highlight innovative thinking, but also disclose the key financial indicators of the case;
- With the pool of case studies, continue to demonstrate successful business activities on the prevention of land degradation and on the mitigation of its effects to other companies within these sectors:
 - Eliminate those cases which can be considered greenwash, i. e. they do not contribute to sustainable land management in the long run;
 - Note that businesses are primarily interested in cases that are economically viable, reduce business risks, open new business opportunities and enhance the company brand and its license to operate. These activities can, however, result in tangible and long-lasting benefits, but they are usually not subsidized;
- If there are, however, cases which were initiated because of incentivizing policies, showcase these for governments.
- Encourage other companies to follow suit. Actions usually cannot be directly copied into other circumstances, but with increasing business awareness, the ELD may well be able to spread the model of innovative thinking;
- Carry out a study on the coherence of existing incentives related to land management;
- Cooperate with existing initiatives and organisations such as the WBCSD to inform companies of potential risks, gains and good practices related to land use and management;
- Support companies and initiatives such as the WRI in the integration of land degradation issues into standard protocols.

Finally, keep alive an idea of a popularised business concept that integrates land management with business leadership (Figure 28).

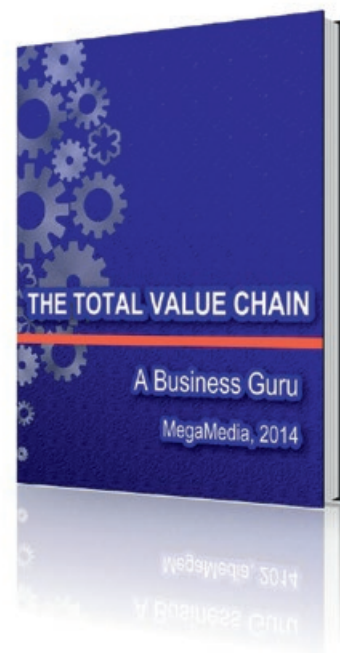
FIGURE 28

A Bestseller Land Degradation Needs

A concept in need of a creator and a bestseller

- A new methodology that fully integrates land degradation into business-as-usual decision making is needed.
- Usually, a new methodology (Balanced Scorecard, Business Reengineering) benefits greatly from having a business book bestseller associated with it: suddenly, it is a “must have” methodology.
- A likely concept candidate is one that considers the changes and transitions ongoing in value chains and creates a new value chain management concept.

Land as an issue risks to be stormed by climate change and flooded by water topics. Its chance is becoming part of a recognized whole value chain-related methodology with its own integrated yet specialised tools.



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- 8 Our term for cities growing too far big for their own good and for the world: the end of a road of development

Annex I: Industry sectors according to the Industry Classification Benchmark

Super sector	Subsector
Oil & gas	Exploration & Production
	Integrated Oil & Gas
	Oil Equipment & Services
	Pipelines
	Renewable Energy Equipment
	Alternative Fuels
Chemicals	Commodity Chemicals
	Specialty Chemicals
Basic resources	Forestry
	Paper
	Aluminium
	Nonferrous Metals
	Iron & Steel
	Coal
	Diamonds & Gemstones
	General Mining
	Gold Mining
	Platinum & Precious Metals
Construction and materials	Building Materials & Fixtures
	Heavy Construction
Industrial goods and services	Aerospace
	Defence
	Containers & Packaging
	Diversified Industrials
	Electrical Components & Equipment
	Electronic Equipment
	Commercial Vehicles & Trucks
	Industrial Machinery
	Delivery Services
	Marine Transportation
	Railroads
	Transportation Services
	Trucking
	Business Support Services
	Business Training & Employment Agencies

Super sector	Subsector
Industrial goods and services	Financial Administration
	Industrial Suppliers
	Waste & Disposal Services
Automobiles and parts	Automobiles
	Auto Parts
	Tires
Food and beverage	Brewers
	Distillers & Vintners
	Soft Drinks
	Farming & Fishing
	Food Products
Personal and household goods	Durable Household Products
	Nondurable Household Products
	Furnishings
	Home Construction
	Consumer Electronics
	Recreational Products
	Toys
	Clothing & Accessories
	Footwear
	Personal Products
	Tobacco
	Health care
Medical Equipment	
Medical Supplies	
Biotechnology	
Pharmaceuticals	
Retail	Drug Retailers
	Food Retailers & Wholesalers
	Apparel Retailers
	Broadline Retailers
	Home Improvement Retailers
	Specialized Consumer Services
	Specialty Retailers

Super sector	Subsector
Media	Broadcasting & Entertainment
	Media Agencies
	Publishing
Leisure and travel	Airlines
	Gambling
	Hotels
	Recreational Services
	Restaurants & Bars
	Travel & Tourism
Telecommunications	Fixed Line Telecommunications
	Mobile Telecommunications
Utilities	Conventional Electricity
	Alternative Electricity
	Gas Distribution
	Multiutilities
	Water
Banks	Banks
Insurance	Full Line Insurance
	Insurance Brokers
	Property & Casualty Insurance
	Reinsurance
	Life Insurance
Real estate	Real Estate Holding & Development
	Real Estate Services
	Industrial & Office REITs
	Retail REITs
	Residential REITs
	Diversified REITs
	Specialty REITs
	Mortgage REITs
	Hotel & Lodging REITs
Financial services	Asset Managers
	Consumer Finance
	Specialty Finance
	Investment Services
	Mortgage Finance
Equity/non-equity investment instruments	Equity Investment Instruments
	Non-equity Investment Instruments

Super sector	Subsector
Technology	Computer Services
	Internet
	Software
	Computer Hardware
	Electronic Office Equipment
	Semiconductors
	Telecommunications Equipment

Annex II: Literature

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THE ECONOMICS OF LAND DEGRADATION

Do not miss this business opportunity!

The Economics of Land Degradation is a global initiative study on the economic benefits of land-based ecosystems. The ELD Initiative highlights the value of sustainable land management and provides a global approach for analysing the economics of land degradation. The initiative is uniquely positioned to make this focus an integral part of business strategies and decision-making.

For business enterprises it is essential to mitigate risks and make the most of their land assets. This scoping document is an assessment of the exposure of business to land degradation risk and the opportunities inherent in sustainable land management. It evaluates the risk of land degradation on various industry sectors and discusses the impacts of land degradation on businesses using examples from different industry sectors. Businesses in direct contact with land are most sensitive to land degradation. For these sectors land is a key asset and managed with normal business tools.

A number of examples of successful business cases that have turned land degradation to a business opportunity are presented as a source for inspiration. Business enterprises can mitigate the negative impacts caused by the industrial activities or improve raw material availability by ensuring sustainable land management practices.

The ELD Initiative continues in assisting companies to assess land degradation risks to their business and opportunities through investment in sustainable land management. The results from this report serves as the basis for the activities of the ELD Initiative in the context of awareness raising and the development of a toolkit for integrating land degradation issues into standard protocols of private sector enterprises.

The ELD Initiative will produce three separate final reports aimed at different target groups, including decision-makers from the private sector.

This ELD business brief is the first step in the development of the private sector report and further activities of the ELD Initiative in cooperation with the corporate sector. It was launched and presented at the first ELD event for the private sector "Land for business – business for land" in Bonn, Germany, in June 2013.

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