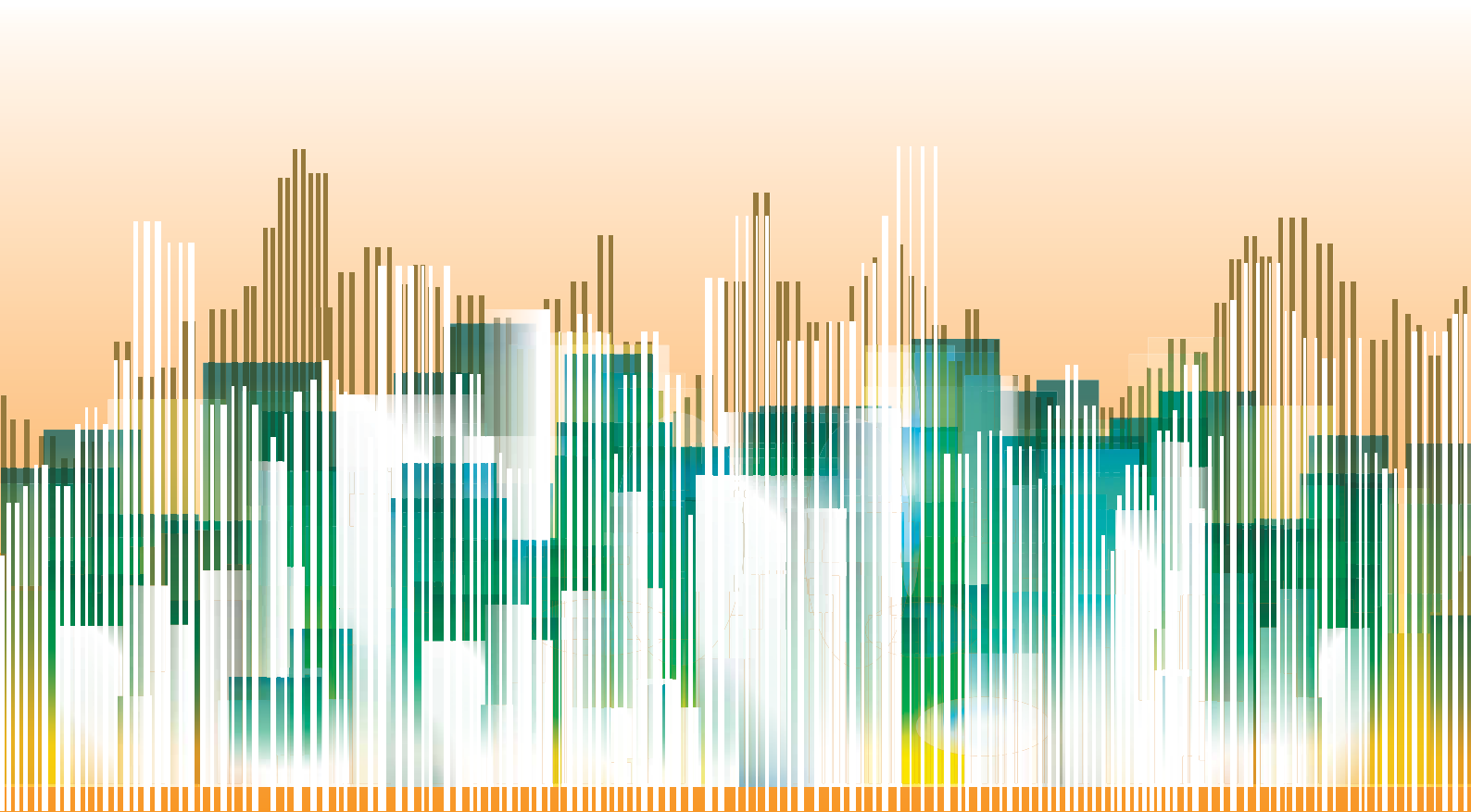


INFRASTRUCTURE DEVELOPMENT

WITHIN THE CONTEXT OF AFRICA'S COOPERATION WITH NEW AND EMERGING DEVELOPMENT PARTNERS



UNITED NATIONS



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OFFICE OF SPECIAL ADVISER ON AFRICA

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FOREWORD

The turn of the Millennium has marked important developments for Africa. Three stand out in significance. First the “African lion” is becoming an important growth pole in the world economy. Continent-wide growth rates in the first decade of the century were more than double those of the 1990s, and have been more than fifty percent higher than global growth rates. Second, many African economies are resource rich and have benefitted greatly from the post 2002 commodities price boom. And, third, the centre of gravity of global growth is moving from the high income economies of the north to rapidly growing and often very large middle and low income economies of the south.

In an earlier OSAA Report entitled *Africa's Cooperation with New and Emerging Development Partners: Options for Africa's Development* published in 2009, the rapid entry into Africa of seven New and Emerging Partners (NEPs) was assessed, chronicling the rapid growth in their trade, aid and investment relations with Africa. China stood out in from the pack, but each of the remaining six emerging economies – Brazil, India, Korea, Malaysia, Russia and Turkey – have also been rapidly deepening their presence in the continent.

This new OSAA Report sharpens the focus of enquiry into the activities of these seven NEPs in Africa by examining their participation in Africa's economic and social the infrastructural sectors. Weak and deficient infrastructure is widely acknowledged to be one of the binding constraints on the rate and sustainability of Africa's growth and development. Amongst other objectives, the Report seeks to asses the extent to which this growing presence is driven by the desire of these seven NEPs to gain access to Africa's abundant natural resources. It also seeks to assess whether this involvement has a character which is distinct from the involvement of Africa's traditional partners in its infrastructural development

Not much is known about the participation of the NEPs in Africa's growth in general, and their infrastructure sectors in particular. The World Bank has constructed a database on the involvement of China in Africa's infrastructure sectors, but it does not explicitly address their links with the resource sector. This Report seeks to augment this World Bank database by including a wider sample of infrastructure projects, from a greater number of countries. Through a careful search of published materials, consultation with key informants and a thorough review of material available on the web, a total of 239 infrastructure projects involving the seven NEPs was identified. In addition an analysis was conducted of Africa's imports of capital equipment used in the infrastructure sectors. This is of course only a partial sample of the involvement of these NEPs in African infrastructure and the Report is frank in acknowledging that it is unsure how representative this sample may be. On the other hand, aside form the World Bank's smaller database on Chinese projects in Africa, there is no other such source of material and at the very least, this Report provides a starting point for more systematic enquiry and raises a number of issues of policy relevance.

In addition to identifying the rapidly growing role of these seven NEPs – and particularly China – in Africa's infrastructure sectors, two important conclusions emerge from the detailed analysis of this database. First, few of the activities of the NEP economies in Africa's infrastructural sectors were, as is widely believed to be the case, focused directly on the extraction and export of commodities. This does not mean that they did not have the longer term and indirect objective of developing mutual relations in order to gain access to Africa's raw materials in the future. Second, a distinctive feature of China's involvement in Africa, increasingly being replicated by other NEPs, is its bundled character. Participation in large infrastructure projects involves a complex combination of aid, commercial finance, foreign investment and use of many inputs from China, frequently repaid through the receipts of commodity exports. This is known as “the Angola Mode”, following its early application in China's

support for Angola's infrastructural development. This strategic 'bundling' is distinctive from the participation of Africa's traditional northern partners.

But at the moment the rewards of bundling are largely reaped by the NEP economies who use it to gain business for their infrastructure firms, to foster their supplier industries and to gain access to Africa's abundant resources. The key policy challenge facing Africa, consequently is to proactively develop its own "bundling strategy". Since raw materials are increasingly scarce and costly, Africa is in a position to leverage access to these natural resources in return for a range of developmental assistance packages. The Sicomines venture in the DRC involves significant synergies between economic infrastructure, social infrastructure and training in return for access to mineral deposits which will be used to repay China's investments. This may be a template which other Africa economies – and perhaps even groups of Africa economies – may use to persuade the NEPs and other partners involved in the commodities sector to devote more resources to the development of economic and social infrastructure on the Continent.

Much remains to be done in the development of infrastructure in Africa, in the contribution which the NEPs can play in the development of this infrastructure, and the lessons which can be learned by Africa to promote deeper and more beneficial involvement of other partners in its infrastructural development.

For too long African policy development has occurred in a knowledge vacuum. The key challenge is to develop evidenced-based policies to promote growth and development. However imperfect the database contained in this Report may be, it provides some level of evidence which can be used to promote more effective policies and to stimulate the development of larger and more reliable data to support the design and implementation of policies appropriate for the development not just of the continent's infrastructure sectors, but of all sectors of economic and social activity.

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EXECUTIVE SUMMARY

This report focuses on the participation of Africa's seven new and emerging partners (NEPs) in Africa's infrastructural development – Brazil, China, India, Korea, Malaysia, Russia and Turkey (hereafter the NEP7 economies).

The involvement of the NEP7 in infrastructural development in Africa occurs in a context of a disrupted global economy. This disruption involves a change in the centre of gravity of global growth, a sustained boom in energy prices since 2002, and a growing recognition that Africa is emerging as a key strategic site for the expansion of commodity production. Since much economic infrastructure is wholly or partially required to export commodities, the sustained commodity boom has important implications for infrastructural investment, and particularly for investment in economic infrastructure.

Access to commodities is not the only reason why the NEP7 have played an important role in Africa's infrastructural development. Africa represents a rapidly growing market, and construction firms in the NEP7 have distinctive competences developed in meeting the needs of their domestic economies which often have similar operating environments to Africa. Further, in the search to widen their economic and geopolitical spheres of influence, governments in the NEP7 have increased their aid programmes to Africa, often providing support for their private sector to participate in African infrastructural development, and often involving support for social infrastructure as well as economic infrastructure. Moreover, as observed in an earlier UNOSAA Report (UNOSAA, 2009), the mode of involvement of some of the NEP7 (particularly, but not exclusively, China) occurs in a framework which departs from the Washington Consensus which has characterised DAC-economy involvement in Africa and this on occasion provides them with a competitive edge over northern rivals. Often, NEP firms are not subject to the transparency, environmental and labour standards which govern DAC economies operations in Africa. In some circumstances this provides NEP firms with the capacity to underbid firms from Africa's traditional partners,

This Report reviews the operations of the NEP7 in Africa's infrastructure by drawing on the World Bank's PPIAF database and complementing this with an extensive search of the internet and information provided by key informants. This produces a database of 239 projects between 2000 and 2010 – the listing of individual projects is provided in the tables at the end of each of the country Case Studies. However, although this is a unique new database, it only provides a glimpse of NEP7 involvement in African countries. It is not possible to determine the representativeness of this sample, but it is a sample which does provide an important insight into the rapidly growing presence of NEP economies in Africa's infrastructural sectors, and the distinctive character of this involvement.

Three sets of lenses are utilised to assess the character of NEP7 involvement in African infrastructure:

- Their general contribution to the infrastructure sector through the provision of capital goods as reflected in their exports of construction equipment to Africa
- The extent to which NEP7 involvement in infrastructure projects are wholly or partially linked to facilitating the exploitation of Africa's natural resources
- The extent to which NEP7 participation in infrastructure involves the bundling of aid, trade and FDI

General findings

The NEP7 satisfy a growing proportion of Africa's construction equipment needs. As a proportion of total African exports, this rose sharply from 7% in 2003 to 25% in 2011. Most of this increase was a consequence of rising Chinese exports, but substantial export gains were also made by Korea, Brazil and Turkey.

It is widely assumed that "resource hungry" NEP7 are strategically focused on gaining access to Africa's commodities and that this predisposes them to invest disproportionately in the infrastructure dedicated or partially designed to facilitate commodity exports. However, whilst the evidence suggests that NEP infrastructural involvement in the resource-sector is indeed in part explained by the desire to gain access to Africa's resources, there is little evidence that it is disproportionately geared to the *extraction and export* of these resources. It is particularly not the case for China's involvement in Africa's infrastructure sectors, since only 6% of the infrastructure projects in our database were wholly linked to resource extraction and export, with a further 3% predominantly so linked.

A number of vectors of NEP involvement were investigated – open tender projects, aid, FDI and direct trade-financed initiatives. Around half of all infrastructure projects are aid- or loan-financed. The proportion is higher for social infrastructure and stadiums (most of these involve concessional loans) and least evident for oil pipelines and airports. The second largest vector of infrastructure projects are those won on open tender which comprise nearly a third of the total. Open tender projects are most evident for housing, airports and oil; pipelines, and least likely in the case of railway projects and stadiums. FDI surfaces as an important vector in the oil sector, and in railways. There are also a small number of projects which involve a combination of aid and FDI, and this is most evident in the case of sea port infrastructure.

Beyond these categories of aid, loans, FDI and projects won on open tender is an additional vector of involvement which is relatively new in the African context. This involves projects where the repayment of loans and the payments to contractors are explicitly and directly linked to the export of commodities. Nearly 21% – that is, 50 of the 239 projects for which information exists – involved this close link between infrastructure projects and commodity production. All but seven of them involved Chinese actors, and these Chinese trade-linked projects were predominantly in road construction and power plants and involved Chinese state owned companies.

Putting together the data on trade-related repayments and projects involving different vectors of financing, it is possible to explore the extent and character of "bundling" by NEP actors in Africa's sector. Three types of bundling can be identified. The first are cases where only a single vector of activity is involved (aid, or finance, or FDI or commodity-export linked payments). The second are cases where two of these three vectors are involved. The third are where all three vectors are bundled. It is these triple-vector projects which most closely fit the "Angola mode" which is said to characterise much of China's involvement in large scale projects in Africa. Of the 161 infrastructure projects for which data is available, the data shows that nearly 60% of NEP infrastructure projects in Africa involve only a single vector – that is, aid, equity, open market tender or repayment through commodity export receipts. A small proportion – 12% – involves two vectors, but nearly 30% of all infrastructure projects are at the "Angola mode" end of the bundling spectrum. Bundling is most prominent in stadiums, power and roads, and least evident in social infrastructure, the oil sector, ICT and airports.

Country specific findings

We have identified 141 cases of Chinese involvement in African infrastructure projects between 2000 and 2008. They are predominantly state-owned enterprises, with access to funds made available by the Chinese government to its EXIM Bank. Few of these loans have been provided on a concessional basis, and many are tied to purchases of inputs from China and are to be repaid by commodity exports. Moreover, many of the large scale Chinese projects involve a high degree of bundling of aid, trade and FDI. In some cases this bundling involves significant synergies between economic infrastructure, social infrastructure and training in return for access to mineral deposits which will be used to repay China's investments. Although China has a distinctive interest in Africa's natural resources to feed its own economic growth, there is no evidence that its presence in Africa's infrastructural sectors is disproportionately focused on facilitating the extraction and export of commodities. The primary motive appears to be to commercial, that is to take advantage of market opportunities in Africa. However, there are notable examples of Chinese infrastructural investments in prestige projects such as stadiums and housing which perhaps set the scene for later developments in which Chinese firms gain access to Africa's natural resources. China is overwhelmingly the largest NEP supplier of construction equipment to Africa.

Brazil, the second most numerous NEP7 participant in African infrastructure, has been involved in 38 infrastructure projects in Africa since 2000. Brazilian aid to Africa is in an embryonic form, and most of its infrastructure involvement have been won through open tenders. There is little evidence of the bundling of aid, trade and FDI in Brazilian projects although there is a close synergy in some cases (notably in Mozambique) between Brazilian firms' operations in the resource sector and the provision of economic infrastructure which partially meets the needs of these resource investments. There has been a sharp growth in Brazil's exports of construction equipment to Africa.

Korea is the third most important NEP7 economy participating in Africa's infrastructural sectors. Of all the NEP7, its operations most clearly mirror those of Africa's traditional economic partners, and indeed, Korea is now a member of DAC. Of its 21 infrastructure projects in Africa, 19 are aid-funded and two result from FDI. Given its DAC orientation, a high share of Korean projects are in social infrastructure. Next to China, Korea is the largest of the NEP construction equipment exporters to Africa.

India follows behind Korea in relation to the number of infrastructure projects in which it is involved. Fifteen cases of involvement in Africa's infrastructure since 2000 are identified. These have been concentrated in economic infrastructure, particularly in power and railways. India's aid to Africa is minimal, but there are signs that it is adopting a more proactive and strategic approach towards its presence in Africa. This is evidenced in its involvement in a large railway project in Nigeria which involves some degree of bundling of aid, trade and private sector involvement. Exports of construction equipment to Africa have been minimal.

Turkey has a strong global presence in the construction sector, and it is not surprising therefore that it has been involved in a number of infrastructure projects (14 in total since 2000), particularly in the airport and oil-infrastructure sectors. Although Turkey has a growing aid programme, its participation in Africa's infrastructure sectors has been driven by its private sector winning open tenders. Although most of these projects have been in North Africa, Turkey is now making major push for deeper involvement in SSA. Exports of construction equipment to Africa have been minimal.

Malaysia and Russia have a very limited presence in Africa's infrastructure sectors, each having been involved in 5 infrastructural projects since 2000. Neither country has an aid programme of significance, and relations with Africa are driven by strictly commercial imperatives. Malaysian firms are concentrated in the oil sector (having divested from the ICT sector), and Russian investments are concentrated in power and oil-infrastructure. Neither economy is an exporter of any significance of construction equipment to Africa.

Policy Implications

The growing role of the NEP7 in Africa's development agenda in general and in its infrastructure sector in particular represents a major opportunity for enhancing the extent of infrastructural investment, its geographical focus, its sectoral orientation and the nature and structure of individual infrastructural projects. As with all disruptive events – and the rapid growth of the NEP7 is indeed a disruptive phenomenon in the global economy – this offers both threat and opportunity. The task for the development of a policy agenda is thus to maximise the positive outcomes and to minimise the negative outcomes.

Key constraints

The policies required to maximise the capacity of African economies to take advantage of the opportunities for infrastructural development opened by the emergence of the NEP economies are necessarily located in the context of key constraints. The first of these constraints is the weakness of strategy development in the continent, visible across the spectrum of individual governments, national firms and regional bodies. Accompanying this gap is a weakness in detailed policy development, particularly with regard to appropriately incentivising policies and ensuring that different policies are mutually supportive.

A second key constraint is that the knowledge base required to develop an appropriate strategy and detailed and effective policies is weak. This pervasive weakness across the continent is particularly apparent with respect to data on the NEP economies, since historically Africa's antennae have been focused on its traditional partners. However, the relevant knowledge gaps are not just evident with respect to the NEP economies. They also relate to the nature and character of Africa's infrastructural deficit and its resource base which can be utilised to leverage greater and more effective participation of the NEP economies in infrastructural development.

The third major constraint arises as a consequence of market failures. Some of these market failures - such as the problems of appropriation and externalities - are intrinsic to all infrastructural development. But others - particularly imperfections in knowledge markets connecting small and medium sized NEP firms with African customers (particularly small and medium sized African firms) - are more marked in Africa's relations with the NEPs than with regard to traditional economic partners.

The fourth constraint concerns the sustainability of NEP contributions to Africa's infrastructural development. The predominant attention has been on rapid delivery of infrastructure where Chinese firms are particularly effective in shortening project delivery cycles. However, without due attention, the consequence of this short term approach to infrastructure development will be to reduce technology transfer and capability building in Africa.

The fifth and final constraint to taking advantage of the NEPs entry into Africa relates to poorly functioning

financial markets. An increasing number of African economies do indeed have capital available for infrastructural development. But in general, this domestic finance is poorly mobilised and financial markets are not focused on the specific character of NEP financial markets, hence reducing the capacity for combining African and NEP financial resources for infrastructural development.

Fashioning a policy response

Appropriate and effective policies need to be developed in the face of these five sets of constraining factors. These policies have differential implications for five different sets of stakeholders – African governments, the private sector in Africa, regional bodies in Africa, external agencies and NEP governments and firms. The Figure below provides a matrix of the policy spaces which need to be filled by the key stakeholders. These cells are not filled in, since the appropriate detailed responses necessarily need to be identified by the stakeholders themselves and must reflect local circumstances. This task should not be addressed lightly since there is a danger that policies will emerge which are insufficiently informed or thought out, which are not mutually supportive or which are unlikely to be implemented effectively.

Tackling the strategic gap is an issue for policy makers across the spectrum. In the context of the disruptive entry of the NEP economies into Africa, and the social and economic importance of infrastructure, these issues need to be addressed at the highest level – within Presidencies in individual countries and inter-governmental discussions and organisations. Key agendas which need to be addressed at the highest level are (a) the capacity to leverage deeper and more appropriate NEP involvement, for example by using access to resources as a carrot, or by fostering links between NEP firms and domestic financial assets (b) the extent to which Africa might use bundling to augment the extent and nature of infrastructure related inflows from the NEP economies (c) being more proactive in taking advantage of the competitive rivalry between potential NEP investors (governments and firms) seeking access to African markets and resources and (d) realising the importance of multi-country negotiations for infrastructure projects that cut across borders but are essential/beneficial to all countries involved. African governments need to include in their strategies the capacity to combine the competences of Africa's traditional and newly emerging partners in infrastructural development. Crudely-speaking, the traditional partners are generally stronger in infrastructure software than many NEP providers, whereas NEP suppliers are often able to deliver infrastructure hardware quicker and at lower cost. The strategic agenda also has major implications for Africa's private sector which is often still focused predominantly on links with traditional northern partners.

Beyond the strategic challenge lies policy formulation. Individual policies need to be "joined-up" and complementary rather than working against each other. The policies need to be incentivised both with negative sanctions (the stick) and positive sanctions (incentives). Externalities between neighbouring countries pose particular policy challenges. Policies also need to be practical and within the reach of decision implementers.

Effective strategy and policy hinge crucially on knowledge. Here there are a range of challenges required to augment knowledge bases. The required knowledges are diverse, including (a) an understanding of a country or region's infrastructural requirements (b) a knowledge of resource assets (c) a deep knowledge of the competitive strengths and weaknesses of individual NEP economies and NEP firms and their northern rivals and (d) an understanding of domestic capabilities and an appreciation of the wider economic and geo-political environment

which sets the context for strategy formulation. Large African economies such as South Africa, Nigeria, Egypt and Ethiopia and a few very large African firms may be able to go some distance themselves in building these knowledge bases, but even they may require support from African regional bodies and external parties. The challenge facing smaller and poorer African economies in building and utilising knowledge bases are of course much more daunting and the role to be played by regional bodies and external agencies will be more important. PIDA may have a particularly important role to play in acting as a knowledge base for these smaller and poorer economies, as will support from traditional donors, The World Bank and the NEP economies.

Addressing the market failures required to make maximum advantage of the entry of the NEP economies into Africa is primarily a policy challenge for national governments, or for groups of neighbouring governments when cross-border externalities are involved. Governments need to be aware of the nature and causes of market imperfections and to take appropriate remedial action. For example, insofar as there is a knowledge gap with regard to links to SMEs in NEPs or in relation to the capacity of domestic SMEs in the infrastructure sector to generate knowledge of NEP infrastructure providers, NEP embassies in Africa and African embassies in the NEP economies may take particular steps to bridge this market gap. In the case of smaller and lower income African economies who may face particular problems in addressing these and similar market failures, regional bodies within Africa may be required to play a more proactive role.

There is now a growing understanding of the factors which determine the breadth and depth of industrial and service sector linkages into the commodities sectors in Africa (Morris, Kaplinsky and Kaplan, 2012: Kaplinsky et. al. 2012; ECA, 2013 forthcoming; OECD Africa Economic Outlook 2013 forthcoming). Although the determinants of linkage development obviously vary between individual sectors and economies, four sets of factors stand out in importance – (a) the ownership of lead resource firms and their suppliers (b) the nature of skills development and the National System of Innovation (c) the nature and quality of infrastructure and (d) the nature and quality of policy formulation and delivery. These four determinants of effective linkage development are equally important to Africa's infrastructural sector which shares many of the characteristics of the resource sector. They require equivalent policy responses from national governments, from Africa's private sector and from Africa's regional bodies. There are also derived implications for external agencies and NEP governments, but these are probably of a lower order of importance. However the policy implications to promote linkage development are not confined to governments and external agencies. Lead firms in the resource sector are equally challenged, since the provision of local low cost and high quality inputs and efficient processing is important to their profitability.

Finally, there is a need to develop policies to promote the mobilisation of domestic resources, the leveraging of external resources and the enhancement of the quality of the finance provided for infrastructure development. In addition to national governments, action is also required by Africa's private sector, regional bodies (such as the AfDB) and external agencies. But, given the distinctive nature of financial markets in many NEPs, NEP governments have a particularly important role to play in promoting the development of these financial markets.

Structure of Report

Part I of this Report outlines the context in which the NEP7 are playing a growing role in Africa in general, and in its infrastructure sector in particular. It highlights the slowdown in growth rates amongst Africa's traditionally

dominant economic partners and the growing and significant role which Africa plays in a world of growing scarcities of many commodities. It further observes a tendency for key NEP7 – particularly China – to participate in African economic growth by bundling aid, trade and FDI. It documents the extent and nature of Africa's trade with the NEP7 and Africa's deficit in both economic and social infrastructure. Based on the survey of 236 reported NEP7 infrastructural projects, The Report summarises the key elements of this overall pattern of involvement, focusing on NEP7 exports of construction equipment to Africa, the links between infrastructure involvement and resource extraction, and the extent of bundling of aid, trade and FDI. Part I concludes by reviewing the nature of participation of Africa's traditional partners in infrastructure development, and contrasts this with NEP7 involvement. Based on the foregoing analysis, policy recommendations are made.

Part II provides a detailed picture of these issues for the individual NEP7. Each country case-study is accompanied by brief descriptions of all of the infrastructure projects with which the country is involved. Annex 1 provides a description of the trade categories utilised in the analysis of NEP7 construction equipment exports to Africa.

PART 1: MAIN REPORT

INTRODUCTION: NEW ACTORS IN AFRICA IN THE CONTEXT OF INFRASTRUCTURAL DEVELOPMENT

Infrastructure in its various forms (Figure 1) plays a critical role in growth and development in Africa and elsewhere. Some types of infrastructure are important because they contribute to growth processes. Here we can distinguish four different sets of economic infrastructure - (a) transport infrastructure (road, rail, ports and airports), (b) power generation (c) the information and communications (ICT) highway (d) and irrigation for the agricultural sector. By contrast, social infrastructure such as water and sanitation predominantly delivers developmental outcomes.

These two sets of economic and social infrastructure interact. For example, a transport system which is distributed throughout the economy, including to rural areas and to regions of relatively low income, has important development impacts. Similarly, good sanitation and sewerage improves the welfare of workers and is required for many products in export markets and thus contributes to growth.

A further important characteristic of infrastructure is the distinction between hard and soft infrastructure. The former is reflected in physical investments (for example, roads, power plants, ICT networks, irrigation networks, water treatment plants), whilst the latter refers to the institutions in which the hard infrastructure is embedded (for example, customs clearance procedures and sanitation system design)

Figure 1: Types of infrastructure considered in this Report

	Predominant arena of impact	
	Economic	Social
Transport		
Roads	X	
Rail	X	
Air	X	
Sea	X	
Power	X	X
ICT	X	X
Irrigation	X	
Sanitation		X
Water		X
Housing, stadiums, etc		X

This Report predominantly focuses on the “hard” forms of economic and social infrastructure, and seeks to determine the extent of involvement of a range of New and Emerging Partners (NEPs) in Africa’s infrastructural sectors. The context of this enquiry is that within the unfolding economic downturn in the northern economies which have traditionally dominated the global economy, Africa is currently entering an era of disruptive change as an increasing number of NEPs enter the stage. These new entrants have growing economic power, and in some cases also significant political influence.

Historically, African economies were closely integrated with the former colonial powers in Europe, and with North America and Japan. This was reflected in institutions of governance (parliamentary democracies), in language, in infrastructure (constructed to facilitate contacts with western powers), in economic specialisation (Africa supplied commodities to, and imported manufactures from the west), and in the integration of African producers in northern firms (foreign direct investment, FDI) and value chains. Financial flows, too, reflected this process of integration between African and northern powers. In the latter third of the 20th century, there was an increasing flow of northern financial resources into Africa (aid and FDI) and back to the source countries (debt repayment, profits and interest).

But the global economy and polity is now entering a period of disruptive change in which new and emerging economic actors contribute growing shares of global output, trade and financial flows. Since 1979 **China** has grown at a compound annual growth rate exceeding 9%, and **India** has also expanded at a similar rate since the early 1990s. China is now the second biggest economy in the world, and India is on a path to become the third largest by 2035. Together, China and India account for almost 40% of the global population, so that when they grow very rapidly for prolonged periods, they have a large impact on the global economy. Their size means that their expansion disrupts the path of incremental change which has dominated many societies for so long, not least the relatively weak and poor economies in Africa. It is for this reason that these newly emerging very large Asian economies are referred to as the “Asian Drivers”.¹

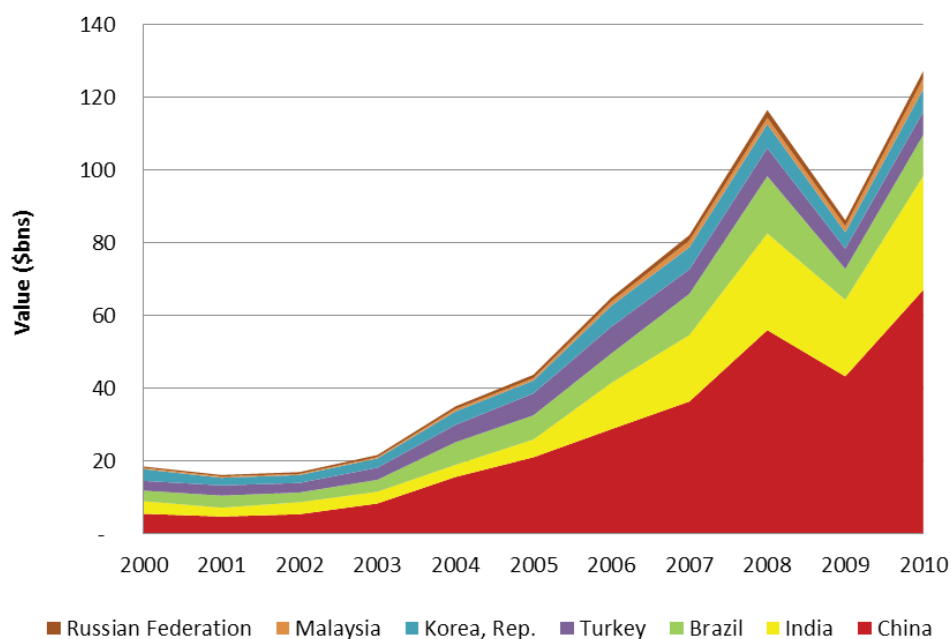
But these two giant Asian economies are not the only new influential actors in the world economy. **Brazil** dominates Latin America continental output and is growing rapidly. In Europe, the very large **Russian** economy is expanding rapidly on a resource-intensive path. On the European periphery, **Turkey** is undergoing a period of structural change and is becoming a manufacturing sub-contractor for the EU. **Korea**, has not only grown very rapidly over the past five decades but has made the transformation from a producer of light manufactures to a producer and exporter of technology-intensive capital and intermediate goods. **Malaysia** seeks to follow a similar path to Korea, but has not yet made the same transition to become a producer of capital goods and technology intensive intermediate products.

Each of these economies is large, and each is rapidly-growing. Moreover, they reflect the trajectory of other formerly low and middle income economies on similar growth paths suggesting that each of their growth paths represent wider trends. The northern economies which have hitherto dominated global production and trade are wrestling with severe structural problems and face the spectre of lower growth rates (and perhaps even in some cases stagnation). Many emerging economies are of course affected by these trends, but there are reasons to believe that despite encountering lower growth rates, they will sustain their strong growth momentum. Thus there is a strong likelihood that these seven economies and those economies with similar trajectories will play an increasingly important role in helping to shape Africa’s future. It is for this reason that this Report focuses on the role which these seven NEPs (hereafter the NEP7 which distinguishes this group of NEPs from all NEPs) will play in shaping the provision of the economic and social infrastructure which will frame Africa’s future growth and development trajectories.

Already the NEP7 are playing a major role in Africa’s development. At the turn of the Millennium, their combined exports to Africa totalled less than \$20bn. By 2011, this had increased to \$130bn (Figure 2). As a share of Africa’s total imports, this represented a rise from 13% in 2000 to 28% in 2011. This rapid aggregate export growth to Africa is dominated by China, but large export gains to Africa were also made by India, Korea, Turkey and Brazil.

1 www.asiandrivers.open.ac.uk; see Special Issue of World Development, Vol. 36, No. 2, 2008. Special Issue of Review of African Political Economy, Vol. 35, No. 115 and the forthcoming Special Issue of the European Journal of Development Research (2009)..

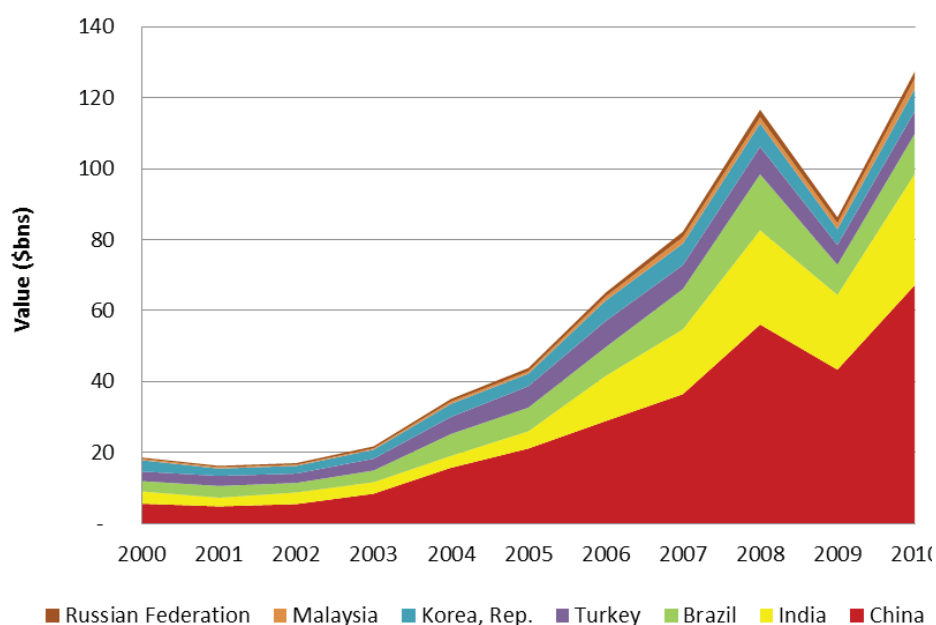
Figure 2: All exports to Africa from the NEP7 countries, 2000-2010



Source: compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

The other side of the coin is a rapid growth of Africa's exports to the NEP7 (Figure 3). These increased from a level similar to African imports in 2000 (somewhat less than \$20bn) to more than \$120bn in 2010. Taken as a group, Africa has a trade surplus with the NEP7. As in the case of African imports, the two dominating NEP7 economies have been China and India.

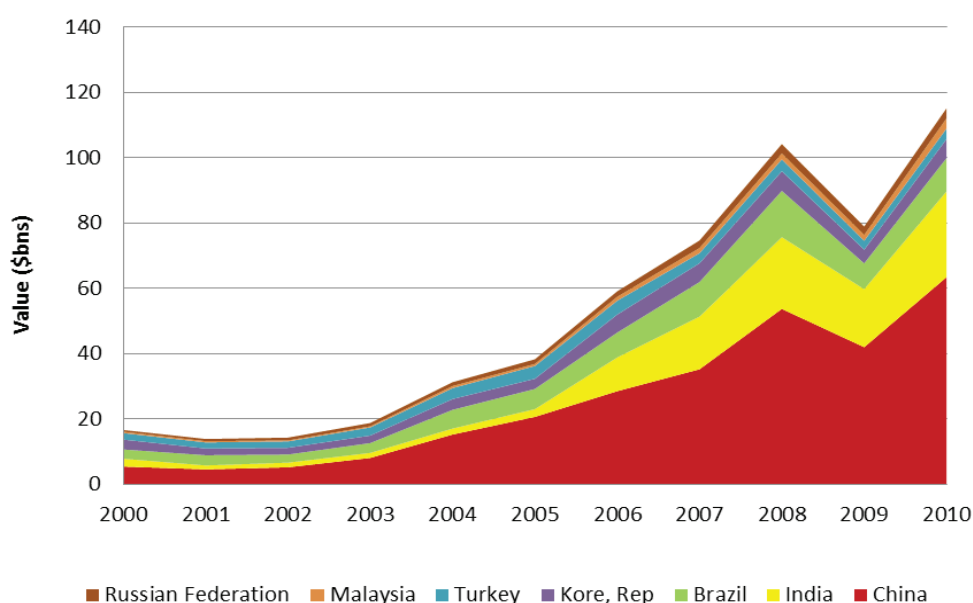
Figure 3: Total Exports from Africa to all NEP7 countries, 2000-2010 (\$bn)



Source: compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

A notable contrast between Figure 2 (Africa's imports from the NEP7) and Figure 3 (Africa's exports to the NEP7) is the impact of the 2008 Financial Crisis on trade. This appears to have had a much more adverse impact on Africa's exports to the NEP7 than on its imports from the NEP7. The reason for this is Africa's reliance on the export of commodities to the NEP7 (Figure 4) and to the world. The demand for commodities is notably more volatile than that for manufactures. Also evident from Figure 4 is the overwhelming proportion of commodities in Africa's exports to the NEP7. Since, at least historically, the development of economic infrastructure in Africa has reflected the need to ship commodities abroad, this is an important structural factor which may influence the role which the NEP7 play in Africa's infrastructural development.

Figure 4: Total commodity (energy, hard and soft commodities) exports from Africa to the NEP7 countries, 2000-2010



Source: compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

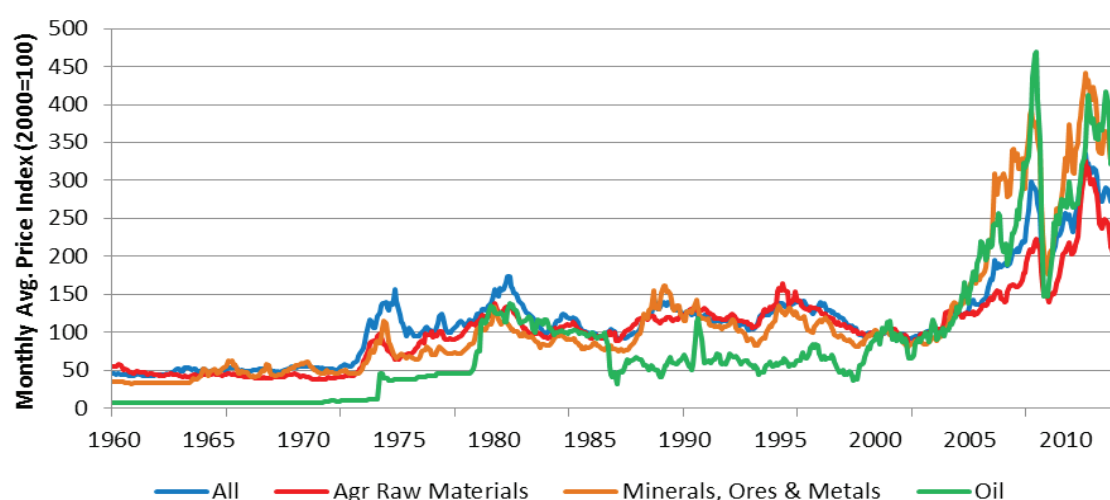
COMMODITIES, INFRASTRUCTURE AND MODES OF ENTRY INTO AFRICA'S RESOURCE SECTOR

In considering the role of new and emerging economic actors in Africa's infrastructural sectors, it is necessary to understand two developments which frame the expanding presence of these new actors in the African continent. The first is the growing importance of the resource sector in the global economy. This has major direct implications for the economic infrastructure which provides transport arteries for commodity exports and for the imports required to produce commodities. It also has major indirect implications for social infrastructure, since, as will be shown below, the quest by external actors to secure access to Africa's raw materials has in some cases resulted in aid programmes which support the development of Africa's social infrastructure. The second framing development is that some of the new economic actors in Africa, particularly China, have followed a distinctive mode of entry in which aid, trade and foreign direct investment (FDI) are tightly bundled. This goes against the "best practice" of the DAC countries who have, over the past few decades, sought to separate aid from trade and FDI. As will be shown below, this bundling of entry modes has important implications for infrastructural development on the continent.

The commodities super-cycle and Africa's resource bounty

Since 2002 the global economy has witnessed the emergence of a long-lived commodity price cycle (Figure 5), that is, long-lived by comparison with the two previous commodity price booms in the early 1950s and early 1970s. The price surge was initially limited to hard and energy commodities, but after 2005 also began to affect the soft commodities sectors. Although commodity prices continued to be very volatile by comparison with the prices of manufactures, and saw a sharp (albeit temporary) price fall after the 2008 global financial crisis, they have been on a sustained upward trend for a decade, a unique trend by comparison with the economic history of the twentieth century.

Figure 5: United Nations Conference on Trade and Development (UNCTAD) monthly average price index, 2000=100 (2000 to Jan 2012)



Source: Compiled from UNCTAD Stat. data. Online. <<http://unctadstat.unctad.org/>> (accessed April 2012).

The short-lived commodity price booms of the 1950s and 1970s were based on a combination of temporary interruptions to supply (anticipated threats to supply from the Korean war in the 1950s and the surge in oil prices after the 1973 oil-crisis) and unrealistic expectations of a sustained growth in demand. But neither of these circumstances endured. Supply threats from the Korean war failed to materialise in the 1950s, and global economic growth adjusted to the higher oil prices by the early 1980s.

By contrast, the post-2002 commodity price boom has resulted from a combination of events which make it likely that prices will remain high and in many cases grow for some years to come (Farooki and Kaplinsky, 2012). On the demand side, China, India and other low and middle income emerging economies are at an early stage of their per capita consumption of most hard and energy commodities. Although their demand growth is often thought to arise from their rapidly growing export-oriented manufacturing sector, in fact most of their demand for commodities has resulted from the massive investments made in infrastructure and construction. The demand for soft commodities is also likely to expand in the future as incomes and per capita consumption of food (particularly animal proteins) continue to grow.

On the supply side, there are constraints in each of the three families of commodities to the expansion of low cost supplies. In energy commodities, low cost deposits of oil have reached their limits and the marginal price of what are often substitutable sources of supply, is set by the costs of deep-sea oil production and shale oil and gas production. The days of cheap energy are almost certainly over. The supply response in soft commodities is limited by the high costs of investment in irrigation, slowing rates of productivity growth, the growing cost of

hydrocarbon-based agrochemicals, the global shortage of water, and climate change and climate chaos. With regard to hard commodities, there are large unexploited deposits of most minerals, but these are generally in inaccessible areas, and in countries of high political risk. Moreover, for a combination of reasons, exploration budgets have been low for much of the past two decades and mines have a long gestation period between exploration and production (frequently this can be more than 20 years).

Consequently commodity prices are likely to consolidate their gains of the last decade, and perhaps also to remain on a rising trend for some years to come. In the context of this commodity boom, Africa is becoming increasingly attractive to many resource hungry economies and firms seeking to exploit what appear to be sustainably high prices for commodities. Already Africa is a major global producer of key commodities such as diamonds, gold, platinum, oil and timber. But perhaps more important, in many commodities Africa commands the lion's share of unexploited deposits (Table 1).

A further attraction for Africa's new economic partners, is that ownership of and access to *existing* production of commodities is often controlled by economies and firms which have historically dominated global production. Hence, those actors seeking access to uncontrolled *future* production are increasingly drawn to the African continent. This increasing interest in Africa's resources is not free from risk and the higher costs associated with weak infrastructural development. However, as the CEO of Glencore (one of the world's leading commodity-traders) observed in 2011 – 'Unfortunately, God put the minerals in different parts of the world. We took the nice, simple, easy stuff first from Australia, we took it from the United States, we went to South America and we dug it out of the ground there. Now we have to go to more remote [and unstable] places [in Africa]'.

Table 1: Africa's share of known and economically exploitable global production and reserves (%)

Mineral	Production	Reserves
Platinum Group Metals	54	60+
Gold	20	42
Chromium	40	44
Manganese	28	82
Vanadium	51	95
Cobalt	18	55+
Diamonds	78	88
Aluminium	4	45

Source: Adapted from African Development Bank (2007)

The bundling of entry into Africa's infrastructural and commodity sectors.

There are a variety of vectors in which the impact of new and emerging actors in Africa can be assessed. Three of these are dominant and have especial relevance to the infrastructure sectors in Africa – aid, trade and Foreign Direct Investment (FDI). (Other key vectors are in institutions of global governance, migration flows and environmental impacts – www.asiandrivers.open.ac.uk.) In the decades since the development agenda was put on the global stage after World War Two, an increasing orthodoxy has emerged amongst the northern economies who came to dominate global production and trade in the second half of the twentieth century. This was an orthodoxy in which there was growing agreement to unbundle aid, trade and FDI. For example,

and although the process is by no means complete, there have been growing pressures to untie aid from trade. Similarly, the FDI and aid vectors are exercised through financial payments in convertible currencies rather than by payment through various forms of barter (such as repayment of loans and aid through the exchange of specific commodities and manufactures).

Another feature of current “best practice” is the growing presence of conditionalities in all three vectors. Conditionality in aid and trade relations became the norm during the decades of Structural Adjustment in the 1970s and 1980s. During that period, aid support was contingent on the acceptance of a particular package of economic policies, the “Washington Consensus” agenda. More recently, conditionality has reflected poverty-reduction and political and social agendas. In the case of aid, for example, transparency of expenditure and the avoidance of corruption have been implemented through the Paris Club and the DAC. In the case of FDI and trade, concerns for the environment and for labour and social standards have led to a series of standards for products (for example, organic foods and furniture made from sustainable forests) and processes (for example, Fair Trade and labour standards).

An earlier UNOSAA Report on Africa’s Cooperation with New and Emerging Development Partners noted that some emerging economies - and China in particular - have adopted a distinctive position by comparison with this emerging pattern of best-practice in the OECD economies’ aid, trade and FDI links with the developing world. This involves a much closer and strategic integration of aid, trade and FDI. This is particularly marked in the case of China, and in some (but by no means all) of its involvement in Africa. This has come to be referred to as the “Angola mode”, based on China’s participation in the provision of infrastructure to Angola (Foster et al, 2008; UNOSAA, 2009). This is an arrangement whereby large scale infrastructural projects in Angola have been funded by China Exim Bank. All of these Exim Bank projects are subject to a closed tender offered to at least three Chinese companies and supervised by the Chinese Ministry of Commerce (Corkin, 2013). Since these are large projects (a minimum value of \$10m), the infrastructure projects are generally undertaken by state owned enterprises (SOEs). The finance sometimes offers some elements of concessionary loan, but requires that more than 50% of project procurement be sourced from China. In turn, the repayment of these loans by Angola occurs through oil-backed revenues or physical exports of oil.

Although, as will be shown later in this Report, the Angola Mode of operation is widely evidenced in China’s operations in Africa, it is not universal. Not all Chinese operations in Africa involve SOEs, and not all of the participation of SOEs and other Chinese firms involves the close bundling of aid, trade and FDI. Moreover, even where bundling does occur, it does not always involve the full “Angola mode” (that is, aid, trade and FDI being part of a package, in which repayments are made through the exports of commodities), but may only incorporate elements of bundling (for example aid and FDI with repayment in convertible currencies and not backed by specified commodity export receipts).

Beyond the prevalence of bundling, much of NEP activity in Africa is relatively free of the conditionality which characterises the operations of northern actors who have traditionally dominated external presence in African economies. This occurs with regard to transparency initiatives designed to curb corruption, politically-orientated conditionality seeking to promote better governance and standards imposed with global value chains seeking to promote better environmental and labour standards. The consequence of this relatively light focus on conditionality is that some NEP projects are decided and implemented much more rapidly than equivalent projects promoted by traditional northern partners, and at lower cost. This is widely recognised to work to the advantage of Chinese participation in African infrastructural and resource sector projects, particularly those which are large in scale.

AFRICA'S INFRASTRUCTURE DEFICIT

The link between economic infrastructure and growth is widely recognised. In high income economies such as the US there is an observed positive impact of infrastructure on total productivity growth (Aschauer 1989). And, despite the fact that the economic returns to infrastructure investment decline as per capita incomes increase (Canning 1999, Auty, 2008), the rate of investment in infrastructure is nevertheless greater in high income than in low income economies (Banerjee, 2004). In addition to the growth impacts of infrastructure, there is also evidence that these investments contribute to more equal distributional outcomes. A study of 100 countries over the period between 1960 and 2000 confirmed both the growth enhancing and income distributing consequences of increased infrastructural investment (Calderon and Serven, 2004). The positive distributional impact of investment in infrastructure is confirmed in an analysis of progress towards meeting the MDG targets, showing a positive relationship between infrastructure investment and reductions in infant mortality and improvements in nutrition (Fay et al, 2005).

Despite the clear link between growth, development and infrastructure and the consequently high payoffs to investment in infrastructure, a variety of studies have identified a significant infrastructural deficit in Africa. This deficit applies to both economic and social infrastructure and has major implications for economic growth. Studies estimate that infrastructure deficits depressed enterprise productivity by around 40% in SSA (Escribano et al, 2008 cited in Foster et al, 2008), and that this negative impact was greater the lower the per capita income of the economy. A World Bank review of the state of infrastructure in Africa concluded that “[f]or most countries, the negative [economic] impact of deficient infrastructure is at least as large as that associated with crime, red tape, corruption, and financial market constraints” (Foster et al, 2008).

As Table 2 shows, SSA is highly disadvantaged in selected categories of both economic and social infrastructure, even when compared with other low income economies. This infrastructure deficit is particularly marked with respect to power generation, and is least evidenced in relation to mobile telecoms. Relative deficits are also evidenced with regard to paved roads, fixed telecoms and social infrastructure. There are also marked distributional deficiencies. For example, only one-third of Africa’s rural population lives within two kilometres of all-weather roads, compared to two thirds in other developing economies (Foster et al, 2008) The infrastructure deficit is less evident (but is not similarly recorded) for North Africa.

Table 2: SSA's Infrastructure deficit: Selected indicators

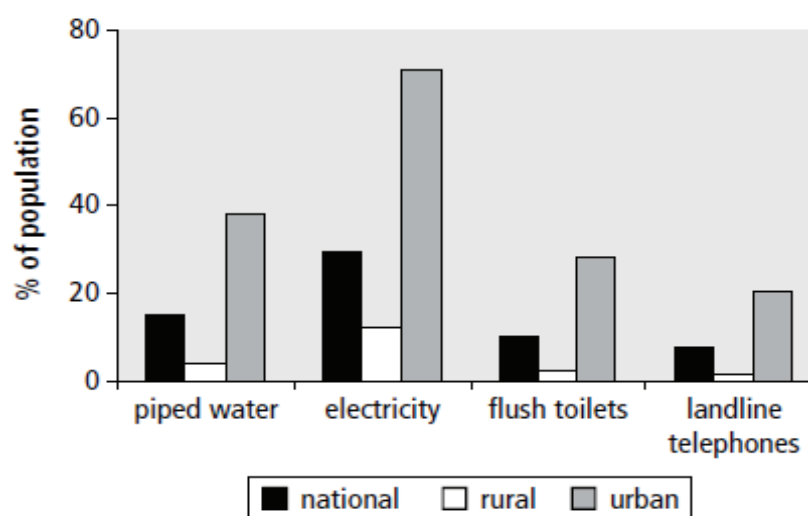
Normalised units	SSA Low income economies	Other low income economies
Transport		
Paved roads density	31	134
Total roads density	137	211
Power		
Generation capacity	37	326
Electricity coverage	16	41
ICT		
Fixed line density	10	78
Mobile density	55	76
Internet density	2	3
Sanitation (Improved)	34	51
Water (Improved)	60	72

Road density = kilometres per kilometres squared; ICT = lines per thousand population; generation = megawatts perm population; electricity, water, sanitation = percentage of population

Source: Derived from Yepes et al, 2008 and cited in Foster et al, 2008

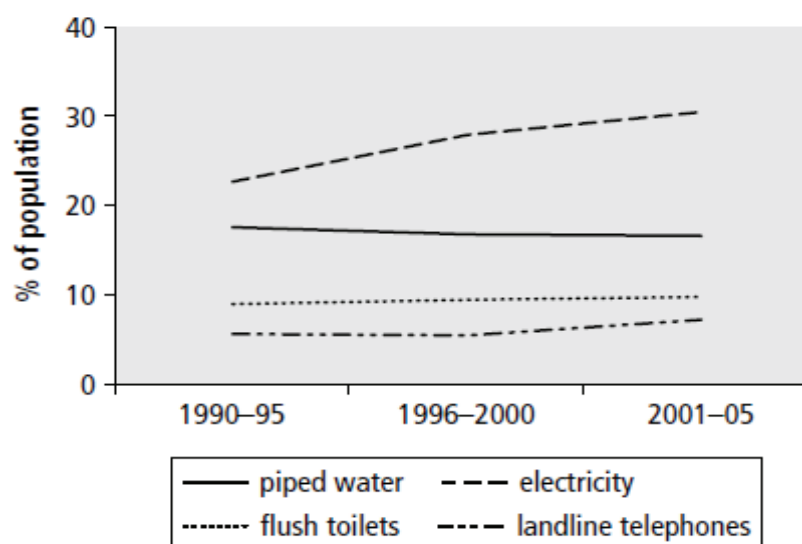
Beyond the low level of infrastructure provision in aggregate is its poor distribution, particularly with respect to social infrastructure. As Figure 6 indicates, the proportion of Africa's population having access to piped water, electricity, flush toilets and landline telephony is considerably higher in urban areas than in rural areas. Further, as Figure 6 shows, progress in the provision of social infrastructure has at best been slow, and more typically non-existent. This contrasts with other low income economies in which there has often been substantial progress in infrastructure provision. For example, SSA had three times more generating capacity per capita in 1970 than India, but by 2000 India had overtaken Africa and had twice as much per capita capacity as SSA (Foster et al, 2008 2008). Thus beyond the poor availability of infrastructure is the slow rate of progress (Figure 7). If South Africa, with its relatively well-endowed infrastructure is excluded from consideration then the severity of Africa's infrastructure deficit (and particularly SSA's deficit) is magnified.

Figure 6: The rural-urban divide in Africa's infrastructure



Source: Foster et al, 2008

Figure 7: Slow progress in infrastructural development in Africa



Source: Foster et al, 2008

African producers and consumers are not only disadvantaged by the poor availability and uneven distribution of economic and social infrastructure, but also by its high cost. Typically, costs are two to three times the levels prevailing in other developing regions, with a much greater differential compared to the costs faced by users in high income economies (Table 3).

Table 3: The high cost of Africa's infrastructure for consumers

	SSA	Other developing regions
Transport		
Road freight tariff (\$/ton/km)	0.04-0.14	0.01-0.04
Power tariffs (\$kWh)	0.02-0.46	0.05-0.1
ICT		
Mobile (\$basket/month)	2.6-21.0	9.9
International (3 min to US)	0.44-12.5	2
Internet dial up (\$/month)	6.7-148.0	11
Water (\$/m3)	0.86-6.56	0.03-0.6

Source: Derived from Africa Infrastructure Diagnostic 208, cited in Foster et al, 2008

Faced with this pervasive deficit in both economic and social infrastructure, African economies – both individually and through the auspices of multilateral bodies such as the UNECA, NEPAD, the AFDB in Africa and the World Bank and the OECD outside of Africa – have increasingly come to recognise the need to take remedial action. In the first instance, this requires resources. One estimate of the annual requirement for infrastructural development in SSA is \$74.8bn, evenly split between capital costs and recurrent expenditure on maintenance and operations (Table 4).

Table 4: Estimated annual requirement for infrastructure expenditure in SSA

	Capital Expenditure	Recurrent expenditure	Total expenditure
Power	23.2	19.3	42.6
Transport	10.7	9.6	20.3
ICT	0.8	1.1	1.9
Sanitation and water	2.7	7.3	10
Total	37.5	37.3	74.8

Source: Drawn from Bricerio-Garmendia et al, 2008, cited in Foster et al, 2008

The Africa Infrastructure Country Diagnostic Study (which focuses on Africa as a whole, and not just SSA) calculates that \$93bn per year is required for infrastructural development. This is roughly double current levels of expenditure. Two thirds of current expenditure is contributed by national governments, a fifth by the private sector, 8% from traditional DAC donors and only 6% from China, India and Arab donors.

However, the financial cost of infrastructural development is only one side of the coin. The other side consists of the “soft” component of infrastructural development, notably the skills required to envision, strategize, implement and then operate often technologically and institutionally complex operations. This reflects a severe skill deficit.

A further challenge confronting Africa’s infrastructural development is that, by necessity, much of the economic infrastructure requires cross-border cooperation. This is particularly evident in the case of transport and power which suffer from classic externality challenges. Although there are some cases where an individual user may be so large that it alone can pay for the costs of the infrastructure (for example, a large power plant, or a point-to-point railway or pipeline between the commodity extraction site and the point of commodity export) it is generally the case that no single user may be able to make enough use of the infrastructure to cover its costs. For example, the proposed Central Corridor in East Africa which potentially links Tanzania, Rwanda, Uganda, Burundi, the Eastern DRC and parts of Kenya with the coast requires the cooperation, resources and support of all of the relevant governments, as well as support from multilateral organisations such as the African Development Bank and the World Bank.

It is in this context of weak infrastructural provision in Africa, a severe financial and skills deficit and a complex political and geopolitical web of decision-making that the NEP7 engage with Africa’s infrastructure needs. They have an important role to play in both financing and in providing the human and institutional capacities required to build, operate, maintain and commercialise Africa’s infrastructural sectors, with regard to both economic and social infrastructure. What contributions have they made in the past, and what contribution may they make in the future?

HOW HAVE AFRICA’S NEW AND EMERGING PARTNERS ENGAGED WITH INFRASTRUCTURAL DEVELOPMENT?

As observed earlier in this Report, the involvement of the NEP7 group of emerging economies in infrastructural development in Africa occurs in a context of a disrupted global economy. This disruption involves a change in the centre of gravity of global growth, a sustained boom in energy prices since 2002, and a growing recognition that Africa is emerging as a key strategic site for the expansion of commodity production. Since much economic infrastructure is wholly or partially required to export commodities, the sustained commodity boom has important implications for infrastructural investment, and particularly for investment in economic infrastructure.

But access to commodities is not the only reason why the NEP7 have played an important role in Africa’s infrastructural development. Africa represents a rapidly growing market, and construction firms in the NEP7 have distinctive competences developed in meeting the needs of their domestic economies which often have similar operating environments to Africa. Further, in the search to widen their economic and geopolitical spheres of influence, governments in the NEP7 have increased their aid programmes to Africa, often providing support for their private sector to participate in African infrastructural development, and often involving support for social infrastructure as well as economic infrastructure. Moreover, as observed in an earlier UNOSAA Report (UNOSAA, 2009), the mode of involvement of some of the NEP7 (particularly, but not exclusively, China) occurs in a framework which departs from the Washington Consensus which has characterised DAC-economy involvement in Africa and this on occasion provides them with a competitive edge over northern rivals.

It is not easy to accurately capture either the full extent of NEP7 involvement in African infrastructure, nor its distinctive character (if indeed it is distinctive from the involvement of northern economies). There are a number of reasons for this. First, the details of many of the projects in which they are involved – particularly

the small and medium projects - are purely commercial relationships which are seldom in the public domain. Second, particularly when infrastructural activities are part of larger initiatives (such as investments in the commodities sector), it is difficult to unravel the specific infrastructural element in these projects. Third, even where the large scale projects do disclose the range of the operations, the specifics of the distribution between infrastructure and other activities are not provided. Moreover, fourthly, there is often considerable un-clarity about the size of many projects; for example, China's Sicominex project in the DRC has variously been cited as involving investments of between \$6bn and \$12bn, a not inconsiderable difference!. Where repayment is made in commodities or through commodity receipts (as in the Angola Mode) the costs are uncertain even to the contracting parties. And, finally, beyond the uncertainty of data on the value and distribution of activities, there is a gap between commitments and disbursements. What exists on paper is seldom what transpires in reality.

In the context of this enormous data gap, this Report seeks to focus not so much on the extent of NEP7 involvement in Africa's infrastructural development, but on its character. It draws on an extensive search of published and "grey" data and information provided by a range of key industry informants. It also involves the calculation of proxies of involvement in the infrastructure sector, notably the export by NEP7 of construction equipment to Africa. In total, 239 infrastructure projects involving the NEP7 were identified for the period between 2000 and 2010.² Of these, 141 (59%) were linked to Chinese stakeholders. The next largest participant was Brazil (15.9% of the total), followed by Korea (8.8%), India (6.3%) and Turkey (5.9%), with Malaysia and Russia each involved in 2.1% of the recorded infrastructure projects in Africa (Table 5).

This database was constructed in the follow manner. The first step was to approach key informants who were known to either have collated data on African infrastructure (notably the World Bank and in particular its PPIAF database³) or to have an expertise on the participation of the NEP7 in Africa. Second, extensive internet searches were made of three different sets of sites - news media, the foreign ministries of the seven countries in this study, and a variety of financial institutions both within the multilateral community and in the individual seven NEP economies. Thirdly, we also obtained information from books, reports, working papers and journal articles available on the public domain.

Table 5: Country of origin of NEP7 involvement in Africa infrastructure projects

Country	No.	Share of total (%)
Brazil	38	15.9
China	141	59.0
India	15	6.3
Korea	21	8.8
Malaysia	5	2.1
Russia	5	2.1
Turkey	14	5.9
Total	239	100

² Since information on projects is incomplete, the number of recorded involvements is not the same in each Table documenting the structure of these activities. The exception to this time period is a single Turkish project which was initiated in 1997, but involved supplementary expenditures in 2003.

³ The World Bank's register of Chinese infrastructure involvement is limited to projects involving Chinese state financing (either debt financing or grant element loans) and excludes Chinese private sector projects

In many cases, project-details were available in two or more sources, allowing for a triangulation of the data. Where multiple sources were used and where discrepancies occurred, we made use of the information that was common among most of the sources which reported on that project.

Using this project data-base, projects were filtered in three ways. The first was by type of infrastructural activity, distinguishing between transport (road, rail, air and sea-port), power, ICT, irrigation, water, sanitation and housing and stadiums. The second filter was by the type of finance – aid, loans or FDI. The third addressed the extent to which the infrastructure was directed to the extraction and export of commodities. Fourth, an estimation was made of the extent of bundling, that is the combination of aid, trade, FDI and repayments made through the export of commodities. This filtering mechanism involved the number of projects and not the value of projects, since in very few cases was it possible to determine accurately the levels of resources involved.

There are a number of important limitations arising from this methodology. Critically, it represents a mix of implemented projects and statements of intent – many commitments are not reflected in disbursements or the outcomes are very different from those which were planned and announced. Compounding this is the ambiguity in many of the announcements – different sources sometimes provide rather different estimates of cost and reach. Further, data was only collected by number of projects rather than the value of projects and was limited to projects which surfaced “above the radar” in the channels described above. The consequence of these methodological limitations is that the information analysed in this Report represents only a sample of NEP7 infrastructure projects in Africa. It is almost certainly heavily biased towards large scale projects such as hydroelectric dams rather than renewable energy, but beyond this it is not possible to interpolate the nature of bias in this sample. As observed, the database provides data on the number rather than the value of projects.

In the face of these daunting methodological limitations, it would be tempting to dismiss the findings of this Report. This would, we believe, be an error. The only comparable data base in existence (the World Bank’s PPI databank) is much smaller than the one in this Report, does not filter the data on the basis of the degree of bundling and does not consider the range of NEP economies addressed in this Report. It, too, provides only a sample of projects, with unknown representativeness. Moreover, in almost all fields the accretion of data over time represents a gradual process of continual improvement after the first generally unsatisfactory data-gathering step. But the journey of assembling a robust, comprehensive and representative database has to begin somewhere, however uncertain the first footsteps may be. Third, an extensive search of the related material shows a complete vacuum of data on the activities of the range of NEPs considered in this Report with most of the available material being limited to China’s involvement in Africa. Hence we believe that the data contained in this Report is indeed valuable – particularly in charting the nature of NEP7 involvement in African infrastructure – albeit a Report which carries a “health warning” to all readers.

Economic infrastructure dominated this NEP7 involvement in African infrastructure (Table 6). Roads were the single largest sector of activity, and all transport (including oil pipelines) accounted for just over half of the total (52.3%). Investments in power were the second largest sector of activity. Social infrastructure (water and sanitation) comprised only a small share of the total (8.8%). The remaining project areas were ICT (9.2%) and construction and housing (5%) with two cases of investments in irrigation (0.8% of the total).

Table 6: Number and share of infrastructure projects in Africa involving NEP7 countries

Type of project	No.	Share of total (%)
Roads	70	29.3
Rails	22	9.2
Power	57	23.8
Sea Port	5	2.1
ICT	22	9.2
Oil refinery & pipelines	14	5.9
Airports	14	5.9
Stadium	7	2.9
Irrigation	2	0.8
Water and Sanitation	21	8.8
Housing	5	2.1
Total	239	100

Table 7 shows the sectoral focus of the four NEPs which dominate involvement in Africa's infrastructure development - China, Brazil, Korea and India together account for 97.2% of the recorded cases. (The outliers - Malaysia, Russia and Turkey are disproportionately represented in airports, oil pipeline and refinery infrastructure). Given that China is involved in 59% of the total, it is not surprising that it has a large presence in virtually all of the sectors. It is disproportionately prominent in roads, ICT and the limited number of stadium projects, and under-represented in airports and oil infrastructure. The latter is perhaps surprising given the scale of China's interest in Africa as a source of future oil supplies. In terms of a share of total infrastructural involvement in Africa, in the period to 2008 the bulk of China's effort was concentrated in (hydroelectric) power and railways (Foster et al, 2008).⁴ Brazil is relatively over-represented in airports and seaports, India in railway, oil infrastructure and power, and Korea in water and irrigation and power.

⁴ Between 2001 and 2007, China was engaged in the construction of 6,000MW of power (at a cost of \$5.3bn) and in the rehabilitation of 1,350 km of railways and the construction of 1,600 km of new railways (at a cost of \$4bn) (Foster et al, 2008: xiii). When completed these hydroelectric power investments will have augmented continental generating power by 30%

Table 7: Shares of Brazil, China, India and Korea in different infrastructural projects (%)

	Brazil	China	India	Korea
Roads	18.6	72.9	0.0	5.7
Rails	13.6	59.1	22.7	4.6
Power	14.0	54.4	10.5	12.3
Sea Port	40.0	60.0	0.0	0.0
ICT	4.6	77.3	9.1	9.1
Oil refinery & pipelines	0.0	28.6	14.3	0.0
Airports	35.7	28.6	0.0	0.0
Stadium	0.0	85.7	0.0	14.3
Irrigation	0.0	0.0	0.0	100.0
Water and Sanitation	14.3	57.1	0.0	19.1
Housing	60.0	0.0	0.0	0.0
Total	16.1	59.8	6.4	8.9

Beyond this aggregate picture of the country of origin and sector of activity of these 239 incidences of NEP7 infrastructural involvement in Africa, it is possible to refine this story into a number of different elements, bearing in mind the incompleteness of data and the inherent difficulties of capturing participation in the sector's development.

Three sets of lenses are utilised to assess the character of NEP7 involvement in African infrastructure:

- Beyond the direct participation of NEP7 involvement in specific projects is their general contribution to the infrastructure sector through the provision of capital goods as reflected in their exports of construction equipment to Africa
- The extent to which NEP7 involvement in infrastructure projects are wholly or partially linked to the extraction and export of resources
- The extent to which NEP7 participation in infrastructure involves the bundling of aid, trade and FDI and repayment directly linked to the proceeds of commodity exports

A brief description of the 239 projects is provided in the context of the individual country case studies in Part II of this Report.

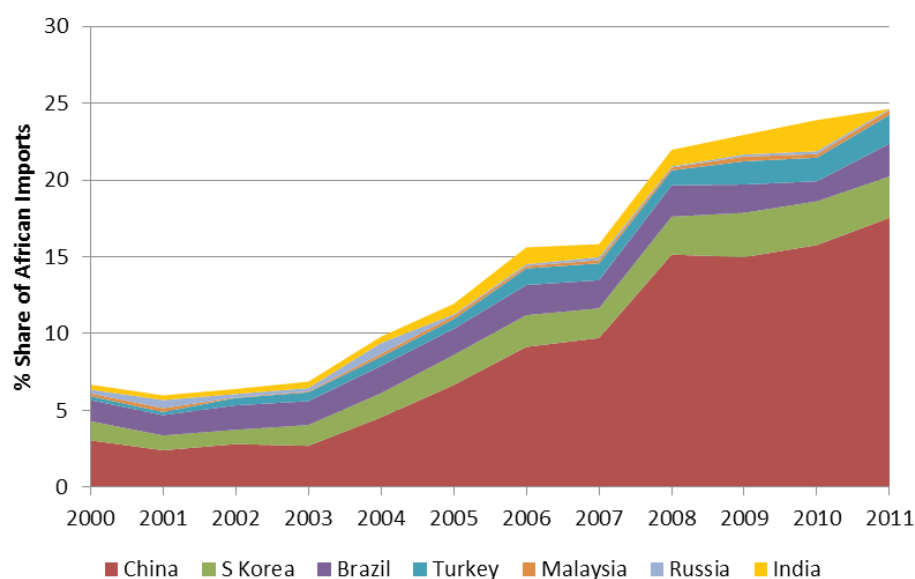
Trade in Construction Equipment

One mode of NEP7 economy participation in Africa's infrastructure sector is through the supply of capital equipment. This is an imperfect measure for a variety of reasons – it only covers physical activities (as observed above, the soft side of infrastructure provision is often more important than the hardware) and earthmoving equipment and other infrastructural capital goods can also be used in the resource sector. Moreover, international trade statistics are highly aggregative in nature and some capital goods which are widely used in the infrastructure sector are included in trade classifications other than those which we have used in the analysis below. The major categories of construction equipment which are analysed are civil engineering equipment (SITC 723), machinery for minerals sector not elsewhere classified (SITC 7283), mechanical handling equipment (SITC 744)

and wheeled tractors (SITC 7224).⁵ The detailed sub-categories involved are listed in Annex A.

From Figure 8 it is evident that the NEP7 satisfy a growing proportion of Africa's construction equipment needs. As a proportion of total African sector imports, this rose sharply from 7% in 2003 to 25% in 2011. Most of this increase was a consequence of rising Chinese exports, but substantial export gains were also made by Korea, Brazil and Turkey

Figure 8: Share of overall construction equipment exports to Africa



Source: compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

The increase in NEP7 construction equipment exports to Africa reflects a broader process of growing NEP7 exports to the continent. It is striking, however, that three of the four largest exporters – China, Korea and Turkey – witnessed an increase in the share of construction equipment in their total exports to Africa (Table 8).

Table 8: Share of construction equipment in the Emerging Economies total exports to Africa (2000 - 2011) (%)

Country	2000	2005	2010	2011
Brazil	3.1	2.1	1.8	2.3
China	1.8	2.5	3.4	3.1
India	0.5	0.7	1.5	NA
Malaysia	0.6	0.7	0.6	0.7
Russia	0.6	0.2	0.4	0.1
S Korea	1.1	1.7	2.2	1.9
Turkey	0.5	1.1	1.8	2.1

Source: compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

5 Wheeled tractors are large articulated vehicles used in the construction and haulage sectors and are distinct from agricultural tractors.

The absence of Nigeria as a market for NEP7 construction equipment exports is striking. The largest importer in 2011 was South Africa (\$576m), followed by Algeria (\$242.2m) and Ethiopia (\$229m) (Table 9).

Table 9: Top 5 African destination of construction equipment exports for emerging economies, in 2000 and 2011(\$m)

Emerging Economy	2000		2011	
	Destination	\$m	Destination	\$m
Brazil	South Africa	14.5	South Africa	52.8
	Malawi	1.5	Algeria	48.6
	Ethiopia(excludes Eritrea)	1.4	Ethiopia(excludes Eritrea)	44.2
	Cote d'Ivoire	0.9	Ghana	9.1
	Senegal	0.7	Egypt, Arab Rep.	6.8
China	South Africa	6.6	South Africa	376.3
	Egypt, Arab Rep.	4.6	Algeria	204
	Ethiopia(excludes Eritrea)	3.6	Ethiopia(excludes Eritrea)	145.6
	Cote d'Ivoire	1	Egypt, Arab Rep.	106.2
	Ghana	0.9	Ghana	90.3
India	Egypt, Arab Rep.	1.0	South Africa	49.3
	Botswana	0.8	Tanzania	49
	Ghana	0.7	Algeria	30.2
	South Africa	0.4	Malawi	27.5
	Tanzania	0.1	Ethiopia(excludes Eritrea)	14.7
Malaysia	South Africa	2	South Africa	5.4
	Mauritius	0.1	Algeria	1.6
	Egypt, Arab Rep.	0.1	Egypt, Arab Rep.	0.8
	Cote d'Ivoire	0.1	Ghana	0.8
	Ghana	0.1	Mauritius	0.6

Emerging Economy	2000		2011	
	Destination	\$m	Destination	\$m
Russia	Egypt, Arab Rep.	1.2	Egypt, Arab Rep.	4.7
	South Africa	0.1	Algeria	2.5
	Algeria	0.1	South Africa	1.2
	Senegal	0.1	Senegal	0.0
	Tanzania	0.0	Tanzania	0.0
South Korea	South Africa	10.7	South Africa	112.9
	Egypt, Arab Rep.	1.9	Algeria	70.3
	Mauritius	0.5	Ethiopia(excludes Eritrea)	24.7
	Ethiopia(excludes Eritrea)	0.5	Egypt, Arab Rep.	24.2
	Algeria	0.3	Tanzania	6.2
Turkey	Egypt, Arab Rep.	2.8	Algeria	72.2
	South Africa	0.7	South Africa	22.5
	Algeria	0.5	Egypt, Arab Rep.	13.4
	Ghana	0.0	Ghana	7.6
	Ethiopia(excludes Eritrea)	0.0	Ethiopia(excludes Eritrea)	4.0

Source: compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

NEP7 involvement in Infrastructure linked to the Commodities Sectors

As observed earlier in this Report, NEP7 involvement in African infrastructure sectors takes place in the context of a sustained commodity price boom. Since much of economic infrastructure plays a role in the export of commodities, it is pertinent to assess the extent to which NEP7 involvement in the sector is directly linked to the extraction and export of commodities. It is widely assumed that “resource hungry” NEP7 are strategically focused on gaining access to Africa’s commodities and that this predisposes them to invest disproportionately in the infrastructure dedicated or partially designed to facilitate commodity exports (Table 10). The picture which emerges (for those cases where it is possible to determine this linkage) is one which does not support the contention that NEP7 infrastructural involvement is resource-sector dominated. It is particularly not the case for China, where only 6% of its infrastructure projects were wholly linked to resource extraction and a further 3% were partially linked. India, Turkey and particularly Malaysia (whose infrastructure activities in Africa are driven by Petronas, its state-owned oil company) are more likely to have linked infrastructural projects to resource extraction.

Table 10: Linkage between infrastructure projects and resource extraction (%)

Country name	Nature of linkage with resource extraction in Africa			
	Wholly	Partially	General	Total
Brazil	6	3	91	100
China	6	3	91	100
India	14	7	79	100
Korea	0	0	100	100
Malaysia	100	0	0	100
Russia	20	0	80	100
Turkey	14	0	86	100
Total	9	3	88	100

However, although the evidence suggests a limited role for NEP7 economies in the promotion of infrastructure directly linked to the extraction and export of commodities, this does not mean that their activities were unrelated to the resource sector. As observed earlier, there is a growing constraint globally on unallocated economically profitable reserve of resources, which is particularly important to newly significant global economic actors such as the NEP7. This means that many of their operations in Africa, whilst not directly related to the extraction and export of commodities, are an indirect route for gaining future access to the exploitation and use of these resources. In this context it is striking that of the nine African economies which are the largest recipients of NEP7 involvement in Africa and which account for more than half of the total involvement, six (Angola, Ghana, Mozambique, Nigeria, Sudan and Tanzania) are existing or future producers of oil and gas and the DRC and Congo have very large reserves of a range of mineral commodities (Table 11). Of these top nine African economies, only Ethiopia can be classified as a “resource-light” economy.

Table 11: Share of largest nine African economies in NEP7 infrastructural involvement (% of total)

	China	Brazil	Korea	India	Turkey	Russia	Malaysia	Total
Angola	6	32	6	7	0	0	0	10
DRC	11	0	6	13	0	0	0	9
Ghana	8	5	6	0	0	0	0	6
Mozambique	4	13	17	7	0	0	0	6
Nigeria	6	0	0	20	0	40	0	6
Ethiopia	6	0	6	0	0	0	0	4
Sudan	6	0	0	13	0	0	0	4
Tanzania	2	0	28	0	0	20	0	4
Congo	4	3	0	0	0	0	0	3
Nine largest recipients	54	53	67	60	0	60	0	52
Multi-country projects	1	0	0	7	8	20	20	3

The Extent of Bundling in NEP7 Involvement in African Infrastructure

It is widely observed that Chinese operations in Africa are characterised by a relatively high degree of “bundling”, that is, that they involve a mix of aid and FDI, generally closely linked to trade relations and in the extreme cases, providing for repayment through commodity exports (either directly to China, or through the receipts from commodity exports) (UNOSAA, 2009; Corkin, 2013). This bundling is not unique to China’s activities in Africa and, indeed, in earlier decades, tied-aid and aid linked to FDI often characterised the operations of northern countries in Africa and other developing economies. However, in the current era it is China’s operations in Africa which are most closely associated with bundling.

Table 12 shows the key forms of engagement of the NEP7 in Africa’s infrastructure sector, distinguishing between aid-funded projects and projects involving loans, projects involving equity, projects resulting from winning open tenders and projects involving a combination of aid and FDI. (Most of the data sources available do not make it possible to distinguish between aid projects with concessionary loans and projects involving loan finance at commercial rates and hence these two categories are combined). It is evident from this data that in aggregate around half of all infrastructure projects are aid- or loan financed. The proportion is higher for social infrastructure and stadiums (most of these involve concessional loans) and least evident for oil pipelines and airports. The second largest vector of infrastructure projects are those won on open tender which comprise nearly a third of the total. Open tender projects are most evident for housing, airports and oil; pipelines, and least likely in the case of railway projects and stadiums. FDI surfaces as an important vector in the oil sector, and in railways. There are also a small number (4% of the total) of projects which involve a combination of aid and FDI, and this is most evident in the case of sea port infrastructure.

Table 12: Type of project by type of funding for the NEP7 (%)

Type of project	Source of funding				Total
	Aid and loan	FDI	Open Tender	Aid and FDI	
Roads	46	18	31	5	100
Rails	59	32	5	5	100
Power	56	16	19	9	100
Sea Port	40	20	20	20	100
ICT	55	18	27	0	100
Oil refinery & pipelines	8	38	54	0	100
Airports	21	7	71	0	100
Stadium	86	0	14	0	100
Irrigation	100	0	0	0	100
Housing	71	0	29	0	100
Water and Sanitation	0	0	100	0	100
Total	50	17	29	4	100

Beyond these categories of aid, loans, FDI and projects won on open tender is an additional vector of involvement which is relatively new in the African context. This involves projects where the repayment of loans and the payments to contractors are linked to the export of commodities. These commodity exports may either be direct to the NEP7 supplying firm or country, or payments made through explicit links to foreign exchange earnings from commodities. Nearly 21% - that is, 50 of the 239 projects for which information exists - involved infrastructure projects in which repayments were explicitly linked to commodity exports. All but seven of them involved Chinese actors, and these Chinese trade-linked projects were predominantly in road construction and power plants (Table 13).

Table 13: Country of origin and sector of activity of trade linked infrastructure projects

Type of project	Countries				Total
	Brazil	China	India	Korea	
Roads	0	17	0	0	17
Rails	0	2	1	1	4
Power	1	17	1	1	20
Sea Port	0	2	0	0	2
ICT	0	2	0	0	2
Oil refinery & pipelines	0	2	1	0	3
Airports	1	0	0	0	1
Water and Sanitation	0	1	0	0	1
Total	2	43	3	2	50

Putting together the data on trade-related repayments and projects involving different vectors of financing, it is possible to explore the extent and character of “bundling” by NEP7 actors in Africa’s infrastructure sector. Projects are neither completely bundled nor free of unbundling; characteristically they involve some degree of mix. Table 14 classifies 161 out of the 239 infrastructure projects (for which we could obtain information on bundling) by distinguishing three types of bundling. The first are cases where bundling is not evident and in which only a single vector of activity is involved (aid, FDI, loan-finance or commodity-export linked payments). The second are cases where two of these four vectors are involved. The third are where three or all of the vectors are bundled. It is these triple/quadruple-vector projects which most closely fit the “Angola mode” which is said to characterise much of China’s involvement in large scale projects in Africa.

The data shows that nearly 60% of NEP7 infrastructure projects in Africa involve only a single vector – that is, aid, equity, open market tender or repayment through commodity export receipts. A small proportion just about 12% involves two vectors, but nearly 30% of all infrastructure projects are at the “Angola mode” end of involvement. Bundling is most prominent in stadiums, power and roads, and least evident in social infrastructure, the oil sector, ICT and airports.

Table 14: Degree and nature of bundling by sector (%)

Type of project	Nature of bundling			Total
	Single	Double	Triple/Quadruple	
Roads	53.1	10.2	36.7	100
Rails	50.0	25.0	25.0	100
Power	43.9	14.6	41.5	100
Sea Port	33.3	33.3	33.3	100
ICT	79.0	5.3	15.8	100
Oil refinery & pipelines	57.1	28.6	14.3	100
Airports	66.7	16.7	16.7	100
Stadium	33.3	0.0	66.7	100
Irrigation	100.0	0.0	0.0	100
Water and Sanitation	100.0	0.0	0.0	100
Total	58.4	12.4	29.2	100

However, as Table 15 shows, the sectoral determinants of bundling are misleading. The only factor which explains *full* bundling is China's presence in the infrastructure activity.

Table 15: Degree of bundling by NEP7 economy (%)

Country	Nature of Bundling			
	Single	Double	Triple	Total
Brazil	100.0	0.0	0.0	100
China	49.2	12.3	38.5	100
India	66.7	33.3	0.0	100
Korea	90.5	9.5	0.0	100
Russia	100.0	0.0	0.0	100
Total	58.4	12.4	29.2	100

WHAT CAN BE DONE TO STRENGTHEN THE CONTRIBUTION OF AFRICA'S NEW AND EMERGING PARTNERS TO INFRASTRUCTURAL DEVELOPMENT?

As observed earlier in this Report, Africa has a substantial infrastructure deficit. Per capita availability is low by international standards, distribution is heavily concentrated in urban areas, operational efficiency is often low and the costs to consumers are high. Moreover, the rate of improvement over the past two decades has been slow in aggregate and in some cases – particularly in fragile and landlocked states and economies with a weak natural resource base – the infrastructural base has been weakening rather than strengthening.

These outcomes have a harmful impact on both growth and development in Africa. Many comparative studies have shown the positive role which infrastructure plays in supporting economic growth. But some forms of infrastructure are also particularly important for the spreading of the gains from development to consumers in general, and poor consumers in particular, such as the availability of clean water and sanitation. Fortuitously, these growth and development enhancing outcomes of infrastructure provision are complementary. The availability of cost-efficient economic infrastructure generally feeds into positive development outcomes, and a healthy population contributes to an efficient workforce. Hence it is important to adopt a comprehensive strategy in the strengthening of Africa's infrastructure.

Africa's infrastructural deficit is dominated by five major challenges. The first concerns the scale of required investment. The World Bank Africa Infrastructure Country Diagnostic Study concluded that much higher levels of capital spending are required on infrastructure. Estimated at \$93bn per year, this is roughly double current levels of expenditure.⁶ PIDA estimates that \$68bn is required for regional infrastructure between 2012 and 2020, of which only \$38bn is currently funded. The second major challenge arises from the cross-border externalities which are intrinsic to many types of infrastructure (particularly transport and hydropower). This requires African governments to invest resources and to harmonise regulations and operations synergistically. The fact that the benefits are spread unevenly across countries and that some countries are less likely to receive benefits in the short term, poses major problems for policy coordination. The third challenge is a pervasive human resource and skill deficit. Weak capabilities have meant that operational efficiencies have been low. Fourth, insofar as investments in African infrastructure are spurred by the commodities price boom and its infrastructural requirements, this will mean that countries without significant natural resources will be proportionately disadvantaged. Related to this, even in countries which do possess abundant resources, the needs of producers and consumers who are not involved in the resource sector will often be neglected. Finally, there has been a disproportionate focus on economic rather than social infrastructure, contributing to the high levels of exclusion which have characterised African growth over recent decades.⁷

Africa's infrastructure deficit is widely acknowledged by individual governments, by African regional organisations

6 Two thirds of expenditure over the past decade was contributed by national governments, a fifth by the private sector, 8% by traditional DAC donors and 6% by China, India and Arab donors.

7 For evidence of this focus on economic infrastructure, see the references cited in the following paragraph

such as NEPAD⁸, the East African Community⁹, SADC¹⁰ and ECOWASS¹¹, by UN Agencies (particularly the UNECA), by Development Banks (such as the African Development Bank¹²), by the International Financial Institutions (particularly the World Bank) and the OECD DAC, and by individual bilateral donors. In recent years, PIDA has come increasingly to the fore as the forum in which Africa's infrastructural needs are discussed and strategies formulated, particularly with regard to regional infrastructure. The predominant - but by no means exclusive - focus of these initiatives is on economic rather than social infrastructure.

This Report focuses on the contribution which the NEP7 might make to African infrastructural development. Since these economies represent a group of external economic partners, one key policy question is whether their contributions have been, or might be, distinctive from other external partners. In order to assess this it is necessary to begin with a brief review of the involvement of traditional partners in Africa's infrastructure development. The second key policy question is whether African economies should adopt a different approach towards the NEP7 with regard to infrastructural development than the approach adopted towards Africa's traditionally dominant external partners.

Africa's traditionally dominant economic partners and infrastructural development

The dominant sectors of external donor support for infrastructural development in Africa have been transport, storage, water supplies and sanitation (NEPAD-OECD, 2011). External private sector equity investments have been proportionately more important in power and telecoms where the returns to investment are more easily appropriated.¹³ World Bank and AfDB projects are predominantly loan finance; bilateral donors tend to have a high share of grants (up to 80%) and EU support for African infrastructure is generally grant-aid. There is a high level of country concentration in this external support for infrastructure by Africa's traditional economic partners and multilateral institutions. Between 2002 and 2009 the lion's share was directed to Ethiopia (which received 10% of the total), Tanzania, Mozambique, Ghana, Uganda, Kenya, the DRC, Senegal, Burkina Faso and Madagascar. The destination of NEP7 infrastructure involvement is similarly concentrated – the eight largest recipients garnered 48% of the total (Table 11 above). But the NEP7 recipients tended to be more commodity-focused than the economies supported by Africa's traditional northern partners.

DAC infrastructure aid to Africa embodies a series of key principles (NEPAD-OECD, 2011). These are that priorities are to be decided by recipient countries; ensuring cross-border synergies; economic and environmental sustainability of investments; coordination of capacity-building; participation of poor citizens in the infrastructure cycle; cost-recovery, tariff collection and transparency; the promotion of capital markets and Public Private Partnerships; addressing the specific problems of fragile and landlocked countries; and the promotion of a stable aid framework.

The World Bank Sustainable Infrastructure Action Plan of 2008 identified four core concerns for its global

8 <http://www.nepad.org/regionalintegrationandinfrastructure>

9 (EAC, Undated)

10 (<http://www.sadc.int/english/regional-integration/is/>)

11 www.comm.ecowas.int/dept/stand.php?id=f1_brief&lang=en

12 <http://www.afdb.org/en/topics-and-sectors/sectors/infrastructure/>

13 NEPAD-OECD (2011)

infrastructural programme in developing economies.¹⁴ The first was to focus on transport, energy, water and ICT, access to basic services, cross-sectoral linkages, sustainability and the scaling up of multilateral support. The second was to address cross sectoral issues such as the role of infrastructure in climate change mitigation and adaptation, Public Private Partnerships and spanning the rural urban divide. The third was to maintain a focus on the development outcomes of economic infrastructure investments and the fourth was to leverage World Bank support to enhance investment by the private sector.

In 2007 the EU established the EU-Africa Infrastructure Trust Fund addressing similar concerns to those of the World Bank. It was designed to encourage greater finance, facilitate interconnectivity between countries and support regional integration, to support synergies between European bilateral donors and to leverage additional investment by blending grants from the European Commission and EU Member-States with long-term loan private sector finance.¹⁵

The character of NEP7 economy involvement in Africa's infrastructural development

The major features of involvement by the individual NEP7 in Africa's infrastructural development have been as follows (see the individual case studies in Part II for details).

China is clearly the new player of significance in Africa in general, as well as with regard to the infrastructural sectors. Chinese actors are distinctive, particularly the large scale firms engaged in Africa's infrastructure regeneration. Our database records 141 cases of NEP7 involvement in African infrastructure projects since 2000. They are predominantly state-owned enterprises, with close links to loan finance from the state. Most of the large scale investments have involved loan finance, but few of these loans have been provided on a concessional basis, and many are tied to purchases of inputs from China and are to be repaid by commodity exports. Moreover, most of the large scale Chinese projects involve a high degree of bundling of aid, trade and FDI. In some cases (such as the proposed Sicominvest investment in the DRC) this bundling involves significant synergies between economic infrastructure, social infrastructure and training in return for access to mineral deposits which will be used to repay China's investments. Although China has a distinctive interest in Africa's natural resources to feed its own economic growth, there is no evidence that its presence in Africa's infrastructural sectors is disproportionately focused on facilitating commodity extraction and exports. The primary motive appears to be to commercialise, that is to take advantage of market opportunities in Africa and to prepare the grounds for future access to resources. In this regard there are notable examples of Chinese infrastructural investments in prestige projects such as stadiums and housing being used as a lever to enhance China's image in Africa.

In terms of the number of infrastructure projects undertaken in Africa, the next major NEP7 economy is Brazil, which has been involved in 38 infrastructure projects in Africa since 2000. Brazilian aid to Africa is in an embryonic form, and most of its infrastructure involvements have been won through open tender. There is little evidence of the bundling of aid, trade and FDI in Brazilian projects although there is a close synergy in Mozambique within the Brazilian firms' operations between resource extraction and large scale investments in infrastructure. There has been a sharp growth in Brazil's exports of construction equipment to Africa.

Korea is the third most important NEP7 economy participating in Africa's infrastructural sectors. Of all the NEP7, its operations most clearly mirror those of Africa's traditional economic partners, and indeed, Korea is now a member of DAC. Of its 21 infrastructure projects in Africa, 19 are aid-funded and two result from FDI.

¹⁴ World Bank, 2008

¹⁵ <http://eu-africa-infrastructure-tf.net/about/trust-fund.htm>

Given its DAC orientation, a disproportionate share of Korean projects are in social infrastructure. Next to China, Korea is the largest of the NEP7 construction equipment exporters to Africa.

India follows behind Korea in relation to the number of infrastructure projects in which it is involved. Fifteen cases are recorded in its infrastructural activities since 2000. These have been concentrated in economic infrastructure, particularly in power and railways. India's aid to Africa is minimal, but there are signs that it is adopting a more proactive and strategic approach towards its presence in Africa. This is evidenced in its involvement in a large railway project in Nigeria which involves some degree of bundling of aid, trade and private sector involvement. Exports of construction equipment to Africa have been minimal.

Turkey, also a member of DAC, has a strong global presence in the construction sector, and it is not surprising therefore that it has been involved in a number of infrastructure projects (14 in total since 2000), particularly in the airport and oil-infrastructure sectors. Although Turkey has a growing aid programme (in recent years seeking to exploit new markets in SSA as opposed to its historical presence in North Africa), its participation in Africa's infrastructure sectors has been driven by its private sector winning open tenders. Exports of construction equipment to Africa have been minimal.

Malaysia and Russia have a very limited presence in Africa's infrastructure sectors, each having been involved in 5 infrastructural projects since 2000. Neither country has an aid programme of significance, while relations with Africa are driven by strictly commercial imperatives. Malaysian firms are concentrated in the oil sector (having divested from the ICT sector), and Russian investments are concentrated in power and oil-infrastructure. Neither economy is an exporter of any significance of construction equipment to Africa.

How can Africa enhance the participation of NEP7 in its infrastructural development?

In the context of these patterns of involvement by the NEP7 and Africa's traditionally dominant external partners, what distinctive role (if any) can be played by Africa's new and emerging economic partners in Africa's infrastructural sectors in the future? And what policies might help in achieving these objectives?

Strengthening market relations with NEP7

Although effective policy seeks to compensate for market failures, the first priority of policy is to ensure that where markets have a positive role to play, they are appropriately supported. Efficiently functioning markets have a particularly important role to play with regard to technology and organisation. Many NEP7 firms are used to operating in low income economy operating environments and have capabilities (particularly organisational capabilities) which are often highly appropriate to African operating conditions.

Two major areas of policy support for fostering market relations can be identified. The first specifically relates to the infrastructure sector and concerns information failures. The main conduits of information flow have traditionally been between Africa and its traditional economic partners and it is likely that a range of potential suppliers in some of the NEP7 are ignorant of market opportunities in Africa. This is particularly true for small and medium sized firms and for small and medium sized infrastructure projects in Africa. Similarly, on the demand side, many African decision makers may be more attuned to their traditional suppliers than to suppliers in new and emerging markets. One way of addressing this market failure is through concerted efforts by Embassies in both Africa and the NEP7 and through support from multilateral agencies such as the ECA, NEPAD and regional African organisations. The function of these efforts is to improve information flows of market opportunities African infrastructure and the range of NEP7 suppliers. However, it also requires explicit recognition of these knowledge imperfections in government ministries and development banks responsible for infrastructural development in Africa.

A second area of policy support is relevant not just to the infrastructure sectors, but also to all economic activities. With few exceptions (and Ethiopia is one exception), most African countries still have transport and communication systems which are disproportionately directed to traditional economic partners. The wider availability of better communication channels (including air services) will help to counteract biases in existing systems which disfavour suppliers from the NEP7.

Leveraging enhanced finance and more concessional finance from NEP7

As observed, Africa requires massive financial resources in its attempts to develop its infrastructure. To some extent this financial gap can be filled by African countries – particularly those benefitting from the resource boom – but even the resource-rich countries face difficulties in generating adequate resources. Hence, external parties have an important role to play in enhancing the financial flows required to meet Africa's infrastructure deficits.

Hitherto, the dominant NEP7 actor in this regard is China, which has provided substantial financial resources to support infrastructure development. However, little of this finance has been on concessional terms and, moreover, much of this finance has been tied to repayment through commodity exports and explicitly requires the use of high levels of Chinese inputs. With the exception of Korea (which has a relatively well-funded aid programme), none of the other NEP7 either has shown a capacity to generate significant loan finance or has developed aid programmes.

The policy conclusion is blunt. NEP7 should up the level of finance provided to support Africa's infrastructural development, should ensure that this finance is provided on concessional terms. Wherever possible and that the availability of this finance should not be tied to inputs from the capital-exporting economy which disadvantages domestic suppliers or which inflates the cost of infrastructural provision unless African countries have been able to match this bundling on the supply side with a bundling of demands on the recipient side (see below)

Linkages and the infrastructure sector

In the context of the commodity price boom, many resource exporting economies are searching for ways to enhance the efficiency of resource extraction and exports. A secondary objective of resource policy is to spread the benefits of resource exports to the population at large. The challenge is to maximise linkages into and out of the commodities sectors. Infrastructure is a key determinant of success in meeting both of these objectives in Africa (Morris, Kaplinsky and Kaplan, 2012).

In one sense, infrastructure is in itself a linkage, arising as a consequence of the expansion of resource production. But it also has an important role to play in fostering linkages from other sectors to the resource sectors. Further, there are numerous potential linkages to other sectors who are potential suppliers to the infrastructural sector itself, both during the investment and operating phases. This is particularly the case in large scale infrastructure sectors such as roads, rail and power projects.

The policy conclusion which follows is that infrastructure policy should be complemented with, and be imbedded in a wider policy framework focusing on linkage development in the economy at large. Detailed investigation into this policy agenda in Africa indicates that four major factors affect this linkage development (Morris, Kaplinsky and Kaplan, 2012). The first is ownership, both of lead infrastructure and commodities firms, and of their suppliers. In the resource sector, there are distinctive characteristics of Chinese, Indian and Brazilian firms which appear to affect the nature and degree of linkage development. The second is the quality of skills and the structure of the National System of Innovation. The third is the quality and nature of the infrastructure sector itself and the fourth, and perhaps most important, is the quality and nature of policy design and implementation. Each of these four areas lends itself to specific policy interventions, but these are of course contingent on the country and sector.

Learning from the success of NEP7

Each of the NEP7 possesses particular strengths in infrastructural development. China has had a massive and generally successful experience in building transport and urban infrastructure and is a global leader in distributed hydropower systems and increasingly in wind and solar power; India is a leading innovator in renewable energy; Turkey possesses some of the world's most successful construction firms; Malaysia and Korea both have strong presences in ICT sectors; Russia has developed capabilities in oil infrastructure.

This has implications for policy in both the NEP7 and African economies. From the African side, there should be more proactive selectivity in determining which of the NEP7 possesses distinctive competences in particular sets of infrastructure, and then in determinedly pursuing links with these economies and their suppliers in these economies. In addition, it is important to take advantage of these competences by studying and learning the secrets of success in these NEP7. From the NEP7 side of the policy equation, there should be a concerted attempt to assist African economies to gain access to the determinants of their success in particular sets of infrastructure where they have distinctive competences and to assist African economies to learn from this successful experience. This may be an important – and relatively low-cost – dimension of aid which is provided to Africa and which may have commercial spin-offs.

Widening the beneficiaries of linkage development from NEP7 involvement in Africa's infrastructure

As observed earlier in this Report, ten African countries have benefitted most from support provided by traditional economic partners. To the extent that infrastructure development in Africa will be augmented in the future in order to allow resource exporting economies to take advantage of growing global demand for resources, this provides a further bias which limits infrastructure development across Africa.

From the perspective of the NEP7 this poses a particular policy agenda. The task is to determine the extent of market opportunities beyond these favoured economies to determine whether the shortfall in financial flows is a function of failures in knowledge markets and, if so, to take steps to strengthen these knowledge flows. Beyond this, NEP7 should consider biasing their infrastructure aid to African economies which have hitherto not been favoured by traditional donors. Further, since one reason why traditional economic partners have neglected some African economies due to the risks of operating in fragile states or countries with high cost operating environments, NEP7 might be disproportionately competitive as infrastructure suppliers to these economies. There is widespread evidence that employing western skilled workers in these uncertain environments is much more costly than employing staff from NEP7, thus providing a market opportunity to NEP7 firms in these infrastructure-neglected economies.

There are associated policy implications in regard to these disadvantaged African economies for African governments and regional bodies. Many governments see infrastructural development as a zero-sum game – “our economy or their economy” or fail to recognise the synergies which arise from cross-border infrastructural developments. Similarly, although regional bodies have flagged the opportunities opened for cross-border infrastructural development, results have often been disappointing. Here there may be the possibility of targeting one or more NEP7 – perhaps through institutions such as FOCAC – with the specific aim of meeting the needs of disadvantaged African economies or multi-country infrastructure projects. The imperative of strategic targeting is the final – and perhaps most important – policy implication opened up to Africa by the growing presence of NEP7 in the continent.

Developing and implementing strategy

Africa possesses two important advantages in the current global environment. First, in a context in which the traditional economic partners look likely to experience a protracted period of economic stagnation, Africa seems

likely to continue to grow robustly in the future. This represents a major market opportunity for NEP7, particularly those heavily reliant on traditional northern markets. Second, in a world of growing supply constraints in the commodities sectors, Africa is often the frontier for new commodity supply. These are important bargaining chips which individual African economies and regional groupings should grasp eagerly.

Here a lesson can be learned from China's approach to its presence in Africa. It is often observed that "whilst China has a strategy for Africa, Africa lacks a strategy for China". China's strategic focus to Africa is most clearly evidenced in the operation of the "Angola mode" in resource rich economies such as Angola. A "bundled" approach is adopted which ensures contracts for Chinese construction firms, returns on non-concessional loans supplied by the Chinese government, work for Chinese suppliers, employment for Chinese workers in Angola and long-term access to key resources such as oil. Too few are the occasions where African countries have responded with a similar bundled approach. The Sicomines venture in the DRC – see Table 28 below – is an example of how access to copper and cobalt deposits can be traded for loan capital, infrastructure and training. This is based on China's resource hunger. How many other opportunities are open to African resource producing economies which are not being grasped? Similarly, when cross border infrastructure such as the Central Corridor in East Africa is involved, there is scope for regional and continental organisations to agree a common bargaining position with NEP7 economic actors. There is widespread recognition that almost all African countries have failed to adopt a strategic bargaining position in each of the five FOCAC meetings. Hitherto, they appear to lack a capacity to strategise their approach towards infrastructure development in the FOCAC meetings and to fail to take advantage of China's resource hunger and its quest for African markets. This glaring failure in African strategic policy is evidenced even more in dealings with other NEP7 which do not have organised structures for interacting with African economies such as FOCAC.

PART II: COUNTRY CASE STUDIES

BRAZIL

Brazil and Africa share a common history of colonisation and over the past decade both have achieved rapid growth, fuelled in part by the boom in commodity prices. Brazil sees its interaction with Africa as based on a 'partnership' rather than a donor-recipient relationship and guided by the principles of non-intervention, respect for sovereignty and solidarity with low and middle income economies. Brazilian aid projects are focused, usually small in scale and designed to build long-term relationships with partner countries (IPEA, 2012).

Historically, Brazil's economic ties have favoured the North American, Europe and South American regions, relegating links with Africa to the margins. Brazil lags behind China and India (and other emerging economies) in formulating and implementing a comprehensive Africa policy. Conscious of this fact and with the recognition that Africa offers significant business and market opportunities, in the last decade Brazil has placed its interaction with the African continent on to a firmer footing. This included the establishment of 13 new embassies, resulting in 32 embassies and two consulate generals in Africa in 2010. Reciprocal moves have been made by African countries, with 26 African embassies and four consulate generals opened established in Brazil.

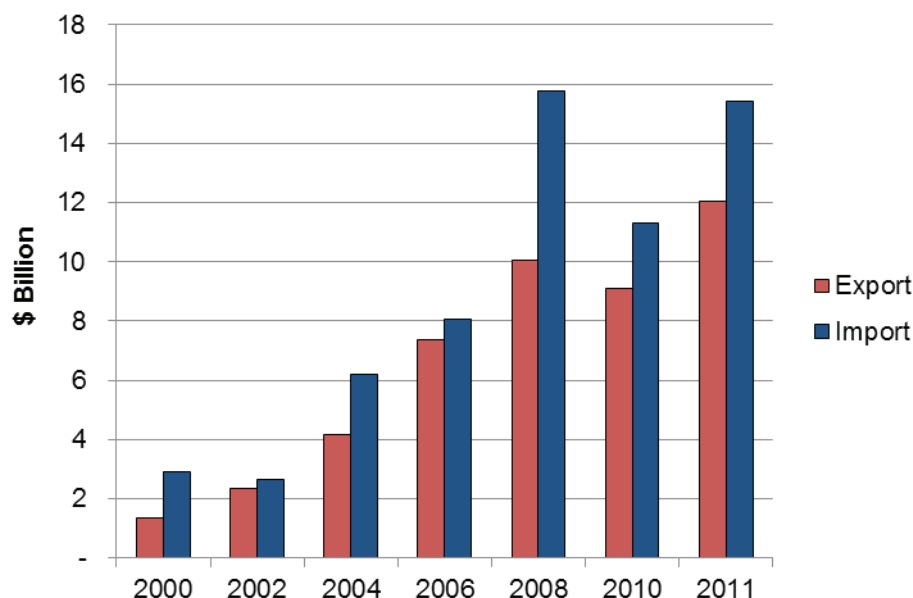
In pursuit of its goal to widen its presence in the international arena, Brazil has adopted a multilateral strategy, the most prominent being the IBSA (India, Brazil and South Africa) initiative. Other multilateral approaches have included the Community of Portuguese Speaking Countries (CPLP). Apart from multilateral agreements, Brazil also has bilateral trade, aid and investment interactions with individual African countries. There has been a gradual move from Brazilian concentration on the five Lusophone African countries (Angola, Cape Verde, Guinea-Bissau, Mozambique and Sao Tome & Principe) towards wider engagement with the continent, particularly with the large South African and Nigerian economies.

Brazil's trade with Africa

As part of a wider programme to develop external markets, Brazil launched an 'Integration with Africa' initiative in 2008, providing \$265m support to Brazilian companies. From 2000 to 2011, Brazil's exports to Africa increased from \$1.34bn to \$12.03bn, while its imports increased from \$2.9bn to \$15.4bn. Exports increased by an average of 28% p.a. and imports by 23% p.a. Africa ranked as Brazil's fourth largest trading partner after the United States, China and Argentina. Despite rapid export growth, Brazil has had a consistent trade deficit with Africa (apart from 2009) (Figure 9).

Brazil's chief exports to Africa are food and live animals, accounting for nearly 63% of its total in 2011 (\$7.5bn), followed by machinery and transport equipment (14%). Between 2005 and 2011, the share of food and live animals exports nearly doubled. Brazil's imports from Africa are dominated by mineral fuels (84%) followed by chemicals (9%) (Table 16).

Figure 9: Brazil's exports to and imports from Africa (2000-2011) (\$bn)



Source: Compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed May, 2012)

Table 16: Sectoral composition of Brazil-Africa trade (2005-2011) (% of total exports)

Trade Category	Brazil's Exports		Brazil's Imports	
	2005	2011	2005	2011
Food & live animals	36.2	62.5	0.3	1.0
Beverages and tobacco	1.6	1.2	0.1	0.1
Crude matter (ex food/fuel)	8.7	6.6	1.3	1.3
Mineral fuel	7.1	0.6	89.4	84.2
Animal veg oil etc	4.5	3.7	0.0	0.0
Chemicals	4.9	3.8	5.1	9.4
Manufactured goods	12.4	5.8	2.9	2.7
Machinery/transp equip.	22.6	13.8	0.9	1.1

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed May, 2012)

Brazil's export of construction equipment to Africa peaked at \$393m in 2008, a significant increase from exports of \$48m in 2000. The 2008 financial crisis led to a drop in equipment exports, but these revived to \$301m in 2011. The share of construction equipment in Brazil's exports to Africa however fell from 3.1% in 2000 to 2.3% by 2011.

Civil engineering plant has been the major subsector within the construction equipment exports to Africa from Brazil, followed by wheeled tractors, and machinery for mineral crushing. As shown in Table 17, between 2000 and 2011, all these sub-categories of construction equipment have seen a rise in exports to Africa, from a

negligible base at the start of the decade

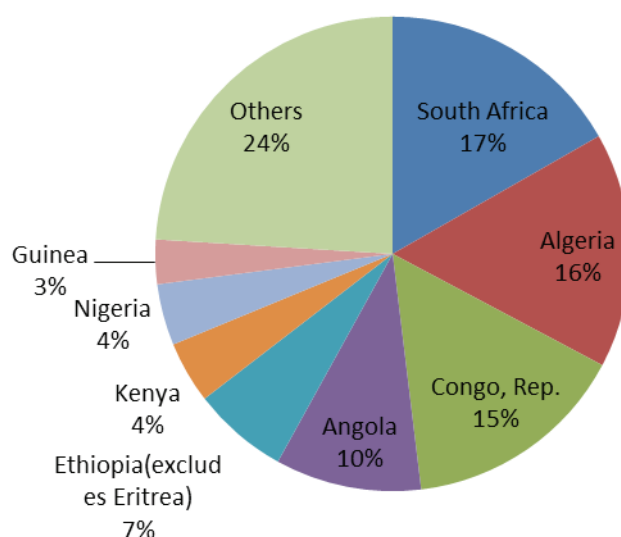
Table 17: Brazil's exports of construction equipment to Africa (2000-2011) (\$m)

Equipment	2000	2005	2008	2011
Civil engineering plant	38.0	55.0	161.0	145.0
Wheeled tractors	5.0	60.0	127.0	78.0
Machinery nes – minerals	2.0	12.0	79.0	56.0
Mechanical handling equipment	0.0	6.0	26.0	22.0
Total	45.0	133.0	393.0	301.0

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

South Africa (17%), Algeria (16%), Congo (15%) and Angola (10%) were the top four destinations for Brazilian construction equipment exports in 2011, accounting for over 60% of total exports. Other large export markets were Ethiopia, Kenya and Nigeria (Figure 10).

Figure 10: Major destinations of Brazilian construction equipment in 2011



Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

As a source of construction equipment, Brazil accounts for less than 11% of any individual African economy's equipment imports in 2011. The largest share of imports from Brazil in construction equipment was in Ethiopia, followed by Togo and then Algeria. Between 2000 and 2011, its importance as an import source increased for Ethiopia, Togo, Algeria and Niger, and fell for Cote d'Ivoire, South Africa and Senegal (Table 18).

Table 18: Share of Brazil in country's' import of construction equipment (2000-2011) (%)

Importing Country	2000	2005	2008	2011
Africa	1.8	2.1	1.7	2.2
Ethiopia	4.6	5.8	11.5	10.5
Togo	1.2	0.0	0.0	8.7
Algeria	0.1	0.7	1.5	3.6
Cote d'Ivoire	3.2	1.3	1.0	2.3
Niger	0.0	1.1	0.4	2.3
South Africa	2.6	3.2	2.5	1.6
Senegal	1.9	4.3	0.5	1.6
Ghana	0.2	0.6	0.9	1.3
Egypt, Arab Rep.	0.0	0.4	0.8	1.0
Tanzania	0.9	1.0	0.4	0.4

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

Brazil's involvement in and infrastructure development in Africa

Brazil has had a growing aid programme and the number of Brazilian technical co-operation projects rose from 23 in 2003 to 413 in 2009. Of these, 53% were in Africa, predominantly focusing on social protection, health and agriculture (AfDB, 2011). However in a few instances, they have also targeted construction and infrastructure. A case in point is the Urban Development Support Project (initiated in 2007) which sought to train Namibians in the construction of affordable housing units using clay-cement bricks and the development and management of urban waste systems. Among other deliverables, the programme made available non-conventional construction technologies. In 2011, Brazil extended a \$1bn line of credit to fund reconstruction efforts in Angola. This is in addition to the \$1.6bn previously committed to help Brazilian construction firms to win tenders for large scale infrastructural projects.

Brazil's involvement in Africa's infrastructure sectors has been driven by its private sector. Infrastructural activities linked to resource extraction are primarily a consequence of the involvement of Petrobras (the Brazilian oil company) and Vale (the world's second largest commodity producing firm). Vale, which also builds and operates railways and other infrastructure in Brazil and elsewhere (largely linked to its resource deposits) is extensively involved in equity investments in Africa (for example, in the exploitation of coal and iron ore in Mozambique). Linked to this resource activity, Vale participates actively in Africa's infrastructure sectors, particularly in economic infrastructure linked to the export of commodities.

The main Brazilian construction firms operating in Africa are Andrade Gutierrez, Camargo Correa, Odebrecht, and Queiroz Galvao. Odebrecht's operations are widespread in Africa, with projects in South Africa, Angola, Democratic Republic of Congo, Djibouti, Gabon, Liberia, Libya, and Mozambique. This involvement stretches back almost two decades when it participated in the construction of the Capanda Dam in Angola (1984), the Letsibogo Dam in Botswana, and in conjunction with Vale, Odebrecht constructed settlements for families displaced by a new mining site in Mozambique. Since 2006, Camargo Correa has been involved in residential housing, roads and power line projects in Angola and in collaboration with other partners the company has also

started producing cement in Angola. In Libya and Angola, Queiroz Galvao is engaged in civil construction works related mainly with the building and rehabilitation of roads, residential apartments and urban planning. (See Table 19 for distribution of projects).

Table 19: Sectoral distribution of Brazilian involvement in African infrastructure

Type of project	Aid/Loan	FDI	Open Tender	FDI and Aid	Total
Roads	0	0	13	0	13
Rails	0	2	0	1	3
Power	1	1	6	0	8
Sea Port	0	0	1	1	2
ICT	0	0	1	0	1
Airports	1	1	3	0	5
Water and Sanitation	0	0	3	0	3
Housing	0	0	3	0	3
Total	2	4	30	2	38

Since 2009, medium and smaller Brazilian firms have become involved in the construction of hydroelectric power projects and ethanol plants in Ghana and Mozambique. These firms are supported by the Brazilian state through partnerships with Brazilian banks (mainly through credit lines) such as the National Economic and Social Development Bank (BNDES), Banco do Brasil and Bradesco (Barros 2010; IPEA 2012).

Table 20 lists 38 construction and infrastructure projects involving Brazilian firms in Africa. The bulk of these projects (30) resulted from Brazilian firms winning open tenders, with 4 resulting from FDI, 2 as a consequence of aid and loans, and 2 resulting from the bundling of FDI with aid. Two of the projects involved infrastructure primarily for commodity extraction and one was explicitly directed at both commodity extraction and general needs. All 38 projects involved the provision of economic rather than social infrastructure

Examples of Brazilian construction projects in Africa

Vale-SA and the Nacala Development Corridor

The Nacala Development Corridor is a corridor in the northern part of Mozambique, linking the port town of Nacala with two landlocked countries, Malawi and Zambia (USAID/AGROFUTURO, 2010). It is a multi-modal enclave with three modes of transport (roads and road haulage, a railway and a port system). Along the corridor there are over 10m inhabitants, including 3.5m in Mozambique. The area has considerable potential for growing crops, particularly livestock and poultry. There are also light manufacturing industries in the beverages, textiles, metals, wood and chemical sub-sectors (AfDB, 2009). In recent years it has become apparent that the Moatize Basin has vast and high quality coal assets with estimates that by 2020 it will export 25m tonnes p.a. in addition there are substantial deposits of iron ore. Two global companies are exploiting these reserves – Vale of Brazil, and RTZ. Whilst RTZ is still considering how it will transport these commodities and ship them abroad, Vale began exporting coal in 2011. It has two railways in operation transporting the coal to the ports of Beira and Nacala, and is deepening the port at Nacala. Its railway investments comprise laying 230km of new track and upgrading 700 km of existing track. Together with the coal mine the project is costed at about \$4bn. Thus, whilst

primarily serving the mining operations in the region, the railway also has the potential to serve the needs of non-mining sectors in adjacent territories in Mozambique, Malawi and Zambia.

Constrotura Norberto Odebrecht (CNO) and Angolan Infrastructure

CNO started operations in 1984 with construction of 520MW Capunda Hydroelectric power plant in Angola, and is currently involved in 25 civil works (infrastructure, real estate, bioenergy and mining) projects employing over 16,000 workers in Angola. The Luanda and Benguela water projects were initiated in 1998 and 2004 respectively and were targeted to benefit over four million people in the two cities and beyond. These projects include the completion of a 225 km electricity network and a 64 km road (with accompanying drainage, sewage, water supply and lighting). As part of the population resettlement programme the company constructed 4,000 housing units in 2002 and subsequently a further 3,000 homes, and provided the infrastructure for another 20,000 housing units.

CNO is currently responsible for the Catumbela International Airport construction work in the province of Benguela. In 2007, the consortium formed by CNO, Alstom, Elecnor and Lyon was engaged in the Gove Dam repair work in Huambo. During the same year, CNO also engaged in the rehabilitation of the Cambambe Hydroelectric Power Plant in the province of North Kwanza which included the installation of transmission lines to carry energy to different cities in the country. It completed the Capanda-Lucala-Viana line in 2009, facilitating the improved stability of the electric energy supply for Luanda. Odebrecht Angola has also invested in bioenergy drawing on Brazil's comparative advantage in sugar-to-ethanol production. It established a joint venture which includes shareholdings by Sonangol and Damer Group. In 2012 the venture will begin producing sugar to supply the domestic market through the Cacuso Agro-Industrial Unit, located in the province of Malanje. The plant will have the capacity to produce 260,000 tons of sugar and supply 45MW of power to the region's electrical system during the six months of harvest.

Table 20: Construction and infrastructure projects undertaken by Brazilian companies in Africa (2000-2012)

Brazilian Company	Country	Project Investment Comments	Project costs	Year
Vale-SA	Mozambique	Railroad from Moatize to the port at Nacala linking with the development of a coal mine.	\$ 4bn	2011
	Guinea	Sumandu Project- mine plant complex, and a railroad and maritime terminal from Guinea through Liberia to link iron ore mines and the coast.	Costing and negotiations underway	Ongoing
Odebrecht-SA	Angola	Saneamento Project- Installation of Telephone lines, Angola		2007
		Saneamento Project- Construction of new roadways, public lighting and Five Pedestrian Bridges, Angola		2007
		Saneamento Project- Installation of water pipelines and a sewer system, Angola		2007
		Capanda-Cacuso highway		2004
		Dondo-Capanda highway		NA
		Condomínio Belo Monte real estate project in Luanda		NA
		520-MW Capanda Hydroelectric plant (including a 110-meter-high dam and airport)		1984
		The Águas de Luanda water project (building treatment plant, installing pipelines, renovating and building distribution centres		2008
	Djibouti	Construction of the port terminal at Doraleh completed in 2009		2009
	Mozambique	Conversion of Nacala Military Air Base into an international airport.	\$110m.	2011
	Liberia	Discussions on Rehabilitation of the Mount Coffee hydro plant in White Plains and the development of the St Paul River Basin's hydro-power potential		2010
		Rehabilitation of the Yekepa-Buchanan rail line		2008
	Libya	Expansion of the airport at Tripoli (two new terminals) in association with others	€ 970m	2007
		Building of the third Ring Road in conjunction the Urban Development Company of Libya.	€ 250m	2007
	South Africa	Construction of tunnel to carry drinking water to Pietermaritzburg		1997

Brazilian Company	Country	Project Investment Comments	Project costs	Year
Camargo Correa	Angola	Acquaville condominium in South Luanda (residential units)	€ 60m	2008
		Costa do Sol housing project		2008
		Samba Housing project (housing and shops)		NA
		Uige Transmission Line		2009
	Mozambique	Mphanda hydroelectric dam on the Zambezi river	\$2bn	2010
Andrade Gutierrez	Algeria	Runway in Oran Airport	€20,000	2006
		Construction Jijel Dam	€25m	2009
		Viaduct at Constantine	€131m	2009
		Awana Port		2008
	Congo	Construction of highway (Travaux d'Aménagement et de Bituminage de la Liaison Kombo-Moukondo à Brazzaville).		2010
	Ghana	Memorandum of Understanding for a 90MW dam on the Oti River		2010
	Cameroon	Completion of improvements to Melong-Dschang Road		2004
	Guinea	Rehabilitation of Route Nationale No. 2 highway from Kissidougou through Guéckédou to Sérédou		2007
	Equatorial Guinea	Constructing the Mongomeyen International Airport		2007
	Libya	Urban infrastructure – including roads and sanitation – in Tripoli	\$600m	2009
	Mauritania	Building the Rosso/Lexeiba section of the Boghé Highway	\$45million	2008
	Mozambique	Mphanda-Nkuwa Hydroelectric Project		2010
Queiroz Galvão	Libya	Urban infrastructure development (Ben Ghazi Area).	\$500m	2009
	Ghana	Tamale International Airport.	\$173m	2012
	Angola	Luanda transportation and Infrastructure development	\$600m	2010
		Rehabilitation of Kuito/Menogui Highway		NA

CHINA

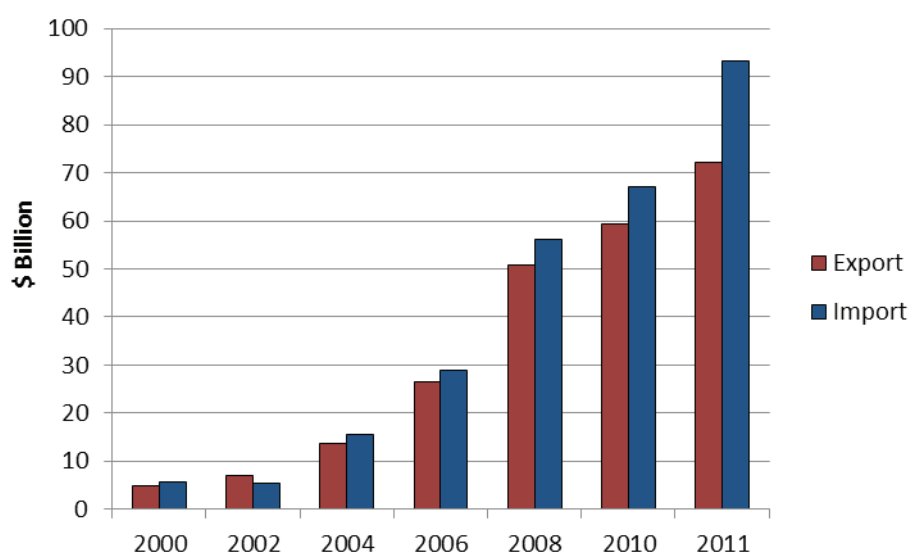
China and Africa have long-lived historical political and economic ties which have intensified in recent years, augmented through rapidly growing bilateral trade and Chinese FDI in Africa. China imports primary commodities from Africa to fuel its growing economy and is a major exporter of manufactures to Africa. It also plays a major role in financing the continent's infrastructure development, mostly associated with tied aid. The 'infrastructure for resource' model, commonly referred to as the Angola Mode, has been widely used by China in its engagement with Africa (Chen, 2010; Corkin, 2013 forthcoming). China has one of the world's largest and most competitive construction industries, with particular expertise in civil works that are often particularly well-suited to infrastructural development in Africa.

The increase in infrastructure development in Africa is partly due to the strong diplomatic ties between Africa and China. This is reflected in the presence of 49 Chinese diplomatic missions and embassies in Africa and 47 Africa diplomatic missions in China. The state-to-state China-Africa has been underwritten in part by the establishment of the Forum for China Africa Collaboration (FOCAC) which has recently had its fifth meeting. The objective of the first FOCAC ministerial conference, held in Beijing in October 2000, was to encourage globalisation and enhance cooperation between the two sides. It led to the adoption of the Beijing Declaration and the Program for China-Africa Cooperation in Economic and Social Development, setting out a blueprint for China-Africa cooperation in political, economic, social development and other fields in the years to come (South African News Features, 2009). The second FOCAC Conference was held in 2003 in Addis Ababa. FOCAC 3 was held in Beijing, with China announcing a package of major assistance, investment, trade and other key cooperation projects with Africa in an effort to forge a new type of strategic partnership and strengthen cooperation in more areas and at a higher level. FOCAC4 was held in Egypt in 2009 backed by the announcement of a \$10bn concessionary loan commitment for a period of three years. The fifth and most recent FOCAC conference was held in Beijing China. Noticeable at the end of the conference was a \$20bn loan facility commitment by the Chinese President Hu Jintao for the development for infrastructure, agriculture, manufacturing, and small and medium-sized enterprises development in Africa.

China's trade with Africa

Between 2000 and 2010, China became a key export destination of primary commodities such as crude oil and precious metal from Africa. In return, African countries imported manufactured products from China on a large scale. Total trade between China and Africa increased from \$10.5bn in 2000 to \$166bn in 2011 (Figure 11). Chinese exports to Africa rose from just under \$5b in 2000 to \$72bn in 2011, while imports increased from \$5.6bn to \$93bn. China's had a positive trade balance with Africa of \$1.2bn in 2001, but this steadily transformed into a trade deficit, starting in 2004, and growing to \$21bn in 2011. This trade deficit is unlike most of China's trade relations with the global economy where it is characteristically in trade surplus.

Figure 11: China's exports to and imports from Africa, 2000-2011 (\$bn)



Source: compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed May, 2012)

China's major exports to Africa are machinery and transport equipment and manufactured goods, accounting respectively for 31% and 23% of its exports to Africa (Table 21). Between 2005 and 2011, there was no significant change in the patterns of exports, with marginal increases seen in the shares of chemical products. Its major imports from Africa comprise mineral fuel (46%) and crude matter (17%), followed by manufactured goods (10%). As with China's exports, there have been no significant changes in the structure of its imports from Africa between 2005 and 2011.

Table 21: Sectoral composition of China-Africa trade (2005-2011) (% of total exports)

Trade Category	China's Exports		China's Imports	
	2005	2011	2005	2011
Food & live animals	1.8	2.2	0.5	0.3
Beverages and tobacco	0.1	0.0	0.6	0.4
Crude matter (ex food/fuel)	0.3	0.3	13.8	16.9
Mineral fuel	0.6	1.1	56.6	45.6
Animal veg oil etc	0.0	0.0	0.0	0.0
Chemicals	4.1	5.1	1.0	0.5
Manufactured goods	23.3	23.0	9.2	10.5
Machinery/transp equip.	25.6	30.9	0.3	0.1

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed May, 2012)

The largest share of China's construction equipment exports to Africa is civil engineering plant, followed by mechanical handling equipment. China's exports to Africa of all sub-categories of construction equipment

increased sharply between 2000 and 2011 (Table 22).

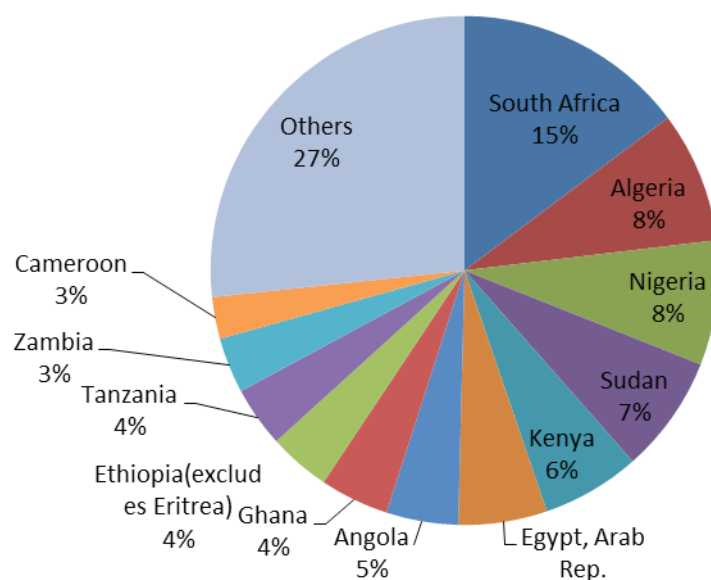
Table 22: China's exports of construction equipment to Africa in \$m (2000-2011) (\$m)

Equipment	2000	2005	2008	2011
Civil engineering plant	54	295	1,729	1,368
Mechanical handling equipment	34	164	679	624
Machinery nes - minerals	8	42	444	394
Wheeled tractors	4	19	64	82
Total	100	520	2,916	2,468

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

The destination of China's equipment exports are diverse. In 2011, South Africa (15%), followed by Nigeria and Algeria (8% each) and Sudan (7%) were its largest export destinations. Other destinations, with a share of approximately 4% each were Egypt, Kenya, Ethiopia, Angola, and Ghana (Figure 12).

Figure 12: Major destinations of Chinese construction equipment in 2011



Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> >

As a source of construction equipment imports, China accounted for more than half of the imports into Niger, and nearly for one third of the imports in Ethiopia in 2011. It held a more than 10% import share in all its top ten destinations, and as Table 23 indicates, it substantially increased its share in all these markets over the 2000 to 2011 period.

Table 23: Share of China in country's import of construction equipment (2000-2011) (%)

Importing Country	2000	2005	2008	2011
Africa	1.5	5.7	11.3	14.8
Niger	0.0	0.7	65.4	57.0
Ethiopia	11.7	17.7	34.6	34.7
Egypt, Arab Rep.	2.5	3.8	10.4	15.9
Algeria	0.5	3.7	16.1	15.1
Tanzania	0.7	7.8	11.1	13.8
Ghana	0.8	1.4	7.3	13.4
Senegal	0.5	3.8	5.1	12.3
South Africa	1.2	3.2	8.5	11.7
Botswana	0.1	0.5	5.8	10.8

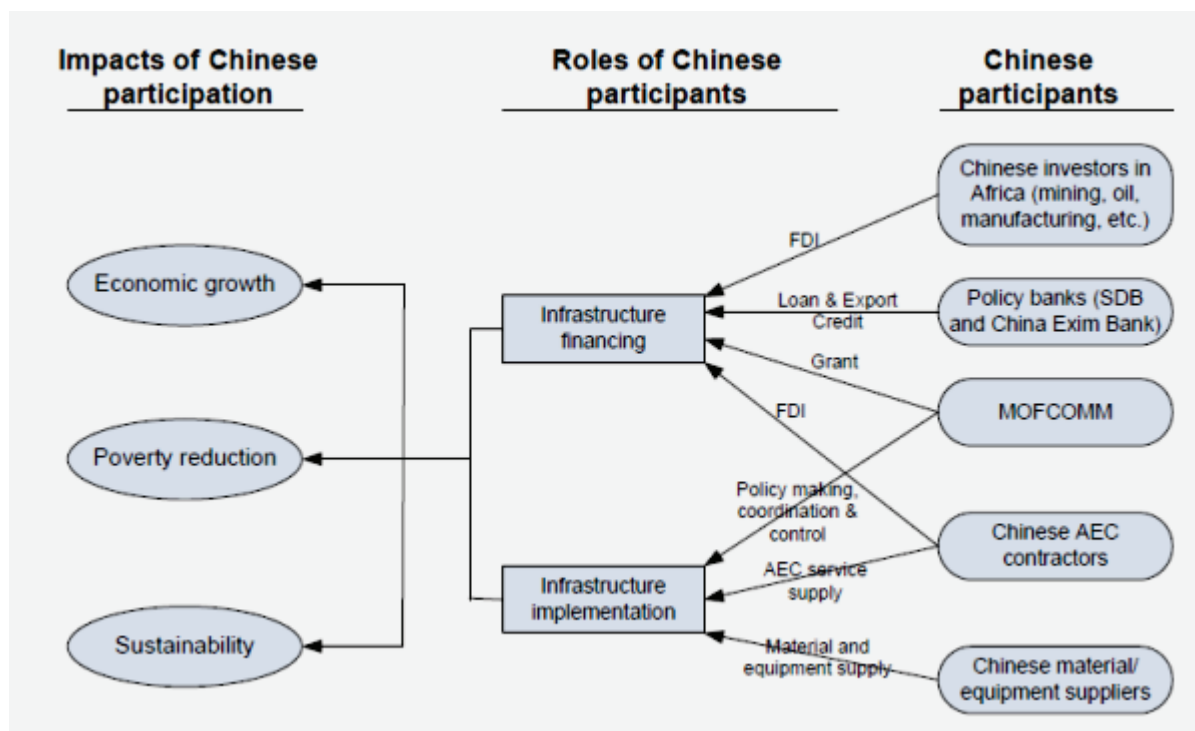
Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

The bundling of China's involvement in Africa's infrastructure sectors

Most of China's large scale investments in Africa are linked with its trade and development assistance and are driven by Chinese state owned enterprises (Kaplinsky and Morris, 2010). China's total FDI to Africa is marginal when compared to its total outward FDI flows to the rest of the world. Between 1991 and 2007, only 5.6% out of the total Chinese FDI outflows went to Africa (Kaplinsky and Morris, 2010). The Chinese Ministry of Commerce estimates that China's FDI in Africa increased by 46% per year over the last decade. Involvement in the infrastructural sector has been one of the core areas of China's FDI in Africa (Davies, 2010).

Because of the bundled character of much of China's involvement in Africa's infrastructure sector, it is often not easy to distinguish Chinese open-market tender-winning from operations which involve some form of FDI or aid. Chinese infrastructure development projects are often based on loans to African governments, with repayment mostly backed with resources from the recipient's country and procurement tied to Chinese inputs (the so-called Angola Mode). Chen's characterisation of Chinese involvement in large infrastructure projects illustrates the bundled nature of these activities (Figure 13). Whilst the operations of some state institutions are confined to the financing of infrastructure (for example, Exim Bank) and some private firms are wholly involved in implementation, other parties such as MOFCOM and large (predominantly state-owned) firms are involved in both the financing and implementation parts of the infrastructure cycle.

Figure 13: The financing and implementation of Chinese infrastructure projects in Africa



Source: Chen (2010)

China's involvement in the financing of African infrastructure is generally provided on terms which are less favourable than other creditors as a whole and other aid donors in particular although they are more favourable than the terms provided by DAC-origin private sector firms (Table 24).

Table 24: Financing terms of Chinese and other creditors in Sub-Saharan Africa, 2002-2006

	Interest rates (%)	Grace Period (yrs)	Financing Term (yrs)	Grant Element (yrs)
All creditors	2.9	5.9	22.3	45.4
Official creditors	1.7	7.7	32.9	65.6
Private creditors	4.7	3.4	7.2	17.0
Chinese creditors	3.1	3.6	13.2	18.6

Source: Foster et al, 2008.

Two-thirds of 135 Chinese infrastructure projects for which relevant data are available are associated with aid or loan finance, with the share of FDI and open tender projects each being around 15%. The oil, ICT and airport sectors are predominantly a result of winning open tenders whilst water and sanitation (social infrastructure) are associated with aid or loan finance (Table 25).

Table 25: Sectoral distribution by vector of participation

Type of project	Source of funding (%)				Number
	Aid/Loan	FDI	Open Tender	Aid and FDI	
Roads	56.5	23.9	13.0	6.5	46
Rails	84.6	7.7	7.7	0.0	13
Power	67.7	9.7	6.5	16.1	31
Sea Port	66.7	33.3	0.0	0.0	3
ICT	58.8	11.8	29.4	0.0	17
Oil refinery & pipelines	0.0	100.0	0.0	0.0	3
Airports	25.0	0.0	75.0	0.0	4
Stadium	83.3	0.0	16.7	0.0	6
Water and Sanitation	91.7	0.0	8.3	0.0	12
Total	64.4	15.6	14.1	5.9	135

The bundling of operations is central to Chinese operations in Africa's infrastructure sector. In 19 of the 141 recorded cases, the data does not make it possible to determine the existence of bundling. Of the remaining 122 cases, bundling is evidenced in half of the projects, in most cases (38.5%) involving three vectors (aid, trade and FDI) (Table 26).

Table 26: Degree of bundling of China's involvement in African infrastructure*

	Freq.	Percent
Single	60	49.2
Double	15	12.3
Triple	47	38.5
Total	122	100

* Excludes 19 projects where data was insufficient to determine the existence of bundling

Of those 122 infrastructure projects which involve some measure of bundling, bundling-intensity is highest in stadiums, power, roads and rail (Table 27). The latter three sectors tend to be very large in size. The oil sector and ICT which are two sectors where Chinese FDI is most evident show the lowest tendency to bundling.

Table 27: Degree of bundling of China's involvement in African infrastructure (%)

Type of project	Nature of bundling			Total
	Single	Double	Triple	
Roads	47.7	11.4	40.9	100
Rails	45.5	18.2	36.4	100
Power	25.0	14.3	60.7	100
Sea Port	33.3	33.3	33.3	100
ICT	73.3	6.7	20.0	100
Oil refinery & pipelines	50.0	25.0	25.0	100
Airports	50.0	25.0	25.0	100
Stadium	0.0	0.0	100.0	100
Water and Sanitation	100.0	0.0	0.0	100
Total	49.2	12.3	38.5	100

Despite the widespread belief that China's participation in Africa's infrastructure sectors is driven by its search for resources, it is notable that most of the infrastructure projects in which it is involved are designed to meet the needs of the economy at large. In only 7 of 141 recorded cases was China's participation in Africa's infrastructure sectors devoted exclusively to meeting the needs of the resource sector, with a further 5 projects which were designed to meet the needs of both the resource sector and the economy at large (Table 28).

Table 28: Extent to which Chinese infrastructure projects were designed to meet the needs of the resource sector (%)

	Freq.	Percent
Wholly	7	5.0
Partially	4	2.8
General	108	76.6
Unknown	22	15.6
Total	141	100

China's involvement in infrastructure development in Africa is disproportionately focused on hydroelectric power and railways. By 2007 China was involved in the construction of 6,000 MW of generating capacity, involving total capital costs of \$5.4bn. When completed, this will augment SSA's power sector by 30%. In Nigeria, China EXIM Bank committed \$1bn to the construction of the Abuja Rail Mass Transit System and another \$2.5bn for the rehabilitation of 1,315 kilometres of the Lagos–Kano line in 2008 (Foster et al 2008). This rail

project was to be repaid with the receipts from oil exports, but was put on hold mainly because the Nigerian government felt the cost was inflated. In Mauritania, in 2007, a 430 kilometres rail line linking Nouakchott to phosphate-rich Bofal was financed by the China EXIM Bank at a cost of \$620m to be constructed by Chinese Transtech Engineering Corporation. The Mauritania project was backed with the export of phosphate to China. Additionally, China EXIM Bank financed the 560 kilometre Belinga–Santa Clara rail line in Gabon as part of a \$3bn package centred on the Belinga iron ore reserve in 2008 (Foster et al 2008).

In the construction of roads, 7,000 kilometres of roads are being rehabilitated by Chinese construction companies in the DRC. This is part of the resource backed \$2bn Chinese EXIM bank loan that was provided in 2008 (Davies, 2010). By contrast, the road projects that Chinese firms have generally undertaken in Africa have been relatively small compared to the average size of other economic infrastructure projects. The World Bank's PPI database recorded only two Chinese funded road projects that exceeded \$100m, both in Angola. Nevertheless, road construction has been an especially important activity in Angola, Botswana and Ethiopia. By far the most active Chinese road construction firm was the China Road and Bridge Corporation (CRBC).

Beyond these involvements in economic infrastructure, China has also provided support for social infrastructure in Africa, although the levels of activity are far lower than in economic infrastructure projects. In 2008, commitments to the water and sanitation sector amounted to \$320m, of which 60% was directed to Angola. The largest project has been in Mauritius where the EXIM bank committed \$64m to the construction of water treatment plant and distribution networks in 2007. China's water supply projects include a number of smaller dams (not related to hydropower) in Cape Verde and Mozambique (Chen, 2010).

Perhaps the most notable example of the bundling of aid, trade and FDI as well as the integration of involvement in the resource sector and economic and social infrastructure is in the proposed Sicomines Project in the DRC. This involves a multi-billion dollar minerals-for-infrastructure deal between the DRC state, Gecamines (a DRC-state-owned mining house) and a consortium of Chinese companies known as Sicomines. The agreement (initially proposed in 2007) specifies that DRC allocates mining titles to in the mineral-rich, south-eastern Katanga Province to Sicomines (a Chinese consortium made up of CREC, Sinohydro, Zhejiang Huayou Cobalt and the China Machinery Engineering Corporation, CMEC). Sicomines was to be allocated a 68% stake in the agreement, with the balance of equity to be held by Gecamines. Finance was to be provided by China to cover both the costs of the mining development and investments in economic and social infrastructure. This loan was to be repaid from the proceeds of exports of copper and cobalt. Since the inception of the proposal, the size of the projects has been repeatedly downscaled. In its most recent form, the Secomines Project is valued at roughly \$6bn, split equally between investment in mines and in infrastructure. The nature and estimated costs of the infrastructure component of the venture is shown in Table 29.

Table 29: Overview of Infrastructure development in the Sicomine Agreement in DRC

Project	Measure	Contractor	Status as of June 2011	Cost(\$Mill)
Road between Beni and the Niania, North Kivu	Refurbishment	Sinohydro	Completed and Evaluated	57
Boulevard Triomphale, Kinshasa		CREC	Underway, about to be completed	N/A
Boulevard Sendwe, Kinshasa				
Central Hospital(Hospital du Cinquantenaire), Kinshasa	Construction	Sinohydro	Underway, estimated inauguration October 2011	200
Part 1 of the Boulevard du 30 juin, Kinshasa	Refurbishment	CREC	Underway about to be completed	N/A
Part 2 of the Boulevard du 30 juin, Kinshasa			Underway	N/A
Tourism Avenue, Kinshasa			Underway	24.4
Lutendele Road, Kinshasa			Underway	21
Road between Lumumbashi and Kasomeno, Katanga province			Underway	138
15 Kilometres of road in Butembo North Kivu province		Sinohydro	Not yet stated	30
Part 1 of esplanade in front of the people's palace, Kinshasa			Not yet stated	19
Part 2 of esplanade in front of the people's palace, Kinshasa			Not yet stated	Not yet negotiated as at 2011
Avenue de la Paix, Kinshasa			Not yet stated	
Avenue Ndjoku, Kinshasa			Not yet stated	
Road between Bukavu and Kamaniola			Not yet stated	

Source: Jonnson, (2011)

Table 30: Construction and infrastructure projects being undertaken by Chinese companies in Africa (2000-2012)

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Roads				
Ethiopia	2006	Ethiopia: The construction of the Gotera Intersection Bridge in Addis Ababa in 2006	EXIM, Bank	13
Gabon	2006	Gabon: Construction of a lagoon road in 2006	Unknown	Unknown
Niger	2008	Niger: Construction of "the second bridge" in 2008	Unknown	Unknown
Niger	2007	Construction of bridge over river Niger in Niamey in 2007 (\$40m)	Ministry of Commerce	40
Sudan	2006	Construction of the Ruffa bridge in 2006, Sudan	China Poly Group Corporation	Unknown
Sudan	2004	Construction of the bridge between Khartoum and the Sudanese-Egyptian border in 2004, Sudan	China National Petroleum Cooperation (CNPC)	10
Benin	2008	Benin: Cotonou Bridge in 2008	Unknown	Unknown
Mali	2008	Mali: Bamako No. 3 Bridge in 2008	Ministry of Commerce	Unknown
Togo	2008	Togo: Rehabilitation of 3 bridges on No. 1 Road in 2008	Unknown	Unknown
Kenya	2006	Kenya: A grant for the rehabilitation of the roads in Nairobi that link Kenyatta International Airport and UNEP in 2006	Government, China	28
Cameroon	2012	Cameroon: construction of a new motorway linking Douala and Younde in 2012	EXIM, Bank	241.4bn CFA francs
Gabon	2007	Gabon: Rehabilitation of 17 roads in 2007	Ministry of Commerce	Unknown
Rwanda	2004	Rwanda: Construction of a 2.6 km road in Kigali City in 2004	EXIM, Bank	Unknown
Chad	2007	Chad: Rehabilitation of 6 roads in 2007	Ministry of Commerce	Unknown
Kenya	2007	Kenya: Construction of roads in Nairobi in 2007	Ministry of Commerce	23
Djibouti	2008	Djibouti: Supply of road maintenance equipment for Djibouti in 2008	Unknown	Unknown
Kenya	2008	Kenya: Construction of the remaining section of a road linking Salem in 2008	Unknown	Unknown

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Benin	2008	Benin: Cotonou overpass project in 2008	Unknown	Unknown
Togo	2008	Togo: Road construction equipment in 2008	Unknown	Unknown
Malawi	2008	Malawi: Karonga-Chitipa Highway in 2008	Unknown	Unknown
Burundi	2008	Burundi: Mugere Hydropwer Station access road construction in 2008	Unknown	Unknown
Ethiopia	2008	The construction of the Nazret-Asela Highway	Unknown	19.57
Madagascar	2003	Rehabilitation of roads in the north of the capital	EXIM, Bank	Unknown
DRC	2007	Refurbishment of the road between Beni and Niania, North Kivu (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	57
DRC	2007	Construction of the Tourism Avenue (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	24.4
DRC	2007	Refurbishment of the Lutendele Road in Kinshasa (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	21
DRC	2007	Refurbishment of the road between Lumumbashi and Kasomeno, Katanga province (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	138
DRC	2007	Refurbishment of the 15km of road in Butembo, North Kivu (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	30
DRC	2007	Refurbishment of the part 1 of the esplanade in front of the people's palace, Kinshasa (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	19
Angola	2005	The No. 1 and 2 ring roads of the Angolan city in 2005 (\$ 211m)	EXIM, Bank	211
Congo	2007	Road linking Brazzaville and Pointe-Noire in 2007, Congo DR (\$386m)	EXIM, Bank	386
Uganda	2012	Road linking the Entebbe International Airport and Kampala in 2012, Uganda (\$350m)	EXIM, Bank	350
Kenya	2009	Expansion of Nairobi Thika road section three in 2009, Kenya (\$ 156m)	EXIM, Bank	156

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Ethiopia	2009	Construction of a 79 km expressway that links the capital Addis Ababa with the Country's largest second town	EXIM, Bank	349
Angola	2005	Rehabilitation of the Kifangondo-Caxito-Uige-Negage road in 2005, Angola (\$170m)	EXIM, Bank	170
Botswana	2006	Letlhakeng-Kang road, phase 2 in 2006 Botswana (\$19m)	EXIM, Bank	19
Botswana	2006	Dutlwe-Morwamosu Road in 2006, Botswana (\$ 17m)	EXIM, Bank	17
Botswana	2003	Letlhakeng-Kang road, phase 1 in 2003 Botswana (\$23m)	EXIM, Bank	23
Equatorial Guinea	2003	Rehabilitation of the Bata-Niefang Road in Equatorial Guinea	Government, China	6
Equatorial Guinea	2001	Construction of the Niefang-Nkue Road in Equatorial Guinea	Government, China	11
Ethiopia	2003	Addis Ababa city ring road phase 2 in 2003, Ethiopia (\$13m)	Government, China	13
Ethiopia	2006	Construction of roads and 2 bridges in Addis Ababa	Government, China	6
Ghana	2003	Rehabilitation of the Accra-Kumasi trunk road in 2003, Ghana (\$23m)	EXIM, Bank	23
DRC	2007	Refurbishment of the Boulevard Triomphale (under the Sicomines agreement)	EXIM, Bank	Unknown
DRC	2007	Refurbishment Part 1 of the Boulevard du 30 Juin, Kinshasa	EXIM, Bank	Unknown
DRC	2007	Refurbishment Part 2 of the Boulevard du 30 Juin, Kinshasa	EXIM, Bank	Unknown
DRC	2007	Refurbishment Part 2 of the esplanade in front of the People's Palace, Kinshasa	EXIM, Bank	Unknown
DRC	2007	Refurbishment of the Avenue de la Paix, Kinshasa (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	Unknown
DRC	2007	Refurbishment of the Avenue Ndjoku, Kinshasa (under the Sicomines agreement in DRC in 2007)	EXIM, Bank	Unknown
DRC	2007	Refurbishment of the road between Bukavu and Kamaniola	Unknown	Unknown
Mozambique	2012	Construction of Ring roads in Maputo	EXIM, Bank	300

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Rail				
Ghana	2007	Ghana: Prefeasibility study for a rail road project in 2007	Unknown	Unknown
Tanzania-Zambia	2008	Supply of wood sleepers for the Tanzania and Zambia Railway maintenance in 2008	Unknown	Unknown
Zambia	2010	Zambia: Provision of interest free loan to revive the Tanzania-Zambia Railways in 2010 at \$ 39m in 2010	Exim, Bank	39
Namibia	2005	Namibia: Railway equipment purchased at 31m	Exim, Bank	31
Angola	2005	Construction of the Benguela railway line in 2005 at a cost of US\$ 300m in Angola	Exim, Bank	300
Gabon	2006	Gabon: 560-kilometer Belinga-Santa Clara rail line at \$790m (part of the \$3bn Belinga iron ore project) in 2006	Exim, Bank	790
Nigeria	2008	Nigeria: Construction of the Abuja Rail Mass Transit System in 2008	Exim, Bank	1000
Nigeria	2006	Nigeria: Rehabilitation of 1,315 kilometres of the Lagos-Kano line at 2.5bn	Exim, Bank	2500
Sudan	2007	Construction of railway from Khartoum to Port Sudan (\$1.154bn)	Exim, Bank	1,154
Sudan	2004	Interest free loan for railway development	Unknown	Unknown
Angola	2006	Angola: Phase I of the rehabilitation of the 444-km Luanda Railway (\$90m)	Exim, Bank	90
Mauritania	2007	Railway linking Nouakchott to Phosphate rich Bofal, Mauritania (\$620m)	Exim, Bank	620
Botswana	2006	Construction of the railway linking the Trans-Kgalagadi railway that would link Botswana and Namibia	Exim, Bank	Unknown
Power				
Guinea	2004	Guinea: Grant for Rehabilitation of Ginkang Hydropower Plant and Tinkisso Hydropower Plant in 2004	Government, China	2
Burundi	2005	Burundi: A grant for the rehabilitation of Gikonge and Ruvyironza hydraulic power plants in 2005	Government, China	Unknown
Congo	2006	Congo Rep: Rehabilitation of the Bouenza Hydroelectric Power Plant in 2006	Unknown	Unknown

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Equatorial Guinea	2008	Equatorial Guinea: Rehabilitation of equipment for a transformer station in 2008	Unknown	Unknown
Ghana	2007	Ghana: First phase of the construction of the Asogli Power Plant (360 megawatts) in 2007 (\$ 200m)	CADF, Shengzen	200
Ghana	2011	Second Phase of the construction of the Asogli Power Plant ((360 megawatts) in 2011 (\$ 300m)	CADF, Shenzhen	300
Sudan	2001	Construction of the El-Gaili power plant in 2001, Sudan (\$128m)	EXIM, Bank	128
Gabon		The construction of the Grand Poubara Hydropower dam in Haut Ogooue in Gabon	EXIM, Bank	Unknown
Congo, Rep	2001	The construction of the Congo River Dam in 2001, Congo(\$ 280m)	EXIM, Bank	280
Ghana	2007	Construction of the Bui Power Dam in 2007, Ghana (\$562m)	EXIM Bank	562
Guinea	2006	The construction of the Souapiti Dam in 2006, Guinea (\$1bn)	EXIM Bank	1000
Nigeria	2005	Construction of a turbine power plant in 2005, Nigeria (\$298m)	EXIM, Bank	298
Sudan	2003	Construction of Power-Transmission and transformation line project for the Merowe Dam	EXIM, Bank	Unknown
Ghana	2006	Construction of the National Rural Electrification Project	EXIM, Bank	81
Equatorial Guinea		Equatorial Guinea: Transmission and Distribution Project of Djibloho Hydropower Station (\$650m)	EXIM, Bank	650
Sudan	2003	The construction of the 1250 MW Merowe dam in 2003, Sudan (\$ 400m)	EXIM, Bank	400
Mozambique		Construction of a dam in Mozambique (part of \$2.4bn wood and ore backed loan)	EXIM, Bank	Unknown
Ethiopia		Construction of a hydropower facility in Ethiopia (part of the \$2bn loan)	EXIM, Bank	Unknown
Togo and Benin	2009	The construction of the Adjarala Dam, Togo & Benin, (\$162m)	EXIM Bank	162
Zambia	2007	Construction of the Kafue Gorge Power station in Zambia in 2007 (\$ 600m)	EXIM, Bank	600

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Kenya	2008	20MW hydroelectric power plant, 5km downstream from Sondu Miriu HEP in 2008, Kenya (\$65m)	EXIM, Bank	65
Zambia	2007	Expansion of Kariba North Bank hydro power plant on the Zambezi river in 2007, Zambia	EXIM, Bank	Unknown
Tanzania	2011	The construction of a 600MW coal fired power plant in Tanzania (also includes coal mine, iron ore mine) in 2011 (\$3billion)	EXIM, Bank	Unknown
Angola	2006	Capanda-Ndalatando and Cambambe-Luanda transmission lines in 2006, Angola	EXIM, Bank	Unknown
Mozambique	2006	Construction of the Mphanda Nkuwa Dam and Transmission line to Maputo in 2006, (\$1billion)	EXIM, Bank	Unknown
Sudan	2006	National Electricity Corporation (NEC) transition line in 2006 Sudan (\$81m)	EXIM, Bank	81
Nigeria		Nigeria: Construction of 2 600 MW Mambilla hydropower scheme	EXIM, Bank	1000
Angola	2004	Angola: Power portion of the first phase of 2004 US\$ 2bn loan from Ex-Im Bank of China	EXIM, Bank	200
Cameroon	2010	Cameroon: Construction of the Mekin hydroelectric project in Dja and Lobo Division of the South Region of Cameroon, 2010	EXIM, Bank	FCFA 21.9bn
Botswana	2010	Development of infrastructure projects with the Botswana Power Corporation	EXIM, Bank	81
Ethiopia	2005	Ethiopia: Construction of the 300MW Tekeze hydropower Dam	EXIM, Bank	50
Sea Ports				
Uganda	2004	Uganda: Construction of a fishing port in 2004	Unknown	Unknown
Gabon	2006	Construction of port facilities in Gabon, (part of the \$ 3bn oil and minerals backed loan)	Unknown	Unknown
Equatorial Guinea	2007	Rehabilitation of the Beta Port in Equatorial Guinea in 2007	Unknown	Unknown
Water and Sanitation				
Nigeria	2004	Nigeria: Grant for the construction of 598 water schemes for 19 states in 2004	Government, China	5
Zambia	2006	Zambia: Rehabilitation of city water supply facilities in 2006	unknown	Unknown

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Comoros	2008	Comoros: Supply of materials for a water supply plant in Comoros in 2008	unknown	Unknown
Congo, Rep	2008	Congo Rep: Water supply projects in 2008	unknown	Unknown
Congo, Rep	2008	Congo Rep: Oyo water supply project in 2008	unknown	Unknown
Mozambique	2008	The construction of a water supply system in the central province of Manica in 2008 (\$45million), Mozambique	unknown	45
Zimbabwe	2010	Improvement of Harare water delivery and sewerage system in Zimbabwe	EXIM, Bank	150
Cameroon	2007	Build a water treatment plant and distribution pipeline in Douala in Cameroon in 2007	EXIM, Bank	24
Congo	2005	Sibiti water supply project in 2005 (5.7m), Congo DR	Government, China	5.7
Angola	2005	Water portion of the 2004 \$2bn Millennium challenge account in 2005, Angola	EXIM, Bank	Unknown
Niger	2002	Niger water sector project to reinforce the water production system in Zinder in 2002	Government, China	4
Tanzania	2001	Chalinze water supply project, Phase 1 in 2001, Tanzania	Government, China	21
ICT				
Ghana	2010	Ghana: Huawei donated telecommunication equipment for the University of Ghana, Legon, the Kwame Nkrumah University of Science and Technology and the University of Cape Coast in 2010 (\$ 1m)	Huawei	1
Zambia	2006	Deploy fibre-optic lines of ZESCO power transmission network in 2006, Zambia (\$11m was the total cost but the Chinese component is unknown)	Unknown	11
Zimbabwe	2004	Zimbabwe: Two contracts for Telecom equipment supply with Zimbabwe state fixed line operator TelOne and mobile operator netOne in 2004 (\$332m)	EXIM, Bank	332
Ghana	2003	Ghana telecom equipment supply phase 1 in 2003 (\$79m)	EXIM, Bank	79
Ghana	2012	Ghana: Construction of Ghana's e-governance project by Huawei in 2012 (\$150m)	Unknown	150
Tanzania	2009	Tanzania: Completion of fibre optic backbone in 2009 (\$ 170m)	EXIM, Bank	170

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Ethiopia	2007	Ethiopia: GSM project phase II in 2007 (\$ 478m)	EXIM, Bank	478
Nigeria	2006	Nigeria: first communication satellite NigComSat-1 in 2006 (\$200m)	EXIM, Bank	200
DRC	2001	Congo DR: China-Congo Telecom network project in 2001	Unknown	10
Nigeria	2002	Nigeria: National Rural Telephony Project, Phase 1 in 2002 (\$200m)	EXIM, Bank	200
Nigeria	2005	Nigeria: National Rural Telephony Project, Phase 1 in 2005 (\$300m)	EXIM, Bank	300
Sierra Leone	2005	Sierra Leone: Provision of CDMA fixed wireless network to government-owned Sierratel	EXIM, Bank	17
Lesotho	2007	Grant to establishment TV systems in several cities in 2007 in Lesotho	Unknown	Unknown
Sierra Leone	2006	Sierra Leone: Upgrading the rural telecom network in 2006	EXIM, Bank	18
Ghana	2012	Ghana: ICT platform for surveillance of oil and gas infrastructure	CDB	150
Angola	2008	Angola: ZTE Constructed a fibre optic backbone for the Angolan Telecom in 2008 (\$1.2bn)	EXIM, Bank	1200
Ethiopia	2007	Ethiopia: Phase 1 of fibre transmission backbone, expansion of mobile phone services for the Ethiopian millenium and expansion of wireless telephone services in 2007 (\$200m)	EXIM, Bank	200
Oil Infrastructure				
Nigeria	2006	Nigeria: The purchase of a 51% stake in the 110,000 bpd oil refinery in Kaduna	Unknown	Unknown
Sudan	2006	Sudan: Construction of a pipeline from Sudan's oil field to Port Sudan on the Red Sea, where China's Petroleum Engineering Construction Group is building a \$215mn export tanker terminal.	Unknown	Unknown
Chad	2007	Chad: The construction of the 1Mt/a Ronier Oilfield, the 1Mt/a N'Djamena Refinery, and a 311km-long crude pipeline between the oilfield and the refinery in N'Djamena.	Unknown	Unknown

Country	Year	Project Description	Source of Finance	Amount (\$m) unless otherwise specified
Sudan	2004	Sudan: Construction of an oil refinery in collaboration with Sudan's Energy Ministry and a \$300m investment to expand the refinery in 2004.	Unknown	Unknown
Airports				
Mauritania	2011	Construction of a new International airport at Nouakchott	Unknown	Unknown
Congo	2007	Rehabilitate Brazzaville airport project (maya-maya international Airport)	Unknown	Unknown
Congo	2009	DRC: Construction of terminals, tower and power control centre at Ollombo Airport	Unknown	Unknown
Comoros	2004	Renovation of the Prince Said Ibrahim International Airport in Comoros at a cost of 7m in 2004	Unknown	Unknown
Stadium				
Ghana	2007	Construction of 2 stadia in Takoradi and Tamale	Unknown	Unknown
Angola	2010	Construction of stadiums in Angola in 2010	Unknown	Unknown
Mali	2002	Construction of sports stadia for the African cup of nations in Mali in 2002	Unknown	Unknown
Mozambique	2011	Construction of sports facilities for the all nations cup in Mozambique in 2011	Unknown	Unknown
Equatorial Guinea	2012	Construction of sports stadia for the African cup of nations in Equatorial Guinea in 2012	Unknown	Unknown
Gabon	2012	Construction of sports stadia for the African cup of nations in Gabon in 2012	Unknown	Unknown

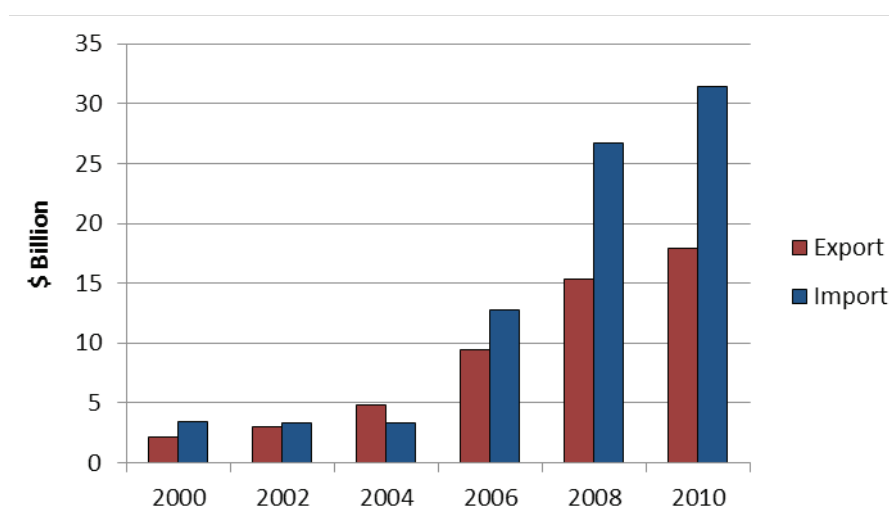
INDIA

India and Africa share a long history. Many of the migrant workers who worked in Africa's sugar plantations and who were employed in the construction of railways in the late nineteenth and early twentieth centuries stayed on, developing roots on the continent and often maintaining ties with their country of origin. India played a significant role in the Bandung Conference and used it as a base to strengthen ties with Africa. India's state-to-state relations with Africa are based on the principles of Non-alignment and South-South Cooperation, crystallised in the establishment of the Africa-India Forum Summit in 2008 with the most recent meeting held in 2011. The Forum focuses on cooperation, often specifically related to economic infrastructure and resource investments. There has also been an expansion of private sector led trade and investments initiatives, again often related to the infrastructure and resource sectors. Currently, India has embassies located in 28 African countries with 38 African countries operating embassies in India.

India's trade with Africa

Trade between Africa and India increased significantly in the last decade, with total trade of \$48.7bn in 2010, more than four times its value in 2005 and almost ten times the value in 2001 (Figure 14). Between 2005 and 2010, India's imports from Africa rose at a faster rate than its exports to Africa, culminating in a trade deficit with Africa of nearly \$13bn in 2010. This increasing trade deficit has been partially influenced by India's duty-free 2008 tariff preferential scheme for 49 least developed countries (Barka, 2011). 33 African countries took advantage of these trade preferences.

Figure 14: India's exports to and imports from Africa (2000-2010) \$bn



Source: Compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed June, 2012)

Indian exports to Africa in 2010 were dominated by machinery and transport equipment (28%), followed by mineral fuels (23%) and manufactured goods (21%). The largest category of Indian imports from Africa are the mineral fuel sector, accounting for nearly 70% of its total imports from Africa, rising significantly from a share of 4% in 2005 (Table 31).

Table 31: Sectoral composition of India-Africa trade (2005-2010) (% of total exports)

Trade Category	India's Exports		India's Imports	
	2005	2010	2005	2010
Food & live animals	13.1	5.9	9.9	2.7
Beverages and tobacco	0.4	0.9	0.0	0.0
Crude matter (ex food/fuel)	0.9	0.9	17.0	5.7
Mineral fuel	11.5	23.0	4.0	70.5
Animal veg oil etc	0.2	0.1	0.0	0.0
Chemicals	15.3	15.8	20.6	5.1
Manufactured goods	30.8	20.8	8.5	1.8
Machinery/transp equip.	21.0	28.0	2.3	0.6

Source: Compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed June, 2012)

The upsurge in trade is also reflected in the increase in the India's export of construction equipment to Africa (\$283m in 2010 compared to \$12m in 2000). These construction equipment exports were dominated by civil engineering plant and wheeled tractors (\$106m and \$97m respectively). Exports of other construction equipment, such as mechanical handling equipment and crushing machinery for minerals increased rapidly, albeit from a low base (Table 32).

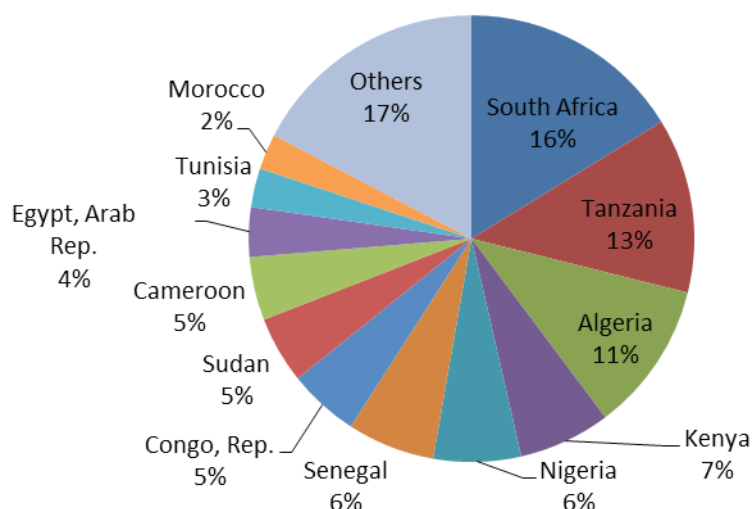
Table 32: India's exports of construction equipment to Africa (2000-2010) (\$m)

Equipment	2000	2005	2008	2010
Civil engineering plant	3	12	42	106
Wheeled tractors	1	12	80	97
Mechanical handling equipment	7	16	36	44
Machinery nes – minerals	1	12	49	36
Total	12	52	207	283

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

In 2010, South Africa accounted for 16% of India's construction sector exports to Africa, followed by Tanzania (13%), Algeria (11%) and Kenya, Nigeria, and Senegal (6-7% each) (Figure 15).

Figure 15: Major destinations of Indian construction equipment in 2010



Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Table 33 shows the share of India in the construction equipment imports of its top export destinations in Africa. In 2011, Malawi imported 42% of its construction equipment from India, followed by Rwanda (12%) and Tanzania (9%). However, in each of these cases there was a sharp rise from previous years, suggesting the impact of a single or a few large projects. Between 2000 and 2011, the share of India as a source of imports increased in all of its major markets, but these share were marginal. In summary, unlike China, India is not a major supplier of construction equipment to Africa.

Table 33: Share of India in country's import of construction equipment (2000-2011) (%)

Importing Country	2000	2005	2008	2011
Africa	0.3	0.9	1.5	2.6
Malawi	0.1	7.8	0.4	42.2
Rwanda	-	0.0	3.4	11.7
Tanzania	0.1	2.3	2.9	8.7
Ethiopia (excludes Eritrea)	0.0	1.7	2.7	3.5
Senegal	0.1	6.3	0.5	2.6
Algeria	0.0	0.2	0.8	2.2
Ghana	0.7	1.3	1.7	1.9
South Africa	0.1	0.5	0.7	1.5
Botswana	1.6	0.2	0.2	1.5

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Indian involvement in Infrastructure in Africa

India's outward direct investment (stock) stood at \$92.4bn in 2010, and its share in global FDI flows remains small. The flow of FDI to Africa increased from \$243m in 2000 to \$2.4bn in 2008, with Indian companies focusing on Africa's oil and mining sector as well as manufacturing and services (Barka, 2011). Although the search for natural resources is a driver of India's investment in Africa, these are not the only drivers. Like China, India is searching for new markets with investment and cooperation in agriculture, health, information and communication and education. (Pham, 2011; Barka, 2011).

India's assistance to Africa has increased substantially in recent years, although reliable and comprehensive data are unavailable. India's development assistance has been extended through budget allocation administered by its Ministry of External Affairs and lines of credit administered through the Indian Exim Bank. India's budget allocation of aid to Africa (through its Ministry of External Affairs) rose from Rs110m in 1998/99 (\$2.6m) to Rs800m (\$16.6m) in 2008/09 (Bijoy, 2009) MnuM. By 2010, India had provided a total of \$3.4bn in 93 lines of credit to 47 African countries. In addition, the Exim Bank, signed a memorandum of understanding with the AfDB in November 2009 to co-finance projects in Africa¹⁶. In May 2011, the Indian Prime Minister while inaugurating the second India-Africa Forum Summit in Addis Ababa announced a new line of credit worth \$5bn for African countries.

India's infrastructure finance is predominantly channelled through lines of credit extended through the Indian Exim Bank rather than through its aid programme administered by the Ministry of External Affairs. As in the case of China, Indian aid for infrastructural project is usually tied to sourcing from Indian firms. India's line of credit are offered at a relatively high interest rate of 4% and has a four years grace period, compared to the concessional IDA loans which charge zero interest (with a 0.75% service charge) with a 10 years grace period.

In total, India has been involved in 15 infrastructure ventures in Africa (Table 34). Six of these have been in the power sector, five in railways and two each in ICT and oil refineries and pipelines, eight of the fifteen have been ventures driven by private Indian firms and the remainder either have aid or loan finance. Only two were wholly linked to the resource sector, and a further one was partially linked (Table 35). Apart from the large Nigerian rail deal entered into in 2005, there is no evidence of bundling in any of these projects or of operations involving repayment through commodity exports (Table 36).

Table 34: Vectors of participation and sector of activity

Type of project	Source of funding		Total
	Aid	FDI	
Rails	2	3	5
Power	4	2	6
ICT	0	2	2
Oil refinery & pipelines	1	1	2
Total	7	8	15

16 Source: Africa Development Bank - <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/India's%20Economic%20Engagement%20with%20Africa.pdf>

Table 35: Extent of linkage to resource sector

	Freq.	Percent
Wholly	2	13.3
Partially	1	6.7
General	11	73.3
Unknown	1	6.7
Total	15	100

Table 36: Frequency of bundling of Indian infrastructure projects

Bundling	Freq.	Percent
Single	6	40
Double	3	20
Unknown	6	40
Total	15	100

Examples of Indian construction projects in Africa

India's role in infrastructure financing in Africa has grown significantly during the last decade (Brixiova et al, 2011). Foster and others (2009) show that between 2003 and 2007, India funded a total of 20 infrastructure projects in Africa, with an estimated investment of \$2.6bn, averaging \$500m per year (although the flows have been highly volatile). Most of this involved state-owned Indian enterprises. Foster identified a further \$7.3bn of investment deals with significant infrastructure components over the same period.

These investments were mainly in natural resource development, particularly in the oil and energy sector with the bulk concentrated in a single Nigerian deal (a resource for infrastructure deal in which Nigeria gives an oil block in return for infrastructure projects), signed in November 2005. The deal involved two Indian companies (the state-owned Oil and National Gas Company and privately owned Mittal Steel) in a joint venture agreement with a commitment to construct an oil refinery to produce 9m barrels of oil per year. The joint venture (ONGC Mittal Energy Ltd - OMEL) would also build 2000 MW power plant and 1000 km railway connecting the eastern and western part of Nigeria. The total value of the investment was \$6bn, split evenly between the refinery and infrastructure (Foster et al, 2008 2009; Pham, 2011). Recent media reports however indicate that OMEL has not honoured its commitment and the Nigerian government called on OMEL to deliver on its promises, with a parliamentary inquiry set up to investigate irregularities surrounding the deal.

In 2006 India financed a \$600m energy infrastructure project in Sudan, leading to the construction of a 741 kilometre oil product pipeline linking the Khartoum refinery to Port Sudan and four 125-MW Kosti Combined Cycle Power Plants and associated transmission systems (Foster et al, 2008 2009).

Beyond financing power generation and railroads directly linked to investments in natural resources, India has also financed several other power generation and railroad projects in Africa which are not linked to the resource sector. In 2010, a \$263m credit line was provided to finance new hydroelectric dams and an

urban railway in Kinshasa in the DRC. Previously, following the signing of a memorandum of understanding between the Federation des Entreprises du Congo and the Federation of Indian Industry in August 2008, Indian Construction Company, Angelique International signed a deal in the DRC to build a second hydro-electric dam at Mobayi-Mbongo on the Oubangui River and for two electric transmission line at a cost of \$49.5m (Africa Asia Confidential, 2010). As part of a \$250m agreement with India's Exim Bank, Angelique International is also under contract to construct two hydro power plants in the Cameroons (The India Business Frontier, 2010). Other power generation projects, with funding from the Indian Exim Bank involve building an electricity grid linking Kikasso, Mali, and Ferkessedougou, Cote d'Ivoire. At a cost of \$138m, the project adds 60MW to the networks of Electricite du Mali (The Africa Asia Confidential, 2010).

Indian investments in the railway sector include a commitment of \$40m to rehabilitate the Namibe-Matala (Huila) railroad in Angola in 2004 (Foster et al, 2009). The project was funded by the India Exim Bank on a concessional basis, with repayment to be made over 50 years. An Indian consortium, Rites and Ircon International (RII), secured a concession contract in 2004 for the restoration and management of the Beira rail system in Mozambique. RII committed to invest \$55m in the system, complemented by a World Bank loan of \$110m.

Indian firms currently play a significant role in Africa's telecommunication industry. In March 2010, India's Bharti Airtel (a private company) acquired Zain Africa, a subsidiary of a Kuwait mobile operator, for \$10.7bn. In 2008 Indian corporate giant Essar (through Essar Communications) announced its intention to invest heavily in Kenya, having acquired 49% of South Africa-based Econet Wireless International, which in turn had purchased 70% of Econet Wireless Kenya in December 2007. In South Africa, Tata Comms (with its partner Neotel) became the 'anchor tenant' on the Seacom International undersea fibre-optic cable. The deal involves Tata managing the cable, the billing systems and customer relations as well the management of the landing at Mumbai and Marseilles while Neotel manages the South African landing at Mtunzini.

Table 37: Construction and infrastructure projects being undertaking by Indian companies in Africa (2000-2012)

Host country	Description	Value	Year
Liberia	Iron ore mining project plus renovation of railways	\$1 billion	2004
Angola	Rehabilitation of the Namibe-Matala (Huila) railroad	\$40 million	2004
Mozambique	Restoration and management of the Beira rail system in Central Mozambique	\$55 million	2004
Nigeria	Construction of an oil refinery	\$6 billion	2005
Nigeria	2000 MW power plant		
Nigeria	1000 km railway connecting the eastern and western part of Nigeria		
Sudan	741-kilometre oil product pipeline linking Khartoum refinery to Port Sudan	\$600 million	2006
Sudan	Four 125-MW Kosti Combined Cycle Power Plants and associated transmission system		
South Africa	Telecommunications		
Zambia	Construction of Thermal power plant	\$700 million	2008
DR Congo	Hydroelectric dams	\$263 million	2010
DR Congo	Construction of urban railway in Kinshasa		
Cameroon	Angelique International to build two hydro power plants	\$ 250 million	
Mali	Building electricity grids between Kikasso, Mali, and Ferkessedougou, Cote d'Ivoire	\$138 million	
Multiple countries	Telecommunications	\$10.7 billion	2010

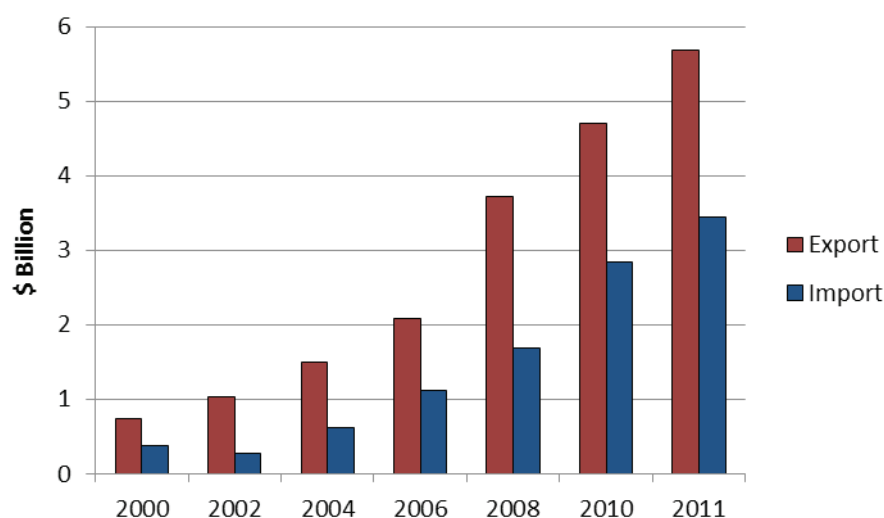
MALAYSIA

The Malaysian government's strategy for engagement with Africa has been shaped by the philosophy of South-South Cooperation, providing support through training and assistance in institutional development, particularly planning and financial skills. Malaysia perceives the potential for business in Africa to be substantial, with the state and private sectors in Malaysia working towards raising levels of trade and investment between the two regions. Malaysia is represented by 13 diplomatic missions on the continent and its external trade promotion agency, the Malaysia External Trade Development Corporation, has offices in Johannesburg, Nairobi and Cairo, and Lagos. Business councils have also been established between Malaysia and some African countries to help guide and promote trade and investments. These include the Malaysia-Egypt, Malaysia-Algeria and Malaysia-South Africa Business Councils. In addition to these, the Langkawi International Dialogue has also been established by Malaysia as a platform to strengthen ties with African and Caribbean countries. There are also 16 African embassies and diplomatic missions in Malaysia.

Malaysia's trade with Africa

Malaysia's trade with Africa has risen steadily, from \$1.1bn in 2000 to \$9.1bn in 2011, with Malaysia maintaining a consistent trade surplus over the decade. This increased from \$1.29bn in 2005 to \$2.23bn in 2011 (Figure 16).

Figure 16: Malaysia's exports to and imports from Africa (2000-2011) \$bn



Source: Compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> (accessed May, 2012)

The largest category of Malaysian exports to Africa are animal and vegetable products (mainly palm oil) accounting for 57% of its exports to the region, followed by machinery and transport equipment (11%). Between 2005 and 2011, the share of animal and vegetable oils increased, as did food and live animals. The share of machinery and transport equipment, and manufactured goods fell (Table 38).

Malaysia's imports from Africa in 2011 were dominated by mineral fuels (43%), followed by crude matter (28%) and food and live animals (16%). Its import profile has changed significantly and rapidly. The share of fuels rose from less than 4% in 2005 to nearly half of all imports in 2011. In 2010, Malaysia's total import of fuels from Africa exceeded \$1.5bn.

Table 38: Sectoral composition of Malaysia-Africa trade (2005-2011) (% of total exports)

Trade Category	Malaysia's Exports		Malaysia's Imports	
	2005	2011	2005	2011
Food & live animals	3.3	6.6	23.3	15.8
Beverages and tobacco	0.2	0.2	1.1	0.4
Crude matter (ex food/fuel)	4.7	2.8	18.2	27.7
Mineral fuel	0.5	2.9	3.6	42.6
Animal veg oil etc	35.8	57.0	0.0	0.2
Chemicals	7.1	5.6	5.7	2.0
Manufactured goods	14.1	8.0	33.3	9.5
Machinery/transport equip.	26.2	10.9	13.4	1.4

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> (accessed May, 2012)

In 2011 Malaysian exports of construction equipment to Africa had risen from \$6m in 2000 to \$42m. The largest category within construction equipment was that of civil engineering plant, followed by mechanical handling equipment. While the exports of the former category increased, that of mechanical handling equipment fell between 2008 and 2011 (Table 38).

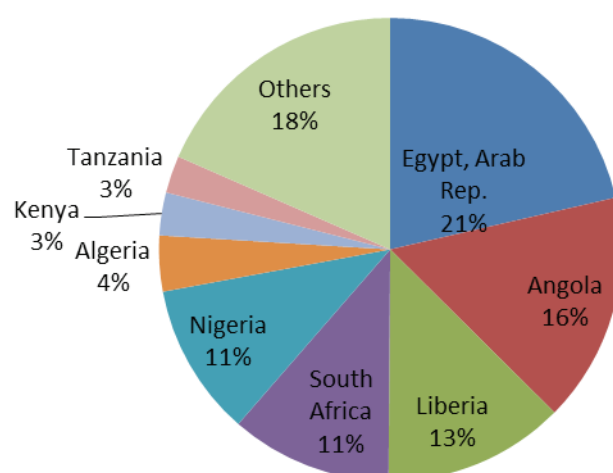
Table 39: Malaysia's exports of construction equipment to Africa (2000-2011) (\$m)

Equipment	2000	2005	2008	2011
Civil engineering plant	5	6	14	25
Mechanical handling equipment	1	7	18	9
Machinery nes - minerals	0	4	2	7
Wheeled tractors	0	0	0	1
Total	6	17	34	42

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Malaysian exports of construction equipment are more concentrated than those of Brazil, China and India, with Egypt accounting for 21% of its exports to Africa in 2011, followed by Angola (16%), Liberia (13%) and a 11% share each for South Africa and Nigeria (Figure 17).

Figure 17: Major destinations of Malaysian construction equipment in 2011



Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Malaysia is not a major supplier of construction equipment for any of the African countries, rarely accounting for more than 1% of a country's construction equipment imports over the last decade. Mauritius, where its import penetration was greatest, sourced just 0.9% of its total construction equipment imports from Malaysia in 2011, and Malaysia as a source of equipment remains inconsequential for the rest of countries listed in Table 40.

Table 40: Share of Malaysia in country's import of construction equipment (2000-2011) (%)

Importing Country	2000	2005	2008	2011
Africa	0.2	0.4	0.1	0.1
Mauritius	0.3	0.6	0.3	0.9
Cote d'Ivoire	0.2	0.0	1.0	0.4
Rwanda	-	0.0	1.9	0.2
South Africa	0.4	0.1	0.1	0.2
Ghana	0.1	0.0	0.1	0.1
Algeria	0.0	0.2	0.2	0.1
Egypt, Arab Rep.	0.0	0.0	0.1	0.1
Ethiopia	0.2	0.0	0.1	0.0

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Malaysia's involvement in infrastructure in Africa

Malaysian aid to Africa focuses on technical and administrative assistance, mainly in providing training to its partner countries. Malaysia has a 'south-south cooperation' approach towards other developing countries and does not operate a substantial aid program which could fund infrastructure and construction projects in Africa or other developing regions.

Since the beginning of the 1990s, Malaysia's strategy to promote South-South cooperation has driven Malaysian FDI to Africa. Around 15% of the 70% of Malaysian FDI that has been targeted at developing countries in recent years, has been directed to Africa. Malaysia invested nearly \$600m in Africa between 2006 and 2008, widely dispersed both in terms of sectors and countries. Malaysian investments were directed towards resource extraction, recreational activities, hotels and leisure, real estate, shipping, broadcasting, banking and financial services, palm oil plantations, oil and gas and telecommunication. Other than oil and some investments in telecommunication, there is little evidence of Malaysian FDI in large scale infrastructure construction in Africa. Bearing in mind that only 3% of Malaysia's outward FDI went into construction, it is not surprising that the presence of Malaysia in Africa's infrastructural sectors is minimal.

Malaysian companies, Petronas and Telekom Malaysia accounted for more than 30% of mergers and acquisitions between Asian and African transnational corporations in the 1990s and mid-2000s, with the largest recipients in Mauritius and South Africa. Engen – a South African petroleum firm acquired by Petronas in 1998 - owns a refinery and possesses more than 1,600 service stations across SSA. In addition Engen also acquired portions of Total's operations in Guinea Bissau, Rwanda and Burundi in 2008. While Petronas has assisted many Malaysian construction firms to acquire and undertake projects in Africa, they have mainly been in the oil sector and concentrated in Sudan, Chad and Cameroon. Telecom Malaysia divested its operations in Malawi to Econet Wireless in 2007. In Guinea, it divested its equity to the Government in 2008. In Ghana Media Prima divested its interest in the TV3 Broadcasting Network in 2011.

Beyond these (divested) ICT operations, there are five recorded cases of Malaysian involvement in African infrastructure. All of these have been linked directly with the resource sector. It is not possible to determine the extent to which any of these involved a degree of bundling. Table 40 gives examples of construction activities

carried out by Malaysian companies, mainly in Sudan. These projects are predominantly oil related, but the marine export terminal has the potential also to be used for other purposes.

Examples of Malaysian construction projects in Africa

Melut Basin Oil Project- Sudan¹⁷

Malaysian companies have played a large part in the development of infrastructure for the Melut Basin oil project in the Sudan. Acting as the EPC (Engineering, Procurement and Construction) contractor in conjunction with Intec Engineering (SEA) and Sudan Piles, in 2005 Peremba Construction completed the construction of the marine export terminal at a cost of \$220m. The export pipeline for the project was constructed in four segments with a total length of 1,380 km. The pipeline connects the Melut Basin field situated near to the town of Palouge in the Faluj area to the port of Sudan which gives export access to the Red Sea (oil started to flow in June 2006 from 98 production wells). A consortium headed by MMC Corporation Berhad (MMC) and including Sinopec Group and Oman Construction Company LLC won a \$65.6m contract in 2004 to build the another 490 km section of the export oil pipeline (completed in May 2005)

Table 41: Construction and infrastructure projects undertaken by Malaysian companies in Africa (2000-2012)

Malaysian Company	Country	Project Investment Comments	Value	Year of project Initiation
Peremba Construction	Sudan	Building of marine Export terminal for Melut Basin Oil Development Basin.	\$220m	2004
MMC	Sudan	Mulet Basin Oil Pipeline.	\$65.6m	2004
Nam Fatt Corporation	Sudan	Construction of Six Pumping facilities at the Mulet Basin.	RM684m	
Ranhill International Inc.	Sudan	Building of a Major oil facility in Mullet Basin.	\$240m	2004
Petronas	Chad and Cameroon	Chad-Cameroon petroleum development and pipeline project. In partnership with ExxonMobil and Chevron estimated at	\$3.7bn	2000

RUSSIA

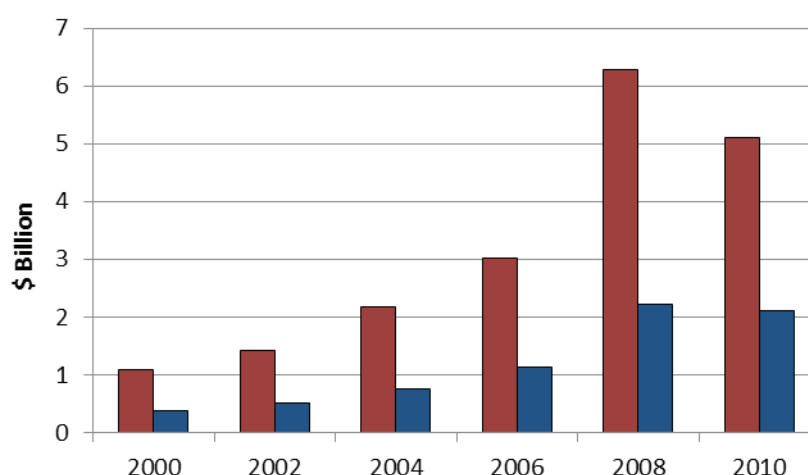
Russia's economic relations with Africa date back to the Soviet Era when they were primarily driven by geopolitical concerns. After the collapse of the Soviet Union in 1991, Russia's interest in Africa waned. In recent times, Russia has renewed its interests in Africa, indicated by increasing trade and investment flows between the two regions. Currently Russia operates 38 embassies in Africa and 36 African embassies are located in the Russia Federation. In this new era, Russia's growing interest in Africa reflects a combination of commercial and geopolitical factors.

¹⁷ <http://www.hydrocarbons-technology.com/projects/petrodaroperatingco/> (accessed June 2012)

Russia's trade with Africa

In 2010, Africa's total trade with Russia stood at \$7.21bn, markedly lower than Africa's other major emerging economy trade partners such as China (\$126.9bn) (Figure 18), India (\$49.3bn) and Brazil (\$25bn) and lower than the much smaller Malaysia economy (\$9.1bn). However, there has been substantial growth in Russia-Africa trade over the last decade; in 2000 it was less than \$1.5bn. Russia's exports to Africa have grown more rapidly than its imports, and its trade surplus with Africa widened from \$1.6bn in 2005 to \$3bn in 2010.

Figure 18: Russia's exports to and imports from Africa (2000-2010) (\$bn)



Source: Compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed May, 2012)

Russia's main exports to Africa are food and live animals, accounting for 22% of its exports in 2010, followed by mineral fuels (15%) and manufactured goods (12%). Between 2005 and 2010, the share of manufactured goods in Russian exports decreased, while the share of exports accounted for by food and live animals and mineral fuels remained stable (Table 42).

The largest category of Russia's imports from Africa is food and live animals, which comprised more than half of total imports in 2010, followed by crude matter (15%). The share of beverages and tobacco, and machinery and transport equipment imports from Africa increased between 2005 and 2010,

Table 42: Sectoral composition of Russia-Africa trade (2005-2010) (% of total exports)

Trade Category	Russian Exports		Russian Imports	
	2005	2010	2005	2010
Food & live animals	22.3	21.8	52.6	55.8
Beverages and tobacco	0.0	0.1	8.8	9.2
Crude matter (ex food/fuel)	12.0	9.2	24.4	14.5
Mineral fuel	13.1	15.3	1.0	0.2
Animal veg oil etc	0.8	1.3	0.1	0.1
Chemicals	5.3	4.8	7.8	1.8
Manufactured goods	27.3	11.6	1.6	3.7
Machinery/transp equip.	9.2	8.7	2.5	5.8

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed May, 2012)

Russia's exports of construction equipment to Africa (\$11m in 2011) are limited, with nearly half of this value accounted for by mechanical handling equipment. Exports have increased over the last decade, but the rise has been slow and remains insubstantial (Table 43).

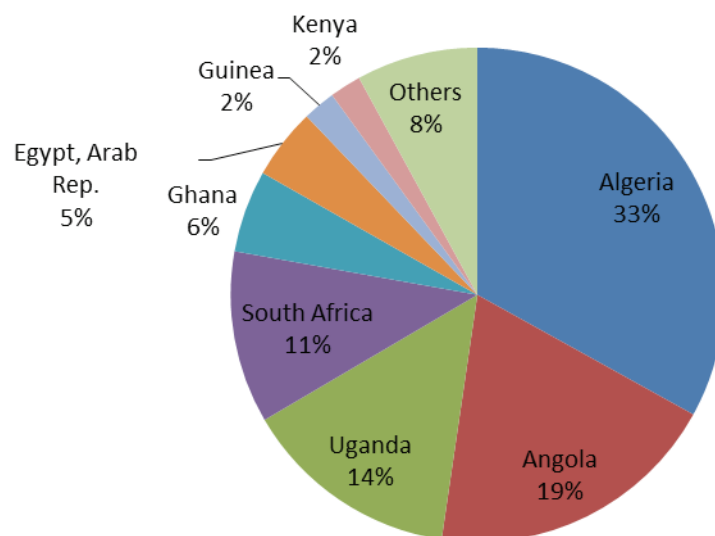
Table 43: Russia's exports of construction equipment to Africa (2000-2011) (\$m)

Equipment	2000	2005	2008	2011
Mechanical handling equipment	3	1	5	6
Machinery nes - minerals	1	3	3	3
Civil engineering plant	3	3	7	2
Wheeled tractors	0	-	-	0
Total	7	7	15	11

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

Russian construction equipment exports are concentrated in northern Africa, with Algeria accounting for 33% of its exports to the continent in 2011. Angola (19%), Uganda (14%) and South Africa (11%) were the other main destinations for Russian construction equipment exports to Africa (Figure 19).

Figure 19: Major destinations of Russian construction equipment in 2011



Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

The significance of imports of Russian capital equipment and machinery as a source of total country imports is low for virtually all Africa economies, with its share in Egypt (its major market) less than 1% in 2011. Between 2000 and 2011, there was little improvement in Russia's share of construction equipment imports in all of its major African markets (Table 44).

Table 44: Share of Russia in country's import of construction equipment (2000-2011) (%)

Importing Country	2000	2005	2008	2011
Africa	0.1	0.9	0.2	0.1
Egypt, Arab Rep.	0.6	1.6	1.1	0.7
Algeria	0.1	0.0	0.0	0.2
Senegal	0.2	0.0	0.0	0.0
Ghana	0.0	0.1	0.0	0.0

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

Russia's involvement with infrastructure in Africa

Russian outward direct investment has expanded rapidly over the last decade, with its share in global outward direct investment more than doubling from 1.45% in 2005. to 3.9% in 2010. Much of its FDI in Africa reflects investments in Africa's hard commodity and energy sector (fuel, energy and metallurgy) (Barka, 2011). In southern Africa, Russian investments totalled \$3bn between 2000 and 2008 (Gerasmichuk, 2009). As in West Africa, these investments have been concentrated in energy intensive sectors such as petroleum and uranium. Table 44 indicates this concentration of FDI in recent major investments made by Russian firms in Africa. With the exception of the proposed nuclear power station in Egypt, the improvements in economic infrastructure are directly linked to the primary investments in resource extraction. This is reflected in improvements in roads in its Tanzanian uranium mine and the power plant linked to Gazprom's refinery operations in Nigeria (Table 45).

In total, five cases can be observed of Russian involvement in African infrastructure (Table 46). Three are in power plants, and one each in roads, and oil refinery and pipelines. Four involve FDI from Russia and one project was won on open tender. Only one of the projects was directed to meeting the needs of the resource sector, the rest were designed to meet the needs of the economy as a whole. There is no evidence of bundling of vectors of participation in these five projects

Table 45: Vector of participation and sector of infrastructure

Type of project	Source of funding		Total
	FDI	Open Tender	
Roads	1	0	1
Power	2	1	3
Oil refinery & pipelines	1	0	1
Total	4	1	5

Table 46: Construction and infrastructure projects being undertaken by Russian companies in Africa (2000-2012)

Russian investor	Host country (company)	Industry	Type of Investment	Value	Year
Alrosa	Angola, Namibia, DRC	Diamond mining, and hydro-electricity	Greenfield investment	\$300 - 400m	
Gazprom	Nigeria (NNPC)	Refineries and pipelines	Joint venture	\$2.5bn	2009
Gazprom	Nigeria (NNPC)	Gas power station			
Rosatom	Egypt	Nuclear power	Ongoing negotiations to build Egypt's first nuclear power plant	\$1.8bn	
ARMZ/ Uranium	Tanzania	Uranium mining plus improvement in roads	M&A (100 acquisition)	\$1.06bn	2011

Russia's aid to Africa is limited and generally takes the form of grants and loan aimed at promoting the Millennium Development Goals, democracy, market economy, conflict prevention and access to markets, without prioritising specific partners or countries (Kragelund, 2008). It also includes debt relief. In June 2008, Russia committed to a \$500m development assistance package to African countries. This aid was directed towards development goals and not towards infrastructure project finance.

Examples of Russia's construction projects in Africa

Gazprom joint venture with NNPC in 2009¹⁸

In June 2009, during a four-nation tour in Africa the Russian president announced a \$2.5bn deal with the Nigerian National Petroleum Corporation (NNPC) to build infrastructure including refineries, gas pipelines and power stations. The deal provides Russia with access to oil (RIA Novosti, 2009). In association with NNPC, Gazprom is building a \$400-500m 360 kilometre gas pipeline linking south western areas of Nigeria with the north. As part of the agreement, a joint venture between Gazprom and NNPC was to be established, to invest \$2bn in Nigeria's oil production and the construction of gas distribution networks, refineries, gas transportation infrastructure and gas power stations.

JSC ARMZ/ Uranium 1 takeover of Mantra Resources Ltd in Tanzania in 2011¹⁹

Mantra Resource Limited, an Australian exploration/mining company carried out exploration work on uranium mining in Mkuju River in Tanzania and confirmed the economic viability of the first phase of the project in May 2011. In June 2011, JSC Atomredmetzoloto Limited (ARMZ), acquired Mantra Resources at a cost of \$1.06bn and transferred the management and operation of Mkuju River Project to its subsidiary, Uranium 1. ARMZ is the world's fifth largest uranium producer and is wholly owned by the Russian State Corporation for Nuclear

18 Source: <http://en.rian.ru/business/20090625/155347183.html> and <http://news.bbc.co.uk/1/hi/business/8118721.stm>

19 Source: <http://www.sedar.com/DisplayCompanyDocuments.do?lang=EN&issuerNo=00029182>

Energy (Rosatom) which consolidates all nuclear assets of the Russian Federation. The total capital cost of the first phase is estimated to cost \$430m. In order to make the mine feasible, it involves investments in economic infrastructure, notably the building of an 80 km road, 30 km of which will be a public road. The project also includes a \$20.4m allocation towards upgrading the remainder of the road.

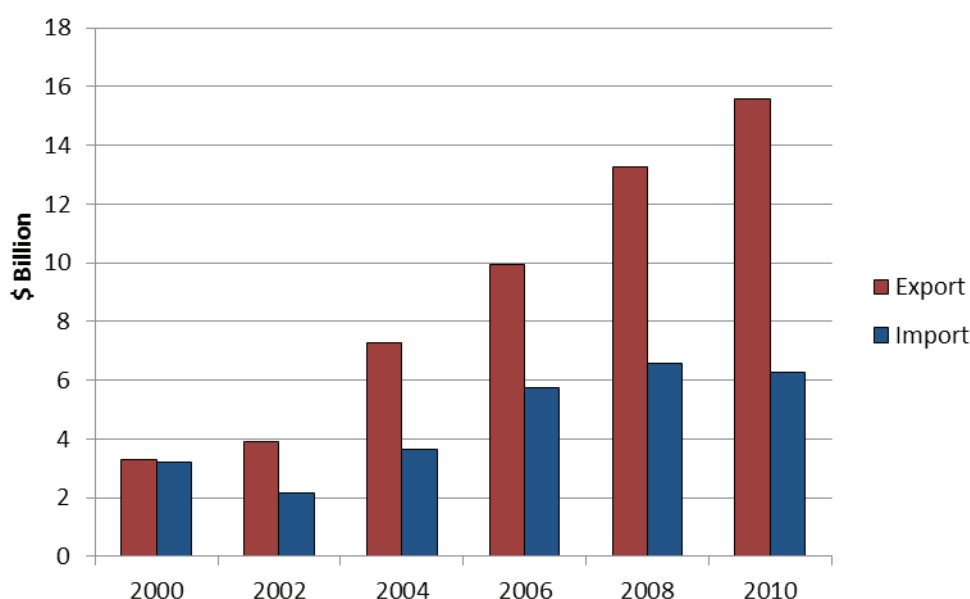
KOREA

Korea has historically had limited aid, trade and investment relations with Africa. However over the past decade its level of engagement with the African continent has increased substantially, reflecting both Africa's robust growth and its emerging role as a resource producer of significance. Currently, Korea has embassies in 20 African countries, with 16 African countries possessing embassies in Korea.

Korea's trade with Africa

Korea's trade with African countries has seen substantial increases over the last decade, growing from \$6bn in 2001 to \$21.6bn in 2010. Korea's trade surplus with Africa has increased steadily over this period, rising from just under \$4.5bn in 2005 to \$9.2bn 2010 (Figure 20).

Figure 20: Korea's exports to and imports from Africa (2000-2010) (\$bn)



Source: Compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed May, 2012)

Korea's major exports to Africa in 2010 were machinery and transport equipment (76%), followed by chemicals (9.4%) and manufactured goods (8.4%). Between 2005 and 2010, there has been no significant change in the profile of Korean exports to Africa (Table 47). Major Korean imports from Africa consist of mineral fuels (51%), manufactured goods (27%) and crude matter (14%). As with Korea's export profile, there has been no major change in the composition of imports between 2005 and 2010.

Table 47: Sectoral composition of Korea-Africa trade (2005-2010) (% of total exports)

Trade Category	S. Korea's Exports		S. Korea's Imports	
	2005	2010	2005	2010
Food & live animals	0.1	0.2	2.1	2.4
Beverages and tobacco	0.0	0.1	0.1	0.5
Crude matter (ex food/fuel)	0.6	0.9	13.3	13.8
Mineral fuel	0.8	3.6	50.8	51.4
Animal veg oil etc	0.0	0.0	0.0	0.0
Chemicals	9.5	9.4	1.4	1.2
Manufactured goods	8.4	8.4	29.6	27.4
Machinery/transp equip.	79.3	75.6	1.8	2.6

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed May, 2012)

The export of construction equipment to Africa from Korea has risen sharply from \$41m in 2000 to \$378m in 2011 (Table 48). Civil engineering plants account for three-quarters of these exports in 2011, followed by mechanical handling equipment.

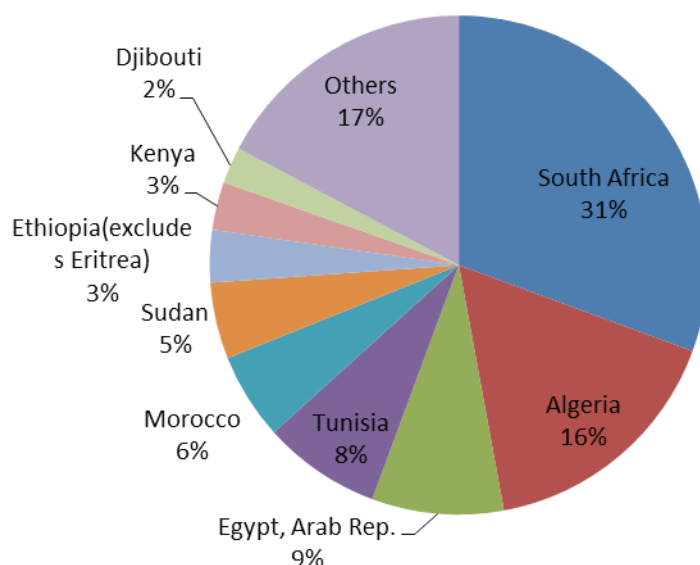
Table 48: Korean exports of construction equipment to Africa (2000-2011)

Equipment	2000	2005	2008	2011
Civil engineering plant	22	114	360	276
Mechanical handling equipment	13	31	79	71
Wheeled tractors	5	5	16	16
Machinery nes - minerals	1	2	21	15
Total	41	152	476	378

Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

South Africa (31%) was Korea's largest export destination in Africa in 2011, followed by Algeria (16%), Egypt (9%) and Tunisia (8%). Morocco and Sudan were amongst its top ten customers (Figure 21)

Figure 21: Major destinations of Korean construction equipment in 2011



Source: Calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Focusing on the ten largest African importers of construction equipment from Korea, Table 49 indicates that with the exception of Rwanda (9%), Mauritius (8%), Ethiopia (6%) and Algeria (5%), it was marginal source of construction equipment imports for other countries in 2011.

Table 49: Share of Korea in country's import of construction equipment (2000-2011) (%)

Importing Country	2000	2005	2008	2011
Africa	1.3	2.6	2.2	3.2
Rwanda	-	0.0	0.0	9.0
Mauritius	1.4	11.6	10.3	8.4
Ethiopia	1.5	2.1	7.5	5.9
Algeria	0.2	1.5	4.1	5.2
Egypt, Arab Rep.	1.0	3.2	2.0	3.6
South Africa	1.9	3.2	2.5	3.5
Tanzania	0.0	0.4	0.9	1.1
Senegal	0.1	0.0	0.8	0.5
Ghana	0.0	1.0	0.2	0.5

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Korea's involvement in infrastructure in Africa

Korea's stock of outward direct investment in 2011 was estimated at \$190.3bn, of which approximately 1% has been directed to Africa. Unlike Korea's share of African trade, its direct investment in Africa lags behind investments from emerging economies such as Malaysia, Indonesia and Singapore (Ye-won, 2011). However, there has been a growth in Korea's investment outflow into Africa in the last decade, rising from \$157m in 2000 to \$372m in 2011. The increase in Korea's investment in Africa is mainly driven by the search for natural resource (energy, ores and minerals) (Kim, 2012). Despite the increase in investment flows directed towards the construction sector, in 2011 the construction sector accounted for less than 1% of Korean FDI in Africa, with mining accounting for 83%. As of 2011, the stock of investments in Africa's infrastructure sector (construction and electricity, gas, steam and water supply) was \$53.5m²⁰.

Korea's aid has mainly been provided through bilateral channels with the Korean Economic Development Cooperation Fund (EDCF) as the main channel. Initially loans from EDCF were mostly extended to Asian countries, extending to African countries after 1990 (EDCF, 2011). However, loans were limited to a few countries, particularly to Tanzania. In 2011, aid to Africa constituted 29.1% of Korea's aid effort, compared to 54.8% and 16.1% for Asia and Central and Latin America respectively. This represents a substantial increase since 2000, and an increasing number of African economies are beneficiaries of Korean aid.

Since 2000, there are 21 recorded projects in African infrastructure (Table 50). Of these 19 are aid-funded and two involve FDI. The two dominant sectors of economic infrastructure are roads and power, but unlike most of the NEP7, Korea has a relatively high rate of participation in social infrastructure, perhaps reflecting the fact that it is now a member of the DAC community. There were only two cases involving the bundling of vectors, in each case only involving two of the three vectors (aid, trade and FDI) (Table 51).

Table 50: Vector and sector of Korean participation in African infrastructure

Type of project	Source of funding		Total
	Aid and loan	FDI	
Roads	4	1	5
Power	6	1	7
ICT	2	0	2
Stadium	1	0	1
Irrigation	2	0	2
Water & Sanitation	4	0	4
Total	19	2	21

20 The figure was calculated from the data sourced from the Korean Eximbank Website (accessed on 1 June, 2012)

Table 51: Degree of Bundling in Korean infrastructure projects

	Freq.	Percent
Single	19	90.5
Double	2	9.5
Total	21	100

Although there is little evidence of the bundling of Korean aid and FDI, there is evidence of Korean companies entering into infrastructure for resource deals in a number of African countries, particularly Congo Brazzaville and Congo Kinshasa. In 2007 a Korean-Malaysia-Congo Consortium gained access to an iron ore mining project at Zanaga and oil prospecting rights in Congo Brazzaville in exchange for the building of two railroads in Congo Brazzaville²¹. In neighbouring Congo Kinshasa, the state-owned Korea Resources Corporation agreed to a joint venture with Alfonso Rowemberg Korea (a private Korean company) and George Forest (a Belgian company) in 2010 to carry out a \$750m ore-for-infrastructure project. As part of this deal, the Korean company will build infrastructure and dams in return for access to 430,000 tonnes of copper, 2,000 tonnes of uranium and 21,500 tonnes of cobalt a year. A similar infrastructure for resources deal was undertaken for the rehabilitation of hydroelectric plant at Koni and Mwandigusha in Congo's Katanga Province.

Most of Korea's investment in infrastructure related sectors has been in oil and mineral rich African countries, particularly in Libya, but also in Nigeria, Angola, and South Africa (Table 52). Libya accounts for more than half of Korea's direct investment in Africa's construction sector. Korea's infrastructure investments have predominantly been in the construction sector, although in Nigeria the dominant form of infrastructural activity has been in telecoms.

Examples of Korean construction projects in Africa

Power Transmission Project, Ethiopia²²

In July 2011, Korea signed a Memorandum of Understanding with the Ethiopian Ministry of Finance and Economic Cooperation to provide the Ethiopian government with an EDCF loan of \$100m over three years. Drawing on this facility, as a first step, the Korean government approved an EDCF loan of \$78.4m for a power transmission project connecting Sululta and Gebre Guracha. This is the first EDCF project in Ethiopia. The power project is expected to satisfy current power demand in Gebre Guracha and nearby towns, with demand expected to grow sharply in the near future due to rapid expansion by factories in the country's main industrial area. The Suluta-Gebre Guracha Power Transmission Project is expected to contribute to the economic development of Ethiopia by providing a reliable supply of power, reducing transmission loss and improved power system stability and reliability.

21 Africa Asia Confidential, 2009-2010 edition

22 Based on EDCF Annual Report, 2011

Prestea-Kumasi Power Enhancement Project, Ghana²³

An EDCF loan totalling \$67m was approved by the Korean government in 2011 for the Prestea-Kumasi Power Enhancement Project as a contribution to Ghana's Strategic National Energy Plan. The loan is the second largest EDCF project in Africa. It includes the erection of transmission lines, construction of a substation and the establishment of the pilot program for the Smart Grid Direct Load Control (DLC) System with eco-friendly technology. The project is aimed at stabilising and improving power supply for northern regions of Ghana and for capacity building in green technologies (the Smart Grid DLC System). In addition, as the project is linked to the construction of integral power transmission systems for ECOWAS, the project seeks to facilitate knowledge and technology sharing between Korea and ECOWAS.

Table 52: Construction and infrastructure projects being undertaken by Korean companies in Africa (2000-2012)

Country	2005	2006	2007	2008	2009	2010	2011	Total
Libya	23.00	0.45	1.72	1.15	1.04	0.35		27.71
Angola		0.28	0.11	5.40				5.79
Nigeria		2.53	0.12	0.15		0.07		2.86
South Africa	0.45	0.35	0.15	0.20	0.09	0.52	0.64	2.40
Egypt							1.64	1.64
Madagascar				0.53				0.53
Congo			0.30	0.20				0.50
Algeria	0.08			1.00	0.04	0.17	0.01	0.31
Central African Rep.					0.09	0.09		0.18
Tanzania			0.05	0.03	0.02			0.09
Senegal			0.02					0.02
Equatorial Guinea							0.01	0.01
Nigeria			8.51	0.68				9.19
Tanzania					1.00			1.00
Egypt					0.67			0.67
Algeria		0.63						0.63
Tanzania	0.07	0.05	8.00					0.13

Source: Korea Exim Bank

23 Based on EDCF Annual Report, 2011

Table 53: Construction and infrastructure projects financed by Korean development agency – EDCF

Country	Project	Value	Year
Tunisia	Olympic Stadium Construction Project	\$30m	1997
Equatorial Guinea	Water supply project for Bata City	\$20m	2005
Angola	Government ICT Infrastructure in Angola Project	\$35m	2006
Madagascar	Toliara Province Road No.35 Rehabilitation Project	\$14.12m	2007
Senegal	Government ICT Infrastructure Establishment Project	\$25m	2007
Tanzania	Malagarasi Bridge and Associated Roads Project	\$25m	
Cameroon	Construction of Siem Reap Sewerage System and Improvement of Siem Reap River	\$30m	2008
Cameroon	Improvement of National Road No. 31 and 33, Provincial Road No. 117 and Kampot Bypass Project	\$30m	2008
Tanzania	Kilimanjaro-Arusha Transmission Line Project	\$25m	2008
Mali	Mali Irrigation Development Programme - Phase I	\$22m	2009
Mozambique	Nacala Road Corridor Upgrading Project - Phase I	\$20m	2009
Mozambique	Rural Electrification in Gaza Province Project	\$49m	2009
Tanzania	Improvement of Water Supply System in Dodoma Town Project	\$50m	2009
Mozambique	Construction of Photovoltaic Power Plants Project	\$35m	2010
Tanzania	Iringa-Shinyanga Backbone Transmission Investment Project	\$36m	2010
Ghana	Prestea-Kumasi Power Enhancement Project	\$67m	2011
Ethiopia	Sululta - Gebre Guracha Power Transmission Project	\$78m	2011
DR Congo	Remba Imbu Water Project	\$68m	2011
Tanzania	Construction of Zanzibar Irrigation Infrastructure Project in the United Republic of Tanzania	\$50m	2011
Total	All infrastructure related projects in African countries	\$709.12million	1997-2011

TURKEY

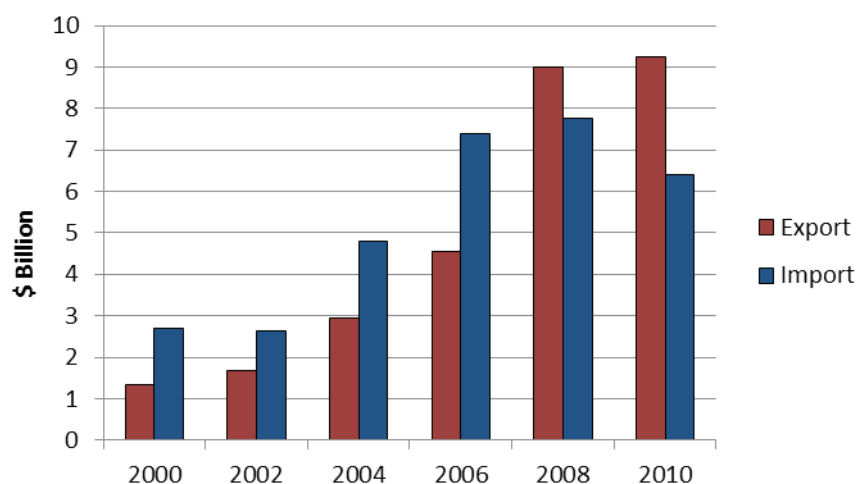
Turkey has a long-lived relationship with Africa, especially with north African countries, which dates back to the Ottoman Empire. In 1998 Turkey adopted the 'Opening up to Africa Plan', declaring 2005 as the 'Year of Africa'. In 2008, the first Turkish-African summit was organised with participants and officials from 50 African countries. One of the major outcomes from this summit was the agreement to set up the Turkey-Africa Chamber of Commerce to help expand commercial relations between the two regions. Between 2009 and 2012, Turkey opened 19 new embassies in Africa and in early 2013 had 26 embassies in SSA.

Since the 1970s, faced with tough economic conditions at home, Turkish construction companies have participated in projects in Libya, Algeria, Morocco and Egypt and in more recent years they have ventured further south into the continent. Turkish construction firms are well known internationally, with 33 companies listed in the world's top 225 international contracting companies, ranking second after China (ENR.com, 2010)

Turkey's trade with Africa

The Turkish Ministry of Economy began implementing the "Strategy for Enhancing Trade and Economic Relations with African Countries" in 2003. Turkey entered into Free Trade Agreements with Tunisia (2005), Egypt (2006) and Morocco (2006) and signed a Free-Trade-Area Agreement with Mauritius in September 2011. Its trade with Africa increased from \$4bn in 2000 to \$15.6bn in 2010. As Turkish exports to the continent accelerated, Turkey moved from a trade deficit to a trade surplus with Africa in 2007, growing to nearly \$3bn in 2010 (Figure 22).

Figure 22: Turkey's exports to and imports from Africa (2000-2011) (\$bn)



Source: Compiled from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed May, 2012)

Turkey's largest exports to Africa in 2010 were manufactured goods (45%), machinery and transport equipment (23%) and food and live animals (7.8%) (Table 54). Between 2005 and 2010, the share of manufactured goods in its exports increased. The shares of machinery and transport equipment and food and live animals decreased.

The largest category of Turkey's imports from Africa in 2010 was mineral fuels (25%), followed by chemicals (14%) and manufactured goods (9%). However, this represented a significant reduction in the share of minerals and fuels imports and an increase in the share of chemicals and manufactures in the period since 2005.

Table 54: Sectoral composition of Turkey -Africa trade (2005-2011) (% of total exports)

Trade Category	Turkey's Exports		Turkey's Imports	
	2005	2010	2005	2010
Food & live animals	10.4	7.8	3.4	5.5
Beverages and tobacco	0.3	0.7	0.6	1.0
Crude matter (ex food/fuel)	0.6	0.7	6.2	7.8
Mineral fuel	3.7	5.6	47.6	24.7
Animal veg oil etc	1.0	0.1	0.0	0.1
Chemicals	5.3	6.1	4.4	13.8
Manufactured goods	39.3	44.9	2.6	9.4
Machinery/transp equip.	27.2	23.1	1.7	3.7

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed May, 2012)

Turkish construction equipment exports to Africa increased sharply, from \$8m in 2000 to \$264m in 2011. Machinery for mineral crushing was the largest category of equipment exports followed by civil engineering plant (Table 55).

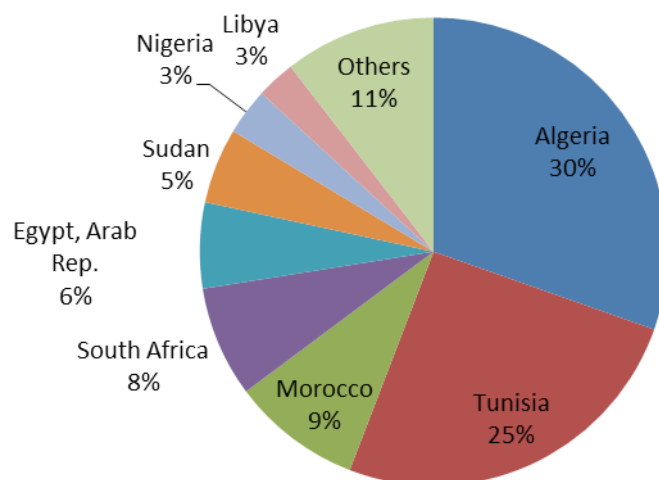
Table 55: Turkey's exports of construction equipment to Africa in \$million (2000-2011)

Equipment	2000	2005	2008	2011
Machinery nes - minerals	2	17	62	119
Civil engineering plant	1	10	48	61
Mechanical handling equipment	3	12	34	46
Wheeled tractors	2	10	44	38
Total	8	49	188	264

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/>> (accessed July, 2012)

The major export destinations for Turkey's construction equipment in 2011 were Algeria (30%), followed by Tunisia (25%) Morocco (9%) and South Africa (8%). Turkish construction equipment exports carry a heavy bias towards north African countries, accounting for more than half its exports to the continent in 2011 (Figure 23).

Figure 23: Major destinations of Turkey's construction equipment in 2011



Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

As a source of construction equipment imports, Turkey accounted for less than 6% for any of its trade partners. Algeria imported 5% of its construction equipment needs from Turkey in 2011. Between 2000 and 2011, Turkey did not shown major growth as a source of construction equipment imports in any African economy (Table 56).

Table 56: Share of Turkey in country's import of construction equipment (2000-2011) (%)

Importing Country	2000	2005	2008	2011
Africa	0.5	0.8	1.0	1.7
Algeria	0.3	1.5	2.5	5.4
Egypt, Arab Rep.	1.5	2.0	1.2	2.0
Ghana	0.0	0.0	0.2	1.1
Senegal	0.0	0.8	0.2	1.0
Ethiopia	0.0	0.3	0.6	0.9
South Africa	0.1	0.4	0.7	0.7
Tanzania	0.0	0.2	0.2	0.6
Malawi	0.0	1.3	0.1	0.5
Botswana	0.0	0.0	0.0	0.2

Source: calculated from COMTRADE via WITS data online < <http://wits.worldbank.org/wits/> > (accessed July, 2012)

Turkey's involvement in infrastructure in Africa

The strength of Turkey's construction sector is reflected in a substantial level of activity globally. Turkish contractors had by the end of 2007 completed over 3,000 projects in 70 countries across the globe, valued

at \$105bn. Africa has been a disproportionately large market for the Turkish industry, accounting for 22% of the total (Ozkan, 2010). Table 56 highlights some of the major construction projects undertaken by Turkish companies in Africa.

The stock of Turkish FDI in Africa was more than \$5bnn in 2011, with Turkey placed among Africa's top five emerging investing partners along with China, India, Brazil and Korea. The Turkish International Cooperation and Coordination Agency (TIKA) was established in 1992 to provide development assistance to developing countries. Currently it has three coordination offices in Africa (Addis Ababa, Khartoum and Dakar). Turkey has steadily increased its aid to Sub-Saharan Africa in recent years, rising from \$10m in 2000 to \$30m in 2010. However, as a proportion of its global ODA, Africa's share fell from 18% to 7% between 2003 and 2009, largely because of the substantial increases in its ODA to other regions. Among African countries, Ethiopia, Kenya, Somalia and Sudan were the largest recipients of Turkish assistance in 2009. In SSA, Turkey's development assistance is mainly focused on capacity building and supporting social services. In 2009, 20% of its bilateral aid to the region was disbursed in the form of technical assistance (UNCTAD 2010)

Turkey has not set specific development assistance targets for SSA, but it has launched an official policy towards the continent in the Turkey-Africa Partnership Joint Action Plan for the period 2010-14. The plan focuses on an improvement in Turkey's relations with the African Union, regional economic communities and individual countries on both bilateral and multilateral platforms.

Turkish aid to Africa has been concentrated mainly in north African countries and parts of the Horn of Africa, mainly Somalia. In 2008, the main recipients of Turkish aid in Africa were Sudan (\$13m), Somalia (\$7m), Mauritania (\$4m) and Ethiopia (\$3m). In Somalia, Turkish aid has concentrated on infrastructure for water supply and the renovation and rehabilitation of an airport in the capital Mogadishu.

There are fourteen recorded cases of Turkey's involvement in Africa's infrastructure sector since 2000 (Table 57). Reflecting the expertise of its developed construction sector, Turkish firms are active in airport construction and in the oil sector. There are also two cases of involvement in social infrastructure. Thirteen of these projects reflect Turkish firms winning open tender.

Two of the fourteen recorded projects involve the construction of infrastructure specifically to meet the needs of the oil infrastructure sectors, the remainder are targeted at the economy at large. There are no recorded cases of bundling.

Table 57: Vector and sector of Turkey's participation in African infrastructure

Type of project	Aid or Loan	Open Tender	Total
Roads	0	1	1
Power	0	2	2
Oil Infrastructure	0	2	2
Airports	1	4	5
Water and Sanitation	0	2	2
Housing	0	2	2
Total	1	13	14

Examples of Turkish construction projects in Africa

Aid to Aden Adde International Airport in Somalia

Aden Adde International Airport, formerly known as Mogadishu International Airport, is the international airport for Mogadishu, the capital of Somalia. Originally a modest-sized airport, the facility grew considerably in size in the post-independence period after successive renovation projects. After an investment hiatus, large-scale rehabilitation of the airport, mainly supported by the Turkish government, resumed in 2008. This included the provision of a modern control tower, a new terminal, an upgraded runway, a new fuel depot and power station, and new aircraft hangers. The road connecting the airport and the Villa Somalia, the seat of government, has also been repaired. Together with improved management, these rehabilitation efforts have helped increase the number of flights handled by the airport and humanitarian aid flights bringing in food and medicines are now able to come into the country with relative ease. The cost of these improvements was \$150m. In addition to the renovation of the airport, Turkish aid has supported the construction of two hospitals in Mogadishu, the rehabilitation of schools and the construction of community water supply systems. Street lights on many roads of the capital have also been restored with Turkish assistance.

Tekfen Group and Infrastructure Development in North Africa

The Tefken Group is a publicly traded cooperative group consisting of 49 companies and seven partnerships operating in the areas of contracting, agro-industry, real estate development and banking. In 2009 it had outstanding projects valued at \$1.33bn, operated in 10 countries on three continents and employed over 16,000 workers. Ranked by the Engineering News Record as the 75th largest contracting company in 2008, Tefken has considerable competence in industrial and infrastructure contracting. The company is currently involved in a number of turnkey infrastructure projects in North African countries like Libya, Morocco, Tunisia and Algeria.

In 2005, the Manmade River Authority of Libya awarded the contracts for Libya's water transmission scheme to Tekfen. The company will initiate and complete the 380 km Al Khufra-Tezarbo Water Conveyance System. The project will convey water extracted from the Sahara Desert to residential areas on the Mediterranean coast. Tekfen's contract constitutes 67% of the \$502m project. The project was temporarily halted due to unrest in the country in 2011.

At the end of 2010, Office Cherifien des Phosphate (OCP), Morocco's largest company and producer of phosphates (the country's principal commodity export) awarded two major projects to Tefken. The first was the ERC project to construct a pipeline to carry phosphate slurry from Khouribga to the port of Jorf Lasfar. The first project for the pipeline which includes storage and pumping facilities, was planned for completion in 2012 at an approximate cost of \$450m. This project will employ 1,500 people. The second project consists of the construction of two Diammonium Phosphate (DAP) fertilizer plants, each of 850,000 tons/year of capacity. Estimated at a cost of \$170m, it was scheduled for completion in 2012.

Table 58: Construction and infrastructure projects being undertaking by Turkish companies in Africa (2000-2012)

Turkish Company or Institution	Country	Project Investment Comments	Value	Year
Tekfen Construction Company	Morocco	Modernization of Morocco's Samir Refinery	\$680m	2010
		Highway project in Algeria		
		Construction of Phosphate slurry pipeline and two Diammonium Phosphate (DAP) fertilizer plants	\$6200m	2010
	Libya	Al Khufra-Tazerbo Water Conveyance system	\$500m	2005
Sinpas Construction Company	Algeria	Real estate investments	\$160m	2011
GAMA	Libya	Construction of Power Plant for the General Electricity Company of Libya.		2007
TAV Construction	Libya	Tripoli Airport Terminal Building Construction Project was awarded jointly to TAV and Odebrecht	\$654m	2007
		Upgrading of the Sabha Airport	\$140-500m	2007
	Egypt	Cairo International Airport TB3 Passenger Terminal Building	\$493m	2004
	Tunisia	New Enfidha International Airport Project.	\$555m	2009
ENKA	Libya	Completion of Various desalination and portable water pipeline projects for Libyan Electric Company		2009
		Construction of Turbine generator groups		2010
	Multiple countries	Construction of the US Embassy buildings in Cameroon, Mali, Guinea, Sierra Leone and Algeria		2000
Government	Somalia	Renovation Aden Adde International Airport in Mogadishu and Ancillary project	\$150million	2011

Annex

Equipment included in Construction and Mining Equipment Machinery

Civil engineering plant	Machinery nes - minerals	Mechanical handling equipment
Bulldozers/graders/etc	Mineral sorting etc machine	Goods trucks/tractors/et
Mechanical shovel/excavators	Mineral crushing etc machine	Pulleys/winches/capstans
Earth-moving/boring equipment nes	Mineral mixing, kneading machine	Cranes/crane trucks
Construction/mining machines nes	Mineral moulding etc machine	Vehicle jacks/hoists
Earth moving mach parts	Parts of machinery	
Wheeled tractors		

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