

## **Emerging Economies – New challenges for international co-operation and development**

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## Abbreviations

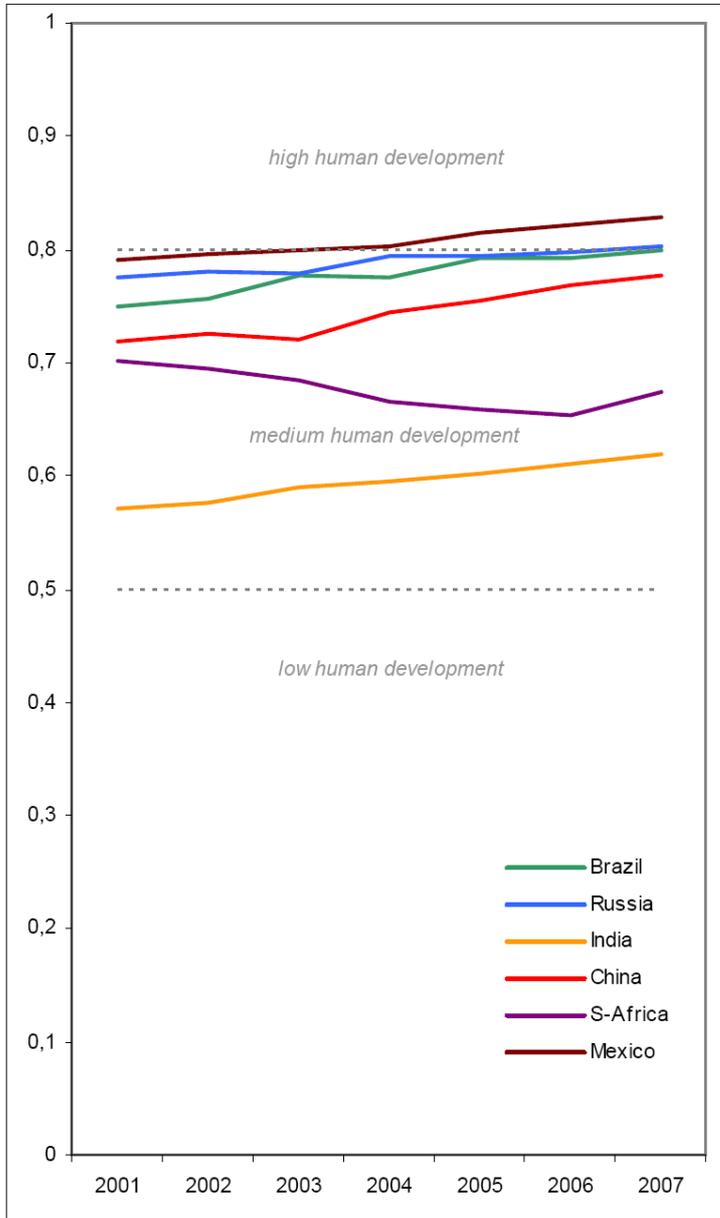
BMZ	German Federal Ministry for Economic Co-operation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung)
BRIC	<b>B</b> razil, <b>R</b> ussia, <b>I</b> ndia, <b>C</b> hina
BRICS	<b>B</b> razil, <b>R</b> ussia, <b>I</b> ndia, <b>C</b> hina, <b>S</b> outh Africa
CDM	Clean Development Mechanism
CSR	Corporate Social Responsibility
EurepGAP	European Partnership for Good Agricultural Practice
FAO	Food and Agriculture Organisation of the United Nations
FDI	Foreign Direct Investment
GATS	General Agreement on Trade in Services
HACCP	Hazard Analysis and Critical Control Point
HDI	Human Development Index
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
StEP	Solving the E-waste Problem
TRIMs	Agreement on Trade-Related Investment Measures
UNDP	United Nations Development Programme
WTO	World Trade Organization

## Introduction

The following research aims to elaborate on the manifold sustainability impacts resulting from the growth of emerging economies and developing countries, thus wanting to identify needs for research, development strategies and co-operation approaches. While this task – due to its immense dimensions – is not manageable for one single research project, the analysis follows a spotlight approach: While the chapter 1 gives an overview on the economic and political implications of the growth of emerging economies from a global perspective, chapter 2 sketches the responses to these developments which have been given by existing and new co-operation initiatives and bodies. The list that is looked at comprises the following six co-operation initiatives and/or definitions: Anchor Countries, BRICS, G8+5 and Outreach Countries, OECD Enhanced Engagement Countries, AP6, Kyoto Protocol and CDM. In examining these initiatives, special attention is drawn to the question of how to deal with these new economic and political powers in order to achieve a more sustainable development.

Chapter 3 enters into a more detailed analysis of four thematic clusters: social and environmental standards in global supply chains, the societal effects of supermarket expansion in Brazil and India, and the impact of exporting used cars from Europe to Africa. Thus, it is aimed to bring the discussion on the challenges of globalisation and their sustainability impact on emerging economies to a more concrete level. This will enable us to prepare for evidence-based decision-making and to sketch the need for further research and co-operation efforts. The combination of all findings from chapter 1 to 3 leads to conclusions which are laid down in chapter four.

# 1 Background



In October 2003, a study by the American investment bank Goldman Sachs gained considerable attention among economic and political actors: in “Dreaming with BRICs<sup>1</sup>: the Path to 2050“, the bank predicted sustained economic growth for Brazil, Russia, India and China, which would lift these countries to the top of the list of the world’s biggest economies, replacing most of the established economic powers within only a few decades. According to the predictions, China would remove Germany from its third rank among the world’s biggest economies in 2007. In 2023 Germany would then be surpassed by India, 2028 by Russia and 2036 by Brazil. From 2039 on, the cumulated economic power of the four “BRIC-countries” would exceed those of today’s six biggest economies. Only the USA and Japan would at that time still be left in the elitist group of six (G6).

Figure 1 The progression of the Human Development Index in selected countries.

While the study set-off a run on so-called “BRIC-funds”, it also caused widespread unease in society and politics and fuelled fears from an unabated globalisation, eroding economic and social gains in the established industrial nations.

<sup>1</sup> The acronym “BRIC” is derived from the initial letters of Brazil, Russia, India and China.

Although it turns out today – six years after the study's publication – that in reality growth rates are lower than predicted, the rapid economic upturn in China and India together with the increasing importance of resource exporting countries do illustrate the fact that the world's perceived division in some rich industrialised nations and many developing countries is changing rapidly: since 1993, the share of North-America, Europe and Japan in the world's exports declined from 72.1% to 61.8% (WTO 2007). While until the 1980s these industrialised regions mostly imported raw materials and exported goods, large portions of the manufacturing industries have meanwhile been relocated to emerging economies.

China now accounts for 23.8% of all exports of computers and office equipment, and 26.9% of all textiles which is already close to the figures of the entire EU25<sup>2</sup> (WTO 2006). In China, there are 32 million people employed in the mass-production of consumer goods, more than in any other country of the world (NBSC 2006). Although the wage-levels are still far below those in established industrialised countries, the economic growth is leading to gradual improvements of living standards in most emerging countries (see Figure 1) and an increase in the demand for consumer goods. Altogether, this results in a rising demand for resources, which is reflected by increasing prices for metals, energy and construction-materials, favouring resource exporting nations like Russia, South Africa and Brazil.

The BRIC-countries are home to 42.2% of the world's population. If – in the course of the economic upturn until 2015 – only 10% of these people were enabled to purchase an own car, this would increase the world car fleet by 300 million or 50% of today's number. It is obvious that these developments do not only lead to social and economic opportunities, but also bear severe sustainability risks which can already be felt today: the CO<sub>2</sub>-emissions of these four countries increased by 33% between 2000 and 2004 and make up 29.1% of today's global emissions (IEA 2006).

Also, emerging countries are of increasing importance on the political level: while after the end of the cold war world policy was almost exclusively dominated by OECD-countries; political scientists now speak of the beginning of a new multipolarity. Humprey and Messner (2006) project that in 2025, Beijing and Delhi – besides Washington – will be the decisive power centres of world politics. Also, the latest developments in the Caucasus led to a widespread reinterpretation of the relations between Russia and the NATO-countries.

One of the first foretastes of this new multipolarity was experienced in 2003 at the WTO-Conference in Cancún, when emerging countries joint together to the Group of 20 (G20) and demanded the removal of US-American and European agricultural subsidies and import barriers.

Beyond this concerted action, many of these countries are increasingly eager to secure and expand their regional and international influence: Brazil, for example, uses its position as the

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<sup>2</sup> EU25: Computer and office equipment 31.0%, cloths 29.2%.

most populous and economically viable country in South-America to obtain regional leadership and to play a major role in developing south-south relationships. Also, smaller emerging countries are in a course of redefining their political role. Thailand, for example, now rejects most foreign development assistance and has turned into a donor country itself, focusing activities on its immediate neighbour Lao. Generally, many emerging countries now increasingly aim to act at eye level with the North-American and European political powers.

## 2 Co-operation initiatives & acronyms

The described developments were not ignored by the governments of industrialised countries, and more and more decision-makers are being convinced that the transformation into economic and political multipolarity bears challenges that can only be solved using new or reformed dialog and co-operation processes. In Europe and North-America, various initiatives were started in order to improve the integration of the emerging countries. Thereby, both the objectives and the acronyms of initiatives are manifold, which makes it particularly difficult to maintain an exhaustive overview. In the following section, the backgrounds and names of some of these initiatives are highlighted, focussing on approaches that explicitly deal with issues of a sustainable development. Thereby, it is aimed to shed light on the frequently used abbreviations, acronyms and the respective concepts that these initiatives are based on.

### 2.1.1 The concept of Anchor Countries by BMZ

The increasing economic and political importance of emerging countries also poses significant challenges for development co-operation: while the co-operation with structurally weak developing countries dominated the portfolios of donor countries in the past, now, ways have to be explored to constructively support the sustainable development of emerging countries – without neglecting the co-operation with low-income countries at the same time. In Germany, this issue was addressed by the concept of *Anchor Countries*, which now is functioning as a guideline for official development co-operation in this field.

Anchor countries are nations that – on the basis of their economic weight, their regional political influence and their growing ability to shape international politics – are of crucial importance to achieve a sustainable development. According to the German Federal Ministry of Economic Co-operation and Development, anchor countries have “a key role with regard to reducing human poverty, working for globally sustainable development, securing peace and stability, as well as for issues relating to global governance and the protection of global public goods” (BMZ 2004). With this definition, there are currently 15 countries listed as anchor-countries. With 11 of these countries, the German government engages in development co-operation activities (see Table 1).

Table 1 List of anchor countries and status of official development assistance (ODA) by Germany

List of anchor countries	Co-operation status <sup>3</sup> of German official development assistance (ODA)
China	Priority partner country
India	Priority partner country
Indonesia	Priority partner country
Pakistan	Priority partner country
Thailand	Partner country
Egypt	Partner country
Iran	No German ODA
Saudi-Arabia	No German ODA
Nigeria	Partner country
South Africa	Priority partner country
Argentina	No German ODA
Brazil	Partner country
Mexico	Partner country
Russia	No German ODA
Turkey	Priority partner country

Source: BMZ 2004

In the medium-term, the existing co-operations should be advanced to „strategic partnerships“. These partnerships are aimed to focus on the following sustainability issues:

- Enhancing social cohesion / reducing poverty.
- Protecting global environmental goods.
- Strengthening good governance and regional security.

### 2.1.2 BRICS

Based on the BRIC-acronym by Goldman Sachs, the term “BRICS” was formed in order to integrate South Africa to the list encompassing Brazil, Russia, India and China<sup>4</sup>. The reason for this integration is not so much South Africa’s economic power (which is quite limited compared to the other BRICS-countries) but the fact that dialog- and co-operation initiatives on global sustainability should not exclude the African continent.

<sup>3</sup> The German bilateral development co-operation is structured in two modes of co-operation: Under the header of “priority partner countries”, up to three development topics are addressed per country. With the label of “partner countries”, the co-operation deals with one topic per country.

<sup>4</sup> Amongst political economists, the BRIC-acronym was also extended to BRICS. In this context the S stands for South-Korea, which featured outstanding high economic growth rates in the last years.

The German Council for Sustainable Development (RNE) together with the German Technical Co-operation Agency (Gesellschaft für Technische Zusammenarbeit – GTZ) initiated a dialog on sustainability and growth in the BRICS-countries and Germany. Within this “BRICS+G” dialog, a national conference was held in each of the six countries in 2005 where representatives from politics, business, science and the civil society came together to discuss the connection between sustainability and growth, and the practical implementations of national strategies on sustainable development. In September 2005, a final international conference was held in Berlin, where participants from the BRICS-countries compared their policies for sustainable development and exchanged experiences regarding respective implementation strategies. Special attention was drawn to the areas of energy, resource management and the social dimension of sustainability.

The dialog exclusively aimed to stimulate the international exchange of ideas and experiences, and did not intend to trigger the level of official negotiations or to deliver any binding results (RNE and GTZ 2005).

### 2.1.3 G8+5 and Outreach Countries

In line with international developments, the Group of 8 (G8) is increasingly aware that global challenges in fields like financial and fiscal policy, international trade and the protection of the climate and the environment cannot be solved by the established economic powers alone. Therefore, they initiated a dialog with the so-called *Outreach-Countries*<sup>5</sup> Brazil, India, China, South Africa and Mexico. The dialog was named G8+5, which should symbolise the close links between these countries and the elitist G8, and partly accommodate demands for full-memberships<sup>6</sup>. On the G8-summit in Heiligendamm in June 2008, it was decided to sustain this dialog in the so-called “Heiligendamm process”. Although there is no work program for this forum yet, it is likely that issues like poverty and climate change will remain on the agenda.

Drawing from the G8+5-acronym and the term of Outreach Countries, the media repeatedly refers to this group of states as the *Plus-Five-Countries* or the *O5-Countries*.

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<sup>5</sup> Unlike anchor countries, the term “outreach countries” is not supported by a clear definition. Generally, it covers Brazil, India, China, South Africa and Mexico, which are of high economic and political importance in their respective regions and globally.

<sup>6</sup> The initial criterion for a G7-membership was a rank amongst the seven biggest economies. With the rise of China to number four and the admission of Russia in 1998 (Russia is ranked 14 – after China, India, Brazil and Mexico), this criterion became obsolete.

#### **2.1.4 The OECD-Enhanced Engagement Countries**

The Organisation for Economic Co-operation and Development (OECD) is an influential international organisation of mainly developed countries. In 1994, Mexico joined the OECD and since that time it is the only emerging economy in the organisation besides Turkey.

The primary goals of the OECD are to support sustainable economic growth, boost employment, raise living standards, maintain financial stability, assist other countries' economic development and contribute to growth in world trade. The OECD works on global issues in the fields of economy, society, governance, finance, innovation and sustainability. The main results of the OECD's work are statistics, studies and policy recommendations, which have significant influence on the design of national and international policies (e.g. "PISA-studies" on education systems).

Due to a growing share of world trade being controlled by non-OECD countries, the organisation currently undergoes a relative loss of influence. Therefore, it is actively discussed whether Brazil, Chile, China, Estonia, India, Indonesia, Israel, Russia, Slovenia and South Africa should be integrated in the OECD (OECD 2007). Nevertheless, membership is only granted to governments of countries that are committed to democracy and to the principles of market economy, which serves as a factual barrier to exclude some major economic powers from the organisation (Meurers 2007). In order to strengthen the co-operation with some of these countries, and despite the existing obstacles, the OECD initiated *Enhanced Engagement Programmes* with Brazil, China, India, Indonesia and South Africa with a view to possible memberships (OECD 2007).

#### **2.1.5 Asia-Pacific Partnership on Clean Development and Climate (AP6)**

The Asia-Pacific Partnership on Clean Development and Climate (AP6) was established in 2005. It is a coalition of Australia, China, India, Japan, South-Korea and the USA. In its vision statement, the involved countries declared to enhance co-operation to meet the increased energy needs and the associated challenges including air pollution, energy security and greenhouse gas emissions (AP6 2005).

The coalition emphasises its voluntary nature and denies legal commitments.

The activities of AP6 are mainly focused on the development, diffusion and transfer of technologies to enhance energy-efficiency and to reduce pollution and greenhouse gas emissions. Currently there are eight public-private sector task forces on the following topics:

- aluminium;
- buildings and appliances;
- cement;
- cleaner fossil energy;
- coal mining;

- power generation and transmission;
- renewable energy and distributed generation;
- steel.

Despite its non-binding nature, the partnership aims *'to marshal considerable financial, human, and other resources, both from the public and private sector'* (AP6 2006).

Although the partnership describes itself as a complementary initiative to the UN Framework Convention on Climate Change and the Kyoto Protocol (AP6 2005), critics see it as an attempt to weaken the binding mechanisms to reduce greenhouse gas emissions (Greenpeace et al. 2006, McGee and Taplin 2006)<sup>7</sup>. Supporters argue that – compared to the current design of the Kyoto Protocol – the partnership is better able to integrate China and India in climate protection efforts (Kellow 2006).

### **2.1.6 The Kyoto Protocol and the Clean Development Mechanism (CDM)**

With the Kyoto Protocol, 35 industrialised countries and the European Union commit themselves to reduce their greenhouse gas emissions by an average of 5.2% below their 1990 level until 2012. In order to reach this aim, the protocol allows flexible mechanisms, which in some cases explicitly aim to enhancing international co-operation to achieve reduction goals. With regards to international co-operation between industrialised and developing and emerging countries, the Clean Development Mechanism (CDM) is of special importance. It allows industrialised nations to meet their reduction goals by carrying out emission reduction projects in developing and emerging countries. Motivation for this mechanism is the fact that emission reductions are more cost-efficient in developing and emerging countries than in mature economies. Although the CDM is no specific tool to enhance sustainability co-operation between industrialised and emerging countries, however, the experiences show that the bulk of all CDM-projects are especially carried out in those countries that currently experience a significant gain in economic and political power (see Figure 2).

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<sup>7</sup> Furthermore, the partnership identified amongst others nuclear power and the long-term use of fossil energies as central strategies to achieve its goals (AP6 2006). With these positions, the partnership significantly diverges from climate protection strategies in Germany and the EU. A further point of criticism is the strong focus on Carbon Capture and Storage (CCS), which is valued critical by some leading environmental experts (i.a. WBGU 2006).

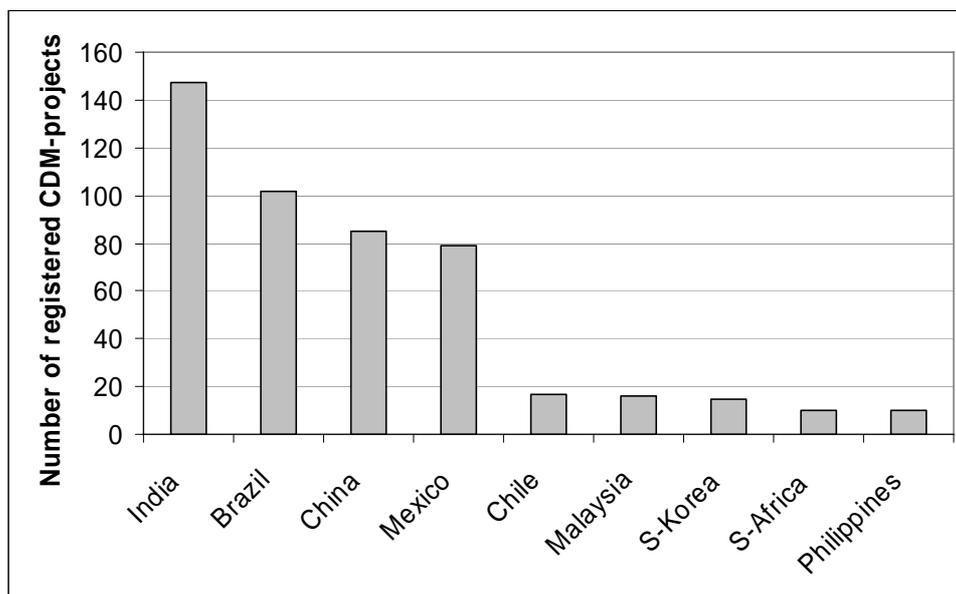


Figure 2 The ten most important locations for CDM-projects. [Source: UNFCCC 2007 (June 2007)]

## 2.2 Interim-Conclusion

The growing importance of the emerging economies is increasingly recognised by political decision-makers, stimulating various bi- and multilateral initiatives to integrate these new forces. While this caused the creation of numerous new dialog- and co-operation-forums, the established organisations of industrialised nations also started considering the admission of countries like China, India, Brazil, Mexico and South Africa. Nevertheless, the question whether these countries should be granted full-fledged membership in G8 and OECD is still open to debate, and many actors prefer the gradual integration via privileged partnerships and enhanced engagement models.

Both in political and economic circles, there is a desire to attribute the emerging powers with a group designation. Varying with the applied criteria, the thematic angle and the target audience, this resulted in *BRIC*, *BRICS*, *Anchor-Countries*, *Outreach-Countries*, *Plus-Five-Countries* and *Enhanced Engagement Countries*. Thereby, none of the existing approaches manages to fully overcome the principle difficulty, which is the extreme heterogeneity of the countries. One example of this definition problem is Russia, which is frequently added to the list of emerging powers by investment-economists because of its high growth potential. From a political perspective, this view is particularly problematic since the country – unlike China, India, Brazil and Mexico – does not pass through a transformation from developing to industrialised country, but can tie up to its history of being one of the world's great powers.

In turn, the classification of South Africa as part of the most important emerging countries (*BRICS*, *Outreach-Countries*, *Plus-Five-Countries*, *Enhanced Engagement Countries*) cannot

be justified by economic terms alone but is rather based on the consideration that at least one African country should be integrated in the respective bodies. Keeping these difficulties in mind, the concept of anchor-countries with its equal recognition of economic and political influence on the respective region seems to be most suitable to address sustainability issues related to countries and emerging-powers of regional and global importance.

Beyond this discussion about naming, definitions and co-operation perspectives, it should not be overlooked that many actors in industrialised countries are highly sceptical regarding the current developments: they fear a widespread loss of jobs, the weakening of the established business locations, the erosion of social and environmental standards, a diminishing importance of international policy regimes and an increasing competition on resources and markets.

Although many of these fears are to some extent justified, they are increasingly exploited in order to demand the protection of national interests instead of an enhanced international co-operation.

The Federation of German Industries (BDI), for example, calls for a “policy in service of resource security”<sup>8</sup> and recommends integrating this principle in the German foreign-, trade- and development-policy (BDI 2007). At the same time, bilateral development co-operation with emerging countries is increasingly on the defensive, and various actors regard the co-operation with China as a dangerous support of a competing economy (i.a. Westerwelle 2006). From the Öko-Institut’s perspective, such voices incorrectly reduce the subject to partial aspects and distract from the core challenge – the search for globally sustainable solutions. Global problems like climate change, poverty and the management of scarce resources cannot be overcome by focussing on national interests and the intensification of global rivalry. It is rather important to establish and strengthen bi- and multilateral co-operations that enable a more sustainable development to the benefit of all parties.

This study specifically examines some global sustainability issues. Thereby, special attention is drawn to problems that are linked to the growth of emerging countries and that have not yet been sufficiently addressed by solution orientated research.

The geographic focus is on Brazil, India, China, Russia, West- and South Africa. This selection does not seek to add another group-classification to the list presented in this chapter, but is a consequence of the themes covered by the thematic clusters of this research (see chapter 3).

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<sup>8</sup> Translated from German (“Politik im Dienst der Rohstoffsicherheit”).

### 3 Thematic clusters

In the following chapter, a selection of thematic clusters linked to the phenomenon of emerging economies is presented. The clusters were chosen because of their high importance for a global sustainable development and the fact that solutions can only be obtained by applying new forms of international co-operation in the respective fields. Furthermore, the described issues are deeply rooted in the current globalisation process, comprising all, the increasing geographic spread of production and the increasingly global reach of individual companies, sectors and products.

Thematic cluster 1 (chapter 3.1) focuses on the increasing globalisation of industrial production systems and its consequences for social and environmental minimum standards. The chapter gives an overview on this situation and summarises the fields of influence for European stakeholders. Thematic cluster 2 (chapter 3.2) focuses on the sustainability impacts of the increasing globalisation of retail structures and on companies with a special focus on supermarket expansion in Brazil and India. Thematic cluster 3 (chapter 3.3) focuses on the sustainability impacts of the globalisation of products. Taking cars as example, the manifold current and future consequences of this globalisation trend are analysed.

#### 3.1 Social- and environmental standards in global supply chains

*By Andreas Manhart*

##### 3.1.1 Background

Outsourcing and off-shoring of industrial production are key features of globalisation. Cheap transport, improved communication technologies and reduced trade barriers make it increasingly attractive to make use of the comparative advantages of other business regions. After its accession to the WTO in 2001, the People's Republic of China emerged as the primary destination for production off-shoring, and now ranks among the most important regions for manufacturing. As can be seen in Figure 3, China's development towards one of the most important exporters of manufactured goods like electronics, textiles and clothes goes hand in hand with stagnant or declining market shares of the US-American, the European and the Japanese economy.

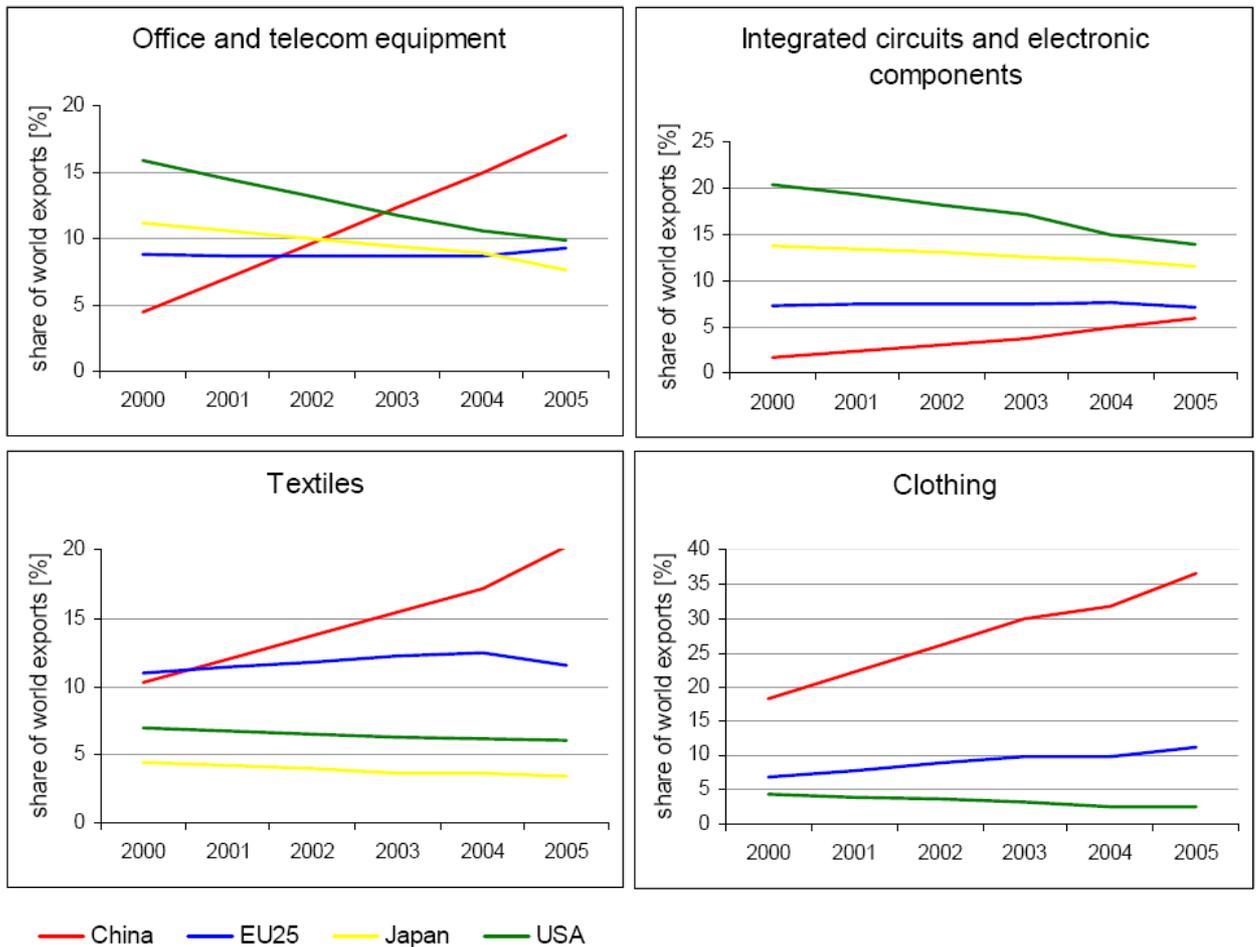


Figure 3 Major business regions' share of world exports in selected industries. [Source: WTO 2006]

In our daily lives, this trend is made visible by the ever increasing number of products labelled as “Made in China”. Additionally, there is a large amount of products that was presumably produced in the established industrialised countries but were in fact assembled in Asia. Many computer-brands for example still appear to be pure “western”, but in reality their mass-production is outsourced to Taiwanese companies with China-based facilities (Manhart and Griebhammer, 2006). But not only labour-intensive production processes are relocated to China. As illustrated in Figure 3, also high-tech processes like the production of integrated circuits and electronic components are increasingly migrating to China.

These developments considerably fuel the Chinese economy and also have positive effects on society: the share of people living from less than 1\$ per day declined from 18% in 1999 to 10% in 2004, lifting almost 100 million people out of extreme poverty within only five years; a trend that was mostly spurred by the country's rapid economic development.

Nevertheless, outsourcing and off-shoring of production bear some major sustainability risks in further respect: the Chinese electricity production is vastly based on coal of low quality, re-

sulting in the fact that greenhouse gas emissions per kilowatt-hour exceed those of industrialised nations by the factor of two (see Table 2). Since companies producing in China are bound to this form of electricity, their environmental footprint is significantly higher than in other places.

In respect to other sustainability issues, Chinese production sites are also more prone to risk than in Europe, USA, or Japan: on average, water pollution by industrial production in China is more than ten times higher than in Japan and four times higher than in the EU25. While roughly 90% of the workforce in industrialised nations is covered by old-age pension schemes, more than 80% of China's workers are not subject to such a basic social security system. Furthermore, child labour is still an issue in some of the country's industry sectors (see Table 2).

Table 2 Selection of sustainability indicator values for major business regions.

	<b>CO<sub>2</sub>-Emissions by electricity consumption</b>	<b>Emissions of organic water pollutants by unit of GDP</b>	<b>Labour costs per worker in manufacturing</b>	<b>Pension contribution</b>	<b>Children in the labour force</b>
	<b>[g CO<sub>2</sub>/kWh]</b>	<b>[kg / million \$ of GDP]</b>	<b>[\$ / year]</b>	<b>[% of labour force]</b>	<b>[% of age group]</b>
USA	576	59	28907	92.2	0
Japan	428	101	31687	92.8	0
EU25	325	259	23271	87.7	0
Germany	488	136	33226	87.9	0
PR China	824	1150	729	17.6	6

Sources: CO<sub>2</sub>-Emissions: IEA 2006; others: WB 2005 and 2006

This collection of indicators does not mean that all Chinese productions are associated with massive pollution, low labour standards and the exploitation of children. However, it cannot be denied that outsourcing to China is likely to lower at least some social and environmental standards in the product chain.

Although multinational companies in many cases do attempt to implement more sustainable production systems in their supply chains via the establishment of CSR-policies<sup>9</sup>, these measures are often limited to a few production sites. Very often, these production sites are either managed directly by the multinational company or they are regarded as the most important (so called first-tier) suppliers. Other parts – especially so called “subcontractors” – within the supply-chains of multinationals are often not affected by these positive measures.

<sup>9</sup> CSR stands for “Corporate Social Responsibility”.

### 3.1.2 Interim conclusion

With the trend of outsourcing and off-shoring, an increasing share of products is being manufactured in the People's Republic of China. Although this situation is beneficial to China's society in terms of income generation, economic growth and the transition towards a developed nation, there are also major sustainability risks that need to be addressed:

- First of all, global production and consumption patterns in some respect do become less sustainable since enhanced GHG-emissions, a lax handling of hazardous substances and relatively low social standards are still widespread in China. If a certain production is outsourced from Europe to China, companies and consumers do benefit from low labour costs in manufacturing, but the relocation of production might also be linked to enhanced GHG-emissions and water pollution, as well as lower social standards. Although not all production facilities in China do feature such low social and environmental standards, the sustainability risks associated with outsourcing and off-shoring are obvious in many sectors.
- The second issue ranks around the changing consumption patterns of the Chinese citizens themselves: while China was ranked as "low income country" by the World Bank only ten years ago, the country's consuming middle-class grew to more than 80 million people meanwhile<sup>10</sup>. Generally, the people's right to increase their living standard is undisputed, and is also regarded as a key issue of sustainable development worldwide. Nevertheless, consumption patterns widely influence the way resources are used, and subsequently the level by which environmental goods and services are maintained or degraded. Until now, the Chinese society started to follow the resource-intensive consumption pathway that industrialised countries have been practicing for many decades – and are just now trying to divert towards more sustainability. If it proves possible to alter these consumption patterns in an early stage of China's industrialisation, the country could possibly leapfrog some of the resource-intensive developments the industrialised countries are still running through.
- The third major sustainability issue is China's internal disparities: while most of the urban population clearly benefits from the economic growth, the gap between rural areas and the booming coastal cities is widening at a high pace (see Figure 4). In 2005, the United Development Programme addressed this issue in a special report and came to the conclusion that large efforts have to be undertaken in order to tackle the problem of increasing inequity (UNDP 2005a). Independent observers of these developments already fear that growing disparities will lead to social tension and political instability in China (Alpermann 2004; Humprey and Messner 2006). Although it appears at first sight

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<sup>10</sup> A consumer is defined as a person with an annual per capita income of more than 2,000 Euro. The figure was calculated with data from NBSC 2006.

that this topic is not directly related to environmental and social standards in global supply chains, the private sector has considerable influence on the well-being of workers, neighbouring communities and consumers.

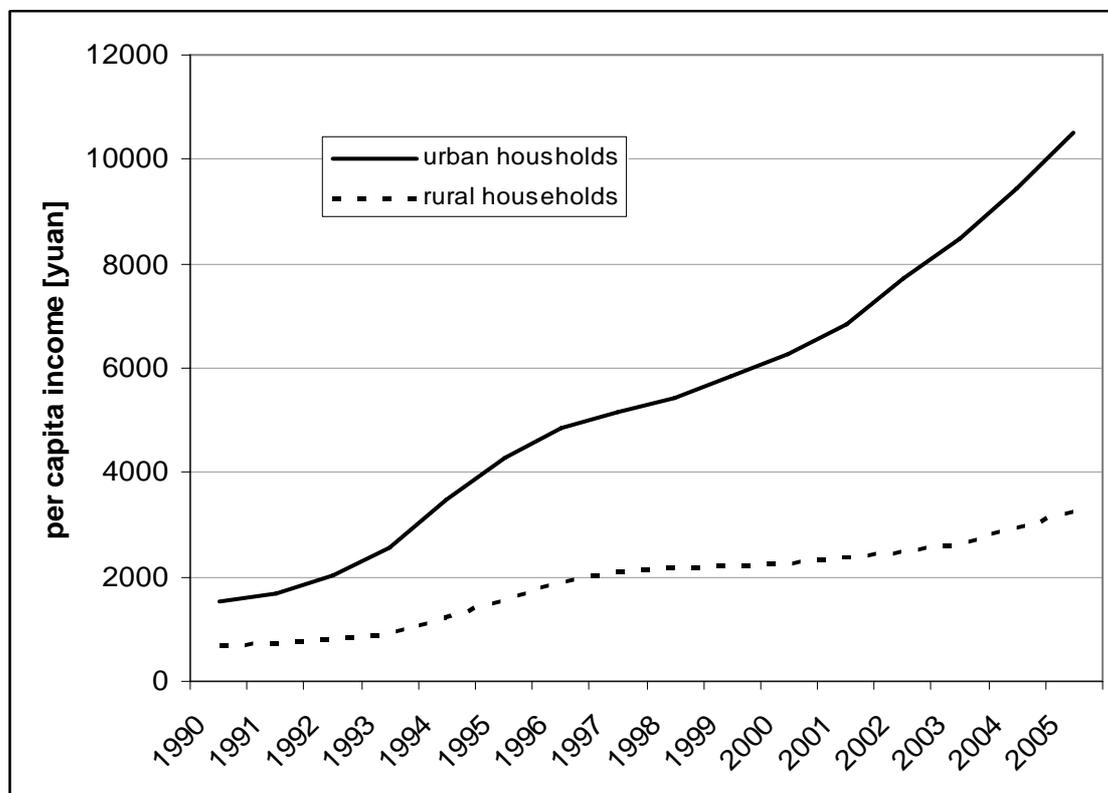


Figure 4 The development of the per capita income in urban and rural China [Source: NBSC 2006]

### 3.1.3 Leverage of European stakeholders

In this chapter, it will be analysed to what extent European stakeholders do have the possibility to positively influence the described sustainability issues without neglecting the development needs of emerging economies, and China in particular. Thereby, special attention is drawn to the question how global supply chains can be managed in order to meet environmental and social minimum standards as defined by the international community. Approaching this question will inevitably lead to measures that do not only affect industrial production for the European market, but that also carry the potential to influence domestic consumption patterns in China. Bearing this in mind, the following five measures will be examined: import regulations, regional and bilateral trade agreements, the OECD Guidelines for Multinational Enterprises, voluntary labelling and certification schemes, and technology transfer and enhanced co-operation.

### 3.1.3.1 Import regulations

In order to ensure the consideration of sustainability issues in global production and consumption patterns, one obvious approach would be simply restricting unsustainable products from entering key markets like the European Union, thus forcing the producing countries to implement internationally accepted social and environmental minimum standards. Although such measures would only apply to products that are imported to the EU, it is likely that according regulations would have significant spill-over-effects on other markets. Nevertheless, from a moral perspective, such practices are highly disputed, due to the fact that such bans would inevitably discriminate producers from developing countries and emerging economies, negatively affecting economic development and wealth generation in such regions.

Furthermore, such import bans are prone to violate international trade regulations laid out in the General Agreement on Tariffs and Trade (GATT) and the WTO: according to GATT and WTO, import bans can be imposed if certain product characteristics pose risks to humans or to the environment in those countries in which the products are used and disposed. However, sustainability issues in product chains can usually not be considered for such bans if they do not negatively affect the physical and chemical properties of the finished product. Though Article XX (GATT) on General Exemptions leaves some room for measures, like import bans that are “necessary to protect human, animal or plant life or health” and are “relating to the conservation of exhaustible natural resources [...]” (Art. XX b and g), the exact interpretation of these articles is still open to debate. Generally, it can be presumed that import regulations based on sustainability impacts in product chains will only endure if they aim to protect social and environmental good and services that

- are perceived to be indispensable by the international community;
- are known to be endangered based on a profound scientific knowledge; and
- cannot be protected by other – less drastic – means.

Taking these aspects into account, it seems principally feasible to restrict the import of products that – during their production phase – have severe negative impacts on topics covered by international sustainability conventions. Nevertheless, the benefits of such measures should be carefully balanced against its potential negative impacts on development and poverty alleviation.

### **3.1.3.2 Regional and bilateral trade agreements**

Since the stagnation of the Doha-Round, a large number of regional and bilateral trade agreements were negotiated. Generally, these agreements are still bound to the WTO-principles and therefore can only implement trade facilitations that go beyond WTO and GATT. Therefore, regional and bilateral trade agreements cannot restrict unsustainably produced goods from entering a market, but they could stimulate trade with goods that were produced in an environmentally and socially sound manner by reducing tariffs accordingly. Although this could be an important measure to take influence on global supply chains, it has to be considered that many regional and bilateral trade agreements are of limited importance only when it comes to the trade of manufactured goods. Experts argue that – in the field of manufactured products – this is caused by the fact that in the last decades, tariffs have already been reduced to a level where further reductions have only minor influences on final product prices (Beattie 2007).

### **3.1.3.3 The OECD Guidelines for Multinational Enterprises**

The OECD Guidelines for Multinational Enterprises are annex to the OECD Declaration on International Investment and Multinational Enterprises from 1976. They are recommendations providing principles and standards for responsible practices for corporations operating in or from the OECD-region or other countries that adopted the guidelines<sup>11</sup>. Since 1976 the guidelines were revised repeatedly. The current version dates back to 2000. The Guidelines cover issues on employment, human rights, environment, information disclosure, combating bribery, consumer interests, science and technology, competition, and taxation. With their recommendations, the Guidelines are one of the most important international documents laying out basic principles for international business operations. Although the Guidelines are of voluntary nature, the adherent countries have to install “National Contact Points” (NCP) that have the duty to promote the Guidelines and to help resolve issues that arise in relation to the implementation (OECD 2000). Since the NCPs are government offices, this last mechanism provides the possibility to file official complaints in the case that a multinational company, based in one of the adhering countries, is violating the Guideline’s principles anywhere in the world. Between the Guidelines revision in 2000 and June 2005, more than 100 complaints had been filed by NGOs and trade unions, most of them revolving around the activities of mining companies in war-zones and developing countries, disputed hydroelectric power projects, violations against freedom of association, child labour, tax evasion and bribery. In some few cases, multinational companies were blamed for violating the Guidelines by

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<sup>11</sup> In addition to the 30 OECD-countries, the guidelines are adhered by Argentina, Brazil, Chile, Estonia, Israel, Latvia, Lithuania, Romania and Slovenia.

having supplier relations with companies from non-OECD countries breaching basic labour rights (OECD Watch 2005).

In a review of the effectiveness of the Guideline's latest version and the National Contact Points, *OECD Watch* – an international network of NGOs – came to the conclusion that, despite some successful conflict resolutions, the expectations by civil society groups have not been fully met and that further efforts have to be made to foster the accountability of multinational companies (OECD Watch 2005).

### 3.1.3.4 Voluntary labelling and certification schemes

As laid out in chapter 3.1.3.1, it is morally disputed and legally difficult for governments to tie sustainability criteria in global product chains to mandatory import regulations. Since voluntary labelling and certification schemes are not subject to international trade regulations, these initiatives offer additional possibilities to strengthen social and environmental standards in global product chains. Because it is beyond the scope of this research to analyse all principles of sustainability labelling, this section will only shed light on the strengths and weaknesses of certification and labelling schemes with regard to a globalised economy.

The main strengths of voluntary certification and labelling schemes lie in their relatively fast and non-bureaucratic implementation processes. While the negotiation of internationally binding sustainability standards takes many years and does not guarantee effective results, voluntary initiatives can focus on interested partners, avoiding lengthy consensus processes. Thus, some certification schemes have the potential to positively feedback on the international policy level by practically demonstrating the feasibility and economic viability of certain measures. Additionally, voluntary schemes are often the only means by which consumers can knowingly influence the sustainability impacts of their purchasing decisions.

Nevertheless, sustainability certification and labelling also have limitations based on the fact that they are bound to certain niche markets: although the organic and fair-trade market experiences annual growth rates of more than 30%, labelled products have not yet reached a market share of more than 5% in any segment<sup>12</sup>. Although some labelled products turn out to be cheaper than non-labelled alternatives, if consequential costs like energy use, maintenance and disposal fees are taken into account, above-average standards in the production phase seldom pay-off for the consumer in monetary terms. This is because high social and environmental standards are aimed to internalise costs that would otherwise be carried by individuals or the society in the producing countries.

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<sup>12</sup> Organic food currently features the highest market share of all labelled products. In Germany, it is projected that organic food will reach a market share of 6% of the whole food-market in 2010 (KPMG 2006). On a global level this figure is significantly lower.

Another obstacle for sustainability labelling is the fact that most schemes do not take a holistic sustainability approach yet: while some labels solely focus on energy efficiency during product use, others only care about content materials or the way in which raw materials are sourced. Although there are some outstanding examples of holistic sustainability labelling (combination of organic and fair labels), they are still limited to the food sector and do not provide solutions for more complex products like computers or cars.

### **3.1.3.5 Technology transfer and enhanced co-operation**

As described in chapter 3.1.1, industrial production in China still features much lower environmental and social standards than it does in Japan, the USA and the EU. Although this is partly due to management and governance practices (e.g. child labour, social security), also, technological limitations play their role: the installed industry facilities in China are on average much less efficient than the best available technologies (see Figure 5). Consequently, outsourcing to Chinese companies is likely promoting the use of outdated machinery and production methods.

This situation makes a transfer of technological know-how inevitable in order to raise production standards in China. Especially Germany, where 20% of the international patents in environmental technologies are developed (Walz et al. 2007), has a high responsibility for spreading its knowledge.

Although this issue is regarded as important aspect by the Chinese government and many international stakeholders (see chapter 2) there are also major obstacles for such technology transfer: the most important driver of know-how transfers are innovative companies that invest in China by installing up-to-date production facilities and by employing local personnel to be trained with the according technology. When in 1979 foreign companies were first allowed to invest in the PR China, it became mandatory to form joint ventures with local entrepreneurs. Although this regulation was passed in order to speed-up the country's technological learning process<sup>13</sup>, it now increasingly turns counterproductive: in many cases, Chinese joint-venture partners used the investors' intellectual property to found own spin-offs that soon turned into fierce competitors. Since in practice there is still little legal support for intellectual property rights (IPR) protection in China, international corporations started to rethink their investment strategies and became increasingly reluctant to import up-to-date process technology (Walz et al. 2007). According to surveys on the Chinese semiconductor industry, this led to a situation where more than 20% of all production facilities work with second-hand-

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<sup>13</sup> Article 5 of the Law on Chinese-Foreign Joint Ventures states that “the technology and the equipment that serve as the investment of the foreign partner in a joint venture must be advanced technology and equipment that actually suit [the] country's needs.”

equipment that would not be acceptable in Europe or America anymore (PwC 2004 and 2007).

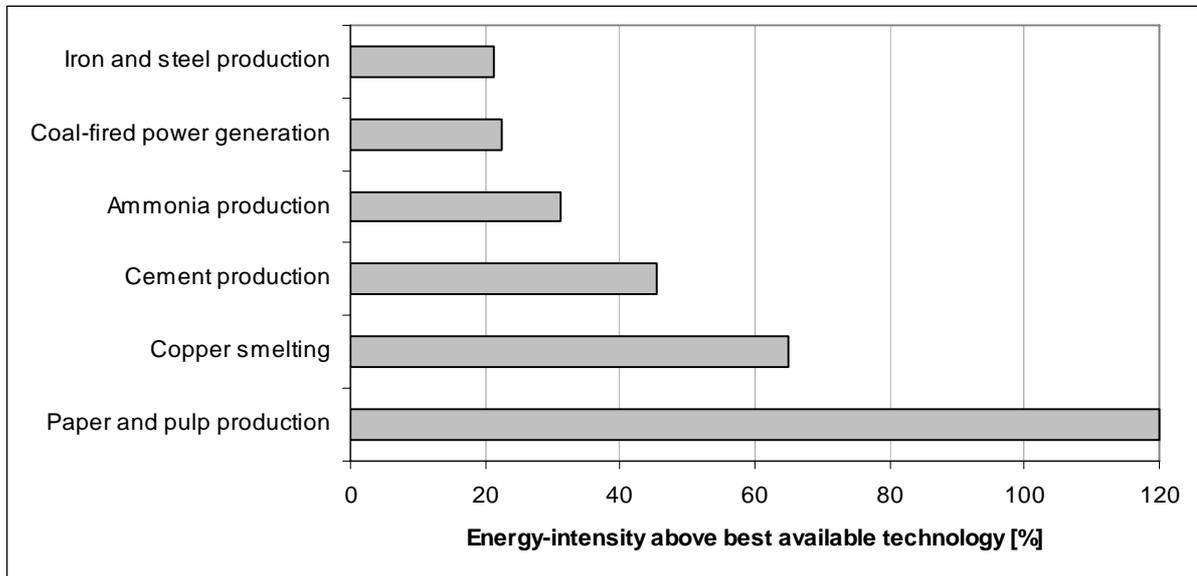


Figure 5 Energy-intensity of selected Chinese industries compared to the efficiency of the best available technologies in this sector. [Source: NDRC 2004]

### 3.1.4 Conclusion

Outsourcing and off-shoring of industries to emerging economies led to a situation where every-day-consumption partly relies on production processes and business practices that are perceived as outdated and as acting against social and environmental minimum standards. Therefore, the question how to turn global supply chains more sustainable is of increasing relevance and determines whether it can be managed to positively change the impacts of our consumption patterns.

In today's world of independent nation-states and a deregulated world economy, the leverage of European stakeholders is limited. Nevertheless, governments, industries, civil-society organisations and consumers do have possibilities to influence global supply chains. Although none of these possibilities provides a silver bullet for all problems, a coordination of efforts has the potential to stimulate far-reaching improvements.

With regards to legislation, governments and the EU can try to ban the import of certain unsustainably produced goods and to promote imports tied to environmentally and socially sound supply chains. Nevertheless, such trade regulations will in many cases also have negative side effects on the economic performance and welfare in developing nations and emerging economies, also bearing the potential of diplomatic crises. Therefore, this policy instrument should only be applied very carefully and in combination with additional co-operation efforts to meet the required import standards.

The private sector should continue its manifold CSR activities and increase the efforts to impose social and environmental standards in supplier and sub-supplier companies. In the course of this, special attention has to be paid to the individual characteristics of each sector in order to prevent negative backlashes caused by blueprint solutions. As laid out in chapter 3.2, strict compliance rules can in some sectors lead to an unintended elimination of small businesses with significant socioeconomic consequences.

Furthermore, mechanisms like the OECD Guidelines on Multinational Enterprises should further be harmonized and applied by civil society organisations and governments. This should also include supplier relationships. However, there is still the need to clarify for which kind of suppliers a company should be held accountable for. While some NGOs demand full accountability for all supplier and sub-supplier companies in the supply chain of multinational companies, this approach does not seem feasible due to the multitude of corporate supplier relationships, which for example also include suppliers of office material.

The above described attempts should be complemented by voluntary labelling schemes that integrate social and environmental criteria and cover the whole product life cycle. It is of special importance to come up with an independent and transparent labelling scheme that builds upon the experiences from existing environmental and fair labels and integrates these approaches to sustainability labelling. Additionally, such an initiative should not only be limited to food-products, but should also cover raw materials and complex manufactures like computers and cars. Although there have been some activities aimed to develop such holistic sustainability labelling in the past years, there is still the need for further criteria development and pilot projects.

Using the criteria developed in such labelling schemes, government bodies should lead by good example imposing public procurement guidelines. In Germany alone, government bodies purchase goods worth 250 billion Euros annually. If these goods would be produced in a sustainable manner, this would inevitably have positive impacts on many global supply chains.

Furthermore, the transfer of know-how and technology is of ongoing importance for making production in China and other emerging economies more sustainable. Thus, the area of conflict between intellectual property rights (IPR) and the need to speed up the technological learning process is a key issue still waiting to be resolved. While western countries repeatedly press the Chinese government to strengthen IPR related legislation and implementation, this approach would only partly resolve the sustainability problems associated with this conflict: if IPRs would be perfectly secured in China, this would very likely lead to a situation where only multinational investors can make use of up-to-date process technology, with Chinese companies still relying on outdated equipment. Taking this scenario into account, new models have to be developed that allow international investors to bring in their latest know-how, which at the same time can be deployed in Chinese businesses. Such models would have to include compensation mechanisms for companies making environmentally sound

lead-technologies available to stakeholders in developing and emerging economies. The question how such models could work in practice and how they could be tied to the framework of international laws and agreements still requires additional research.

## **3.2 Societal effects of supermarket expansion in emerging countries – the cases of Brazil and India**

*By Katharina Schmitt*

### **3.2.1 Background**

The rapid rise of supermarkets in emerging economies is a megatrend in retail and a core aspect of globalisation. Different authors describe this phenomenon as being ‘a revolution in the nature of the food supply chain’ and ‘an extremely rapid transformation of the food retail sector in developing countries’ (Reardon et al. 2005; UNDP 2005b). Among the driving forces for supermarket expansion, three factors prevail in the academic and public debate: the liberalisation of trade and investment at national, regional and multilateral level (GATS, TRIMs); the technological revolution in logistics and inventory management<sup>14</sup>; and the increasing concentration of the market power of retailers due to a flurry of international mergers and acquisitions (see AT Kearney 2007a; Deloitte 2007; UNDP 2005b; Reardon et al. 2004; Wiggerthale 2007). Traill (2006) names additional socioeconomic forces that spurred the spread of supermarkets in developing countries themselves. These forces include: rising incomes, urbanisation, more female participation in the labour force and the desire of local consumers to emulate western culture.

Leading American and European retail chains – such as WalMart (US), Carrefour (France), Metro Group (Germany) or Tesco (UK) – heavily invested in exploiting their growth potential abroad and in opening up new consumer markets.

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<sup>14</sup> Technological achievements include in particular the development of Electronic Data Interchange (EDI) and Radio Frequency Identification (RFI).

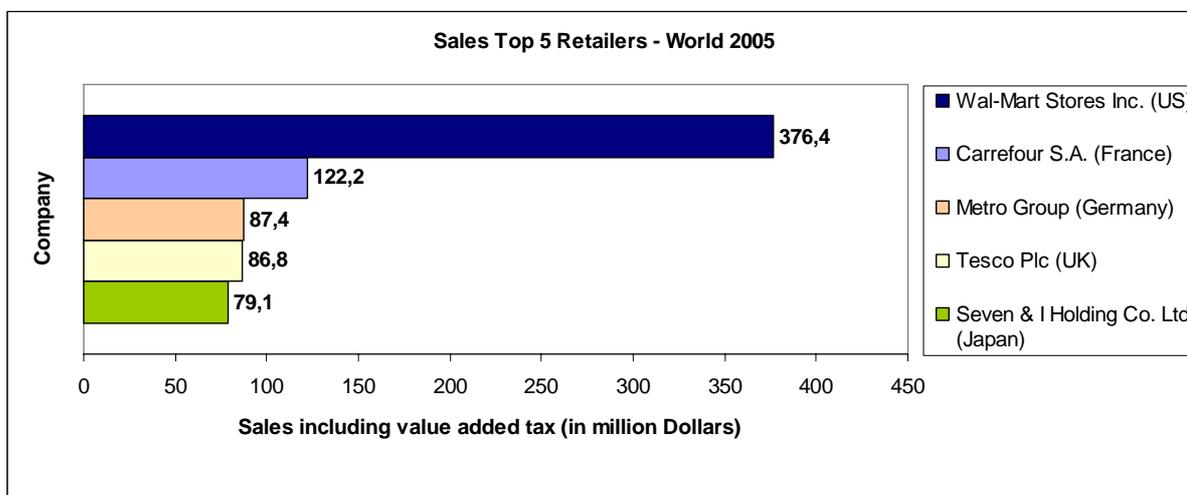


Figure 6 Top 5 retailers worldwide by turnover (2005) [Source: own; Data taken from *Lebensmittelzeitung* (2007)]

The three biggest global retailers (see Figure 6) already generate much of their net turnover in foreign markets (Wal Mart: 22%, Carrefour: 53%, Metro Group 55%) (Lebensmittelzeitung 2007). According to AT Kearney (2007a), the four emerging economies that are favoured by western supermarkets to expand into are Brazil, Russia, India and China – BRIC countries.

The process of “supermarketisation” in emerging economies has taken place over the last 20 years, albeit at different rates and depths across region and countries. Reardon et al. (2004) describe 4 waves of expansion in different regions of the world. The process began in Latin America, hitting major cities in the larger or richer countries of Latin America. By 2000, supermarkets delivered 50%-60% of retail food sales in countries in the region. The take-off in South-East Asia as well as in Central and Eastern Europe began 5-7 years later, with Asia registering even faster growth than Latin America. The supermarket sector in China is the fastest growing in the world. The third wave hit small and poorer countries of Latin America and Asia as well as southern and eastern Africa. Most of the rise in supermarket diffusion in South Africa has come since the end of apartheid in 1994. The most recent venue for supermarket take-off is southern Asia and western Africa. The latter experiences the investment of South African chains, with Kenya being the front-runner in terms of supermarket spread, followed by Zimbabwe and Zambia.

What gathers from the above described developments is that supermarkets in emerging economies are no longer niche operators catering only rich or middle class consumers. They have spread from big cities to intermediate towns and even to small towns in rural areas, pervading the food markets of the poor (Reardon et al. 2005). Supermarket expansion is an ongoing process that will soon see supermarkets as the dominant food suppliers around the world. The following section will address the sustainability effects that arise from the spread of western supermarkets into emerging economies. These effects include above all those

implications that occur in emerging economies themselves, their societies and their natural environment. These effects will be analysed with a particular focus on the developments in the retail sectors of Brazil and India. Thus, the following section provides first an overview of the retail sector in Brazil and India, putting emphasis on key structural data and their implications with a view to a sustainable development. Next the social and environmental effects that arise from supermarket expansion will be examined. Finally, conclusions will be drawn and further research needs that seek to explore the effects of supermarket expansion in emerging economies will be elaborated on.

### 3.2.2 The cases of Brazil and India

#### 3.2.2.1 Structural data

The following section provides the reasoning on why we chose to analyse the effects of supermarket expansion in Brazil and India and it presents some structural data on the two country cases.

**Brazil** has seen a decade of intense supermarket expansion and today holds the highest share of food retail in Latin America. Back in 1975, Carrefour opened its first supermarket in Sao Paulo, not being followed by any western competitor until 1995, when Wal-Mart and its French and Dutch counterparts entered the scene. From 1995 onwards, a wave of mergers and acquisitions hit the country, leading to vast concentration in Brazilian retail. As a consequence, the market share of the five largest retail chains in Brazil practically doubled in a period of ten years (see Belik 2004, Berdegue et al. 2003, Farina 2003). Brazil therefore represents a country which has experienced the entry of western supermarkets for more than two decades. Effects of the transformation in retail are well-known and broadly documented for analysis.

According to AT Kearney's Global Retail Development Index 2007, **India** is the most attractive country for global retailer to expand into. Modern retail grew between 25% and 30% in India and it is expected to grow at the same rate in the next 5-6 years. Despite this bright economic outlook, only two international retailers entered the Indian market so far: Metro Group and Wal-Mart. This can be traced back to the fact that the Indian government places tight restrictions on foreign companies wanting to enter the Indian market. Only recently (February 2006) did the Indian government relax its regulations on Foreign Direct Investment (FDI) in Indian retail firms (see Guruswamy and Sharma 2006; Guruswama et al. 2007). Until then, foreign food retailers were forbidden to enter the market, in a bid to protect local businesses. Whereas Metro with its Cash & Carry self-service wholesale stores profited from the new regulation (Metro Cash & Carry 2007), Wal-Mart had to launch a 50:50 joint venture with Indian retailer Bharti Enterprises in order to enter into India (Ethical Corporation 2007). In conclusion, India represents a country where supermarket expansion is still in its infancy, with market opportunities and changes in retail structure rapidly emerging.

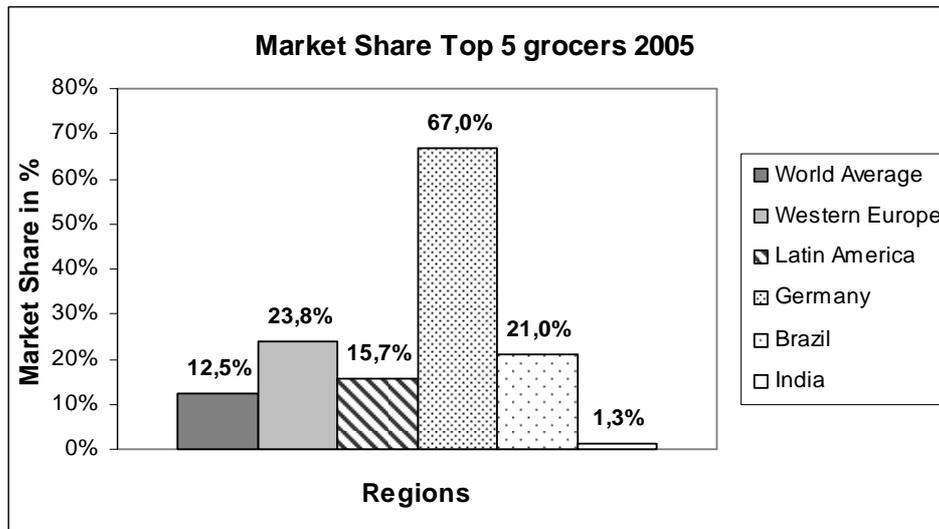


Figure 7 Market share (2005) of Top 5 grocers in selected world regions [Source: own; Data taken from Planet Retail (2007) and AT Kearney (2007a)]

The figure above displays the current retail structure in Brazil and India as compared to other regions of the world. It presents the consolidated market share of the TOP 5 grocers by turnover operating in each of the countries or regions stated in the figure.

When analysing the retail structure of an economy, there is one indicator often used due to its highly descriptive value: the share of organised retail. Organised retail is defined as *‘trading activities undertaken by licensed retailers that is, those who are registered for sales tax, income tax, etc. These include the corporate-backed hypermarkets and retail chains, and also the privately owned large retail businesses.’* (Guruswamy et al. 2005)

The following figure displays just that, giving data on the share of organised retail in India and Brazil. The market share of organised retail is further broken down to portray the market share that each of the Top 5 supermarket chains in Brazil and India have accomplished so far.

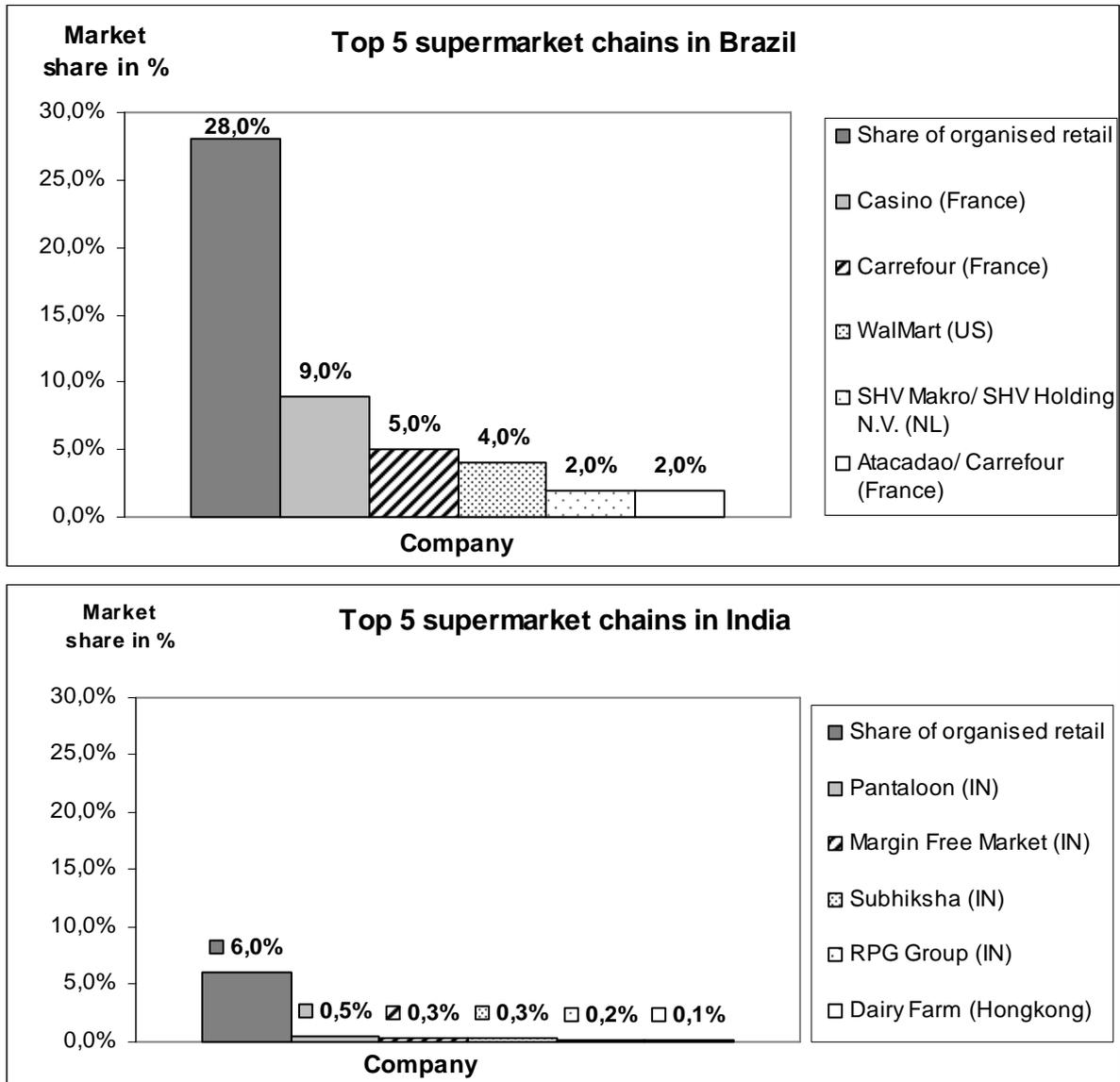


Figure 8 Share of organised retail and Top 5 supermarkets in Brazil and India [Source: own; Data taken from AT Kearney (2007b)]

As indicated by the charts above, Brazil has already accomplished a share of organised retail that is some five times larger than that of India. Whereas the biggest supermarket in Brazil (French giant Casino) holds some 9% market share, India’s leading supermarket chain Pantaloon only accounts for 0,5% of the market. Consequently, India offers huge growth potential in this segment of organised retail.

Beyond the figures presented above, a large part of unorganised retail remains in both countries. This is by far the prevalent form of trade in India – constituting 94%. Guruswamy et al. (2005) define unorganised retail as ‘the traditional formats of low-cost retailing, for example,

*the local shops, owner-manned general stores, [...] convenience stores, hand cart and pavement vendors [street vendors, author's note] etc.'*

These forms of retail constitute an important source of income for millions of rural poor who seek agricultural diversification and urban markets as an escape route from poverty. According to Guruswamy et al. (2007), organised retail in India employs about 0.5 million people, whereas the unorganised sector employs nearly 40 million people. The huge employment in the unorganised sector is due to the fragmented nature of this traditional form of retailing that is characterised by small family-owned and mostly self-employed retail trade.

What are the implications of the above described changes in retail structure witnessed in Brazil and India? Both country cases are somewhat representative for a much large number of emerging economies which will face comparable transitions. Hence, implications from the developments in Brazil and India might be of high importance to these economies, too.

Following the outline of this study, the implications will be related to the structural data presented above – that is, the social and environmental effects of the structural change in retail will be examined. Academic literature often puts forth a much broader set of interdependencies and causal relations which are seen to have triggered supermarket expansion and its social and environmental effects. Such detailed reconstruction is, however, not the aim of this study. Rather, the focus lies on giving some first insight into the drivers and effects of supermarket expansion and on providing a sound basis for further applied research in the area.

### 3.2.2.2 Societal Impacts

A large number of studies have described the effects caused by the diffusion of western supermarket chains in emerging countries (see e.g. Belik 2004; Farina 2003; Guruswamy 2004, 2005, 2006; Reardon et al. 2004 and 2005; Traill 2006; UNDP 2005b; Wiggerthale 2007a). With varying geographical and actor-specific focuses, all of these studies have portrayed the implications of supermarket spread for local supply chains, the workforce, local competition and consumers. The following section will take up a large number of the arguments, impacts and conclusions drawn from these studies. Based on two distinct characteristics of modern retailing, this chapter will provide an analysis of the effects of supermarket spread on four stakeholders – namely small farmers / suppliers to supermarkets, local competitors, the workforce and consumers – and it will provide brief description of the causes of these effects.

Concluding from literature, two main characteristics of modern retail seem to trigger most of the negative effects on emerging societies which have been reported so far:

1. The increase in **dominance** and **bargaining power** of western supermarkets in local food **supply chains** and its effect on small farmers.
2. The increase in **market share** of western supermarkets and its effect on local and small retail (competitors), on workers (employees) and on consumer purchasing.

As concerns the first point, the entrance of vertically integrated transnational supermarket chains into emerging markets has brought about severe changes for local supply chains (see Farina 2003; Reardon et al. 2004; Wiggerthale 2007). Over recent decades, supermarkets gained increasing control over the global trade and sale of food. This leads to consolidated supply chains in which buyers of giant supermarkets *'wield increasing power to set standards, prices, and delivery schedules'* (FAO 2004). With the transfer of their procurement systems to emerging economies, supermarkets increased their power upon local supply chains, too. They began to introduce preferred supplier systems, shifting towards contracts with a limited number of suppliers who met their requirements. These requirements impacted upon the *quality* and the *quantity* of goods that farmers were to provide to supermarkets, leaving many small producers in the cold. In terms of *quality*, there has been a rise of quality and safety standards, such as the HACCP standard on hygiene and quality or the EurepGap standard on good environmental and social practice in agriculture. Additionally, supermarkets often introduce private environmental and ethical supplier standards in line with their Corporate Social Responsibility programmes. This rise of supplier standards often poses substantial risks of even deeper poverty to small farmers who cannot afford the investments connected to increasing the quality and safety standards of their produce (Reardon et al. 2004). Ironically, social and environmental supplier standards have mainly been introduced after NGOs, and a considerable number of consumers started to demand the integration of such standards into the supply chain management of multinational companies in order to protect workers and local communities from the negative impacts of globalisation. Farina (2003) reports that supermarkets as well as international food chains such as McDonald's are very demanding in terms of food safety and other quality attributes. They require from their suppliers the control of water quality, seeds variety, pesticides, packaging and temperature, along with rigid standards of size, colour and texture.

In terms of *quantity*, the development of "modern retail" is often said to be directly linked to a system of mass production (see Chandler 1976). The accompanying industrialisation along the whole food value chain poses an enormous challenge to agriculture and the environment. These two down-stream challenges will not be addressed by means of this paper, but their magnitude is profoundly dealt with e.g. by Carlsson-Kanyama and Faist (2000) and Jungbluth (1999). Supermarket procurement systems aim at constantly lowering product and transaction costs and risks. Hence, supermarkets are to select only the most capable farmers who may additionally offer large volumes in order to reduce transaction cost. Farina (2003) reports that more than 75,000 Brazilian dairy farmers were delisted by the 12 largest milk processors between 1997 and 2001 due to the consolidation of the milk supply chain. This is due to the fact that supermarket transaction costs may be significantly higher for negotiating and managing contracts with small farmers.

As concerns the overall effect on small farmers from the above described developments in supermarket procurement, FAO (2004) states: ‘*Smallholders face many obstacles to joining the ranks of preferred suppliers for supermarkets. Meeting standards for quality and reliability may require substantial investments in irrigation, greenhouses, trucks, cooling sheds and packaging technology*’. It is thus not surprising that the evidence is mounting that the changes in standards and quantity demanded have driven many small firms and farms out of business over the past five to ten years.

The second point outlined above is that of increased market share of western supermarkets in emerging market economies and its effects on local and small retail (competitors), on workers (employees) and on consumer purchasing. FAO (2004) reports that the world’s 30 largest supermarket chains now account for about 30% of food sales worldwide. In Brazil, the share of organised retail has ballooned over the recent decade (see also Figure 8) whereas India is said to face similar supermarket expansion at even faster rates during the next 5 to 6 years. The effects that the spread of supermarkets exercises on both competitors and workers are somewhat interwoven as they result from the employment opportunities offered by different forms of retail. Generally, employment opportunities diminish with an increase of the share of organised retail in an economy. The loss of employment opportunities is the more drastic, the more the economy relied on a large part of unorganised retail in its trading structure so far. Wiggerthale (2007a) argues that supermarkets (“Big C”) offer fewer jobs per turnover being made as compared to street or shop vendors (see Figure 9).

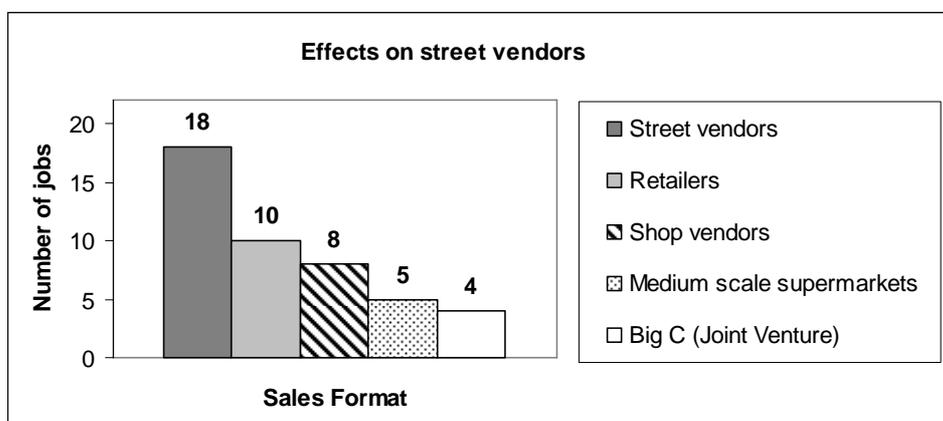


Figure 9 Average number of jobs offered by sales format [Source: own, data taken from Wiggerthale (2007b)]

Furthermore, considering that street vendors often belong to the rural poor, their competition for market share with supermarkets is very likely to intensify the poverty in emerging economies.

Further effects have been reported for the workers of supplying firms and farms to supermarkets. As the latter gain larger market shares, their bargaining power over their suppliers increases, and price pressure is increasingly pushed down the value chain. This may lead to

varying outcomes: either, supermarket suppliers pass this pressure onto their workers and staff who have to work longer hours or receive lower wages. One example often cited in this context is the case of banana production in Latin America (see e.g. Wiggerthale 2007a), where wages of workers decreased from around \$13 per day in 2000 to \$7-8 per day in 2003 due to pricing pressure from UK supermarkets. Alternatively to passing on price pressure on their workers, large suppliers might also change their workers base from consisting of permanent workers to only employing seasonal and temporary workers. Some have even been reported to employ migrant or illegal workers without working permission. The latter often receive wages far below the minimum wage or do not receive any money at all.

As concerns the effects on consumers, FAO (2004) argues that the increasing dominance of supermarkets has yielded greater consumer choice, more convenience, lower prices and higher food quality and safety for urban consumers. McKinsey (2007) published a study that presents similar insights for the Indian consumer market. However, Wiggerthale points to the fact that food prices in the unorganised sector is often just as cheap as in supermarkets. Additionally, unorganised retail also benefits the poor who do not have access to supermarkets in large urban agglomerations. So far, the effects of supermarket expansion on consumer purchasing and eating behaviour have not been portrayed in detail – though comparable studies have been conducted with view to the spread of fast food / food services in China (see FAO 2004).

Complementing the above reported societal impacts of supermarket expansion, literature often cites related effects in more detail. Small farmers and general supply chain effects are subject to very profound analysis, often focussing on individual food value chains such as the milk sector, certain fruit and vegetables sectors or the horticultural sector (see e.g. Farina 2003; UNEP 2005; Wiggerthale 2007a).

### **3.2.3 Conclusions and looking ahead**

The diffusion of supermarkets in emerging economies is an issue of high interest because of its potentially significant impact on different actors in the retail sector. These include local farmers, farm workers, large supermarket competitors as well as consumers.

At first sight, the negative effects of modern retailing entering into emerging economies prevail. The increase in control and power of supermarkets over global supply chains is reported to lead to a multitude of disadvantages for small farmers. The line of argument is that small farmers do not possess the resources necessary to comply with supermarkets' requirements on quality and reliability of produce. Furthermore, negative employment effects will often hit entire labour markets (the unorganised retail sector) with an increase in the market share of supermarkets. However, some voices are being raised that underline the positive effects that the diffusion of supermarkets in emerging economies might bring. They emphasise the increase in efficiency of trading processes, the provision of cleaner and healthier food as well as better wages for farmers.

The following research needs and research questions can be derived from the insight of the this study:

- How can small farmers be supported to have a (larger) share in those potential opportunities that the change in retail structure implies? How can supermarkets adapt their purchasing systems to also include small scale farmers? Are there already Best Practice Examples from supermarkets?
- What are indirect environmental impacts that result from a shift from unorganised to organised retail in India (e.g. environmental impacts from industrialised agriculture, from an increase in customer traffic by consumers having to travel further distances to buy their food)?
- Is there any empirical evidence as to how supermarket expansion affects nutrition and eating habits of emerging societies? How does this impact on people's health? How does it change their purchasing behaviour?
- What role can national policy making in emerging economies have in creating framework conditions for a “sustainable” supermarket expansion in their country?
- What conclusions from supermarket expansion in Latin America and Asia can be drawn for the African continent?
- What are the costs for society or the economy as a whole resulting from an increase in unemployment among street vendors and the potential urbanisation of rural poor that move into cities to find a job?

### 3.3 Used cars on the way to Africa – dead-end or the path to mobility?

By Hartmut Stahl

Hundreds of thousands of used vehicles are transported annually by ship from Europe to West Africa. A large share of them is in questionable condition, a controversial grey zone between illegal, cross-border waste transportation and the export of used vehicles. From the perspective of the German recycling of end-of-life vehicles, this is a million-fold loss in a monetary sense as well as with regard to the whereabouts of important secondary raw materials. The African viewpoint opens up a very different perspective. The need for improved mobility and progress cannot be satisfied without cheap vehicles from Europe.



Figure 10 Country Map of West Africa

But how is this topic to be assessed from the perspective of global closed-loop materials management? Could an extension of the life cycle – e.g. talented improvisation artists in Africa make a “new” used car from two scrapped vehicles – even be desirable in terms of closed-loop materials management? Or would the regulated utilisation in Europe and the special production of inexpensive, fuel-saving passenger cars for the African market be the better alternative? And how is the final disposal of used vehicles in Africa to be assessed? Even if the cars can be driven after some time, many ultimately end up in road ditches as remnants of progress. This certainly has little to do with regulated disposal or even recycling. The setting up of a closed-loop materials management is urgently needed. Returning secondary raw materials back to Europe in the empty freight ships that transported the used vehicles to West Africa would seem to be the most obvious path. The commodity market prices

for many metals such as platinum or steel are high enough to serve as an incentive system for the recirculation of reusable materials back to Europe. There is also a chance for a recycling industry to be set up locally, which would realise at least parts of the value chain directly in West Africa.

On the other hand, the question naturally arises as to whether improved mobility based on individual transport is also – or even – sustainable in Africa. Against the background of the economic development of West African countries with dense populations, individual transport instinctively gives rise to images of scrap metal mountains, traffic congestion and smoggy air. This is a path which has already led Europe and many newly industrialising countries into the mobility cul-de-sac. It is widely common practice in West Africa to journey in overfilled and seemingly audacious ‘tro tros’ (mini buses), which undoubtedly represents a new cultural challenge for Europeans who spend time there. For the population in West Africa, the rickety mini buses and similar vehicles are often the only possibility of getting from A to B – the African variant of public passenger transport. This steers the focus towards the set-up and development of a functioning and sustainable public transport system.

Where is the need of increasing and improved mobility leading to in West Africa and generally in newly industrialising and developing countries? And what does it mean for the global material flows of raw materials, products and reusable materials, for the associated global climate and, last but not least, for the economic development in Africa?

### **3.3.1 Secondary raw materials – the deposits of a sustainable development**

It would seem appropriate to first of all address the question of used vehicles. On the one hand, the export of used passenger cars to West Africa has been common practice for years; on the other hand, economic development without an equally increasing motorisation can hardly be imagined from today’s perspective. In other words: the disposal or utilisation of used vehicles will have to be addressed in the future, no matter what.

It is well known that precious metals are very valuable and the recycling of them, particularly in the case of platinum and the related metals palladium and rhodium, involves a considerable reduction in environmental effects compared to primary production. These constitute two important reasons, then, to deal with the platinum group metals (PGM) first. In the recycling of end-of-life vehicles, these metals play a prominent role, particularly in the catalytic converter in which they are found in comparatively high concentration (the ceramic of the catalytic converter is covered with PGM). In 2005, Öko-Institut analysed their recycling paths and material flows in detail within the scope of a practical project in Germany, undertaken in co-operation with the industry partner Umicore (Hagelüken et al. 2005). Furthermore, export flows of used vehicles from Hamburg harbour to West Africa were examined also (Öko-Institut 2007). On the basis of these studies, an initial picture can be derived of what the situation concerning the car catalytic converters in West Africa looks like.

In Germany alone, approx. 220,000 used vehicles are exported annually to West Africa via the two harbours in Hamburg and Antwerp. Assuming an average PGM content of around 2.5 g per car catalytic converter, approx. 550 kg PGM therefore no longer remains available for recycling in Germany. Initially, that sounds like a small amount, but if the annual German demand for PGM is considered, it constitutes at least 2.5% of the total PGM demand of all end use areas, thereby representing quite a notable quantity. Based on the current market prices (10 January 2008: 35.51 Euro/g for platinum and 9.08 Euro/g for palladium (Euwid 2008)), 550 kg of precious metals represent a current value of approx. 12 million Euro, if equal shares of platinum and palladium are assumed. It is generally the case that PGM prices have steadily risen in recent years. Assuming that this trend continues, there is an ever-increasing incentive to be concerned with catalytic converter recycling.

Until a few years ago, the actual problem of the car catalytic converters in West Africa did not only lie in a lack of systematic recycling (which still exists), but rather in them not even being used during the operation period (driving state). This is firstly due to leaded fuel being mostly tanked in these countries, which is toxic for catalytic converters and renders them unserviceable. Moreover, in the case of 12 to 20 years old used passenger cars, the life cycle of catalytic converters is often limited, is furthermore shortened as a result of leaded fuel and bad roads or is often exceeded due to a lack of emission controls. The poor road infrastructure in particular leads to extensively destroying the sensitive ceramic body in the catalytic converters during driving, whereupon the valuable precious metals are quite literally lost in road dust. Analyses of road dust and soil at the roadsides in Ghana verify this effect (Kylander 2003). In spite of the fact that catalytic converters were only recently introduced there, platinum concentrations were measured which already correspond to levels in Europe and the USA where catalytic converters were introduced a long time ago.

Thanks to the UNEP Initiative Partnership for Clean Fuels and Vehicles<sup>15</sup>, the lead issue can now be regarded as resolved. In recent years, more and more countries have converted to lead-free fuel; as of June 2006, West Africa was identified as a region without leaded fuel. The initiative also encompasses efforts towards a comprehensive use of catalytic converters in passenger cars.

The introduction of lead-free fuel fulfils a basic prerequisite for the use of catalytic converters. However, in order to guarantee a proper operation, regular emission tests are indispensable, especially against the background of the high age of the passenger cars and potential catalytic converter damage. Only this way it can be decided – also with a view to cars being more and more frequently fitted with catalytic converters – which catalytic converters can contribute to emission reduction and which ones can be better used within the scope of PGM recycling because they no longer function properly.

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<sup>15</sup> [www.unep.org/PCFV](http://www.unep.org/PCFV)

A systematic, comprehensive collection and processing of catalytic converters for passenger cars has not yet been carried out in West Africa. Information is only available on individual, smaller charges on old catalytic converters, which come to Germany for recycling. The lack of recycling of the catalytic converters for passenger cars does not only represent an economic loss, but also the loss of secondary raw materials, which implicates a not inconsiderable burden for our climate. Every kilogram of platinum or palladium that cannot be re-fed into the closed-loop system for materials via recycling has to be made available through primary production. In contrast to recycling, primary production involves considerably higher greenhouse gas emissions. In the case of recycling alone, the precious metals of the catalytic converters for passenger cars release approx. 2.2 t of greenhouse gas emissions (calculated as CO<sub>2</sub>-equivalent) per kg of PGM. In the primary production of PGM for the catalytic converter, they are around seven times as high, namely approx. 14.2 t per kg (Hagelüken et al. 2005). Projected onto the 220,000 used passenger cars and 550 kg PGM which are annually transported from Germany to West Africa and thereby disappear from the closed loop of reusable materials; this corresponds to a difference or additional burden of approx. 6,600 t CO<sub>2</sub>-equivalent due to primary production. Nevertheless, this represents the equivalent value to the greenhouse gas emissions which are caused by the annual road performance of a total of 3,100 passenger cars.

What are the ways out of this misery? The PGM content of the catalytic converters from exported used passenger cars should be around 20 und 80 Euro per catalytic converter, depending on the share and quantity of platinum or palladium. This is incentive enough to introduce systematic PGM recycling. This is confirmed by the situation in Germany where catalytic converter recycling has been common practice for a long while. For the introduction and development of a systematic collection of old catalytic converters for passenger cars, the corresponding logistics for the collection, transportation and storage could be established within the scope of a pilot project. Due to the high density of passenger cars in the large West African cities, the Accra-Tema Metropolitan Area of Ghana, in which the majority of vehicles are registered in Ghana, suggests itself as a possible location. Ghana is regarded as one of the pioneer countries within West Africa in both economic and political terms.

In the simplest case, the constructed catalytic converters could be completely loaded onto the freight ship for used cars. There is sufficient capacity for a return transport available. In Germany, the proper utilisation of the catalytic converters would take place. On the other hand, the first recycling steps could be carried out locally at a collection site, which would mean a higher value added for the West African countries. In this way, the catalytic converter is opened, the PGM-covered ceramic is removed and the remaining components are separated (dismantling). The individual process steps are technically not especially difficult; it is rather a case of semi-automated work. At the same time, the greatest care is needed not only in the dismantling of the catalytic converter, but also with regard to transport and storage. The necessary precautions to protect health must be complied with. The realisation of

these recycling steps in West Africa also makes sense economically: first of all, the personnel costs are much lower than in Germany; and secondly the transport requirement and costs are lower if only the removed PGM-covered ceramic is transported. Above all, the local dismantling means that a further step of the value chain is conducted directly in West Africa. The last step of PGM recycling for the reproduction of precious metals takes place in refining plants that are technically highly specialised. A plant of this sort, of which in any case there are only a few worldwide, does not yet exist in all of West Africa. Thus, at least in the foreseeable future, the last process step has to take place outside of the country or outside of West Africa.

The PGMs certainly represent a very valuable component of end-of-life vehicles, but at the same time are also an increasingly small part of them. From the perspective of closed loops of reusable materials, it is worth considering the other metals, steel above all, as the core component of a passenger car. In turn, with regard to the 220,000 used vehicles, approx. 114,000 t of steel scrap as well as around 16,000 t of aluminium scrap and a further 10,000 t of non-ferrous (NE) metal scrap bypass the German recycling paths as a result of their export to West Africa.

A structure for the collection of steel scrap and other metals (such as aluminium or copper) that is sufficient in comparison to the European standard does not currently exist in West Africa. However, basically it can be assumed that approaches for a corresponding infrastructure for collection and utilisation are in place. The Ghana example shows that at least three electric steel furnaces (CDM 2008) are available for the utilisation of steel scrap. Wahome Steel Ltd, which is said to be West Africa's largest steel manufacturing plant in Ghana, can process 200 t of steel scrap daily (Recycling 2007). This would correspond to an annual processing capacity of around 70,000 t. The capacities are not fully tapped because Ghana's scrap dealers export 600 to 1,000 t of steel scrap daily. If we make projections on the basis of these export data, in turn, this corresponds to a quantity of around 280,000 t per year. With regard to steel scrap from end-of-life vehicles, these quantities would definitely be considerable. However, this consideration relates to the total steel scrap and not only to the end-of-life vehicles. At this stage, it can hardly be estimated how well end-of-life vehicles are collected and subjected to metal utilisation. More precise research in this respect is necessary in order to be able to estimate the current situation in the West African countries and the remaining potential – research which should usefully incorporate local analysis in the countries themselves.

The considerations up to now have only addressed the 220,000 used vehicles exported from Germany. It is worthwhile to widen the horizon of the analysis in this respect and also to take a look at the future. The potential of PGMs, steel scrap and the other metals is in fact higher in the case of end-of-life vehicles which are available for recycling – very much higher. On the one hand, it can be assumed that other countries also export used passenger cars to West Africa. On the other hand, new passenger cars, which are also available for recycling at

the end of their life cycle, can be taken into account. Moreover, increasing economic development in West African countries is generally likely to be accompanied by a further increase in cars.

In the following, a simple estimate of potential is presented, based on the two West African countries Nigeria and Ghana.

According to the Federal Road Safety Commission (FRSC) of Nigeria, the total number of vehicles registered in Nigeria between 1999 and July 2004 was 5,828,900. Based on this figure, the total number of vehicles registered by the end of the year 2004 was estimated at 6.0 million. Furthermore it was assumed that 70% of all vehicles would be passenger cars. Thus, a total of 4.3 million cars would result for Nigeria in the year 2004 (Basel 2004).

In Ghana, the vehicle population steadily increased from 511,755 (year 2000) to 767,067 vehicles in the year 2005. This corresponds to an annual growth rate of 8.6%. The annual number of newly registered vehicles varies between 40,014 and 64,419 in the same time period. Cars make up approx. 65% of these annual registered vehicles. Most of the registered vehicles are in the major urban cities of Accra, Kumasi and Tema (Ghana 2007).

On the basis of statistical data (IRF 2007), the stock of passenger cars for additional West African countries (Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Guinea, Mali, Niger, Senegal and Togo) was determined. Gaps in data were closed with the help of growth rates for the passenger car stock (on average 8.9% per year) and shares of passenger cars in the total vehicle stock (on average 69%). By including the above data for Nigeria and Ghana, the passenger car stock for West African countries was projected or estimated in 2005. A stock of a little more than 6 million passenger cars results, in which Nigeria accounts for more than two thirds. The two following figures show the development of the passenger car stock from 2000 to 2005 and the share of the individual countries in the total stock of passenger cars in 2005.

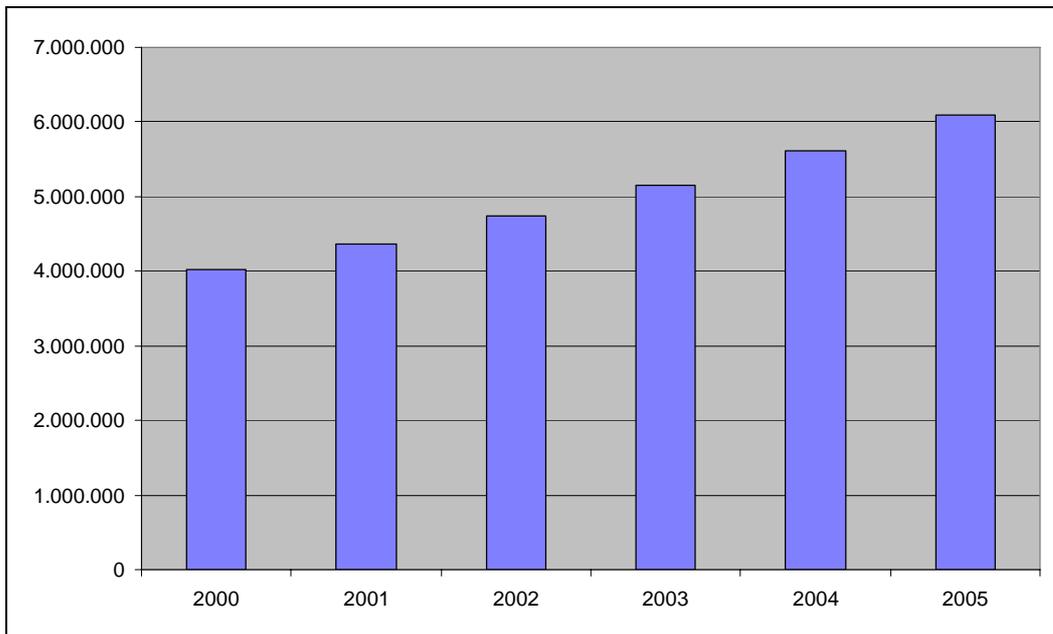


Figure 11 Total passenger cars in use, West Africa (Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, Togo) 2000 to 2005 (source: IRF World Road Statistics 2007, own calculation)

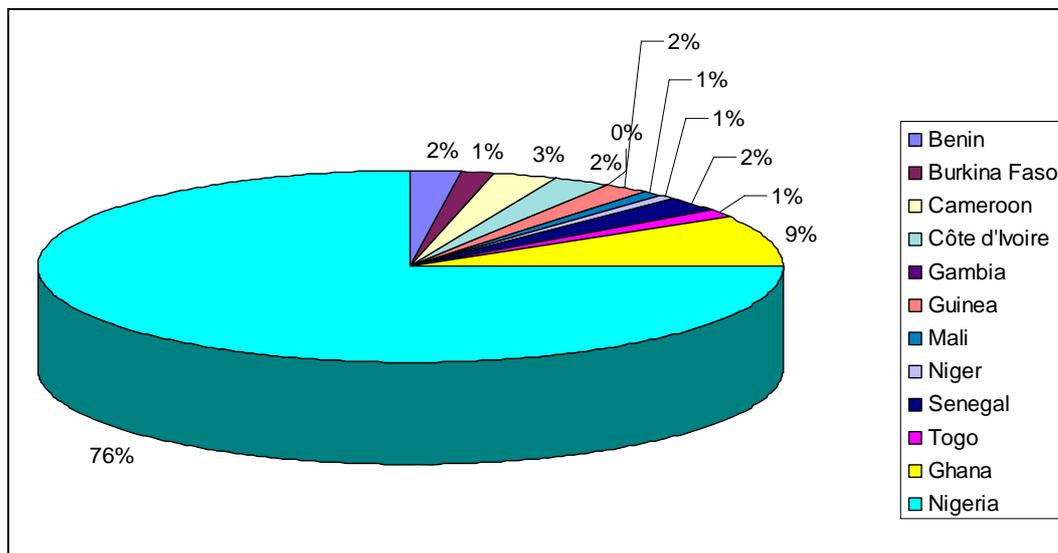


Figure 12 Passenger cars in percent in West Africa according to country, 2005 (source: IRF World Road Statistics 2007, own calculation)

Based on the stock data of 2005, the number of passenger cars which were taken out of operation and potentially could be recycled was subsequently estimated. If the percentage share of the deleted vehicles in Germany (around 8%) is used for projection, a potential of approx. 520,000 passenger cars, which would in total be available in the West African countries for utilisation, results. This corresponds to an annual PGM quantity of around 1,290 kg as well as around 270,000 t of steel scrap, around 37,000 t of aluminium and around 23,000 t of non-ferrous (NE) metals. The PGM quantities alone have an equivalent value of around 29 million Euro if equal shares of platinum and palladium are assumed. The recycling of PGM gives rise to savings of approx. 16,000 t of CO<sub>2</sub>-equivalent compared to primary production.

With regard to the PGM recycling in West Africa, it can be assumed that an increase in the PGM recycling-potential is likely from the used and new car areas. In order to tap this potential, a comprehensive utilisation and logistics chain has to be set up step by step. In this respect, the recycling scenario described above in the Accra-Tema Metropolitan Area of Ghana as well as a pilot project are useful to determine feasibility and, at the same time, to create a point of departure from which further collection and processing structures can be developed.

### 3.3.2 Mobility – where does the road ahead lead to?

Let's return to the initial points of the discussion, namely the need and the necessity of improved mobility in West Africa. In the following, three different scenarios are presented which show the spectrum of possible developments and alternatives on the basis of various transport systems.

### 3.3.2.1 Simple but economical – a cheap African car? (Scenario 1)

Against the background of satisfying mobility needs, a hypothetical ban on exports for old used passenger cars to West Africa means that new cars are necessary for the African market: this constitutes a conceivable alternative. BMW, Golf or the Opel Corsa, irrespective of whether they are new or in a good used condition, are not financially attractive for the majority of the population in Africa. The example of the Tata company's cheap Indian car shows that inexpensive passenger cars can also be produced for customers with little spending power for around 1,700 Euro (FR 2008). Would that be a model which could also work if transferred to West Africa? A roadworthy used passenger car for the West African market costs at least 1,500 Euro. Can a factory in Africa manufacture a simple but safe, low-emission and economical passenger car (Euro4, 3 litre car), for example, for the domestic market which has a price magnitude of around 2,000 Euro? And what would that mean for the environment? Is the lengthening of the use phase, i.e. the further use of used passenger cars from Europe and other highly fuel-consuming industrial countries, the better alternative or the worse one compared to the option of an inexpensive new three litre passenger car produced in Africa for its own domestic market?

### 3.3.2.2 Clearing the roads for “tro tro” and “BRT” (Szenario 2)

The first scenario comes closest to our European way of thinking: the seemingly popular path towards satisfying personal mobility needs, most notably those concerning individual transport.



Figure 13 Traffic congestion in the suburban area of Johannesburg, South Africa (source: Öko-Institut)

As the example in South Africa shows, this represents a thoroughly probable development for the African continent. Already in 2005, more than 4.5 million passenger cars were trundling along the roads of South Africa. This corresponds to a passenger car density of around 100 passenger cars per 1,000 inhabitants. Scrap metal mountains have been sullyng the

normal streetscape in urban spaces for a long time. Congested roads are the order of the day in many places. The South African passenger car fleet is quite comparable to European standards. However, the situation regarding the public transport system is very different. Public transport systems are inadequate and often only poorly developed, buses are out-of-date and thus, emission standards are low. The logical consequence of the prioritisation of individual transport are high emissions, poor air quality in the cities and a poor carbon footprint.



Figure 14 Old buses of the local public transport system in Port Elizabeth, South Africa (source: Öko-Institut)

In South Africa one is very conscious of the current plight of transport. The upcoming 2010 Football World Cup is regarded as an opportunity to elaborate and improve local public transport in the large cities. To this end, the introduction of so-called Bus Rapid Transit (BRT) systems is planned. BRT systems are inexpensive alternatives to underground trains or trams, by means of which the buses have right of way due to specially installed bus lanes. They have proven themselves to be a good investment in other respects and to a certain extent can be understood as a further development of the “tro tro” (minibus taxi) that is seen everywhere. BRT supports the set-up of a bus system that is fit for the future.

The situation in high density areas in South Africa is representative for the metropolises in West Africa. An ever-increasing mobility between the cities is inevitably gaining importance everywhere in Africa, coming hand-in-hand with increasing development. Thus, an extensive and efficient public transport system also needs to be developed in the outer-city areas – one option would be, for example, trains as an environmentally friendly means of transport.

In West Africa, there is still the possibility of giving priority to environmentally friendly public transport rather than individual transport. The paths leading to an environmentally friendly mobility, which are especially based on public transport means such as the bus and train, can still be paved. In this way, the streetscape would be characterised by public service

buses and coaches, and not by millions of private passenger cars in concentrated areas and on the country roads.

### **3.3.2.3 Sunny Africa (Scenario 3)**

‘Sunny Africa’ involves an outlook in the more distant future and builds upon the previous scenario, which is based on environmentally friendly mobility on the basis of public transport. Whilst the use of buses and trains is propagated by public transport and is given priority over individual transport, ‘Sunny Africa’ goes a step further and considers alternative drive systems for public transport. Their energy demand will be entirely supplied by renewable energies.

A network of solar power plants with large power plants in the Sahara and fuel stations for renewable energies would be set up in West Africa and would deliver the upcoming metropolises with environmentally friendly energy for mobility purposes. Buses or trains would be operated in an environmentally friendly manner. From today’s perspective, an option for renewable energy would be, for example, solar-powered electricity that is directly used for power in electric vehicles.

Principally, there is also a similar environmentally friendly drive system using renewable energy for passenger cars, too. However, the reflections in the previous chapter on the material flows of the precious metals, steel and non-ferrous metals should not be forgotten. If one considers how many hundred thousands of tonnes of steel and aluminium already trundle over the West African roads today, it quickly becomes clear that the emissions of the drive system cannot alone make up the decisive criterion for a sustainable means of transport. The material flows represent a further reason as to why public transport should be given right of way over individual transport.

The final scenario describes mobility for all that is fit for the future: buses and trains are operated in a practically climate-neutral fashion and natural resources are handled sparingly.

### **3.3.3 Conclusion**

The direction-setting decision on future transport systems in Africa will have a great effect on the environment – in Africa and world-wide, too. The economic development will be affected by it, as will social issues, when it comes to the question of the creation of job opportunities in Africa, for example, in the area of renewable energies or of a separate car industry. This is incentive enough to address the issue of sustainable mobility in Africa more in-depth as well as to analyse and evaluate in more detail the scenarios described above, along with their material flows, demand for raw materials and the environmental effects that result. However, the following should not be forgotten: if Europe does not succeed in credibly acting as a role model in terms of sustainable mobility, Africa will continue moving along the trodden paths and will inevitably have to cope with after-effects such as metal mountains and smoggy air. A

sustainable development in Africa can only be realised with support from industrialised countries.

## 4 Conclusion and outlook

In the last decade, it has become increasingly obvious that the traditional world order, a few industrialised nations and a majority of developing countries, is changing rapidly. While various countries managed to boost economic growth and to integrate well into the world economy, other economies profit from these developments by an increased demand for resources. Although these trends have significant negative sustainability impacts that are reflected by severe pollution, greenhouse gas emissions and an overuse of soil-, water-, biologic- and mineral resources, on a large scale they provide – for the first time in many decades – the possibility to overcome established development barriers and to lift a large number of people from extreme poverty. Nevertheless, these chances do not come about automatically, and it has to be assured that the developments which are often termed as “globalisation” really do suit the needs of the people in emerging economies and developing countries. As illustrated in chapter 3, there are numerous examples where globalisation does not only serve development needs, but has severe negative impacts on people and the environment that by far overcompensate the associated gains.

Research also illustrates the high diversity of effects caused by the economic growth of emerging economies: while outsourcing and off-shoring of production sites are intensively discussed in the European media, other facets like the expansion of North-American and European retail structures are almost completely overseen by the European public. Furthermore, the globalisation of new, second-hand and obsolete products is still widely ignored but has significant sustainability impacts worldwide: while cars are only one example, products like computers, mobile phones and air conditioners are also increasingly produced to serve a worldwide market and will increasingly stimulate changes in infrastructure, energy-demand, hazardous waste volumes and living habits.

Generally, it is perceived that – within the field of sustainability impacts of globalised economies – there is a severe lack of sound and evidence based research. While a number of publications describing sustainability problems and their associated mechanisms already exists, little has been published that helps to identify feasible solutions without ignoring possible rebound effects of implementing measures. The importance of such systematic approaches is illustrated by the issue of minimum standards in global supply chains: while most actors agree that social and environmental minimum standards should be enforced in global supply chains (see chapter 3.1), blueprint solutions either bear the risk of being unfeasible or having unintended effects on small businesses that do not have the capacities to manage complex compliance mechanisms (see chapter 3.1 and 3.2).

In order to fill this gap, it is suggested to focus future research on both structures and mechanisms as well as solution orientated research. Thereby it is proposed to primarily address individual sectors and associated challenges in order not to broaden the focus too much on the analysis of general globalisation dynamics. While the thematic clusters of this research provide some examples for such sector and problem orientated research, the selection is by no means complete. Additional topics that need to be covered include the following issues:

- Production, trade and use of biomass products (for food, animal feed, bioenergy and biomaterials);
- Resource extraction, trade and utilisation;
- Traffic and urbanisation;
- Globalisation of consumer products and consumption patterns and its impact on sustainability.
- Global management of e-waste

It should be kept in mind that not all methodologies needed for this kind of research are readily available yet: while many of the currently used research tools were initially developed to quantify sustainability impacts in North America and Europe, emerging economies feature significantly different socioeconomic and political set-ups, which all have to be taken into account in solution orientated research. Prominent examples thereof are social aspects: while in Europe and North America environmental policies are widely treated separately from social policies, the issues can hardly be separated in most emerging economies. In situations where social welfare systems are less mature, every attempt to restructure industrial business operations is likely to meet fierce resistance of those who are directly affected by these changes. Therefore, the development of comprehensive sustainability assessment methodologies is urgently needed.

Finally, such problem-focused research should make the most of worldwide networking potentials: although the sustainability challenges vary from region to region, the problems are increasingly interlinked and spread across different parts of the world. Therefore, it would be a waste of energy and leverage to build up knowledge and to implement different measures in each country in parallel. Rather, international co-operations need to be built up. However, such co-operations should not be misused for paternalistic advices from “experienced” industrialised countries to emerging economies. As laid out in chapter 2, sustainability can only be achieved using a cooperative approach at eye level.

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