

Commodities and Linkages: Meeting the Policy Challenge

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MAKING THE MOST OF COMMODITIES PROGRAMME

Like many other developing economy regions, Africa is benefitting from a sustained boom in commodities prices. Received wisdom has been that commodities production is an inherently enclave activity and that it undermines the viability of industry. The Making the Most of Commodities Programme challenges this negative view of the commodities sector. It's research analyses the determinants of backward and forward linkages, identifying policy responses which will broaden and deepen them. In so doing it contributes both to achieving sustainable growth and the spreading of benefits to a wider population. By incorporating younger researchers, building a research network, and dialogue with policymakers, the MMCP also seeks to build analytical and policy capacity, and to influence policy outcomes.

The MMCP focuses on a diverse range of commodity sectors in a number of African economies, as well as on key infrastructural determinants of effective linkage development. A number of common factors are identified which will increase linkages beneficially and which lend themselves to policy intervention - the role of ownership, the nature and quality of infrastructure, the national system of innovation, spillover of skills to and from the commodities sector, linkages in regional economies and the nature and consistency of policies directed towards the commodities sectors.

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13. *'Commodities and Linkages: Industrialization in Sub Saharan Africa'*, Mike Morris, Raphael Kaplinsky, and David Kaplan
14. *'Commodities and Linkages: Meeting the Policy Challenge'*, Mike Morris, Raphael Kaplinsky, and David Kaplan

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<http://commodities.open.ac.uk/discussionpapers> or www.cssr.uct.ac.za/prism/publications

Abstract

The results of detailed empirical enquiry into the nature and determinants of the breadth and depth of linkages in and out of the commodities sector in eight SSA countries (Angola, Botswana, Gabon, Ghana, Nigeria, South Africa Tanzania, and Zambia) and six sectors (copper, diamonds, gold, oil and gas, mining services and timber) has shown extensive scope for industrial development (MMCP DP 13, 2011). A primary conclusion of this research was that policy in both the private and public realm was a prime factor holding back the development of linkages. Addressing this problem requires the closing of three sets of misalignments between policy and practice – within the corporate sector, within the public sector, and between the public sector and other stakeholders involved in linkage development. In addition, specific policies need to be developed, monitored and implemented in relation to the three contextual drivers of linkages from the commodity sector – skills and capabilities, infrastructure and policies towards ownership.

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FOREWORD

Making the Most Commodities Programme (MMCP)/Africa results from a unique, cross-cutting collaboration by the University of Cape Town and the Open University with the International Development Research Centre (IDRC). The MMCP builds and consolidates on other IDRC supported research on Asian Drivers and their relations with Africa by expanding the research program to focus on the growth and boom in global commodity demand. The resulting data and analysis provided opportunities for vibrant and high quality capacity building processes which was an integral part of the core research process, as is evidenced in the various Discussion Papers.

These discussion papers offer new information that will help Sub Saharan African (SSA) countries to maximize the potential linkage opportunities emanating from the production of commodities so as to promote sustainable industrial growth, and ensure widespread access to the fruits of this growth. The analysis will help decision-makers integrate and target efforts to increase the returns from extractive natural resources and promote mutual benefits between partner countries. The findings are aimed at academics, policy makers and high level technical officers working on African industrialisation, including those focusing on Asia-Africa trade relations. The findings have also enhanced our understanding of the dynamics that SSA countries experience in management of their natural resources and the significant threats these pose to their governance, macroeconomic management, and industrial development. The MMCP also makes recommendations for developing countries to incorporate into local and regional decision-making and how governments can respond to development challenges associated with natural resources. This publication therefore encapsulates an area of critical importance to resource rich, but often poor, countries in SSA.

The MMCP's approach, based on innovative ideas and integrated research, created exceptionally strong links with industry and public stakeholders, hence the potential for widespread application in other developing countries. These final synthesis discussion papers ensure that decision-makers in Africa have the appropriate tools and information to minimize the potential costs of the boom in commodities prices and to maximize the opportunities to build industrial linkages to lead commodity producers. In achieving these objectives, the team applied a distinctive and innovative policy dissemination process. This involved taking the research results and policy proposals to forums where policy makers were present, not just in Africa, but in the UN system and the International Financial Institutions in Europe and North America. In doing this they contribute to a policy agenda which will ensure that new opportunities for SSA commodities will not bypass decision-makers, and countries will not have to lose significant amounts of wealth as new natural resources are exploited. The MMCP process has also played a major role in capacity development in SSA – in total seven of the young researchers in this project will have obtained their PhDs as a direct consequence of their participation in this programme. Moreover, links have been established with research institutions across the continent which will no doubt endure in future research collaborations.

I am confident that the information contained in this document will assist SSA countries to develop strategic responses to the boom in commodity prices and improve the management of their natural resources. I therefore hope that decision-makers will see the value of the analysis and apply the findings to inform future decisions. On behalf of the International Development Research Centre (IDRC), I wish to extend our sincere thanks to the lead researchers involved in this effort, the University of Cape Town and the Open University, as well as all participating institutions and stakeholders that contributed to the development of these Discussion Papers.

Paul Okiira Okwi, *Senior Programme Officer, International Development Research Centre*

INTRODUCTION: THE BACKGROUND

The strengthening of the industrial sector lies at the heart of the development agenda. The success of China and other emerging economies in expanding their manufacturing sectors and enhancing their economic growth rates over the past two decades is suggestive of the fruits to be obtained from this development path. However, the challenge facing many developing economies in promoting industrialisation in the modern era is a complex one. On the one hand, the foundations of the success of China and other newly emerging economies were built on decades of import substituting industrialisation. This route to promoting industry is now heavily restricted by the trade-policy liberalisation which has accompanied deepening globalisation. On the other hand the export-intensive route which has underwritten the success of the first- and second-tier Asian economies is circumscribed for new entrants precisely because of the success of China and other successful exporting economies. Global markets for manufactures are now intensely competitive, making it not just very difficult for new entrants in external markets, but also in competing with imports in their domestic markets.

In recent years, commodity exporting economies have benefited greatly from a sustained increase in the price of their exports and there are reasons to believe that commodity prices will remain robust in the medium-term, and perhaps in the long-term too (Morris et al, 2011a). There are great dangers to relying on these resource rents. The capital intensive nature of many commodities sectors limits employment and concentrates income, thus often confining the fruits of exploitation to a narrow segment of society. Moreover, despite the confidence which these economies may justifiably have in sustained high prices for commodities, prudence dictates that a diversified economy is more robust and less vulnerable to the shocks which confront monoculture economies, particularly in the commodities sectors which have experienced, and will almost certainly continue to experience severe price volatility. One route to industrial development in these commodity exporting economies arises from the possibilities of building linkages into and out of commodity production. It is this agenda which the Making the Most of Commodities Programme addresses.

In Discussion Paper 12 (Morris et al, 2011a) we set out the reasons which lead us to believe that linkage development from the commodities sector – particularly with regard to backward linkages – needs to be looked at in a new light. We argued that in the current era of globalisation, the strengthening of linkages to the commodities sector presents an important and attractive avenue for industrial development. In particular we challenged the conventional wisdom in the Resource Curse literature that the exploitation of commodities undermines the viability of industrial activity. We observed that the association between low levels of industrialisation and high dependency on commodities was to a significant extent determined more by the absence of capabilities in commodity-dependent economies than by the inherent conflict between the simultaneous and synergistic expansion of both sectors. We drew this conclusion both on a basis of a review of historical evidence in economies such as Australia, Sweden, Norway and the USA, and an understanding of the factors driving outsourcing in the modern transnational corporation. In this latter respect we argued that contrary to the widespread belief that commodity-exploiting lead producers sought to promote enclave import-intensive activities, the reality is

that lead commodity firms have strong incentives to increase the level of outsourcing in general, and near-sourcing in particular in their non-core activities. This provides a substantial opportunity for a win-win alliance between lead commodity firms, existing and potential suppliers, national governments and supporting institutions.

In a previous Discussion Paper 13 we reported our research findings based on detailed primary research undertaken between 2009 and 2011 by a group of African researchers working to a common methodology (Morris et al, 2011b). We reported on the extent and determinants of linkages in and out of the commodities sector in eight SSA countries (Angola, Botswana, Gabon, Ghana, Nigeria, South Africa Tanzania, and Zambia) and six sectors (copper, diamonds, gold, oil and gas, mining services and timber). In addition to these sectoral studies, we undertook two sets of studies on infrastructure in order to highlight the role which this sector plays in both vertical and horizontal linkages into the commodities sector. The first of these two studies was on the Central Corridor in East Africa. The second focused on Chinese firms operating in infrastructure in Angola and their propensity to source inputs locally. We also commissioned a study on the determinants of linkages as seen from the perspective of the mining companies.

In summary, based on our comparative analysis we concluded that six factors helped to explain the breadth and depth of linkage development from the commodities sectors.

First, we observed some signs of progress in linkage-development, particularly with regard to backward linkages. Even in Tanzania, perhaps the weakest performing economy in our sample, the pressures for, and the desire to promote linkages show notable signs of development in recent years. Other economies, notably Botswana and Nigeria, are moving forward at a more rapid pace. But not all African countries are moving forward, and there are signs that to the extent that there is movement in the pattern of linkages in South Africa and Zambia, this may be a regressive rather than a progressive movement.

Second, although there are widespread signs of growing linkages from the commodities sector, looking under the surface often reveals that it is the breadth of linkages (the percentage of spend which is local) rather than the depth of linkages (the accretion of local value added) which is expanding most rapidly. In the most extreme cases – for example the “suitcase businessmen in Zambia” and the provision of basic general goods in Angola – the major consequence of outsourcing is to (inefficiently) move the import function from the lead commodity producing firms and first-tier suppliers to small scale local entrepreneurs. But this is not always the case, since in other countries (for example South Africa and increasingly in Nigeria), local linkages also show considerable local value added.

Third, as we postulated in our opening analysis, there are some *generic* drivers which explain this pattern of linkages in all sectors and contexts. Many commodity lead-firms have indeed made the strategic decision to increase outsourcing. This is in response to local content legislation and CSR pressures but also because they no longer wish to take responsibility for what they consider to be non-core operations. Another generic factor is that the possibilities for linkage development very much reflect sectoral and technological characteristics. Whilst almost all commodity

production will involve the provision of similar products (such as fresh food and other consumables), producing equipment for offshore oil extraction in Angola provides much greater challenges than does the provision of fresh meat and vegetables to sustain mine workers in Tanzania. Further, there are important differences between economies, as exemplified in the different operating conditions which gold-mining lead commodity producers find themselves operating in Ghana, Tanzania and South Africa. A final generic factor is the passage of time. Those economies with long-lived commodity sectors show deeper levels of linkage development, again as evidenced in the contrast between gold-mining in these three economies.

Fourth, there are a series of *contextual* drivers which explain linkage-outcomes in particular circumstances:

- Skills and the ensemble of institutions which affect the development of firm-level and sector-level capabilities “shouts out” in all of the country-studies as being the single most important determinant of linkage development. This of course reflects a global challenge in an increasingly knowledge-driven world, but its affects are particularly acutely felt in Africa’s commodity sectors. They are an important factor explaining why outcomes differ in the same sector in different economies, for example in the provision of knowledge-based services into the offshore oil industries in Angola and Nigeria.
- The nature of ownership affects linkage development. Lead-firms from different countries and selling into different countries appear to operate in different ways. Linkages from Chinese firms are particularly distinctive. In Zambia their investment expansion has been countercyclical, diminishing the harmful impact of market slowdown on suppliers. On the other hand they provide no support to their suppliers. In Angola, Chinese SOEs rely almost entirely on Chinese suppliers, although some of these have relocated to Angola. In general, local content in these SOE-related investments is very low, in part as a consequence of China’s “aid” package (which is heavily tied to the purchase of Chinese inputs) and in part as a result of the Angolan government to achieve speedy results. There are, however, signs that the sourcing criteria of some Chinese investors (notably Chinese private companies) may be converging with those of northern investors. Another major ownership factor is the differential role played by national and foreign suppliers and customers in the commodity value chains, as a general finding, there are strong pressures for local suppliers to be owned by nationals. This has resulted in a pervasive trend to conflate local value with local ownership. In some circumstances indigenisation of ownership has not only substituted for localisation of value added, but has even undermined the development of local linkages, as in the case of Zambia where the outsourcing of importation to “suitcase businessmen” has eroded the position of established local suppliers.
- Infrastructure emerges as a significant contextual driver in the development of linkages. This has particular relevance in the case of backward linkages, most notably in the way in which poor roads undermine the capacity of local suppliers to feed into the Tanzanian gold mines which are some distance from areas of settlement and industry, and in Gabon where the reliance on rivers influences the product mix of exports. But it is not just hard infrastructure

which impedes linkage development, since the efficiency with which logistics operate also has a bearing on linkage development. Botswana and South Africa are two economies which show how effective soft infrastructure such as business support and trade facilitation can be in the promotion of linkages.

- Not surprisingly, policy is critical as a contextual factor explaining the breadth and depth of linkages. It has pervasive impact not just in regard to the commodity sector itself, but on the contextual of ownership, skills and infrastructure. We believe that it is the single most important factor determining the trajectory of linkage development in SSA's commodities sectors. Bluntly-speaking, some countries do this well. Botswana is perhaps the exemplar here, although it is still too early to tell whether this focus and strategic integration will endure and whether it will achieve competitive advantage in the future. At the other extreme are Tanzania and Gabon, where the policy framework acts to impede linkage development. But even in the cases where policy functions well, there is scope for improvement.

A fifth major conclusion which we draw from our empirical studies is therefore that there is considerable scope for enhancing linkage development. This entails both the broadening and deepening of linkages. Linkages are best affected where there is a coherent vision for linkage development, supported by joined-up policy instruments which embody both incentives and sanctions to foster linkage development. This applies to both firms and government. In turn these visions and policies need to be backed by appropriate skills, effective institutions and by the will to make a positive difference. There is a great deal of well-meaning lip service paid to the promotion of linkages in all of the countries where we undertook research. However, our analysis has shown that this is seldom backed by appropriate actions, and it is this which explains the sub-optimal pace of linkage development.

Finally we concluded that the gap between rhetoric and performance arises from a series of misalignments. First, within value chains, lead-firms often fail to back up their strategic commitment to broadening and deepening linkages with appropriate institutional structures. We observed very few cases of the supply chain development functions which characterise many of the leading global manufacturing sectors (such as autos and electronics) and global retailing. Secondly, there is a similar misalignment between governments' stated objectives on linkage development, and the institutions and structures which are available to promote linkage development. Too often government industrial policy is misdirected and hence constrained in being able to harvest 'low hanging fruit' (for example, supplies which are either available locally at lower acquisition costs than imported supplies, or at costs which are close to the cost of imported supplies) and assist supplier firms to build their capabilities so as to enter lead commodity producers supply chains. Similarly, and particularly in the soft commodities sectors, there are missed opportunities on the processing side of resource extraction. In the most extreme cases, government confuses indigenisation with localised value added. Another area of policy misalignment is that support for linkage development is often the responsibility of the ministry which oversees the commodities sector rather than where it belongs, that is the ministry responsible for the development of industry and services relevant to the commodities sector. Thirdly, a final area of misalignment is the pervasive failure of governments, lead-commodity firms and other actors in the commodity value chain to work together with suppliers

and processors to build strong linkages. International experience suggests that this misalignment is perhaps the single most important factor constraining the further development of linkages,

Thus, we have observed discernible signs of progress in the extension of linkages from Africa's commodities sectors. But we have also observed areas of misalignment and thus where there is considerable scope for further development. Even in the best cases, there is room for improvement, allowing Africa to make the most of the commodities boom. What actions need to be taken to allow this potential to be realised?

POLICY RECOMMENDATIONS

Our policy recommendations flow from the conclusions outlined in the previous section. We first deal with the three general issues of *misalignment* identified – misalignment in the corporate value chain, misalignments in government policy and strategy, and misalignment in the government and the various stakeholders involved in commodity production and linkage development.

This is followed by recommendations focused on the *contextual* drivers identified - skills and technology, infrastructure and the different modalities of ownership. These recommendations focus on the major binding constraints to effective policy implementation that seeks to utilise commodity abundance for a path to industrial development through linkage development. We have attempted to avoid a shopping list of wishful recommendations, and instead have focused on big-ticket prioritised proposals. These proposals do not necessarily have to be followed sequentially. However if the major policies are not implemented then detailed policy initiatives are unlikely to be effective. Finally our policy recommendations are not meant to be read as a *manual* setting out detailed steps. Rather they are a framework setting out the architecture of a policy and a broad strategic direction.

1. Misalignments within the Corporate Sector, Government and between Public and Private Sector

Linkage development is by definition about achieving optimal and best-fit alignment between the commodity producers and their current and potential suppliers and the processors of their output. It is about extending the scope of such alignment by growing the scale, range and depth of domestic capabilities. It is about putting into place visions, policies, strategies and implementation plans to bring about the systemic competitiveness of any particular commodity value chain.

We observed a pervasive and serious misalignment between institutions, visions, policies, strategies, both within and between the private and public domains in African countries exploiting commodity advantage. These misalignments can be observed at a variety of levels: between various governmental policy initiatives, between different departments in government, between government policies and implementation initiatives, between corporate visions and their supply chain and customer development strategies, between corporate buyers and their procurement strategies, and finally between government and the private sector.

We start with the misalignments within the corporate sector. As is apparent from our previous analysis, in this era of globalisation significant power lies with the corporate drivers of the commodity value chain. If linkage alignment is not secured within the terrain where production and value is located, then government is severely constrained in its ability to secure the necessary cooperation between the various stakeholders to create a linkage based industrialisation path.

1.1. Corporate policy to foster commodity linkages

Lead commodity producers have a substantial interest in creating a locally based outsourcing platform within their value chains. Infrastructural and logistic complications in ensuring reliable and continuous flow of inputs favour localised linkages. However, our analysis shows that these lead commodity producers are often much weaker than their global counterparts in industry and retail in developing the necessary corporate vision and implementation strategies to drive the necessary alignments, both within their supply and customer chains.

In some instances there are mining companies and oil firms that are simply not interested in expanding the scale of their local suppliers or upgrading them through supplier development programmes. They are instead focused purely on short term price decisions or upgrading upstream and downstream linkages in their host countries. In other instances lead commodity producers are still imbued with an institutional memory of vertical integration, enclave existence, and import dependency. They do not have a coherent, long term vision of creating reliable and competitive local industrial and community linkages. Insofar as the top levels of management articulate a vision in discourse, it is seldom fleshed out, coherently organised, and driven through the lower levels organisation as a corporate vision statement. Many corporates in this sector therefore do not have clearly articulated framework policies to engage with their suppliers, customers and government to build local linkages.

Moreover, some who do have declared policies do not know how to go about operationalizing them. One reason why this occurs is that there is often a dislocation between corporate visions/policies and their buyers/procurement managers who are posted to the mines or oil-extraction sites on short-term cycles. These buyers/procurement managers lack the practical knowledge of developing a sustained supplier base and seek the easy way out of procuring necessary supplies by importing from who they know best in their home country.

Our recommendations are grouped in order to ensure a sequenced, prioritised process of strengthening strategic alignment within the corporate sector:

A Corporate Vision

- The lead commodity producer requires a clearly articulated vision statement setting out its corporate vision for extending and deepening local linkages and community involvement.
- This vision statement must be driven from the very top of the organisation all the way down so as to ensure that lower levels of management (especially the

procurement managers and buyers) have bought into all its principles and practical aspects.

- The vision statement should be prominently displayed and made available so that domestic suppliers and customers and local communities are fully aware of the corporate commitment to local linkage development

Internal Corporate Strategies

- The corporate vision has to be translated into specific supply, procurement and customer development instruments within the lead firm. If these internal administrative procedures are not set out clearly, and reflected in specific internal organisational structures, their external relationship with suppliers and communities are likely to be half-hearted and marginalised within the corporate structure. Lower level management charged with running the daily operations of the corporate lead firm cannot be expected to break with old tried and trusted practices without senior management assisting them to develop clear, practical, and codified programmes, and monitoring the results of these programmes, and without this being written into their job responsibilities. These internal programmes need to have clearly articulated incentives and sanctions to ensure implementation.
- In regard to hard and soft commodities which entail large, capital- and technology-intensive investments, procurement patterns are established at the mine development stage. It is thus critical that the programme for linkage development be explicitly incorporated when the investment is being planned, and when it is commissioned.
- All strategies require specific and effective monitoring and evaluation programmes to test the success and failure of their supply chain development
- Internal training programmes for procurement managers, buyers and customer development should be instituted so as to ensure that they break from old, easier to implement, importing policies.

Strategies to engage externally with suppliers, customers and public sector

- Internal procedures should be translated into specific and detailed programmes aimed at local suppliers and communities. They need to be articulated in specific, codified, and transparent supply chain and customer development instruments. The detail of such procedures, programmes and instruments are well articulated and set out in the supply chain, community development, and corporate social responsibility literatures. They are detailed in numerous manuals on the subject and can be customised to the specific environments of a particular commodity producer and country context. Aligning a lead commodity firm's supply chain and community development programmes with public sector support programmes provides not only access to public sector financial support for their suppliers, but also provides an important element of legitimacy.

(See Box 1 which exemplifies some of the issues discussed above.)

Box 1. Supply chain development - Nigerian oil and Zambian copper industries

Three quarters of the oil companies in Nigeria had developed supply chain development programmes. They implemented these in-house rather than through international organisations. These involved various degree of vertical cooperation with their suppliers. These were aimed at: assisting them, occasionally or continuously, to improve product quality, ensure better delivery times and supply reliability, develop quality assurance systems, cooperation in technical upgrading and labour training, and meeting various standards. This facilitated upgrading processes within the supply chain, especially in the terms of process and product upgrading, with local firms investing in upskilling and new capital equipment.

In Zambia, Northern and South African copper mining companies engaged in both informal and formal types of cooperation with local suppliers. Informal cooperation, for example, targeted logistics: the mining companies contracted a transport and logistics company to carry goods to the mines, from few collection points. Suppliers only had to deliver the goods to the nearest collection point, located in the main Zambian towns and in South Africa. For smaller suppliers, with limited or no fleet, this arrangement enabled a reduction in transport costs and in lead times. Another important area for cooperation was the provision of Forward Purchasing Agreements (FPAs) and advance payments. Forward Purchasing Agreements tied buyers to purchase an agreed amount of goods or services from the supplier, for a relatively long-term. This relationship was based on reciprocal trust. Buyers had to trust that suppliers would meet short lead times, while suppliers had to trust that buyers would place orders as per agreed quantities. As one buyer put it, the contract had to be respected, to ensure that 'you don't kill your suppliers'. This type of relationship was critical to sustain upgrading processes as suppliers used FPAs as a basis for investment. This, as well as advance payments, enabled suppliers to overcome constraints in accessing capital markets. One mine consistently assisted suppliers to develop internal quality assurance systems. Local suppliers were helped to identify and address bottlenecks in their quality management system, increasing their firm competitiveness.

Oyejide and Adewuyi (2011) and Fessehaie (2011)

1.2 Government policy to foster commodity linkage

Many African governments do not recognise the potential of the commodity sector for developing linkages and hence providing a platform for an industrial growth path. There remains an ingrained and institutionalised suspicion of the commodity sector in general and of the generally foreign-owned firms driving this sector in particular. Governments also tend to see the commodity sector primarily as a source of fiscal rents. Even where governments recognised the potential importance of the commodity sector for development, they often lack the political will and capacity to act. There are very few instances in Africa where government has developed a coherent industrial policy for the commodity sector to ensure an industrial growth path through the development of linkages to its oil fields, mines or plantations. This has often resulted in a vicious circle in which government policies reinforce the enclave nature of commodity extraction and then conclude that as a result of the absence of linkages, there is nothing which can be done to promote linkages.

In setting out a framework for creating alignment between government policy and the commodity sector, we follow a similar architecture as previously used in respect of the corporate sector.

A Government Vision

- Government should develop and articulate a clear policy vision for the commodity sector and its role in building industrial linkages within the country's economy. This vision should be clearly focused on setting out a growth path which is based on developing and supporting backward and forward linkages to the main commodity sectors dominating the domestic economy.

Government practices and policies

- The linkage based growth path requires the development and articulation of an industrial policy based on this strategic direction. By industrial policy we refer broadly to the range of governmental policies that enhance manufacturing and service capabilities and provision.
- Effective implementation of this policy will require a high-level "champion" within government with sufficient authority to ensure that the support necessary will be forthcoming from the relevant ministries and institutions of government.
- Policy can only be effective if the institutional arrangements within government are strategically directed and appropriately aligned. Where there is a ministry responsible for business development, this ministry, as opposed to a department of energy and minerals should drive an industrial policy focused on developing backward and forward linkages to the commodity sector. Likewise if an investment promotion agency has industrial development as part of its mandate then it must be able to implement strategies directed at suppliers in the commodity sector. Targeted and joined up government is an essential prerequisite for a successful linkage based industrial growth path.
- Industrial policy can only be effective if the public servants that implement it are sufficiently qualified and trained to do so effectively. Government has therefore to prioritise the building of internal capabilities to ensure this.

Aligning government policy with external stakeholders

- A linkage based industrial policy should have clear and detailed strategies and instruments directed at assisting firms engaged in backward and forward linkages to the commodity sector. These strategies should be aimed at assisting firms to harvest 'low hanging fruit', to build capabilities, and to provide technical assistance to increase competitiveness of local suppliers. Strategies should specify clear and detailed programmes providing financial, human resource, technology, and training support. Lead commodity firms can also better pursue a supplier development path if they are able to link their suppliers and customers into well developed government frameworks.
- If government is to ensure that these policy instruments are effectively driven down through lower levels of the various departments and institutions responsible, as well as firms that are recipients of support, then they must

incorporate clear incentives and sanctions to make them effective in meeting these goals.

- If programmes are to have long term sustainability, mistakes rectified and success built on then they have to be accompanied by rigorous monitoring and evaluation procedures to identify failure and success.

(See Box 2 which exemplifies some of the issues discussed above)

Box 2. Financing SMEs to expand upstream linkages in Nigeria

In order to address the challenge of accessing the financial capital market for local SMEs, Nigeria has addressed this issue in a manner complementary to the local content policy provisions. The Nigerian Content Support Fund (NCSF) was established in 2006 at the instance of the Nigerian National Petroleum Corporation (NNPC) with active participation of the banking industry. The \$350 million fund is designed to support local supplier companies with working capital and medium to long term financing, prioritising procurement and fabrication, engineering, and construction services. Moreover, the Nigerian Oil and Gas Industry Content Development Act 2010 established the Nigerian Content Development Fund (NCDF), aimed at building the capacity and capability of indigenous oil and gas operators. One per cent of every contract awarded in the oil and gas sector is paid into NCDF and the fund has the potential to accrue up to \$150 million annually. The alignment of local content provisions with expansion of funding opportunities for national SMEs was critical in enabling Nigeria to raise its local content from 5% in 2004 to 35% in 2010.

Otti (2011)

1.3 A public/private partnership to foster linkages

A necessary condition for linkage development to occur is creating alignment between government and firms in the private sector (lead commodity producers, suppliers and forward linkage firms) with the aim of developing a common vision, formulating a consensual policy, constructing aligned strategies, and securing resources to support linkage development. Public/private sector alignment is hence more than formulating substantive policies simply within the public and the private sector. It is fundamentally an issue of building a strategic alliance and institutionalising the appropriate process to ensure a consensual coalition of visions, strategies, priorities, and plans between the public and the private sector. This would incorporate the following:

- Create institutional forums(s) bringing together the key business and government stakeholders involved to drive common visions, strategies and implementation plans.
- The aim of this forum would be to firstly share information about government and corporate programmes to foster industrial linkages.
- On the basis of shared information, to identify a step-by-step process which would create focused, prioritised and sequenced activities. The initial focus should be the identification of “low hanging fruit” and the steps to be taken to build dynamic capabilities of potential suppliers

- Once these are agreed the strategic alliance would create business plans with clear budgets specifying activities, outputs, responsibilities and milestones.

(See Box 3 which exemplifies some of the issues discussed above)

Box 3: Strategic alliance between government and industry in Botswana

In Botswana, the government and private sector are cooperating effectively to build a local polishing and cutting industry. Government brought on board the lead commodity producer and the beneficiating companies. Access to diamonds is controlled by Debswana, owned by Government and De Beers, the latter exerting governance over downstream activities: distribution, marketing and indirectly, polishing and cutting and jewellery making. By bringing on board De Beers, it was possible to create a system of incentives for processors, determined by access to rough diamonds. As cutting and polishing firms relocated their activities to Botswana, they agreed to hire and build local skills. Thus, Botswana managed to align Government, De Beers and processors strategies for the creation of a cutting and polishing industry. In order to ensure that such public/private alignment supported the implementation stage of the linkage strategy, the Government set up two supporting institutions: the Diamond Office and the Diamond Hub. The Diamond Office aims at building strategic alliances, developing infrastructure and enabling a favourable fiscal regime in order to support diversification in the diamond industry. Cutting and polishing firms reported that the Diamond Office was 'very approachable and willing to listen to the stakeholders in the industry'. The Diamond Hub is tasked with facilitating the establishment of the industry by providing stakeholders with a one-stop service. To this end, it has a number of programmes in place to provide a favourable business environment with respect to tax regime, work permits, training programmes accreditation.

Mbayi (2011)

Beyond these various spheres of alignment, it is necessary to develop policies addressing the contextual drivers of linkages that we identified earlier. These are skills and technological capabilities, infrastructure and ownership. We now consider these in turn

2. Contextual Drivers

2.1. Skills Upgrading and Technology Capability Building

Many potential local suppliers and processors are generally well behind the international competition. They lack skills, technological capacities and the supportive institutions that would enable them to close the gap. Firm level expenditures directed to closing the gap will always be sub-optimal, a consequence of extensive market failure. Hence, public provision can potentially play an important role in meeting these market failures.

Skills shortages are ubiquitous throughout all African countries. They are a often a binding constraint and obstacle to the development of industrial linkages. Lack of sufficient and appropriate skills hampers local suppliers in upgrading firm level operational competitiveness, meeting technical requirements, instituting innovation, adopting world class manufacturing practices, and implementing successful supply chain and customer management programmes.

These capability gaps pervade all levels of the local economy – management operational and financial skills, knowledge of world class manufacturing and

manufacturing excellence, technical skills, artisanal skills, operator skills, and so on. They require corporate policies and interventions to upgrade training and skilling within and between lead commodity producers and supplier and processing firms, government interventions aimed at the upgrading of training institutions, as well as international programmes targeting specific skills such as manufacturing excellence. Supplier firms are often caught in a classic coordination problem – they cannot get into supply chains until their firms exhibit the necessary skills, technology and management capabilities, but they have great difficulty in acquiring these without being involved in supply chain programmes.

Clearly the problem of skills supply and skills gaps is a very broad one and refers to the general state of the educational system – primary, higher, technical, vocational and tertiary - in any particular country. However our proposals are focused solely on the industrial policy terrain and aimed at the skills upgrading and capability building of local firms and their personnel.

We identify these specific policy initiatives:

- **Information to address the problem:** Government cannot address this problem unless it has base-line information of the prevailing shortages and gaps in respect of skills needs and the future supply of these skills. A first and necessary step is to collate and gather the necessary information in a consolidated form.
- **Capability building of local firms:** There is ample evidence that local management lack the necessary financial and operational skills to enable them to reach and maintain sustainable levels of international competitiveness. Building management capabilities requires the provision of suitable courses/programmes aimed at upgrading the international competitiveness of supplier and processing firms. These can be focused on a variety of issues – understanding standards requirements of lead commodity producers, world class management techniques, financial and budgeting procedures, technology applications, etc). Such capability-building can take the form of general courses run by the external international or private sector bodies public sector institutions (e.g. IFC, UNIDO, etc) available to local suppliers.
- **Specific upgrading of the technical skills of key local staff:** Programmes aimed at expanding the availability of technical personnel, artisanal skills, and general engineering capabilities. These are the core of the higher level skills required to build a broad industrial base.
- **Upgrading of technology institutions and organisations:** We found little evidence of publicly funded institutions providing support to local firms attempting to enhance their technological capacities. In support of enhancing linkages, governments should give priority to the development of such institutions.
- **Skills transfer and training:** In a context of a severely constrained skill supply, firm level training to upgrade skills will suffer from high labour turnover. Firms will have a strong disincentive to train. Therefore there are strong

grounds for advocating government financial support for training. International best practice suggests that this should operate on a matching grant basis.

- **Skills importation:** Given the skill constraints and the long time lag in the education and provision of skills, in the immediate and short term it would be advantageous to allow the importation of scarce skills.

(See Box 4 which exemplifies some of the issues discussed above.)

Box 4. Capability upgrading to facilitate access to capital markets in Ghana

Renaissance Africa Group (RA) is a private Ghanaian investment bank. On the strength of past experience in the mining sector, RA took the strategic decision to develop indigenous Mining Services Companies (MSCs) in order to grow and diversify the bank's portfolio and to generate foreign exchange. Currently RA has a portfolio of ten offshore trade/project finance deals with eight Ghanaian MSCs. RA developed CALAG Capital, a US\$100m Mining Service Contract Financing Facility. Additionally, RA successfully prepared and procured two separate syndicated Mining Contract Financing Facilities of US\$60m each for two Ghanaian MSCs. Transcending the conventional boundaries of investment banking, RA prepares African MSCs to meet the credit requirements of potential lenders by upgrading their corporate management. MSCs face particular challenges which exclude them from the capital market. Ghanaian businesses are small-sized, with limited financial resources, technical and management capacities. Poor management, in particular, was found to be a consequence of many factors: a lack of competent professionals, lack of proper book-keeping, limited management of information. Firms tend to be owner-managed, which coincide with weak management systems and leads to governance issues, the quality of management depend on robustness of owners' value systems and technical competencies. Because they depend on unsophisticated funding sources (personal savings, family and informal loans, equipment hire and other expensive forms of indirect funding), they have weak balance sheets (under-capitalization, working capital deficiencies etc) and lack credible borrowing records, these firms are constrained by inappropriate funding, that is small, short-term loans instead of large, long-term ones.

When Ghanaian MSCs access the supply chain to the mining sector, they are confronted by two interrelated challenges: the capacity on the ground to deliver on new contracts and limited funding capabilities and possibilities. RA facilitates upgrading processes and prepares the companies for negotiations with financial institutions. RA fills the gaps in the MSCs' operational/management systems by helping recruit competent professional and technical teams, by providing advisory service during the tender and the negotiations with off-takers and equipment /service suppliers and by providing technical expertise in meeting the terms and conditions of the credit facilities as well as service contracts. RA intervention encompasses the entire contract project, from initial application to financial institutions through closure of the financing facility. In particular, it supports the due diligence process, a time-consuming exercise because firms hold incomplete records and sometimes fail to comply with regulatory requirements. During this process, firms need to be sensitized to the strict requirements of the international market in terms of evaluation of the borrowers' creditworthiness and soundness of its business model, and need to be assisted in addressing weaknesses in their internal organization.

Gidi (2011)

2.2. Addressing the Infrastructural Constraint

The pervasive inadequacy of infrastructure in Africa is a major constraint on industrial development. This is not simply a problem of hard infrastructure – such as roads, bridges, ports, railways, telecommunications and electricity - adding a massive cost premium being added on to local suppliers and processors. It also refers to often hopelessly inefficient, cumbersome, inappropriate and inadequate soft infrastructure. Poor infrastructure has a crippling effect on the ability of local suppliers to start enterprises, operate a successful business model, import inputs, supply competitively the lead commodity producers and first tier OEMs and to process commodities efficiently. The detail of infrastructural inadequacy in Africa, as well as the specific interventions to resolve this problem, is the subject of a large corpus of research, knowledge and policy advice. It is not our purpose here to replicate this. Rather we focus on a few general policy recommendations in regard to infrastructure provision that are pertinent to ensuring linkage development

- **Avoid enclave infrastructural projects** and programmes aimed only at satisfying the needs of the commodity producers. Development Corridors present an important example of how mining investment, infrastructural development and linkages development can go hand-in-hand (see Box 5).
- **Use commodity access to leverage favourable financing of infrastructure.** The provision of hard infrastructure provides significant linkage opportunities for local suppliers. Bilateral agreements in relation to infrastructure projects with commodity seeking countries/firms, such as the Chinese, need to be negotiated such that local suppliers will benefit from infrastructure projects.
- **Upgrade public sector infrastructure** which provides basic services so that local enterprises are not saddled with exorbitant cost premiums through providing private alternatives to public goods – for example firms having to buy petrol generators because they cannot depend on the reliability of the public energy utility.
- **Restructure institutions which provide soft infrastructure provision** to simplify and make the regulatory framework business friendly. Over-elaborate customs and immigration procedures slow up and raise the cost of imported inputs to an inordinate extent. Inappropriate regulatory frameworks penalise local suppliers and make the operational costs of starting and running a business uncompetitive.

(See Box 5 which exemplifies some of the issues discussed above)

Box 5. Making Development Corridors work

The experience of the Central corridor in Tanzania and the Mozambique's Zambezi Valley corridor throws up useful comparative policy experiences. Corridors and Spatial Development Initiatives represent positive examples of policy measures that create synergy between mining investment, infrastructure development and linkages with the domestic productive sector. The policy lessons from Tanzania and Mozambique are that corridor development has to take into account several factors:

- 1. Soft infrastructure is sometimes more important than hard infrastructure. Trade facilitation measures are found to be a major component of high transport costs in Africa. Bottlenecks in customs and other border procedures, inconsistent travel-related regulations and documentation across bordering countries need to be addressed to reduce the cost of doing business.*
- 2. Complementary measures are required for development corridors. Upgrading of services to local businesses and of connectivity between the agricultural regions and the corridor are critical to break with the past experience of enclave development. The alignment of public and private action should not only work for mining companies and national revenue authorities but also for networks of smaller-scale enterprises and their associated networks of customers.*
- 3. Policy, legislation and political will send the correct signals from policy makers to investors and enterprise owners. These are the platform for partnership arrangements that both corridors and linkage processes require. The Mozambique government's experience with the linkage programmes of the Mozal aluminium smelter, as well as public-private collaborative infrastructure projects such as the Port of Maputo and the Maputo Corridor linking the country with the South African economic hinterland, has impacted positively on the development of commodity extraction and linkages in the Zambezi Valley. Consequently, the Mozambique government has sought to strategically support what are seen as mega projects.*
- 4. Regional integration is critical to create economies of scale for new infrastructure development as well as for private mining firms and local linkage industries.*
- 5. In Tanzania, the Central Development Corridor has not been significantly implemented. In Mozambique the successful experience of the Maputo Corridor has given stakeholders direct experience of a well functioning corridor institution.*

Perkins and Robbins (2011)

2.3. Ownership – national and foreign

Our findings in respect of ownership drew three major conclusions: government policy often equates ownership by country nationals (i.e. indigenisation) with local value added; the particular characteristics of Chinese firms in commodity production and infrastructure provision; and the idiosyncratic nature of individual lead commodity producers. On the basis of these findings we draw three policy conclusions:

- National ownership, either of suppliers or the lead commodity firms, does little to enhance the depth of linkage development, at least in the short-term. Certainly they are no substitute for policies aimed directly at enhancing linkages. Hence the policy focus should shift from a primary emphasis on indigenous ownership to promoting local value added activities.

- What is presented to African governments is a complex tapestry of potential foreign lead commodity producers. Gathering information and intelligence of the different characteristics and practices of various foreign lead commodity producers is hence crucial. At a time of great demand for African commodities the opportunity exists for governments to play off different lead commodity producers and their contributions to local development.
- China's hunger for commodities and its bundling of aid, trade and FDI provides host African country governments with considerable bargaining power to leverage greater commitment for the enhancement of local linkages.
- Individual firms have particular strategies, and this often provides opportunities for governments to foster linkage development. Therefore, with an eye to developing linkages, governments need to be informed by industry dynamics and to target those firms wishing to invest in Africa's commodities with a view towards maximising the potential for linkage development.

(See Boxes 6, 7 and 8 which exemplifies some of the issues discussed above)

Box 6. Indigenous, but what about value addition?

In Angola, an oil industry local content manager candidly admitted that while officially local expenditure spent on local purchases was 40 – 50%, if he utilised what he called 'true local content' (i.e. purchasing from locally owned, managed firms employing locals) this would represent only 5% of expenditure.

In Zambia, until the 2008 economic crisis, the local supply chain to the copper mines was populated by a large group of Zambian-owned, one-man businesses, known as 'briefcase businessmen' because they operated 'out of a briefcase'. They would secure on-the spot orders and import, mostly, from South Africa. With no overheads, they sometimes became price-competitive, pushing more established suppliers out of the value chain. In order to secure market access to the supply chain, they invested in networking and lobbying procurement departments within the mines. The large majority did not invest in any form of upgrading nor expanded into established businesses. For buyers, briefcases businessmen were often not cost effective, as they would collude with mine personnel to maintain high prices and high profits. Whilst keen to show high levels of local sourcing, buyers had to bear with increasing economic inefficiencies, as 'briefcase businessmen' failed to meet lead times, provided no technical advice and engaged in various forms of fraud.

Source: Corkin (2011), Fessehaie (2011)

Box 7. Capitalising on Firm Strategies

In the oil sector, subsea systems supply are generally contracted-out by oil producing companies to large first-tier suppliers through the use of EPCI (engineering, procurement, construction and installation) turnkey contracts. Firms who are not incorporated in the value chains used by these first-tier contractors are thus locked out of supply contracts. In Angola, the government took advantage of the exclusion of alternative suppliers by reaching agreement with locked-out firms to produce control- and flow-lines in Angola, in some cases in joint ventures with the state-owned Sonangol oil company. These investments by outsiders are the first, and as yet the only backward linkages in Angola's oil sector.

Source: Teka (2011)

Box 8: Strategic Leveraging of Policy from China

The DRC signed a the aid-trade-FDI package with China in 2007 and 2008. This constituted two large, but related, initiatives. The first, entered into in late 2007, involved a loan for \$8.5bn from the Chinese EXIM Bank. This was to promote exploitation of the mining sector, and was supplemented with a further \$5bn loan in early 2008. Together, these loans were securitised by providing China with access to, and security provided by \$14bn of copper and cobalt reserves. This aid was tied to an investment package to exploit these mineral resources by a jointly owned company, Socomin, owned by Chinese (68 percent) and Congolese (32 percent) state-owned companies. The \$3bn investment in the mines will be repaid out of future profits. By agreement, not more than 20 percent of the workforce can be Chinese, 0.5 percent of investment will be allocated to training, a further one percent will be spent on social investments and three percent on environmental projects in the surrounding areas. In addition, at least 12 percent of the work will be sub-contracted to local firms.

In addition to these investments in mines, China will provide support for investments in five key areas identified by the DRC state – in water, electricity generation, education, health and transport. \$8.5bn will be allocated to a variety of projects which include a high-voltage power distribution network, highway and railway extensions, and the construction of 31 hospitals, 145 health clinics, 5,000 houses and two universities. Additional resources are allocated to rehabilitate and expand water supplies. Supplementing all of this are a range of additional aid projects, including training programmes in China for poverty reduction and subsidised loans to construct the national People’s Palace (the parliament) and the Stadium of the Martyrs outdoor and sports complex.

Kaplinsky and Morris (2010)

Adopting these general and contextual policy recommendations is only the first, albeit important, step if African governments wish to take advantage of the opportunities provided by the commodity boom in this new era of globalisation. However successfully implementing them to put their economies onto a linkage based path to industrialisation entails more than the adoption of a new policy framework on the part of African governments. It also requires government to develop capacity within their own government departments, for without appropriate levels of human resources in the state it will be difficult to convince the lead commodity producers and linkage enterprises that government is serious about implementation. Without political will and capacity, it is likely that these recommendations will simply remain compelling words on paper, but with no substantial impact on the trajectory and speed of industrialisation.

REFERENCES

- Bloch, R. and G. Owusu (2011). Linkages in Ghana's Gold Mining Industry: Challenging the Enclave Thesis. MMCP Discussion Paper 1. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Corkin, L. (2011). Chinese Construction Companies in Angola: A Local Linkages Perspective. MMCP Discussion Paper 2. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Fessehaie, J. (2011). Development and Knowledge Intensification in Industries Upstream of Zambia's Copper Mining Sector. MMCP Discussion Paper 3. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Gidi, C. (2011). Preparing African Mining Services Companies to Source Funding: The Experience of an Investment Banker. Presentation for the Roundtable Panel on "Local Content Promotion In Africa's Extractive Industries: Issues and Lessons of Experience", 17th Annual Meeting of the Advisory Group on Trade, Finance and Export Development in Africa, African Export-Import Bank, Luanda Angola, 24th June 2011.
- Hanlin, C. (2011). The Drive to Increase Local Procurement in the Mining Sector in Africa: Myth or Reality? MMCP Discussion Paper 4. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Kaplan, D. (2011). South African Mining Equipment and Related Services: Growth Constraints and Policy. MMCP Discussion Paper 5. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Kaplinsky, R. and M. Morris (2010). "The Policy Challenge for Sub-Saharan Africa of Large-Scale Chinese FDI." *Elcano Royal Institute of International and Strategic Studies, Madrid, Spain* **2010** (169): 8.
- Mbayi, L. (2011). Linkages in Botswana's Diamond Cutting and Polishing Industry. MMCP Discussion Paper 6. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Mjimba, V. (2011). The Nature and Determinants of Linkages in Emerging Minerals Commodity Sectors: A Case Study of Gold Mining in Tanzania. MMCP Discussion Paper 7. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Morris, M., R. Kaplinsky, et al. (2011a). "One Thing Leads to Another" – Commodities, Linkages and Industrial Development: A Conceptual Overview. MMCP Discussion Paper 12. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Morris, M., R. Kaplinsky, et al. (2011b). Commodities and Linkages: Industrialisation in Sub Saharan Africa. MMCP Discussion Paper 13. Milton Keynes and Cape Town, The Open University and University of Cape Town.
- Otti, A. (2011). Financing Local Content Vehicles and Local SMEs in Africa's Extractive Industries: Issues and Challenges. Presentation for the Roundtable Panel on "Local Content Promotion In Africa's Extractive Industries: Issues and Lessons of Experience", 17th Annual Meeting of the Advisory Group on

Trade, Finance and Export Development in Africa, African Export-Import Bank, Luanda Angola, 24th June 2011.

Oyejide, A. and A. Adewuyi (2011). Enhancing Linkages of Oil and Gas Industry in the Nigerian Economy. MMCP Discussion Paper 8. Milton Keynes and Cape Town, The Open University and University of Cape Town.

Teka, Z. (2011). Backward Linkages in the Manufacturing Sector in the Oil and Gas Value Chain in Angola. MMCP Discussion Paper 11. Milton Keynes and Cape Town, The Open University and University of Cape Town.

Terheggen, A. (2011). The Tropical Timber Industry in Gabon: A Forward Linkages Approach. MMCP Discussion Paper 10. Milton Keynes and Cape Town, The Open University and University of Cape Town.