



Agricultural Growth Corridors

Mapping potential research gaps on
impact, implementation and institutions

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ISPC Commentary on the Commissioned Study on Agricultural Growth Corridors

Background and rationale

The ISPC interest in growth corridors and spatial development initiatives (SDI) stems from the concern that the current research agenda of the CGIAR needs to take better account of potential major shifts in the location and nature of smallholder agricultural production. This study complements the 2013 ISPC study on [farm size and urbanization](#) (Masters et al. 2013) that explored the question of “who will be farming in 20 years’ time, where will they be, and what farming systems might they employ?”

The ISPC study on spatial development initiatives and growth corridors has three objectives:

- (i) Collate and synthesize existing information and experiences on development corridors, growth clusters, and similar initiatives in the context of agricultural development in Africa.
- (ii) Analyze potential implications for internationally-funded agricultural research (including plant breeding, natural resource management, livestock, agricultural policy research, “systems” or “action” research) in the context of concentrated private sector and government investment.
- (iii) Facilitate the consideration of spatial development strategies into the establishment of CGIAR research priorities.

Conduct of the Study

A paper was commissioned by the ISPC in 2015 on Agricultural Growth Corridors: mapping potential research gaps on impact, implementation and institutions. The conclusions and recommendations of the paper were discussed at a multi-stakeholder workshop that was convened in collaboration with NEPAD-CAADP and ECDPM. The workshop entitled: “Corridors, clusters, and spatial development initiatives in African agriculture” was held as a side event of [Global Forum for Innovations in Agriculture-Africa](#) (Durban, November 2015; see Annex 1). The Workshop brought together some of the key institutions and researchers that are active on this topic in Africa, with CRP scientists and research managers together with representatives of major promoters of change and other key partners and stakeholders. The Workshop’s main objectives were to understand the current state of thinking in research and policy circles, and provide the opportunity for participants to discuss the potential implications for the CGIAR of transformational change driven by corridors and SDIs.

Synthesis and recommendations

During the last decades of the 20th century African agriculture stagnated. Yields of major commodity crops failed to grow or even declined in many countries and even where some growth occurred, it failed to keep pace with population growth. Per capita availability of food decreased. Yields of most crops were far below potential and this continues to be the case at a continental scale. Many factors contribute to low agricultural productivity in Africa but lack of infrastructure is widely cited as one of the most critical (Limão & Venables, 2001).

The past decade has seen a resumption of growth in agricultural outputs in many African countries. Gross domestic agricultural product is now increasing by 6.8% per year on average. Growth has

been strongest in countries where investments have improved infrastructure and where markets have emerged for both agricultural inputs and products. Countries such as Tanzania and Ghana have seen particularly good performance of their agricultural sectors (World Bank, 2007).

In recent years there has been a growing investment by both public and private sector in integrated development corridors and other spatial development initiatives where coordinated investments in transport infrastructure, power, communications and markets are expected to create conditions to unleash Africa's undoubted agricultural potential (Weng et al., 2013; WorldBank, 2009).

Interest in the concept of Growth Corridors and SDIs has existed for decades in Africa but it received added impetus from an initiative by the fertilizer company Yara launched at the UN General Assembly in 2008. The growth corridor concept was subsequently endorsed by the World Economic Forum and has become a main element of the Malabo declaration, an inter-governmental strategy for agricultural growth in Africa, adopted by CAADP.

Over 30 growth corridors are now being developed or are planned throughout Africa (Weng et al., 2013). These formally designated growth corridors represent only a small fraction of the total ongoing or planned investment in infrastructure expansion in Africa. The potential exists for growth corridors or improved infrastructure to have an impact on agriculture throughout the continent. Many areas with agricultural potential that are at present occupied by subsistence farmers achieving low yields are likely to be soon connected to markets by the expanding infrastructure investments (Gálvez Nogales 2014).

The ISPC study indicates that SDI impacts on smallholders are highly dependent on local circumstances, with the potential for both positive and negative outcomes. Smallholders may lose their land to investors, they may suffer from land competition from migration of people from other areas to the corridors and in some situations they may enable smallholders to capture the benefits of market access. Competition with large commercial farms may render smallholder farming for commodity crops such as maize uncompetitive – however smallholders may move into more specialized markets for tree crops, vegetables, etc. and thus benefit from the new development.

The ISPC study raises a key issue for the CGIAR: the extent to which a two tier farming system might emerge with i) increased prosperity for farmers practicing modern agriculture and integrated with markets in areas served by corridors, and ii) further marginalization of subsistence farmers in the hinterlands who could not benefit from infrastructure developments. In many cases, the future of subsistence smallholders in hinterland areas would be very precarious and they would be faced with little alternative other than to abandon agriculture and move to urban areas or seek employment as workers on farms in more favored areas. There are now anecdotal accounts of daily paid wage laborers on commercial farms having higher incomes than independent smallholders in adjacent areas.

The CGIAR will have to reflect upon its role in addressing the research needs of those who get “left behind” in the hinterlands where SDIs and corridors do not have impact. Emphasis should be given in impacts on both smallholders and the environment and how the CGIAR research will address them to change from a win-lose to a win-win scenario.

The present ISPC study emphasizes at least four major potential implications for CGIAR research: i) the need for strengthening CGIAR's work on connecting smallholders to value chains in areas with corridors and SDIs, ii) the importance of the work on land tenure institutions to protect/enhance smallholder benefiting from corridor development, iii) a need for integrated and interdisciplinary research around corridor-approaches and assess their impact on food and nutrition security, poverty and sustainability, and iv) the need for foresight analysis of potential agricultural transformation scenarios -especially in Sub-Saharan Africa- and identifying appropriate research agenda to support smallholders in hinterlands.

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Agricultural Growth Corridors

Mapping potential research gaps on impact, implementation and institutions

Commissioned by the Independent Science and Partnership Council of the CGIAR¹

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Executive summary

Corridors: a (re)emerging approach

Growth corridor strategies are increasingly invoked to coordinate public and private investment around infrastructure backbones in Africa and developing countries. Investments in 'soft' and 'hard' infrastructure to promote investment in e.g. processing zones or out-grower schemes and facilitate multi-stakeholder dialogue aim to overcome coordination failures and bottlenecks related to market linkages or producer-relations to secure supply chains etc.

Corridors and other spatial development initiatives (SDIs) have this coordination potential within or between countries and regions, but also between industries, farmers, people and firms. Boosters expect these coordinated investments to catalyze Africa's agricultural transformation.

Corridors vary in their geographical scope, their objectives and underlying drivers. At their simplest level they connect ports and thus international trade flows to surrounding hinterlands, sometimes across borders, taking on a regional dimension.

The corridors approach is also evolving, ranging in objectives from transport and logistics corridors linking landlocked countries or regions and ports, for example the Trans-Kalahari Corridor, the Northern Corridor in Kenya, or the Abidjan Ouagadougou Corridor; to so-called development corridors, embodying a wider range of additional development objectives and accompanying investments around the central infrastructure, for example the Maputo Development Corridor.

Agricultural growth corridors, endorsed by the World Economic Forum in 2008 and a key part of the Malabo Declaration that Africa's Heads of State committed to in 2015, aim to catalyze agricultural development in particular through infrastructure and market linkages. On the one hand this means increasing investments in agriculture, raising production, productivity and employment and linking African agriculture to regional and global markets. On the other, critics point to risks of land and water grabbing and negative effects of corridor development on natural resources and livelihoods, particularly in the contexts of weak institutions and unclear or unenforced land and resource rights. Price effects will create winners and losers in the short and long-term.

One approach, many forms

Corridors and SDIs can help link policies with places, representing a potentially important policy tool;

1 The Study was conducted with input and coordination from Jeffrey Sayer (ISPC Council) and Rachid Serraj (ISPC Secretariat).

2 See ecdpm.org.

they can offer an opportunity to experiment with targeted policy reforms with short feedback loops and regular, iterative policy reform and could help link ‘top-down’ policy frameworks with ‘bottom-up’ functional initiatives, leading to employment-creating investment and improved livelihoods.

Corridors and SDIs are collaborative undertakings, including public and private interests and involving international, regional, national and local bodies. These can be mostly government or state-led, have businesses in the driver’s seat, or be led by donors or international financial institutions like development banks.

Whatever organizational setups are used, these take place within a specific context that is affected by long-run structural and geographical factors, institutions, the incentives these create for those affected in the process and the underlying interests of key players. This raises the importance of understanding political economy factors around corridor and SDI endeavors.

Research implications

There is a lot of potential for agricultural research for development to contribute to understanding how growth corridors function and how they can contribute to agricultural transformation, improved livelihoods and natural resource sustainability. Indeed, CGIAR Research Programs are already involved in many research and development activities directly related to or, relevant to corridors.

As with all policy reforms, there will be winners and losers. Research is therefore required to understand who these are in terms of impact, effects on implementation and the accompanying institutional challenges.

There is a need for integrated and interdisciplinary research to contribute to research around corridor impacts on food and nutrition security, poverty and sustainability, inclusivity, and how to reach the most vulnerable if corridors fail to do so. CGIAR research could be independent, action-oriented or be more demand-led. The need for clear and measurable development goals that are monitored and evaluated against robust and reliable indicators will remain a key issue to contribute to improve the developmental impact of corridors.

Given the likely winners and losers, important lessons might be learned from how corridor approaches are implemented in practice. Much is made of partnerships as an implementation modality for a range of reasons, whether linking public with private actors, or private with non-state actors and civil society. Lessons can be learned from existing approaches in and around corridors and SDIs about the implementation process, with implications for impact.

The institutional environment in which corridor development takes place will be fundamental for the above two areas singled out for research. This relates to the broader environment created by initiatives like CAADP, but also regional, national and local institutional environments. While land rights is clearly one fundamental area, research into the formal and informal ‘rules of the game’ around corridors will be key. More action-oriented research linked to corridors could be key in understanding how corridor initiatives can connect farmers to innovation systems to build knowledge and skills.

All this points to the need of both CGIAR and corridor-specific organizations to engage in more farmer-led research. Systematization of the different context specific corridor-related research streams should inform a corridors and SDI-based research agenda, so that agricultural growth corridors can indeed contribute to achieving agricultural and economic transformation, and thus attainment of the SDGs.

1. Introduction

This paper discusses so-called ‘growth corridors’ as a tool for inclusive agricultural development. It aims to inform policy-makers and researchers about how development corridors might bring about changes in patterns of agriculture and consequently influence research needs. More alignment between agricultural research for development and corridor-related work could have a strong added value, enabling corridor approaches to contribute better to the Sustainable Development Goals (especially SDG1 and SDG 7) as well as mitigating the social, environmental and economic risks they might pose. It could also contribute to the collection and systematization of evidence on the impact of the corridor approach.

Focused principally on Africa, this paper discusses corridor and other spatial development approaches in terms of i) their geographical scope, ii) their objectives and iii) their governance mechanisms - the driving force behind the corridor initiative is of particular interest for policy-makers and researchers. Based on some of the highlighted risks and opportunities from corridors and spatial development initiatives (SDIs), the paper proposes key research priorities under three broad headings: Impact, Implementation and Institutions.

By highlighting key issues with research potential under the three I’s, the paper aims to help guide discussions of the shape future corridor and SDI-related research might take, particularly through a range of different CGIAR research areas. A draft of this paper and the ideas it draws on were discussed at a workshop on the margins of the Global forum for innovations in agriculture in Durban on the 30th of November 2015 (Annex 1), organized by the ISPC of the CGIAR together with the New Partnership for Development in Africa (NEPAD) and the European Centre for Development Policy Management (ECDPM). This was an opportunity for international agricultural researchers of CGIAR centers from all over the world to meet representatives of major corridor projects and discuss potential research paths, some of which are also captured in this paper.

Corridors in perspective

Development corridors, SDIs and other territorial approaches are (re-)gaining notoriety as a development strategy in developing countries, especially in Sub-Saharan Africa. Sometimes formulated as economic or growth corridor initiatives, they are a conceptual, programmatic and investment framework to develop a territory and/or link regions and countries along a physical backbone of transport infrastructure (e.g. Healey 2004). In general the corridors approach aims to promote spatially targeted coordinated public and private investment with focused policy reforms and public finance, clustering of investments, logistics, and market integration both within and between national markets, often formed with links to, or building on SDIs.

With Regional Development and Spatial Inclusion the theme for 2015’s African Economic Outlook (AEO, 2015), corridors are increasingly cited as a developmental approach at the continental, regional and national levels. Spatial approaches are part of the New Partnership for Africa’s Development (NEPAD), Grow Africa and the G8 promoted New Alliance for Food Security and Nutrition.³ Corridors and SDIs also feature in the regional strategies of the Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Tripartite Free Trade Agreement (TFTA), among others.⁴ National strategies of numerous countries also point to corridors as an approach, for example Kenya’s Vision 2030 highlights the Lamu Port South Sudan Ethiopia Transport (LAPSSET)

3 The Grow Africa platform was founded by the African Union commission, NEPAD and the World Economic Forum to promote agricultural investment. Grow Africa is considered to be the private sector platform or agenda of the Comprehensive Africa Agriculture Development Program (CAADP), the main Africa-owned framework guiding agricultural development, public and private investments and research.

4 SADC: <http://www.sadc.int/themes/infrastructure/transport/transport-corridors-spatial-development-initiatives/>; NEPAD

Corridor, while the Master Plan for Acceleration and Expansion of Indonesia's Economic Development provides an example from outside Africa. Growth Poles are also increasingly promoted as development strategies, often linked to corridors, for example in Central Mozambique and linked to the Beira Corridor. Weng et al. (2013) identify more than thirty corridors being developed or planned throughout Africa.

These spatial approaches are an evolving concept. While corridors can be said to be 're-emerging', largely along historical transport connections across the continent, their objectives are changing, aligning more closely with those of SDIs. Corridor approaches therefore range in objectives from transport and logistics corridors linking landlocked countries or regions and ports, for example the Trans-Kalahari Corridor, the Northern Corridor in Kenya, or the Abidjan Ouagadougou Corridor; to so-called development corridors, embodying a range of additional development objectives and accompanying investments around the central infrastructure, for example the Maputo Development Corridor.

The approach is increasingly also linked to agriculture, allowing spatially targeted policies and investment offering direct and indirect effects on agricultural outcomes. More specifically, they aim to target public investment for priority agro-ecological or underutilized zones along a corridor; promote domestic and foreign private investment into producing and processing agricultural goods; and help focus policies and support programs to link smallholder farmers to national, regional and international production networks. They can help improve agricultural input and output markets, transport and logistics, energy access and national and cross-border marketing. Prominent examples are the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) and the Beira Agricultural Growth Corridor (BAGC), though both remain at early stages.

Corridors offer a means to link different sectoral strategies to promote economic transformation towards higher productivity sectors and activities, and more and better employment and market opportunities across low-income countries, with agriculture a focal sector. Corridors and SDIs therefore offer the potential to help reduce rural poverty, improve food and nutrition security, and improve environmental sustainability, all important parts of the UN Sustainable Development Goals (and the overall CGIAR System Level Outcomes - SLOs).

At the same time, concerns are raised around the type, scale and distribution of impacts of corridor-related policies and investments. In particular, agricultural growth corridors approaches have been associated by critics with so-called land-grabs, mono-cropping, and a focus on large-scale business and large-scale commercial farming to the exclusion of small-scale producers and operators. The interventions associated with corridors may also have unintended consequences for existing trade and production systems, and on natural capital and its capacity to deliver healthy ecosystem services including habitats for biodiversity. Further, corridors are sometimes considered to be driven by outside interests and/or political elites, with far less 'development' than their names suggest, implying a need to pay attention to implementation approaches and the broader institutional environment (e.g. Oxfam, 2014). Some express concern that vulnerable people outside corridor areas may be ignored and condemned to a two-tier farming system.

Research and agricultural corridors

Corridors and SDIs therefore offer many potential new angles for research, whether related to the role of corridors in helping improve crop yields, climate adaptation, raising profitability, resilience and sustainability of farming systems, improving markets, nutrition and diets, or sustainable natural resource management.⁵ As this paper discusses, the challenges of using corridors as long-term development instruments also offer opportunities to contribute to the overarching themes of gender, capacity strengthening, partnerships and stakeholder engagement, key objectives among agricultural researchers.

5 The CGIAR Research programs are summarized here: <http://www.cgiar.org/our-research/cgiar-research-programs/>

Research targeted at specific aspects of corridor and SDI approaches may help to shift strategic priorities in the future and the targeting of agricultural innovation systems to ensure corridors approaches are as inclusive and positive for development as possible. This may also shed light on the linkages between research and impact pathways in the context of an agricultural transformation brought by SDI and corridors, particularly in light of the CGIAR Independent Science and Partnership Council (ISPC) analysis of the major impact pathways through which agricultural research can address poverty reduction, food and nutrition security and natural resource management (ISPC 2013).

Outline of this paper

The remainder of this paper is organized as follows. Section 2 characterizes different corridor approaches according to i) their geographical scope, ii) their objectives and related activities, and iii) their governance and corridor coordination systems. These clearly influence where and why corridor initiatives take place, their chances of success, and the risks and research gaps they face. These key aspects are discussed in Section 3 according to the impact of corridors on CGIAR System-level Outcomes, implementation approaches including potential partners, and broader aspects of institutional setup and policy. Section 4 briefly concludes.

2. Characterizing corridors

The focus and potential impact of agricultural research in the long-term development of SDI and corridor approaches is likely to be highly context specific, so affected and indeed defined by the nature of the corridor in question. This section draws on examples to illustrate how corridor and spatial approaches vary according to structural factors, the range of different objectives, and their accompanying governance mechanisms.

2.1 Structural features

By definition, corridors are spatial approaches that aim to link different territories or areas together. The nature, and particularly the production potential of the areas being connected determines the nature and volume of trade flows between regions and countries, and the balance of inflows and outflows. This affects the way in which the corridor develops, particularly in terms of accompanying investments, and the degree to which different segments of the population can take advantage of the corridor in an inclusive way.

At their simplest level, corridors link hinterlands to ports and thus international trade flows to surrounding hinterlands. This can include national or cross-border hinterlands, taking on regional characteristics when including two or more countries. The Maputo Development Corridor (MDC) connecting South Africa's Gauteng industrial heartland to Maputo, Mozambique, its closest port, is a case in point, broadly characterized by South African mineral outflows and manufactured inflows through Maputo port.

Corridors can also link different agro-ecological zones with each other, connecting surplus production areas of certain commodities with deficit regions. This seems to be the case in West Africa, where numerous corridors offer the potential to link surplus rice production areas in Mali and Burkina Faso, for example, to deficit areas in the wider region. Numerous West African corridors also link livestock production surplus areas in the Sahel with deficit areas in coastal countries like Benin, Nigeria, Ghana or Cote d'Ivoire, countries that hold comparative advantage in cereal and roots production facilitated by better climate conditions. Corridors have in turn played an important role in supplying Sahelian country demand in these agricultural commodities. The corridors approach may increase access to previously unexploited regions, with the both positive and negative outcomes, further discussed below.

Underlying economic factors also shape the dynamics around corridor initiatives. Depending on whether the port country is higher income, serving its hinterland, as with the Abidjan-Ouagadougou Corridor, or the other way around, as with the Maputo Corridor, the economic and political interest and benefits from a well-functioning corridor may differ. In the former case, there may be little market or other incentive to facilitate regional flows of goods, underlining the need to think of policies and approaches to link dynamic industrial areas with hinterland agricultural zones to lower existing imbalances (Masters 2013). Similarly, where a low income country links to a wealthier hinterland, it may require specific approaches to offset imbalanced agglomeration effects that accumulate in the wealthier country to share benefits from the corridor through accompanying investments.

The geographical scope may also be important for corridor initiatives in terms of the share of the corridor in one country. Fraser and Notteboom (2014) classify corridors according to trade type: domestic, transit (transporting the cargo of other countries), foreign (transporting primarily imports and exports of a country), and hybrids, depending on service catchment area. While this has implications for cross border trade procedures and trade facilitation along a corridor, it may also affect the underlying political interests and carrying out associated reforms. The fact that the same corridor, for example from Abidjan to Ouagadougou, can also serve domestic interests, connecting the South of Côte d'Ivoire to the North, boosts the political relevance of the domestic component of the corridor and by doing so lowers the marginal cost of linking such efforts across borders.

The number of countries along a corridor or connected to an SDI may also have implications for corridor processes. While the Maputo Development Corridor is relatively short, at around 500 km, and includes only two countries, the North-South Corridor from Durban to Dar-es-Salaam includes five countries (or eight if one includes branches). While clearly much more of a regional undertaking, and potentially best considered a series of corridors, the difference between the two is important, particularly in terms of policy coordination (Byiers and Vanheukelom 2014). As Gálvez Nogales (2014) highlights, “the move from a narrow national corridor to a narrow regional corridor requires facilitating regional cooperation through different coordination mechanisms like regional blocs or dedicated corridor bodies, strengthening border policies, transport facilitation and trade and investment promotion.” There is therefore a tradeoff to be made between narrow (or short) corridors covering few countries (or even only one country) and more ambitious corridors with potentially additional regional and cross-border externalities. This is important in thinking of the potential role of corridors in addressing (or not) cross-border agricultural trade and value chains.

Rather than focusing on a specific corridor or SDI, a further approach links a network of corridors under one strategy. The Greater Mekong Subregion (GMS) and MP3EI corridors in East Asia are part of an overall development strategy based around numerous corridors which are regional in the case of the GMS and national for the MP3EI.⁶ The boucle ferroviaire ouest africaine (or West African rail-ring), linking 5 west African countries can be thought of as a rail corridor approach, linking a network of corridors under one multi-sectoral SDI which includes (i) transit corridors connecting landlocked countries like Niger and Burkina Faso with major ports in Benin, Togo and Cote d’Ivoire, (ii) mining transport corridor linking Benin to Niger, and (iii) and better transport infrastructure and trade facilities along the numerous existing agricultural trade corridors between these countries.

While a single corridor approach such as the BAGC or SAGCOT may allow more focused coordination and implementation, even at a national level this involves political choices over which corridor to focus on, and more importantly, which areas or corridors to include or exclude. Pinning the national development strategy on numerous corridors may potentially overcome this at the cost of effective planning, coordination and momentum in implementing such a resource-intensive approach over numerous corridors.

These different structural factors shape the underlying rationale for a corridor or related SDI, and define some of the associated challenges and opportunities both in terms of impact and implementation. Combined with path dependency around, within and between country political and economic dynamics, this then has implications for how and where to focus corridor-related research to contribute to the long-run developmental impact of corridor and SDI approaches.

2.2 Corridor objectives

Evolving objectives

Many trace the origins of the corridors concept back to South Africa’s post-apartheid focus on SDIs and the Maputo Development Corridor in particular, one of six initial SDIs. While agriculture has been an integral part of South Africa’s Mpumalanga’s economy and Mozambique’s agricultural strategy now includes the Pro-Sud initiative to link agricultural investments to the corridor, this was not at the center of the original concept (e.g. Byiers and Vanheukelom 2014). Rather, South Africa’s SDIs were centered on four main pillars: transport infrastructure, freight logistics, institutionalized frameworks and procedures. Nonetheless, the MDC was intended to encourage anchor projects in agribusiness, industry, tourism and other sectors with demand for transport (Jourdan, 1998).

6 MP3EI is the Indonesian acronym for Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia, the Master Plan for Acceleration and Expansion on Indonesia’s Economic Development, which focuses on economic development along six national corridors.

While broadly heralded as a transport success, the MDC is also increasingly criticized for its lack of inclusivity and wider development impact. This relates partly to the original objectives of the corridor where transport was the de facto focus, although other factors also played a role, discussed below, while policies increasingly aim at going beyond logistics.

Corridors objectives therefore vary from improving transit to achieving agricultural and economic transformation. In its most extreme form the transit corridor is about either moving materials from the hinterland to a port, often minerals, or moving imports inland, with little or no links to the surrounding areas. On the other extreme, agricultural development corridors aim to inclusive and sustainable agricultural development, sometimes through large scale public-private partnerships (PPPs). Between these two extremes, trade corridors build on the transport infrastructure and logistics coordination, but seeks to also improve trade flows by removing obstacles streamlining trade procedures and policy. Sequeira et al. (2014) distinguish between historical corridors, transit corridors, mining and ore-based industries corridors, and development corridors (Sequeira et al., 2014). The focus of agriculturally related research must therefore take account of the specific objectives being addressed by a corridor approach.

Corridor objectives can also evolve, from transport sector-based initiatives, to logistics and trade corridors, to economic corridors with a multisectoral approach (Gálvez Nogales 2014). This seems to be the case for the MDC, while efforts are increasingly made to leverage minerals-based infrastructure investments for broader corridor-related opportunities to share both the costs and benefits of the infrastructures (e.g. Ramdoo 2015). This includes connecting last-mile mineral infrastructure to roads linking farms to markets, or in linking agri-business to other food supply chain-supporting infrastructure such as storage or warehousing (Gálvez Nogales 2014). To illustrate, the multi-user infrastructure along Brazil's Northern Corridor was initially conceived to serve the extractive sector but has subsequently enabled the opening up of new agricultural frontiers (Ramdoo 2015). The West African Rail Ring mentioned above can also serve the same purpose, where agricultural corridors and investments are built on high-return investments in the mining sector. This approach then recognizes the potential importance of extractive-based 'anchor projects' to pay for infrastructure provision. Such approaches might lead to what Jourdan (2011) calls 'densification' around corridors through cluster effects and expanding markets - what are otherwise known as agglomeration effects.

Corridors have also offered important channels to improve other human basic needs such as education, electricity, energy and better health, water and sanitation services. For instance, the Abidjan-Lagos Corridor Organization has played an important in activities aiming at sensibilizing and preventing the transborder HIV/AIDS transmission in West Africa. These clearly offer further corridor and SDI-related research opportunities.

Different corridor and SDI objectives then require different types of activities. Gálvez Nogales (2014) organizes corridor activities according to four categories (Gálvez Nogales 2014):

1. Hard infrastructures - roads, rail, ports, border infrastructure as well as pipelines, and energy connections,
2. Soft infrastructures - the accompanying regulatory reforms required for smooth clearing of goods at ports and borders, one-stop borders, non-tariff barrier monitoring, transport market structure, security and other regulations and policy measures;
3. Investment promotion - investment plans, instruments and incentives to promote investment in industrial processing zones, growth poles, clusters promotion, or specific related investments around out-grower schemes, post-harvest storage and processing etc.
4. Multi-stakeholder collaboration - partnerships to overcome various challenges relating to market linkages, producer-relations to secure supply chains etc.

The impact of a corridor initiative and how research might focus there will therefore depend on the original objectives set, the evolution of those objectives, and the kinds of activities engaged in around a corridor.

Transport and transit

By focusing attention and policy reforms around logistics and transport linkages, a corridors approach has the potential to lower transactions costs with knock-on effects for agricultural and other activities, especially if cross-border in nature (and if accompanied by transport sector reforms).

In the transport literature, freight or transit corridors are seen as a convergence of “urbanization integrating global, regional and local transportation and economic processes in a geography of distribution” (Rodrigue, 2004 cited in Fraser and Notteboom, 2014). Key factors driving interest in corridors include the high transactions costs of trade and exchange in developing countries, particularly in Africa - paved road densities are low, while transport costs and times in Africa are among the highest in the world, putting an enormous brake on investment, productivity growth and market integration. Corridors can provide opportunities to strengthen intra and extra regional trade flows connecting regional and local market to international markets. The competitiveness of local companies and producers can be enhanced through better access to innovation and both inputs and outputs markets. Corridors may help overcome transport barriers and other non-tariff barriers, while SDIs additionally offer the potential to create integrated clusters or investment poles, thus encouraging accompanying employment-creating investment and improved livelihoods.

Focusing specifically on hard infrastructures with soft infrastructures to facilitate cross-border trade, examples include the North-South Corridor (NSC) that connects South Africa to the region via 8,599 km of road linking Durban to Dar es Salaam through Zimbabwe, Botswana and Zambia (Byiers and Vanheukelom 2014). A similar corridor is the nascent LAPSSET Corridor, (Lamu Port South Sudan, Ethiopia Transport Corridor) that aims to link Lamu in Northern Kenya with South Sudan and Ethiopia. It intends to cover road transport, rail and also an oil pipeline but, in terms of initial stated objectives, is focused on logistics and reducing transport costs.

Beyond hard and soft investments in infrastructure, competition between corridors, ports and SDIs may lower transport costs. As Fraser and Notteboom (2014) state, “capacity developments in new and existing ports are intensifying competitive dynamics and act as catalysts for an increased focus on hinterland corridors in a given port system”. This holds some relevance for the Maputo Corridor for example, where part of the reasoning was to offer an alternative route for exports from South Africa’s industrial heartland. In West Africa there are also numerous transport North-South corridor initiatives from rapidly improving ports where corridor competition between Côte d’Ivoire, Ghana, Togo and potentially Benin to serve the Sahelian hinterland may be an important factor in driving corridor effectiveness.

As there remains limited evidence on whether or not the above potential gains have been realized, a focus on logistics along a corridor clearly offers interesting research questions into market functioning in agricultural marketing and transport markets. SPS and other non-tariff barriers to cross border agricultural trade are also areas where corridors might benefit from research and/or offer interesting cases for analysis. Questions about how different corridor-related infrastructures - including roads, energy, ports, and waterways - specifically affect agriculture beyond market access issues are also clearly relevant.

Investment and agricultural growth corridors

Beyond logistics, agricultural growth corridors and SDIs are an attempt to overcome two key market failures that undermine investment taking place to promote wider economic transformation, not least in agriculture: information failures involved in discovering the cost structure of an economy, where the ‘first mover’ absorbs the costs of initial exploratory investments without capturing the benefits; and coordination failures of investment activities with scale economies (Rodrik 2013, Hausmann et al. 2008).

Both information spillovers and coordination failures are of specific relevance in boosting agricultural productivity and smallholder engagement. Private sector operators are generally not willing to invest without access to inputs and markets, while firms will not invest to provide inputs if the demand is not there and public inputs are missing. A coordinated approach that focuses public investments, donor attention, and identifies opportunities for private sector investment through a corridor approach may then be a suitable approach. But corridors may also draw away resources from other areas or at least limit the impact of such resources. This calls for research precisely around the nature of the coordination failures, the role of technology, different forms of public support programs and technological diffusion and the role of clustering and corridor-related approaches in promoting these. This is particularly important given the finding that value chain approaches only work for 2-10 percent of the smallholder population (Vorley et al. 2012) and therefore the risk of exclusion through such approaches.

Gálvez Nogales (2014) describes several corridors where part of the logic is to coordinate private and public investment in agriculture. Agriculture is the focus of the Beira Agricultural Growth Corridor (BAGC) and the Southern Agricultural Corridor of Tanzania (SAGCOT) in Africa with significant investments in the postharvest subsector (processing, storage and packaging) of agricultural value chains. These are important in reducing food loss and can contribute to stability and availability of commodities across time and space. This is the case in the Greater Mekong Subregion (GMS) and MP3EI corridors in Indonesia, which although multi-sectoral approaches, have agriculture as one priority sector amongst several others. These type of multi-sectoral approaches nonetheless build on corridors as a backbone for investment.

Both the SAGCOT and BAGC investment blueprints promote production clusters along the hinterland corridor. Each cluster is envisaged with a nucleus farm and outgrower schemes, cold storage facilities, and infrastructure access, including roads, water and energy. They also envisage finance as well as access to research, with public funds intended to finance a catalytic fund of \$50m for startup agribusinesses incorporating smallholders in SAGCOT; 'patient capital' will finance the cost of 'last mile infrastructures' such as farm roads and irrigation connections; and loan guarantees and currency risk instruments will leverage capital from the banking sector. These agriculturally focused corridors therefore operate within a broader national policy framework with specifically corridor-targeted instruments and policies⁷.

While the SAGCOT approach suggests that corridor-based plans to stimulate agricultural growth should be as detailed and targeted as possible, this differs from the Poverty Reduction and Alleviation (PRA) corridor in Peru. This USAID-led public-private model maps out the strategy, targets and results framework and listed available components such as business development services and technical assistance to develop and field test infrastructure PPPs, but left open the approach on how to deliver targets and which sectors, industries or beneficiaries to include. By selecting 'star-firms' instead of pre-determining potential sectors, they have reportedly been able to help unexpected and non-traditional subsectors. One example relates to where the Business Development Centre helped an entrepreneur with the introduction of thornless artichokes on the European market, set up a processing plant, linking him with dozens of small local producers.

For the BAGC corridor, investment opportunities are identified beforehand and presented as 'brownfield' and 'greenfield' investments opportunities assuming that small businesses will be attracted by the critical mass gathered through the 'fast-track brownfield developments and other quick-win agribusiness projects. In the GMS corridor's most recent long-term Strategic Framework, emphasis is put on technical assistance, coordination and capacity development (Gálvez Nogales, 2014). This is part of a renewed strategy to widen and deepen the GMS corridor, bringing more complex, multi-sector initiatives that require more involvement of local authorities and private firms, institutional innovation and better knowledge generation and management.

Agriculture can also be addressed through a corridors approach as a second-tier sector. The Central

7 See SAGCOT Investment Blueprint: http://www.sagcot.com/uploads/media/Invest-Blueprint-SAGCOT_High_res.pdf

Asia Regional Economic Cooperation (CAREC) focuses on six corridors where the approach is not sector wide, but limited to focused projects to support efforts in core sectors where agriculture is one of these, along with trade facilitation (Gálvez Nogales, 2014).⁸ Masters et al. (2013) find, for example, that innovation can spread growth along transport routes and also in remote hinterlands, relating to the above discussion about the potentially varying impact of direct versus indirect support to agricultural investment, technological diffusion and market development.

The spatial approach then offers an opportunity to encourage the combination and critical mass of investment that can put a corridor or SDI and its surrounding area on a virtuous cycle of complementary investment, market creation and employment creation. By combining investments around investment plans, interventions to promote agricultural growth are planned comprehensively and bundled up together to generate synergies and maximize impacts. This raises research questions regarding farm scale, land access, land titling and the nature of contracts between nucleus farms and outgrowers.⁹ It also underlines the importance of coordinated investment around post-harvest storage, processing, and packaging.

Piloting policies

In addition to improving transport and overcoming investment market failures, spatial approaches also offer opportunities for targeted policy reforms around a geographically delimited area, potentially simplifying reform processes relative to full-scale national reforms, and acting as reform pilot experiments. While this can relate specifically to transport sector reforms, as being undertaken jointly by Burkina Faso and Côte d'Ivoire, for example, this piloting of policy reforms can clearly carry over to other areas, such as encouraging linkages between regional, national, local (and international) markets.

The corridors approach offers the potential for policy-makers and external actors to target support to low-income farmers to bring them to levels to benefit from the above potential opportunities offered by corridors, removing major barriers to impact, adoption and scaling of agricultural research technologies and products. Corridors may offer better connected and supplied pilot areas to trigger transformational change of current agricultural production systems.

The corridors approach encourages more holistic approaches to policy issues around the corridor by moving away from sectoral approaches. This favors an integral focus on agricultural market failures, linking infrastructures, investment promotion tools, policy reforms, and multi-stakeholder partnerships as well as access to finance and public services. The hope, somewhat like that expressed for special economic zones, is that policy reforms in the corridor can later be spread beyond.

The corridors approach also offers opportunities for linking public-private dialogue and identifying where interests align around specific investment opportunities as well as potential technical and policy reforms for agriculture. By promoting spatial linkages towards, if not across, borders the corridors approach can serve as an important tool in boosting regional trade in agricultural and other goods in a practical manner that may indeed drive the more institutional, top-down regional integration processes focused on tariff barriers.

These more policy-related objectives then also offer opportunities to frame agricultural research, particularly in terms of measuring the impacts of specifically targeted reforms and support mechanisms, and of different approaches to engaging around corridor initiatives to promote inclusive approaches to agriculture.

8 For more on CAREC corridors see here: <http://www.carecprogram.org/index.php?page=carec-corridors>

9 See SAGCOT investment blueprint, for example: http://www.sagcot.com/uploads/media/Invest-Blueprint-SAGCOT_High_res.pdf

2.3 Governing corridors

Given that corridors provide a spatially focused package of reforms and investments, each of these require a range of different types of skills, actors and institutional organization. Dealing with the complexities of coordination across this number of actors is important, and raises the question of what the institutional basis can and should be, and therefore what policy research might offer for collaborative approaches to making corridors effective and developmental in the long-run. This section points to a few examples of the organizational set-ups to accompany and implement different corridor approaches.

Different drivers, different challenges?

An important aspect of corridor governance is understanding the underlying different drivers that underpin different initiatives and their implications for the inclusiveness and sustainability of a corridor initiative. Corridors and SDIs are collaborative projects, including public and private interests and involving international, regional, national and local bodies. Despite being multi-stakeholder, they are driven by specific interests.

Gálvez Nogales (2014) distinguishes between partnerships that are mostly government or state-led, corridors where businesses are in the driver's seat, corridors where donors or international financial institutions like development banks are in the lead, and multi-stakeholder partnership corridors or PPP corridors where there is a more bottom up approach (See Table 1). Kindornay et al. (2013) also identify five types of PPPs: i. donor-led models; ii. coalition models; iii. business-led models; iv. business-Civil Society Organization (CSO) models and v. CSO-led models. A publicly set objective that aims to attract private investment is likely to operate quite differently from a private investment to which public support is added.

Table 1. Key drivers in corridors

Governance mechanism (Key driver)				
Corridor	Government	Private-led	Donor/IFI	PPP
Maputo Development Corridor		X		
Abidjan-Lagos Corridor		X		
SAGCOT				X
BAGCI				X
Poverty Reduction and Alleviation Corridors (Peru)			X	
Greater Mekong Subregion corridors	X		X	

Source: based on Gálvez Nogales, 2014

This difference between types of PPPs is illustrated by the case of the SAGCOT and Beira corridors. Identified as PPP-led corridors by Gálvez Nogales (2014), both corridors are championed by the private sector. Specifically both are the brainchild of the Yara fertilizer company, legitimized to some extent through the World Economic Forum (WEF) (see Byiers and Rampa 2013 and Paul and Steinbrecher 2013). The SAGCOT and Beira corridors are in this sense more business-led model PPPs.

While it is not fair to say that the business-led model PPPs do not link to national policy, Byiers and Rampa (2013) point out for SAGCOT that this type of model does have implications for the way in which the corridor project is put together and implemented, and the kinds of investment and policy reforms that accompany it. On the positive side, the commercial interest of Yara serves as an important incentive for maintaining

momentum and building coalitions of donors, state actors and businesses around the initiative that may not have happened without this private sector drive. On the other, SAGCOT has been criticized for its lack of local involvement, dreamed up at the WEF between an international company and the president, with limited buy-in at the local or even ministerial level, although the initiative is still at an early stage (Byiers and Rampa 2013).

In contrast, the Maputo Development Corridor (MDC) was very much state-led. This meant that success relied on high-level presidential partnership between Presidents Mandela and Chissano and the authority to push through the necessary steps to put the MDC in place. Different businesses were certainly involved, both as investors, beneficiaries, PPP operators and then observers, but the initiative and underlying drive was at the state level. This is clearly also the case for the above-mentioned GMS and MP3EI, while the LAPSSSET Corridor described above is part of Kenya's national Vision 2030, even if implementation is planned along with the partner countries.

For the PRA in Peru, USAID pioneered the approach, as in much of Latin America (Gálvez Nogales 2014). The PRA corridor nonetheless emphasizes a demand-driven approach, which affects decisions regarding the approach used to select sectors and firms, the sequence of investments and the delivery of business development services. The role of intermediate cities as hotspots linking the agricultural areas to a higher demand for agricultural and food products is central in this approach (Gálvez Nogales 2014). Although clearly different given its higher income level, the MP3EI Corridors in Indonesia have been entirely publicly financed.

While the potential benefits of a regional corridor were described above, the lack of a clear lead to implement or promote regional corridors may limit their implementation and impact. While COMESA has championed the North-South Corridor as a key part of its regional integration, implementation necessarily takes place at the national level. Similarly, those corridors appearing in the SADC Regional Transport policy are national or cross-border corridors requiring that the relevant national agencies and Ministries work towards implementation, presenting a continuous challenge between regional and national level approaches. On the other hand, now that South Africa has been made North South Corridor 'champion' under the NEPAD Presidential Infrastructure Champion Initiative, it is not clear that this will necessarily bring improvements either, depending on the incentives and interests at stake.

Research on partnerships will ideally lead to insights into what drives and constrains these initiatives in achieving inclusive agricultural investments and policy reforms. The corridor process can then be seen as a process of discovery that can facilitate information sharing and lesson learning e.g. within a neutral coordination council to elucidate this process. Whether public or privately led, transparency and accountability mechanisms seem necessary to strengthen confidence in society at large that the corridor policy is part of a larger growth strategy that aims to improve the opportunities of all, instead of benefiting mainly an existing elite (Rodrik 2012).

Managing corridor complexity

Sequeira et al. (2014) point to the evolution through time of the different needs and actors involved and the institutional implications: the "development cycle" is about raising investment in economic or transport infrastructure while "the operational efficiency cycle" is more focused on solving and fixing logistics bottlenecks. The institutional requirements for arranging the finance and contracts for road concessions is very different from building the road and operating it afterwards. Hardware interventions have reportedly been easier to accomplish in the GMS corridor than software and organizational reforms, with little real push to implement transport and trade facilitation measures or improve cross-border issues.

The World Economic Forum identifies six types of activities needed to coordinate and implement large scale and multi-stakeholder partnerships for agricultural growth (WEF 2012). They group these according to the same idea of evolution through time, although as Gálvez Nogales (2014) and others note (e.g. Brouwer et al. 2015) design and implementation are an iterative process.

The first type of organizational actions are centered on the effective strategic direction of the corridor program - the objectives. This involves developing and aligning a shared vision and goals between all stakeholders that can then be used to choose target sectors, industries and firms. This also involves the choice of tools for planning, implementation and M&E, strategic frameworks and long-term plans and medium-term action plan. The second type of activities revolve around the effective implementation and scalability of the corridor program. The implementation of interventions, both hard infrastructures (roads, energy, telecommunications) and soft (policies and regulatory frameworks, business development services, institutional strengthening) have to be done in a coordinated fashion, not only taking into account multiple stakeholders, but also multiple levels of government. The way the corridor initiative intends to finance these interventions and manage delivery and implementation needs institutional mechanisms installed. These choices and how they are implemented affect the inclusiveness of the corridor program.

Sequeira et al. (2014) suggest that greenfield or development corridors allow more organizational innovation, unhindered by existing institutional setups, while “historical corridors have to mitigate existing organizational dysfunctions, overcome the problem of overlapping jurisdictions, and aggregate ongoing development plans that may not have been originally designed to maximize synergies between projects”. However, apart from the fact that any investment project will necessarily need to alter or adapt to existing institutional and socio-economic setups, using the Tanzanian Mtwara Corridor example, Mtegha et al. (2012) point out that getting a “greenfield” corridor off the ground at all may be a challenge, given the need to first of all establish economic demand for such a corridor. The institutional mechanisms in place seem likely to be important, regardless of the phase a corridor or SDI is at.

A key area where this is important relates to land rights. Corridor-related investments rely on well-defined and defended land rights which are not always present in corridor countries. This is a key criticism of corridors from NGOs, who find that lack of inclusion and poorly implemented compensation mechanisms lead to landlessness on the ground, the opposite of the corridor objective.¹⁰ Debates center on the implications of changing land relations due to large commercial investments more broadly (e.g. Oxfam 2014), whether part of a corridor approach or not, where research into impacts and processes would also help to provide a more informed basis for policy decisions around corridors. Lawry et al. (2014) draw attention to the significant gains in productivity and investment in agriculture in the Latin American and Asian cases due to tenure formalization, but contrast this with comparatively weak effects attributable to formalization in Africa, raising important questions for further research. Tawa et al. (2014) highlight some of the challenges for the specific case of the ProSavana initiative around the Nacala Corridor in Mozambique, highlighting the difficulty of working with commercial companies within customary land rights systems. The above issues clearly relate to CGIAR research areas on land policy, institutional arrangements for shared governance, and trade and value chains.

Whatever organizational setups are used, these take place within a specific context that is affected by long-run structural and geographical factors, institutions and the incentives these create for those affected in the process. Going back to the MDC case mentioned above, Byiers and Vanheukelom (2014) suggest that what success it has achieved is a fortuitous alignment of Mozambican and South African political, public and private sector interests at a specific moment in post-apartheid, post-civil-war South Africa and Mozambique, with no small part played by the respective presidents of each country. This raises the importance of understanding political economy factors around corridor and SDI endeavors.

10 A recent example is Nigeria where farmers in Taraba State are reportedly being forced off lands that they have farmed for generations to make way for US company Dominion Farms to establish a 30,000 ha rice plantation, the kind of investment to be encouraged through corridor approaches: <http://www.grain.org/article/entries/5126-dominion-farm-s-land-grab-in-nigeria>

Corridor-specific organizations

The scope of activities around a corridor clearly has implications for the policy framework and instruments that are used, even if these are not always transferable across countries and activities. Different corridors have set up different organizational forms, as illustrated in Table 2.

Table 2. Corridor-specific organizations

Corridor	Observatory	Business Development Services	Coordination
Maputo Development Corridor	X+		
Abidjan-Lagos Corridor	X		
SAGCOT			X
BAGCI			X
Poverty Reduction and Alleviation Corridors (Peru)		X	
Greater Mekong Subregion corridors			X

Source: based on Gálvez Nogales, 2014

The coordination mechanisms developed to implement and facilitate corridor strategies depend on the objectives set and the phase, as described above. For transit corridors with the main objective to facilitate transport, an observatory mechanism to monitor transit times is sufficient. Trade corridors need to focus on improving skills and linkages between market actors through business development services. The agricultural growth corridors can have a different range of objectives: from increasing investments and production to achieving system change by linking smallholder to integrated value chains. The corridor-specific organizations will call for more complex coordination mechanisms.

Focused more on transit than on development, Maputo corridor governance is less structured and relies on a private sector observatory mechanism. The Maputo Corridor Logistics Initiative (MCLI) represents a non-profit association of firms that use the corridor, with MCLI as a focal point for engaging with the authorities to discuss trade and transport challenges, regulatory reforms, and policy implementation to improve the corridor's functioning. In these discussions the MCLI represents the interests of infrastructure investors, service providers and other major stakeholders but also markets the corridor, focusing on agricultural development issues only inasmuch as these reflect corridor user interests.

The Abidjan-Lagos Corridor was also initially set up as a transit corridor. Trade facilitation, infrastructure investments and project management of the Abidjan-Lagos Corridor is in the hands of Project Coordination Units that have to coordinate with the national agencies (customs, ports etc). The Abidjan-Lagos Corridor Organization (ALCO) is charged with the monitoring of the corridor performance (with an HIV/AIDS program as an extra component).¹¹ Corridor governance is set up in a project based fashion, while ALCO has had to stretch their mandate considerably due to the Ebola outbreak in 2014. But these corridors themselves have a limited scope of activities.

11 See documentation from Borderless: http://www.borderlesswa.com/sites/default/files/resources/feb12/RAPPORT_AN1_OCAL_PFCTAL_090212_Approved_Angl_pdf

The corridors around Walvis Bay in Namibia, including the Trans-Kalahari Corridor, may offer a different model. This includes the Trans-Kalahari Corridor Management Committee, a joint regional committee with rotatory chairmanship, originally established by Namibia's Ministry of Works, Transport and Communication in conjunction with the Botswana and South African Governments as well as private sector transport representatives.¹² This Committee aims to simplify cross-border transactions and customs operations along the Corridor, and signed a Memorandum of Understanding to establish a Trans-Kalahari Corridor Secretariat office hosted by the Walvis Bay Corridor Group, itself a PPP established to promote use of the network of transport corridors comprising the Port of Walvis Bay, the Trans-Kalahari Corridor, the Trans-Caprivi Corridor, the Trans-Cunene Corridor, and the Trans-Oranje Corridor. The PPP form allows the Walvis Bay Group to pool resources and the authorities of both transport regulators and transport operators, thus effectively serving as a one-stop shop for coordinating trade along the Walvis Bay Corridors. Walvis Bay is now looking towards collaboration with South Africa on promoting accompanying investments around the corridor.

The WEF, PRA and ADB corridor-specific organizations all reflect public and private collaboration, but the difference in geographical scope and the institutional drivers have led to different outcomes. The extensive geographical scope of the GMS and CAREC corridors have led to a dual model with a heavy regional coordination structure. The involvement of local governments and communities in the development of the corridors has been insufficient, indicates Gálvez Nogales (2014). Also, the communication between the regional and local level and implementation capacity at local level can become problematic.

The SAGCOT and Beira corridors are led by legally registered PPPs, where public, private and development partners participate, and are assisted by professional secretariats working on a contract basis. For SAGCOT and Beira corridor these are mostly private companies who take up this work as a part of their CSR policy although the SAGCOT Centre also engages with the Tanzania Private Sector Foundation, the Agricultural Council of Tanzania and other private sector organizations to address pertinent issues. The PRA corridor in Peru works with a similar arrangement, with NGOs or consortia of companies taking up the management and coordination of the corridor program (Gálvez Nogales 2014).

Within the corridors approaches discussed, there is an underlying question about sequencing. While infrastructure investments are at the core of the corridor approach, there are various ways to set up this component, with questions also about which comes first between different elements of infrastructure, accompanying reforms, and strategies to promote investment along the corridor. Again, the PRA corridor appears to go against the grain by investing first in broadening the corridor through technical assistance and providing Business Development Services before investing in hard infrastructure. Second, the organizational setup can vary between only government investing in infrastructure or co-financing between donors or international financial institutions and governments through grants and loans. It is also possible to offer technical assistance to develop and field test infrastructure PPPs, like the PRA corridor. This way, government gained time to fine tune regulatory and legal frameworks while building institutional capacity of the government agencies involved.

Stakeholder engagement for building partnerships can also take place in different phases. The SAGCOT and Beira corridors have invested a lot in building trust, shared goals and principles before launching pilot projects while others like the CAREC and PRA corridors opted for the 'action first' sequence (Gálvez Nogales 2014). This means starting activities to which the stakeholders commit first and build upon these processes to strengthen cooperation. The risks of learning by doing can have negative impact on the effectiveness and efficiency of the activities, however.

12 <http://www.wbcg.com.na/home-page.html>

Financial sustainability of corridor-specific organizations

The financial sustainability of corridor-specific organizations is a challenge. The MCLI is financed through a membership fee paid by the private sector stakeholders. Willingness to keep financing MCLI is always a risk, and it's unclear to what extent the private sector funders are prepared to carry possible higher costs for the running of the Secretariat. The SAGCOT Centre has also faced funding challenges, relating in part to lack of willing financiers of what is in many respects a private sector-led initiative, although plans have been drawn up to promote a PPP model for this. The ALCO is a donor financed project rather than an institution, also putting its sustainability in question.

Beyond form, the mix of different drivers underlying the corridor and the ability to find strategic partners from public and private sectors with a long-term commitment to developing the corridor appears to be of key importance. "The majority of the corridor programs are requiring more and more financial resources over time" states Gálvez Nogales (2014). So, apart from corridor conveners and governments, new developmental partners and new, global funds like climate change funds and food security and other possible mechanisms to attract private sector investments like guarantees and PPPs.

Clearly the institutional setup may also link to the level of funding available for both public and private investment. Referring to the GMS and PRA, Gálvez Nogales (2014) finds that 'the majority of the corridor programs are requiring more and more financial resources over time.' Further, the ratio of private investments induced in the corridor to each US\$ invested in the corridor program vary a lot, from 1 to 0.45 in the PRA corridors, to 1 to 3.51 in Mozambique, also reflecting the type of investment that accompanies a corridor, whether SMEs in the case of the PRA or multinational investments, in the case of the Maputo Corridor. Clearly it also depends on the type of investment mobilized: infrastructure investment (e.g. feeder roads and on-farm infrastructure that are among the main items in the African and Indonesian corridors), versus productive investments relating to agribusiness and agro-industry processes (e.g. processing facilities and equipment for bixin, trout and dairy production).

This opens up avenues for research on processes relating to PPPs. As the SAGCOT case suggests, proactive involvement of the private sector may be needed to reach a critical mass of investment for success, particularly if most private economic activity will be undertaken by small or mid-sized firms, as is the case in agriculture. This raises questions about risk-sharing, the incentives or conditions required to entice private sector participation, and the potential role of the public sector in ensuring investments are socially and environmentally sustainable. This might take the form of undertaking required environmental and social impact assessments clarifying land rights and adjudicating disputes, and providing last mile infrastructure to link local people to benefits of the project, but the relative costs and benefits of this approach have received little research attention thus far.

Corridor-linked policies & regulations

The growing importance of PPPs as mechanisms for infrastructure and investment projects in agriculture and other sectors points to the potential need for specific PPP legislation. However, while this might help optimize regulation and governance of public private partnerships, there is often no existing regulatory framework. Private sector partners will need a more solid legal base to take up the high risk involved in doing business around corridors than the general public contract law, while PPP infrastructure concessions may be crucial. Technical assistance can assist national governments in developing legal, regulatory and procedural instruments and PPP-concession business-schemes and transactions, something that has been the approach of PRA in developing infrastructure PPPs.

In the case of the more complex public-private-producer partnerships (so-called PPPPs in Thorpe and Maestre 2015), safeguards to protect smallholder farmers from the potentially negative impacts of corridor-related farming systems or business models are also key in supporting

corridor inclusiveness. This includes the regulations in place for contract farming, policies and regulations on natural resource management, capacity development and skills development through agricultural training, and policies to promote adapted and appropriate technology.

With agricultural corridors linking to investment in land, the policies and regulations around land titling also become extremely important. For inclusive corridors to take place and have a development impact, land policy must guarantee both business needs, through secure land titling regulations, as well as safeguard against inequitable land-lease systems or compensation for those displaced by corridor-related investments or construction. Given the focus on investment promotion, the broader regulatory and institutional framework for private sector development are also important. Investment promotion facilities, trade reforms (mostly removing restrictive import and export policies) and improvement and enforcement of quality standards are policies that are addressed by most corridors and have particular relevance in the agricultural sector. Some specific policies might be needed to facilitate the development of prioritized value chains along corridors.

3. Key research priorities

The discussions above point to a wide range of researchable issues that influence corridor development and potential impacts. The AEO (2015) points to the need for regional and spatial policies to focus on local assets, whether “generic resources” like gas or minerals, or “specific resources”, like specifically local landscapes or know-how; to articulate sectoral policies and public investments in a regional framework to maximize complementarities; and to engage different actors in multi-level government settings, and in particular promote the active participation of local stakeholders.

This section discusses first the potential for impact-related research that looks at issues of scope, objectives and impacts on agricultural, economic transformation and ecological sustainability, including the underlying assets or foundational factors. Second, the potential for doing research in support of different implementation approaches is discussed, including how to work in public-private partnerships and the policy and thirdly, institutional issues relating to the governance and policies guiding SDIs, and corridors in particular.

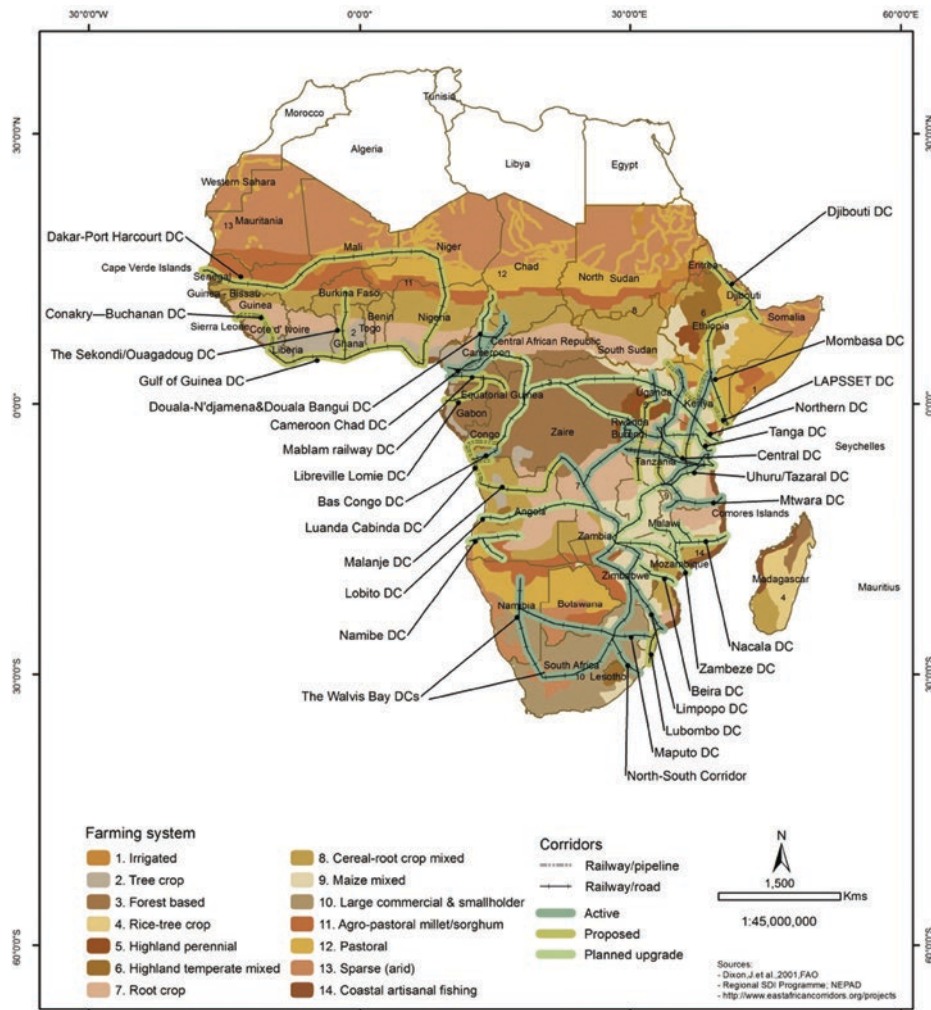
These also coincide with outcomes from a recent workshop in Durban, South Africa (Annex 1), where CRP representatives suggested two main sets of research questions, both of which require collaborative work across different CGIAR research programs. The first related to the social, economic and ecological impacts of spatial development initiatives and corridors in particular. The second concerns more demand-driven research that produces policy and practical options in response to the needs of corridor-related policy makers, designers, developers, managers, local businesses and farmers as well as other stakeholders who seek to benefit from such initiatives, therefore overlapping with issues of implementation and institutions.

3.1 Research on corridor impact and agricultural transformation

Independent research regarding the impact of spatial development initiatives and corridors might focus on the effects on their social, economic and natural environment, both negatively and positively, looking at the impact on agricultural transformation, poverty, ecological services and natural resource management for example. This stream of research might look at the impact of corridors on the people living in the areas affected by it, including those close to the corridor as well as in the hinterland, and look at the effects of large scale commercial farming stimulated by corridors on the food and nutrition security of local smallholder farmers and small entrepreneurs. Evidence suggests that living near such a corridors can have effects beyond access to markets, linking to health and social effects, that need more research. It might also examine the effect of corridor approaches on those outside the target area, given the fear that corridors will compete resources away from the most needy.

The scope for corridor-related agricultural research is striking in Figure 1. This highlights the different farming systems in Africa along with existing and planned corridors. These also clearly overlap with CGIAR research countries, suggesting that for certain CGIAR programs, corridor-related research is unavoidable. Indeed, CGIAR Research Programs are already involved in many research and development activities directly related to or, relevant to corridors. These include: stakeholder engagement in spatial development planning; socio-economic contexts to identify agricultural development opportunities; ex ante agricultural fore-sighting and yield-gap analysis; supplier development, organizing and linking stakeholders to markets and consumer preferences; the prioritization of value chains for particular areas or countries and, crop modeling, breeding and the identification of recommendation domains (areas, regions) where particular technologies can be applied to improve productivity and agricultural value added.

Figure 1. Farming Systems and Development Corridors in Sub-Saharan Africa



Source: Weng et al. (2013)

The difficulties of tracing the link between agricultural research and developmental impact have been extensively discussed within CGIAR and the ISPC, and CGIAR's Standing Panel on Impact Assessment (SPIA) specifically. The same holds for interventions planned and implemented by the corridor growth programs, often involving the use of new crops and inputs, institutional innovation etc. The conditions and (potential) impact of corridors are highly context-specific, and indeed may change with the impacts of climate change: as IFPRI foresight work highlights, current corridors are not yet connecting new areas that may surge as surplus or deficit areas due to climate change. This points to an essential role for prioritization and stakeholder engagement feeding into research on how agricultural landscapes are changing, and the role of corridors in that process. It also implies a need to differentiate between regions (favored and less favored) and types of small farms (subsistence farms and market oriented), as is suggested in the ISPC White Paper on the impact pathways and inter-linkages of CGIAR's System Level Outcomes. Identifying these factors in the design phase of corridors is essential to be able to identify indicators. As pointed out in the ISPC White Paper, every audience, purpose and context will change the design of the indicators needed. The need for clear and measurable development goals that are monitored and evaluated against robust and reliable indicators will remain a key issue to contribute to improve the developmental impact of corridors.

Impact distribution

It is important to gauge the impact of corridor initiatives against baselines, including but not exclusively in terms of investment, employment generation, and agricultural transformation, not least to allow feedback loops to help adapt strategies and approaches when needed. The methodology needed to assess the impact on sustainable agricultural growth and economic transformation is much more complex than monitoring transport and trade, and a subject for research. It involves defining what results are expected and what indicators can be used. The task of target setting and impact assessment is now frequently outsourced to external parties. Taking into account the complexity of corridor interventions that aim to catalyze infrastructural investments and institutional and agricultural innovations, the similarity with impact assessments needed for CGIAR systems programs and innovation platforms is evident.

A key research concern around corridor impacts is the distribution of impacts on productivity, access to land, water use, food security and market accessibility, particularly with regards the poorest households. Smallholder farmers might be affected disproportionately in areas where corridors are being implemented, particularly with regard to land-rights, contractual relations, the differentiated impact of investments in infrastructure on agricultural productivity, post-harvest losses, commodity markets effects on local and regional trade, and the mechanisms through which this is felt. Besides, positive or adverse effects on the availability and quality of water and other resources to smallholders may affect existing farming systems. The International Center for Tropical Agriculture (CIAT) is working with smallholders in the green beans and groundnut value chains in the SAGCOT-area on how to take advantage of the several corridor-related (infrastructural) investments in the region.

Corridor-related impacts include the impact of new or modified farming systems, associated with agricultural growth corridors, on wider ecosystem services. While especially the SAGCOT and Beira corridors emphasize the importance of linking smallholder farmers to markets, actual changes point in the direction of agricultural growth through industrial monocropping with farmers in the role of contract farmers or outgrowers. The differential impacts of growth corridors on natural resources and their capacity to deliver healthy ecosystems services including habitats for biodiversity in rapidly transforming agro ecological landscapes are also potentially significant. Many CRPs stress the need for more research addressing the social-ecological systems, the potential tradeoffs between different development objectives, and the tentative policy actions needed to ensure the sustainability of ecosystems within and around corridors.

Working towards sustainable intensification that can prevent land use change is becoming a key argument for investments in agricultural growth corridors. It has the potential to optimize the benefits of private investments in agricultural growth corridors. Yara being the driving actor of the SAGCOT corridor, this is certainly a major point in the SAGCOT and other corridors. In the Environment and Climate Compatible Agriculture project (ECCAg)¹³ Syngenta, the Sokoine University of Agriculture (SUA) in Tanzania, the Norwegian University of Life Sciences and Yara have studied the impact of the 'Syngenta package' (seed treatment, fertilizer use, herbicide and micronutrients, training in basic agronomy and conservation agriculture¹⁴) on productivity, farmer income and environmental impact. Field trials on smallholder maize and rice farms in Tanzania comparing existing practice with the Yara/Syngenta/SUA protocols have shown an increase in productivity and profitability.¹⁵ Increased connectivity could potentially contribute to higher productivity because of better access to markets and inputs. In the best-case scenario higher productivity and profitability can lower demographic pressure on vulnerable areas although Laurance et al. (2015) suggest that from the 33 current and planned corridors in Sub Saharan Africa, the large majority (28 of the 33) show high environmental costs and/or modest agricultural benefits. Byerlee et al. (2014) highlight how technology-induced intensification is more effective in reducing pressure on increasingly scarce land resources and conserving natural ecosystems than market-induced intensification.

13 See http://www.yara.com/media/news_archive/improved_yields_and_quality_of_life.aspx?WT.ac=PushingClimateSmartAgriculture_RelatedArticle2

14 See http://issuu.com/syngentauk/docs/science_matters_2012-1/20

15 See http://www.yara.com/media/news_archive/pushing_climate_smart_agriculture.aspx

Collier and Dercon (2014) point to the challenge of massively increasing agricultural production, “requiring a vast reduction in the proportion of the population engaged in agriculture and a large move out of rural areas” while attempting to encourage smallholder agriculture as the main route for growth in African agriculture. While they call for a more open-minded approach to different modes of production they also find that “a rush to establish “mega-farms” with government discretionary allocation of vast tracts of land is unlikely to be the answer.” Sustainable intensification is only one part of a multi-faceted approach of making local and global food systems more resilient to face future challenges. Without a broader approach to impact it will be hard to distinguish between approaches that are truly sustainable and those that are more extractive in nature or replicate existing power disparities by e.g. increasing farmer indebtedness. Solid and unbiased research able to assess the broader impact is becoming more and more relevant within corridor programs, as the case of Yara and Syngenta in the SAGCOT illustrates. The Climate Change, Agriculture and Food Security CRP in collaboration with the Sokoine University has conducted a CSA Rapid Appraisal of the SAGCOT corridor. They highlight the importance of demand-driven research for development, involving policy engagement and strengthening local institutions.

The impact of policies to lower transport prices is also important to examine more closely. This relates to price transmission, but also the nature of the transport sector, the degree of regulatory impacts on transport prices, and transport market structure, all of which may boost or undermine the impact of corridor-related approaches to promoting inclusive agriculture and affect the distribution of benefits.

Relatedly, the impact of corridor management approaches would also benefit from further research. Continental learning on the institutional mechanisms of transport corridors may be helped by the Africa Corridor Management Alliance (ACMA), a body that was set up in 2013 with a view to stimulating cross-corridor learning, supported by the African Trade and Policy Centre.¹⁶ Up until now the ACMA has not shown activities, but they indicate that they are not only interested in the trade aspects of corridor management but also in its economic, social and, albeit to a lesser extent, in its environmental impact. Comparative research between corridors is also mentioned as an interesting possibility for demand-led research by ACMA. Even though private sector interest is important, governments like the government of Namibia in the case of the Walvisbay Corridor, have high stakes in the corridor organizations and also want reliable information about the social impact of their investments. The Africa Transport Program (SSATP) also aims to disseminate lessons learned, but is limited to transport activities and subsequent policies and strategies. There is no independent body that aims to facilitate continental learning on growth corridors.

Impact channels

Corridors or cluster approaches can be used as pilot areas to research how different technologies help remove major barriers to development impact, adoption and scaling of CGIAR research technologies and products. The role CGIAR can play in growth corridor research will differ according to the phase of the corridor intervention; design, implementation or evaluation. These phases are not necessarily linear but do impose limitations and influence scope and reach of research.

The interaction of infrastructures and agricultural systems can also benefit from research relating to the use of geospatial tools and big data for better targeting of technologies. These can be used for identifying potential gains to corridor or cluster approaches, identifying impacts of new infrastructure, estimating potential rates of return, and monitoring progress during implementation. The results can then be used for improving corridor impact and potentially in informing and improving the process of promoting additional corridors. Indeed, IFPRI has shown through forecasting how Climate Smart Corridor development strategies should take into account

16 See http://www.uneca.org/media-centre/stories/consultative-meeting-african-corridor-management-alliance-starts-ad-dis-ababa#.VNzCUVXF_IQ

climate change: current corridors are not yet connecting new areas that may surge as surplus or deficit areas due to climate change. Further, investments in electricity, roads and railways may play important roles in reducing postharvest losses, contributing to lower food prices, higher food availability, and improved food security.

The research interest in corridors in this regard relates to the interaction of corridor hardware and software with those already existing around a corridor. For example, the degree to which new feeder roads and energy connections can be made to improve “densification” of the corridor (Jourdan 2011) through connections to local economic activity may be of specific relevance. Similarly, the broader “software” includes rules and regulations governing the transport sector, port regulations on goods distribution among transporters, police discipline and land titling are all indirectly also important for corridor development. The Maputo Corridor road concession agreement, for example, did not include regulation for overload control, requiring that additional agreements and investments be made to avoid deterioration of the road (Sequeira et al. 2014). It is also the target approach of donor spatial initiatives such as TMEA, that itself targets the ‘interconnected costs’ around specific corridors.

It may be that increased investments in research have more impact on post-harvest losses than infrastructural development. Rosegrant et al. (2015) argue that the investments in infrastructure (electricity, roads, particularly paved roads, and railways) in reducing post-harvest losses (PHL) can be significant although these depend on the region and commodity. They find that “reductions in post-harvest losses are not a low-cost alternative to productivity growth for achieving food security” but rather are “complementary to investments in long-term productivity growth to achieve food security” [emphasis added]. More perishable commodities like roots and tubers, fruits and oilseeds benefit more than cereals from infrastructure development. The PHL reduction can in its turn lead to lower food prices, higher food availability and improved food security, but existing literature does point to the relatively high costs associated with remedying losses and the tendency of PHL technologies to exclude smallholders because of the required size of production of these technologies. CYMMIT’s projects on grain storage to reduce PHL and the RTB program’s systematic assessment of PHL in the cassava value chain are showing the highly differentiated extent, reasons and thus solutions of these losses.¹⁷ It needs to be explored to what extent these experiences could be valuable for growth corridor interventions.

3.2 Research and implementation options for sustainable corridor development

The second area for research to be discussed here concerns more demand-driven research options in response to the needs of corridor policy makers, designers, developers and managers, and other stakeholders who seek to benefit from corridor implementation. It would include for example, working directly with smallholders and local authorities and support their efforts to turn their areas into sustainable agricultural growth hubs, connected with the corridors. It would involve understanding the economic, technical, social and environmental constraints and opportunities arising from corridors and, support for innovation towards sustainable production and marketing systems. Such research would respond directly to the existing policy demands on the part of African authorities to make corridors more development effective, inclusive and sustainable. It may touch upon existing and newly growing areas of CGIAR expertise, such as spatial analysis, territorial development, agricultural foresighting, value chain facilitation and innovation, and how to sustainably increase productivity and profitability of farming systems, how to involve multiple stakeholders in the planning of these spatial type of interventions or how to best link smallholders to better access to inputs, services and markets.

Implementation approaches: the potential of public-private partnerships

Beyond research that aims at understanding the different linkages and paths from corridor and SDI initiatives to impact, key research questions relate to how such approaches are designed and implemented in

17 See <http://www.rtb.cgiar.org/addressing-postharvest-losses-cassava-value-chains/>

practice. Corridors/SDIs are increasingly concerned with contributing to the achievement of sustainable development objectives. The big question is, how to design and implement such public-private partnership initiatives in such a way that besides private interests, public interests are served as well. Although agricultural research for development is increasingly picking up on partnerships with the private sector, directly working together with the private sector has its risks and opportunities that need to be identified and weighed. For example, the evidence on agricultural corridors emphasizes the need for realizing benefits and empowerment of smallholder farmers, implying a need to better understand the business models used and how they benefit smallholders (i.e. employment, capacity building, income, sustainability), possibly helped by a local neutral party. The role of brokers to support monitoring processes and facilitate dialogue around conflicts is also emphasized by e.g. Thorpe and Maestre (2015) and Brouwer et al. (2015).

Asymmetry of information (Vermeulen and Cotula 2010) in large private investment projects in agriculture like the WEF-corridors is a major hurdle to overcome. The availability and access to information, together with the limited access to finance have proven to be major constraints in achieving more equitable business relations between the private sector investors and smallholder farmers. Critics of the larger corridor programs like the SAGCOT and the Nacala corridor criticize these programs for a lack of transparency, public consultation and public participation. Often, they signal, information is not (easily) available, or not available in local languages. Consultation processes are said to be rushed and sometimes merely symbolic. Also here, the role of brokers like NGOs, CSOs or research organizations within PPPs prove to be key in helping to ensure transparency and dialogue. All this then raises questions on how the different processes within the corridor programs should be monitored and with what kind of indicators.

An important line of research relates to the additionality of different partnership approaches, and particularly the impact of donor and other public funding destined to support corridor-related initiatives. African governments are increasingly betting on SDIs and large-scale public-private partnerships to achieve their much needed agricultural development is rising, with donor interest and funding of these partnerships also rising. The OECD estimates that donor funding of PPP mechanisms increased from \$234 million in 2007 to \$903 in 2010 (although this is rough because of the unclear definitions of donor spending lines and reporting mechanisms). Part of the controversy is the 'moral hazard' (Oxfam 2014) involved in contributing to or engaging with corridor programs with ODA funded research if the inclusivity of these business models is questioned. CGIAR has been building experience with multiple stakeholders and complex issues through innovation platforms or Agricultural Innovation Systems (AIS) in as diverse countries as Egypt, Ghana and Mozambique. The extent to which these innovation platforms can also serve as a tool to facilitate the multi-stakeholder partnerships of corridors needs to be explored to be able to create synergies and avoid duplication of efforts.

The CGIAR Strategy and Results Framework may be a useful tool to retrace the steps of research to developmental outcomes and the way private sector involvement can affect impact pathways. The potential transformational change of corridor and SDI approaches can have both synergies and trade-offs between the different outcomes. As pointed out in the ISPC White Paper (2013), CGIAR research could focus more on exploring the interlinkages between different impact pathways and to track possible negative trends and outcomes. In the context of growth corridors this becomes ever more crucial. Lessons learned within the CGIAR from experiences such as the public private partnership between the World Agroforestry Centre (ICRAF) with Unilever on extracting oil from *Allanblackia* seed could be shared in a more systematic way¹⁸ as well as CGIAR experiences with natural resource management for example the CRP on Water, Land and Ecosystems.

As pointed out by IFAD's work on inclusive business models (Vermeulen and Cotula 2010), there is no single business model that stands out as the best for smallholders while staying attractive for private sector investors. This is very much context-specific, depending on land tenure, policy, history etc. Linking agribusiness and

18 See http://worldagroforestry.org/research/tree_diversity_domestication/Allanblackia.

smallholder farmers will always need careful design and implementation because of the inherent power disparities between the two groups. One thing the IFAD study emphasizes is that to make inclusive business models work, the private sector actor needs a real economic motivation to engage with smallholders beyond a CSR framework. Government policy can set the stage to promote this, but also the negotiating power of smallholders vis-a-vis the private sector and government is key. There is a potential role for CGIAR research in making corridors safe developmental investments, providing more independent evidence on the impact on poverty reduction, food and nutrition security and sustainable natural resource management.

More specifically, research might focus on the cost of engaging smallholders in such multi-stakeholder partnerships and understanding where specific constraints lie. High costs may make engagement with outgrower smallholders financially unviable without donor support raising questions about whether donors should subsidize business to work with smallholders or rather support smallholders directly in organizing and training for markets. One of the key issues raised at the ISPC workshop was the importance of strong partnerships with government, farmers' organizations and NGOs, for example through innovation platforms. Research might also look at differences in transactions costs for different crops and contract types around agricultural corridors. Governance structures with commodity value chains will differ strongly, as is the place in the chain where power and leverage is concentrated. Retail firms at the consumer-end of the chain that run a greater risk of reputation damage can offer a good point of entry to align development objectives and business interests (Abdulsamad 2015). Building the capacity of farmer representatives is important in this regard, allowing them to negotiate with other stakeholders as equal partners as a means to spreading the benefits of PPPs (Fairtrade Foundation 2012).

Relatedly, questions might be addressed on how corridor initiatives can connect farmers to innovation systems to build knowledge and skills. Current practices and their outcomes should be monitored systematically. Research is currently being done on market system approaches to, for example, extension services, but more research is needed on how corridor approaches can incorporate this in their programs.¹⁹ CGIAR is using geospatial tools and big data for better targeting of technologies (e.g. see Mapping crops to improve food security).²⁰ The question is how this research can add value to the work on corridors and what feedback from the projects can trigger new research?

3.3 Institutions and Policies for inclusive and efficient corridor management

Finally, the broader institutional and policy environment is key for looking at how agricultural research might support agricultural growth corridors. While there is a lot of rhetoric on developing and implementing good agricultural policy, this doesn't always translate into action. That raises questions about when, where and why agricultural policy is effectively implemented and whether or not corridors help facilitate this.

CGIAR has opened up channels to align research with CAADP. What could the role of the CAADP-CGIAR partnership (regional or national) be in improving the impact and inclusiveness of corridors approaches? There is a perceived need for deeper understanding and more dialogue to build trust between different parts of the private sector, policy makers and other key stakeholders at the national, regional and international level around corridor initiatives. There is a need to understand when, where and how broad policy reforms can further ensure smallholders can benefit from increasing attention to promoting investment and trade in agriculture, with a view to finally raising productivity and incomes for the vast populations relying on agriculture in Africa. Further, and as highlighted in the introduction, corridor and spatial approaches feature in the strategies of a growing number of RECs, raising the importance of providing research to bridge the gap between policy and practice.

19 See <http://www.beamexchange.org/en/webinar/agriculture/>

20 See <http://www.pim.cgiar.org/2014/08/20/mapping-crops-to-improve-food-security/>

The role of public policy in promoting investment is also key. Corridors try to attract private investments by policy and regulatory changes and concentrate public investments in for example infrastructure to solve coordination failures and information spillovers. Private investors need to be convinced though, that the benefits outweigh the costs of such an investment. Gelb et al. (2015) indicate that the role of the private sector and the incentives they face needs more careful analysis for corridor partnerships to understand this threshold. Corridors that open up underutilized agricultural territory but do not in addition generate other economic activity (e.g., trade between population centers, major tourism, mining, minerals, etc.) may be hard sells on rate of return alone. Further, Gelb et al. (2015) suggest that most agglomeration focused World Bank interventions are too complicated to be working satisfactory and would benefit from a smaller number of projects and better institutional capacity, again opening up some potential avenues for research.

Dealing with land tenancy, land rights and integrated water management is crucial to the sustainability and political viability of growth corridors. Especially because of strong private sector push of some corridors, lack of clarity about institutional players and rules of the games and a context of weak institutions, environmental sustainability in the medium term can be undermined if not safeguarded. Fears are commonly expressed that corridors focus on working with large companies to promote commercial farming, leading to so-called land-grabs. Ekman and Macamo (2013) find that the ProSavana program in the Nacala corridor has learned from the experiences of the WEF growth corridors and is more cautiously engaging with smallholder farmers. ProSavana is investing a lot in this, by not only facilitating collective land registration through the local DUAT (Direito de Uso e Aproveitamento da Terra) system, but also in capacity strengthening of local government officials. Still, critics of the ProSavana program are still not convinced by the safeguards and guidelines built in the program (Funada-Classen 2013). As two leading scholars put it, “there is no one grand land grab, but a series of changing contexts, emergent processes and force, and contestations that are producing new conditions and facilitating shifts in both de jure and de facto land control” (Peluso and Lund 2011).

Finally, like any policy reform or process, the corridors and SDI approaches necessarily take place in a specific political economic context, shaped by geography and history, economic dynamics, the interaction of formal and informal institutions, external factors and by the incentives that emerge from the specific nature of what is being carried out - for example, constructing roads involves different actors and interests from designing border reforms. While a corridor may offer space for policy experimentation, a better understanding of interests and power relations around a corridor may be needed to ensure policy and support mechanisms sufficiently align or alter incentives towards sustainable and inclusive investment. This may relate to challenges around land access, the quality and standards infrastructure, and non-technical barriers to trade along or near corridors but also wider issues of tax policy and the broader national policy environment. This raises the need for policy research into the drivers and constraints of policy reforms around agricultural corridors and their potential to overcome the barriers faced at a national level.

4. Conclusions

This paper discusses growth corridors as an approach for sustainable and inclusive agricultural development. It aims to provide inputs to thinking about how agricultural research might contribute to their long-term development. Focused principally on Africa, the paper discusses the implications for corridor approaches of structural factors, different corridor objectives, and corridor governance mechanisms, where the driving force behind the corridor initiative is of particular interest for policy-makers and researchers.

The potential role of corridor initiatives varies widely, depending on the underlying geographical and spatial features. Emphasis is particularly placed on understanding the economic and agro-ecological zones being connected, and the balance between the coast and the hinterland economies. The political-economic relations between countries and markets in different sectors, including transport, are also key.

The paper also highlights the evolving nature of corridor-related approaches, which are increasingly moving from a focus on transport and logistics to investment and linking smallholder farmers to large-scale farms and markets. The driver behind such initiatives is also evolving, from primarily public sector drivers to the private sector. What these have in common is their approach to overcoming coordination failures among private and public investments in a narrowly defined spatial area. As raised, this may offer important opportunities for piloting specific technologies as well as policies and institutional forms. The way corridors are governed then has important implications for the role that corridor initiatives might play, and the impact of agricultural research.

Based on some of the highlighted risks and opportunities from corridors and SDIs, the paper proposes key research priorities under three broad headings: Impact, Implementation and Institutions. These relate to impact distributions and channels, questions around public-private partnership approaches, particularly with the private sector, and the policy and institutional environment.

As the discussion suggests, there is a need for integrated and interdisciplinary research to contribute to research around corridor-approaches and assess its impact on food and nutrition security, poverty and sustainability. Such research should go beyond a few technical disciplines working together. Research into the strategy, combination of instruments, governance, business environment and regulations needs an integrated approach, aware of the political economy aspects of the research itself. Farmers are often in the midst of (informal) innovation systems, but are not necessarily well connected with formal research systems. Corridor-specific organizations as well as formal research systems should invest in strengthening the innovation capacities of smallholder farmers to react to market changes and strengthen negotiating power towards larger market actors (Abdulsamad et al. 2015). This points to the need of both CGIAR and corridor-specific organizations to engage in more farmer-led research.

Systematization of the different context specific corridor-related research streams should inform a corridors and SDI-based research agenda, so that agricultural growth corridors can indeed contribute to the SDGs.

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Annex 1. Corridors, Clusters, and Spatial Development Initiatives in African Agriculture



Independent
Science and
Partnership
Council



Workshop Report (Durban, 30 November 2015)²¹

Summary

ISPC, NEPAD and ECDPM stimulated discussion between agricultural researchers and corridor stakeholders on their contributions to inclusive and sustainable development. Spatial development initiatives (SDI), including corridors, aim to coordinate and concentrate investment on transport infrastructure (typically building new roads or upgrading existing ones, often related to access for exploiting mineral resources – and accompanying logistic infrastructure (transport services, storage capacity, agricultural extension services – i.e. soft infrastructure. The cooperation among institutions required to coordinate such efforts involves the national governments of the countries concerned, the private sector, international donors, development institutions and researchers. Corridors are becoming priorities in developing countries, as governments and aid agencies are investing heavily in them to try and facilitate dynamism in rural areas. FAO has recently carried out a comparative analysis to establish a corridor typology, to identify the main drivers and components of corridors and to develop policy decision support tools and checklists. A large part of this cross-comparison focuses on the agricultural component of corridor interventions, identifying the most recurrent activities under this component, the financial resources involved, the most often selected subsectors or value chains and target markets, the interface between infrastructure and agro-industrial development and the positive or negative impacts of corridor interventions on the agricultural sector. Growth corridor initiatives like the SAGCOT in Tanzania sometimes spur heated debate. On the one hand, corridors can attract and direct public and private investment towards a sustainable increase in production and income; on the other, corridors are accused of imposing a model that encourages land grabbing, mono-cropping and exclusion of small scale farmers and entrepreneurs. Which one of these visions reflects reality most accurately, remains unclear. The debate is not helped by a lack of undisputed evidence²². The workshop brought together some of the key institutions and researchers that are active on this topic both from within and outside the CGIAR²³, with the objectives of understanding the current state of thinking in research and policy circles, and to help define how best the ISPC might contribute through its strategic study on corridors and spatial development initiatives in African Agriculture.

African spatial development initiatives and challenges to research

²¹ Draft prepared by Paul Engel and Paulina Bizzotto Molina (ECDPM), January 2016.

²² [Link ECDPM Blog](#)

²³ List of participants in Annex 1.

At the **Global forum for innovations in agriculture in Durban** on the 30th of November, the Independent Science and Partnership Council (ISPC) of the CGIAR together with the New Partnership for Development in Africa (NEPAD) and the European Centre for Development Policy Management (ECDPM) organized a workshop on the role of Clusters, Corridors and Spatial Development Initiatives in African Agriculture. It was an opportunity for international agricultural researchers of CGIAR centers from all over the world to meet representatives of major corridor projects. In his introductory remarks ISPC Member Prof Sayer underscored that there has been a remarkable growth in African agriculture over the past ten years. Corridors and SDIs might give agriculture in Africa a new impulse. These and other unknown changes make it difficult to foresee what the African agricultural landscape will look like in twenty years' time. He also pointed at the challenges implied in tailoring agricultural research to the new sustainable development agenda, particularly with regards to the needs of smallholders.

During the introductory session, the African policy and research perspectives were laid out by Augustin Yamdjeu of NEPAD's Comprehensive Africa Agricultural Development Program (CAADP) and Aggrey Agumya of the Forum for Agricultural Research in Africa (FARA). Yamdjeu sketched the context for agricultural development in Africa: rapid and poorly coordinated urbanization; a young population demanding economic opportunities, globalization and its discontents and climate change. Within this context the Malabo Declaration of Heads of State and NEPAD's "Transforming Africa" agenda emphasize agricultural transformation, engaging with the private sector and the need to upgrade agriculture in national agendas to make it attractive to young people. Agumya underlined agricultural productivity was a first priority, complemented with research on markets and trade, value addition through industrialization and natural resource management. He also emphasized the policy dimension, the need for sound policy as a key instrument for corridor development and FARA's work on decision-support, developing a platform for sharing research results with policy makers and getting their feedback. Finally, Bruce Byiers presented the ECDPM background paper commissioned by the ISPC, on agricultural growth corridors, their scope, objectives and governance and the impact and implications these corridors have for agricultural research.

The cases of the Maputo Corridor and the Walvis Bay Corridor

During the first panel session the scene was set by Barbara Mommen, of the Maputo Corridor connecting Mozambique and South Africa and Johnny Smith and Gilbert Boois of the Association of Corridor Management Associations and the Walvis Bay corridor in Namibia. Both stressed the lead role of the private sector and their pressing need as managers for a better understanding of past and future social, economic and ecological impact of spatial initiatives; considered vital to improving the corridors' contribution to sustainable and inclusive development. Mommen emphasized that for a corridor to develop successfully, scale is essential as well as supply chain predictability and competitiveness. Her experience in the Maputo corridor had convinced her of the need of larger-scale farming to achieve agricultural transformation, creating the backbone for small farmers in demand for inputs, services and access to markets. She mentioned research pointing at a considerable improvement in rural women's health within 30-40 km of the Maputo Corridor.

Box 1: Spatial Development Initiatives (SDIs)

SDIs are large external investments in infrastructure, both by government and private sector players. Corridors are usually based on existing infrastructure that has historical roots. They can be built to connect rich hinterlands to poorer ports or poorer hinterlands to wealthier ports. They can connect different agro-ecological zones, linking surplus regions to ports or deficit regions. Often the incentive for such large investments in infrastructure has been the interest from the extractive sector. However, corridors do often take a more programmatic approach. Transport corridors that connect different countries for example may aim to shorten the time and reduce the costs for cargo crossing the borders along the corridor. They can also identify agricultural growth poles along the corridor and stimulate development initiatives in these communities; leading to additional product flows along the corridor. Already, in these and other corridor initiatives the drive to stimulate investments in agricultural development has gained momentum. This includes investments to stimulate large commercial farming. Both the Maputo Corridor and the Walvis Bay corridor are moving from being a transport corridor to becoming a corridor with more developmental ambitions. These corridor organizations offer trade facilitation and targeted investment and development around the corridor with the aim to achieve socio-economic benefits, for example for smallholder farmers or SMEs. Yet they often lack the evidence to monitor and understand the impact of public and private investments on ecological and social developments. Much more research is necessary to design, plan and implement interventions that aim to improve the ecological, economic and social development impact of corridors.

Smith and Boois explained how the Walvis Bay Corridor had evolved from a transport corridor into a development oriented economic growth corridor as part of Namibia's "Growth At Home Strategy". The corridor was able to coordinate investment and infrastructural investments, but also prioritized anchor projects directed at particular industries such as, for example, agricultural growth poles along the route. Philip Kiriro of the East African Farmers Association, emphasized growth corridor were a good vehicle to attract investments, which is much needed because investment in agriculture is by far not enough yet, closer to 3-4% instead of 10% of government spending, as intended in the Malabo Declaration. Also, that farmers didn't forever want to remain the weakest link in the value chain, they want to start adding value to their products. Farmers need to be involved much more actively in the design, planning and implementation of agricultural growth corridors if they want to be able to truly contribute to inclusive development. Finally, William Benjamin of USAID indicated corridors are central to the "Feed the Future" strategy and stressed the importance of partnerships with more advanced agricultural countries such as India, Brazil and South Africa who successfully engage with their private sector, their leverage, skills and finances. He also highlighted the importance of predictability to the private sector and the need to include smallholders, particularly women, in corridor development. The discussion focused on the viability of corridors to benefit smallholder farmers. Maputo Corridor reported huge growth in the movement of agricultural products, while the Walvis Bay corridor underscored the 'Green Scheme' the Namibian Government recently established in the North of the county, allowing producers to market their produce jointly through the corridor. Other successful examples of the inclusion of smallholders to achieve scale were given, such as an out grower scheme in Mozambique that combines marketing and technical assistance to producers. An important role for farmer cooperatives in reaching scale was highlighted. The importance of the government actively facilitating and supporting smallholders in achieving quality and scale was underlined.

Relevance and implications of SDIs for existing CRPs

Already many CGIAR centers and CRPs do research relevant to agricultural corridors. CIAT Regional Director Robin Buruchara signaled that the value chains of green beans and groundnut overlap with the SAGCOT corridor and the CGIAR is working with smallholders on how to take advantage of the infrastructural and other elements of corridor initiatives. Paul Kiepe indicated that AfricaRice works closely with stakeholders in dynamic rice sector development hubs, two of which are in the SAGCOT corridor. Research includes the impact on

access to markets for smallholders. Evan Girvetz elaborated on SAGCOT green growth strategy and argued that climate-smart growth corridors are the future of agricultural development in Africa. Also the climate change program (CCAFS) in collaboration with the Sokoine University has conducted a CSA Rapid Appraisal of the SAGCOT corridor. He highlighted the importance of demand-driven research for development, involving policy engagement and strengthening local institutions. Jordan Chamberlin, of CIMMYT, sees SDIs as part of working towards sustainable intensification of agriculture. SDIs drive change but also react to change, so the demand for foresight is increasing. And while geographical targeting is already happening for some time, our thinking on how this may (be managed to) enhance multi-sectorial development has not progressed much.

Jawoo Koo of IFPRI, also underscored the importance of foresight research for SDIs, besides several other research areas such as, spatial targeting, value chains, farm gate price and transport modeling, technology adaptation, national policy and border regulations, social protection and gender. In particular he called attention for Climate Smart Corridor development strategies: current corridors are not yet connecting new areas that may surge as surplus or deficit areas due to climate change. Jenni Baron, IWMI/Water, underscored that part of the work of the Land and Ecosystems CRP is in corridor areas, which gives it a chance to look at how agricultural landscapes are changing and how resources can be better managed for the future. She highlighted the relevance of investigating spatial development impact on natural resources particularly the contested resource water. Flemming Nielsen, IITA/Humid Tropics CRP, stressed the importance of learning from the experiences of the corridors, particularly with regard to the role of large farmers. Existing infrastructure is a constraining factor we can do more with the experiences already gained. He also calls attention to possible trade-offs at national/regional level: Corridors may draw away resources from other areas. The CGIAR works to a large extent in poor regions with poor farmers, and it is these regions that may see less government resources due to corridors. Finally, Alastair Orr, representative of ICRISAT/Dryland cereals, underlined the importance of small farmers being subsistence farmers and commercial ones with regard to their surpluses at the same time. All farmers are involved in markets in one way or the other, but on what terms? Understanding their terms and how we can guarantee continuity of supply in value chains is crucial for creating opportunities for smallholders through corridors.

Box 2. Working groups - Possible implications for agricultural research and partnerships

The questions addressed by the working groups were: What agricultural growth corridors may mean for agricultural research and development outputs and activities, and how synergies between CGIAR Research Programs, SDIs and official African policy processes may be enhanced. In line with the NEPAD policy “Transforming Africa” agricultural corridors were understood as a special development initiative that combines investment, infrastructural and socio-economic development of the areas served by it.

Relevant ongoing CGIAR research / Immediately it became clear that CGIAR Research Programs are already involved in many research and development activities directly related to or, relevant to corridors. These include: stakeholder engagement in spatial development planning; socio-economic contexts to identify agricultural development opportunities; research into water, energy and natural resources management, identifying opportunities for and threats to their development; ex ante agricultural foresighting and yield-gap analysis; supplier development, organizing and linking stakeholders to markets and consumer preferences; the prioritization of value chains for particular areas or countries and, crop modeling, breeding and the identification of recommendation domains (areas, regions) where particular technologies can be applied to improve productivity and agricultural value added.

Corridor interests / The corridor representatives on their part emphasized a number of recurrent issues that hamper their efforts to achieve sustainable and inclusive agricultural transformation in particular with respect to smallholder agriculture. In the first place these include market failures: small holders lack access to information, finance and inputs to be able to respond to economic opportunities provided by

corridors. Another issue is the difficulty of organizing smallholders for scale. The corridor developers themselves often lack information on potential areas for agricultural intensification and growth, particularly with regard to smallholder farmers and, lack understanding of spatial issues regarding agricultural adaptation and competitiveness. Besides they signal a frequent lack of coordination between trade and sector policies and the often unpredictable nature of government policy and bureaucracy.

Opportunities for research / The discussion focused on the needs for research on the part of agricultural corridors. One principal question both corridor representatives and researchers would like to be able to answer is whether corridors indeed drive agricultural transformation and how. Also, they would like to know much more about agricultural, ecological and socio-economic impacts, both negative and positive, in order to be able to adjust their strategies in line with national and pan-African policy objectives. Comparative research between corridors is mentioned as an interesting possibility. Areas mentioned as particularly interesting for impact research include in the first place environmental impact, such as the effects on ecological services provided by the areas affected by corridor development, the trade-offs between sustainability, productivity and inclusivity and, the possibilities for sustainable intensification. This type of research is considered extremely important to inform corridor decision-makers. A second area of research concerns the institutions that are involved in corridor design, planning, implementation and management. How to improve the enabling environment for those entrepreneurs, including smallholder farmers, who need to transform their businesses to grasp the opportunities provided by corridor development? How to solve cross border trade issues? How to settle land ownership in the areas affected by the corridors, avoiding speculative land acquisitions? How to optimize policies along the corridor so as to favor sustainable and inclusive development, including for example, land policy, technology transfer and skills development, storage and services development, seed certification, price policies?

Partnerships / The groups discussed how to optimize multi-stakeholder arrangements, so smallholders can participate fully in these arrangements. What may be the possible consequences for research partnerships? Clearly, on corridor development the private sector is in the lead, but they need strong partnerships with government, farmers' organizations and NGOs, for example through innovation platforms. Organized farmers, through for example cooperatives or out grower schemes, need to take an active part, in order to develop an adequate and timely supply of agricultural products and build up the required flow of goods along the corridor, for which more often than not a minimum scale needs to be respected. As a consequence, the 'viability' of farmers to participate in these schemes is seen as not so much related to their individual farm-size, but to their entrepreneurial spirit and their ability to organize and scale up the delivery of the required produce. In order to allow multi-stakeholder partnerships to organize themselves and to develop their contribution to the value chain, corridor managers need to create space in their programs. This can be done for example through smaller-scale area intensification programs, besides the customary large-scale economic generator and infrastructural programs, as in the case of Walvis Bay Corridor. The cost of participatory processes, both in time and resources, has been marked as problematic. Clearly also a number of questions arise with regard to agro-logistics, reduction of post-harvest losses, distribution and quality management need to be addressed.

Outlook: two possible areas of opportunity for future research

The implications of corridors and spatial development initiatives for agricultural research can be huge. Corridors can be designed and managed to serve different purposes: for profit only or, for sustainable and inclusive development as well. The challenge for research may be to contribute elements and choices that enable spatial development initiatives to become more sustainable and inclusive. The Durban workshop was a fruitful first step in bringing these two worlds together. It is up to the CGIAR research programs to respond to it.

As the conditions and (potential) impact of corridors are highly context-specific, during the workshop CRP representatives paid much attention to specifying or deepening research questions within a particular context. This cannot be reflected in this report. However, CRP representatives agreed that research questions relevant to corridors and spatial development initiatives in general might be grouped in two different research areas; the two of which will require collaborative work across different CGIAR research programs.

The first area concerns demand-driven research producing policy options in response to the needs of corridor policy makers, designers, developers and managers, and other stakeholders who seek to benefit from corridor development. It would include for example, working directly with smallholders and local authorities and support their efforts to turn their areas into sustainable agricultural growth hubs, connected with the corridors. It would involve understanding the economic, technical, social and environmental constraints and opportunities arising from corridors and, support for innovation towards sustainable production and marketing systems. Such research would respond directly to the existing policy demands on the part of African authorities to make corridors more development effective, inclusive and sustainable. It may touch upon existing and newly growing areas of CGIAR expertise, such as spatial analysis, territorial development, agricultural foresight, value chain facilitation and innovation, and how to sustainably increase productivity and profitability of farming systems, how to involve multiple stakeholders in the planning of these spatial type of interventions or how to best link smallholders to better access to inputs, services and markets.

The second area might focus more on independent research regarding the impact of spatial development initiatives and corridors in particular, on their social and natural environment, both negatively and positively, looking at the impact on poverty, ecological services and natural resource management for example. This stream of research might also look at the impact of corridors on the people living in the areas affected by it, close to the corridor as well as in the hinterland, such as the effects of large scale commercial farming stimulated by corridors on the food and nutrition security of local smallholder farmers and small entrepreneurs.

Closing session remarks

The participants recognized the value of bringing so many different perspectives together, leading to many questions and rich discussions on what is known, done and what can be done with regard to turning transport corridors into agricultural growth corridors. Clearly, the CGIAR is already engaged in much research and policy work related to corridor initiatives in Africa. And it has a lot to offer to corridor policymakers, architects and stakeholders, in terms of for example, understanding social, economic and ecological constraints and opportunities of corridor development as well as in terms of policy support, (spatial) assessment tools, climate-smart agricultural business models, M&E indicators and support to local and regional agricultural and market innovation. Lots of landscape, integrated water management and value chain work can be helpful to address the implications of SDIs for agricultural growth, employment, biodiversity and the availability of natural resources. Particularly where corridors go into places with vulnerable ecologies and weakly developed infrastructures and institutions, the CGIAR can help develop ways to make agriculture and corridor landscapes more diverse, and more sustainable.

At the same time, teaming up with public and private sector actors in order to turn corridors into opportunities for sustainable smallholder-led agricultural development is seen as a huge opportunity for research too. Corridors are long term development plans that specify what investments are going to be made, where and in what. Still much is unclear about whether corridors indeed drive agricultural development? Corridor architects and managers are interested in research on whether corridors deliver what they promise and, on what makes them work for development. A challenge is how to open up new areas of research to support smallholders in connecting with and benefiting from these investments; and to support governments and private companies in designing and implementing adequate programs to support effective smallholder engagement and organization for scale.

List of Participants

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Additional participants through web link



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