SADC industrialisation and agricultural mechanisation:

Prospects Opportunities and Challenges for China-SADC Cooperation

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Background

Industrialisation has become the buzzword for developmental regionalism in the Southern African Development Community (SADC) – and indeed the rest of Africa. Development discourse in the SADC region over the past few years has pointed to the importance of structural transformation of economies of the 15 member states. This is in realization of the fact that countries in the region are getting very little in return from their resources since most of the value-addition and beneficiation is taking place outside the region (SARDC, 2015). In this regard, industrialisation has been identified as the key engine for facilitating the economic – and social – transformation of the region through strengthening the comparative and competitive advantages of the economies of the SADC member states.

The importance of industrialisation is acknowledged in various regional policies and other legal documents. The Revised Regional Indicative Strategic Development Plan (RISDP), first approved in 2003 and revised in 2015, prioritises industrialisation as a major tool for sustainable growth, development and eradication of poverty in SADC (SARDC, 2015). It also reaffirms commitment by SADC member states to develop policies for industrialisation and the promotion of industrial linkages and value-addition, and calls for countries to pursue national industrial policies in a way that fosters regional coherence and reduces inequalities within the region. Furthermore, the SADC Protocol on Trade specifically calls for an industrialisation strategy to accompany implementation of the SADC Free Trade Area. Among the objectives of the protocol is the need enhance economic development, diversification and industrialisation of the region.

The industrialisation discourse in Southern Africa gathered momentum during the past three years, starting with the 34th Summit of SADC Heads of State and Government hosted by Zimbabwe in August 2014. The theme for the 2014 summit, *"SADC Strategy for Economic Transformation: Leveraging the Region's Diverse Resources for Sustainable Economic and Social Development through Beneficiation and Value Addition"*, summed the general thrust of the thinking in the region. The general mood is that it is time to move away from trade in primary products to trade in manufactures.

Since that historic summit in 2014, successive summit themes for SADC Summits have continued with the industrialization trajectory. For example, the 2015 Summit held in Botswana looked at harnessing industrialization through *"Transformation of Natural Endowment and Improved Human Capital."* The 2016 Summit held in Swaziland paid special attention on promoting industrialization through "*Resource Mobilisation for Investment in Sustainable Energy Infrastructure*", while the forthcoming 2017 summit scheduled for South Africa will focus on how to governments could partner the private sector in developing industry and regional value-chains. This is the first time in the history of SADC that a similar thematic focus has ran for successive years – an indication that the region has identified industrialization as a top priority.

The 2014 summit, therefore, gave birth to what has almost turned into a movement – a movement to move the SADC region off an economic growth path built on consumption and commodity exports onto a more sustainable development path based on industrialization. This drive towards an industrialised region saw the adoption of the SADC Industrialization Strategy and Roadmap in March 2015 and its related Costed Action Plan in March 2017.

The strategy, which spans the period 2015-2063 aims to accelerate the growing momentum towards strengthening the comparative and competitive advantages of the economies of the region, and is anchored on three pillars of industrialization, competitiveness and regional integration The action plan seeks to establish a coherent and synergistic implementation scheme containing strategic options and general policies towards the progressive attainment of time-bound targets set out in the strategy and roadmap.

However, it should be noted that the process of developing and strengthening industries in SADC is generally not an easy task. It depends on a number of enabling factors, including infrastructure development and the availability of technology and energy. Another critical factor is investing in agricultural development. In fact, one of the strategic interventions proposed by the SADC Industrialisation Strategy and Roadmap include the creation of an improved policy environment for increased value addition for agricultural and non-agricultural products and services.

The Revised RISDP also identifies three key sectors – one of which is agro-processing – as critical to push forward the industrialization agenda. The other two sectors are mining beneficiation and pharmaceutical. This paper, therefore, seeks to highlight the importance of agricultural mechanization in promoting industrialization in SADC. The paper will unpack the state of affairs in SADC with respect to mechanisation of the agriculture sector and explore the prospects and opportunities for maximising the sector's contribution to industrialisation in SADC. Focus will also be on how SADC could cooperate with China in pushing forward the industrialization agenda through agricultural mechanization.

As shown in Table 1, most countries in the region are still in the early stages of industrialisation, given the dominance of the agriculture sector and extractive industry. The structure of production of SADC countries is characteristic of a developing region where large shares of Gross Domestic Product (GDP) originate from primary production sectors, mainly agriculture and mining. The contribution of these sectors to GDP is relatively high, averaging close to 50 percent of GDP. However, value addition in these primary sectors remains low, on average remaining at 14 percent of GDP in 2009 (SADC, 2014).

Table 1: Contribution of Manufacturing to GDP, Percentage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Angola	3	4	4	4	4	4	4	5	5	6	6	6
Botswana	5	4	4	4	4	4	3	4	4	4	4	4
DRC	5	5	5	5	6	7	6	6	6	5	NA	NA
Lesotho	14	19	23	22	22	20	22	20	19	16	13	12
Madagascar	12	12	13	14	14	14	14	14	14	14	NA	NA
Malawi	13	12	11	12	10	9	11	10	10	10	NA	NA
Mauritius	23	23	22	22	21	20	20	20	20	19	18	18
Mozambique	12	14	14	17	18	15	16	15	14	14	13	13
Namibia	13	13	13	15	14	14	16	17	14	15	8	8
Seychelles	19	18	18	16	17	13	12	12	12	11	NA	NA
South Africa	19	19	19	19	19	18	17	17	17	15	15	13
Swaziland	39	42	41	41	40	40	43	44	44	46	42	41
Tanzania	9	9	9	9	9	9	9	9	9	10	10	10
Zambia	11	11	12	12	12	12	12	11	10	10	9	9
Zimbabwe	16	15	13	14	16	17	18	17	17	16	14	11
SADC	14.20	14.67	14.67	14.73	15.07	14.40	14.87	14.73	14.33	14.07	14.60	13.90

Source: SADC Industrial Development Policy Framework, 2014

Given the dominance of agriculture in most SADC economies, the sector offers one of the low-hanging opportunities for accelerating the industrialisation drive. According to the SADC Regional Agricultural Policy (RAP) of 2013, the sector remains central to poverty reduction, growth, food and nutrition security, accounting for the livelihoods, employment and income and wealth creation for about 70 percent of the region's 300 million population. The RAP further notes that the agricultural sector contributes some eight percent of the region's GDP, with this rising to 28 percent when all medium income countries are excluded (SARDC, 2015).

The sector has been growing at an annual rate of 2.6 percent against a population growth rate of 2.5 percent during the 10 year period to 2012 on account of expanded cereals production, which recorded a 46-percent growth owing to a 40 percent increase in maize production. Cassava production has more than doubled in the last 20 years. However, despite these positive production trends, the region remains a net importer of foodstuffs, and malnutrition levels are still high, with vulnerabilities to variable climatic conditions remaining a huge challenge. The RAP further notes that intra-regional trade in agriculture remains subdued at 10 percent in comparison to other regions such as the ASEAN where it records 30 percent. Some of the challenges include low labour productivity, low land productivity, weak market linkages, and low cereals yields.

SADC agricultural mechanisation: State of play

According to the United Nations' Food and Agriculture Organisation (FAO), agricultural mechanization covers all levels of farming and processing technologies, from simple and basic hand tools to more sophisticated and motorized equipment. It eases and reduces hard labour, relieves labour shortages, improves productivity and timeliness of agricultural operations, improves the efficient use of resources, enhances market access and contributes to mitigating climate-related hazards (FAO, 2016).

Farm mechanisation holds the key to unlocking the value of SADC's rich agricultural potential. Table 2 shows that other than the Democratic Republic of Congo (DRC), Mozambique and Seychelles, most countries in the region have huge potential for agricultural production (SADC, 2017). Four countries Lesotho, Madagascar, South Africa and Swaziland have the greatest agricultural potential, with more than 70 percent of their land being suitable for either crop production or animal husbandry.

Table 2: Total SADC Agricultural Land (Hectares and %)

	Total agricultural land							
	'000 Ha				**% of land area**			
	2012	**2013**	**2014**	**2015**	**2012**	**2013**	**2014**	**2015**
Angola	58 390	58 390	58 390	58 390	47	47	47	47
Botswana	25 861	25 861	25 861	25 900	46	46	46	46
DRC	25 755	25 755	25 755	25 755	11	11	11	11
Lesotho	2 312	2 312	2 312	2 312	76	76	76	76
Madagascar	41 395	41 395	41 395	41 395	71	71	71	71
Malawi	5 580	5 580	5 580	5 580	59	59	59	59
Mauritius	89	89	89	n.a.	44	44	44	n.a.
Mozambique	49 400	49 400	49 400	49 400	6	6	6	6
Namibia	38 809	38 809	38 809	38 809	47	47	47	47
Seychelles	3	3	3	1	7	7	7	2
South Africa	96 374	96 374	96 374	96 374	79	79	79	79
Swaziland	1 222	1 222	1 222	1 222	71	71	71	71
Tanzania	37 300	37 300	37 300	37 300	42	42	42	42
Zambia	23 435	23 435	23 435	23 435	32	32	32	32
Zimbabwe	16 320	16 320	16 320	16 320	42	42	42	42
SADC (Total)	422 245	422 245	422 245	422 193	25	25	25	25

Source: SADC Statistical Year Book 2015 (2017)

Table 3 paints an interesting picture. It shows that about 14 percent of the total agricultural land or 60 million hectares is arable. More fascinating is the fact a mere six percent of all arable land in the region is equipped with irrigation equipment. Only South Africa and Madagascar have significant levels of irrigated land.

Table 3: Total SADC arable land and area equipped with irrigation

	Arable land				Total area equipped for irrigation			
	'000 Ha				'000 Ha			
	2012	2013	2014	2015	2012	2013	2014	2015
Angola	4 390	4 390	4 390	4 390	86	86	86	86
Botswana	261	261	261	261	2	2	2	2
DRC	7 555	7 555	7 555	7 555	11	11	11	11
Lesotho	312	312	312	312	3	3	3	3
Madagascar	4 100	4 100	4 100	4 100	1 086	1 086	1 086	1 086
Malawi	3 730	3 730	3 730	3 730	74	74	74	74
Mauritius	82	82	82	82	20	19	20	19
Mozambique	5 400	5 400	5 400	5 400	118	118	118	118
Namibia	809	809	809	809	8	8	8	8
Seychelles	3	3	3	3	0	0	0	0
South Africa	12 446	12 446	12 446	12 446	1 601	1 601	1 601	1 601
Swaziland	190	190	190	190	50	50	50	50
Tanzania	13 300	13 300	13 300	13 300	184	184	184	184
Zambia	3 435	3 435	3 435	3 435	156	156	156	156
Zimbabwe	4 220	4 220	4 220	4 220	174	174	174	174
SADC – Total	60 233	60 233	60 233	60 233	3 573	3 573	3 573	3 573

Source: SADC Statistical Year Book 2015 (2017)

Other countries in the region have very small percentages of their arable land under irrigation. Botswana, Lesotho and Namibia have less than one percent of their arable equipped with irrigation equipment while Seychelles has no irrigated land (SADC, 2017).

The power sources for agricultural activities in most SADC and other African countries are human muscles, draught animals and tractor engines (FAO, 2016). According to the UN agency, most large farms and the emerging agricultural sector (farms of 20-50 ha) in sub-Saharan Africa do not generally have a problem with access to farm power. It argues that it is the smallholder farmers (those who operate farms of less than 2 ha in size) that experience extreme difficulty.

Table 4: Sources of power for land preparation (% of total)

Region	Human muscle power	Draught animal power	Engine power
Sub-Saharan Africa	65	25	10
East Asia	40	40	20
South Asia	30	30	40
Latin America and the Caribbean	25	25	50

Source: FAO, 2016

Compared to other regions, Africa has the lowest level of mechanisation with respect to the use of machinery. The bulk of farm activities are done using manual labour, a development seen as highly unsustainable given the impact of HIV and AIDS on the productive population on the continent. Besides the concerns about the impact of diseases on Africa's agricultural sector, another compelling reason for moving towards mechanisation of Southern Africa's, as well as the continent's, agricultural sector is the declining numbers of draught animals. There is, therefore, a very strong need to move away from muscle and draught animal power towards tractors and engines for planting and post-harvest operations in SADC.

The preceding narrative – though not very indicative of a region most of whose economies are dependent on agriculture – points to an abundance of opportunities for growing SADC's agricultural sector through mechanisation. There are already various initiatives currently underway in the region. These include the commitment made by SADC member states to invest in irrigation facilities and other areas of farm mechanisation. Although this commitment – made under the Dar es Salaam Declaration on Agriculture and Food Security in the SADC Region of 2004 – has to a large extent not been met by most member states, it provides a starting point for a call to action in the quest to push for a shift towards agricultural mechanisation. This is particularly timely as the region is focused on making sure that its industrialisation thrust is successful. A vibrant and rejuvenated agricultural is one of the key success factors for SADC's industrialisation agenda.

In terms of investment in agricultural machinery and equipment, only South Africa has so far invested substantial amounts in agricultural machinery and equipment.

Table 5: SADC agricultural machinery and equipment, US$ million

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Angola	264	264	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Botswana	97	98	n.a	n.a	n.a	n.a	n.a	108	153	152
DRC	526	533	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Lesotho	44	44	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Madagascar	284	287	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Malawi	206	210	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Mauritius	20	20	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Mozambique	425	430	253	246	110	82	152	491	235	255
Namibia	11	13	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Seychelles	6	5	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
South Africa	3634	3634	4553	4665	5449	5595	5123	4518	25067	5067
Swaziland	20	20	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Tanzania	879	1194	1477	1203	1441	2567	2457	2018	2217	n.a
Zambia	246	248	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Zimbabwe	476	476	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
SADC	4645	4670	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Source: SADC Statistical Year Book 2015 (2017)

Challenges to agricultural modernisation in SADC

Agricultural mechanization is affected by a series of constraints in SADC. Some of the main challenges identified have to do with issues of affordability and availability of the equipment, lack of skills, and an infant farm equipment private sector.

Research has shown that most smallholder farmers in SADC often lack resources to invest in mechanised farm equipment. They rely on manual labour or animal-drawn draught power. Due to the nature of land tenure systems in most SADC countries, the farmers often lack collateral security to enable them to access bank credit. As a result, they usually have difficulty investing in physical assets in general and in agricultural machinery in particular. Experience from other parts of the world, however, shows that extending credit products to farmers to invest in agricultural machinery not only allows them to raise their productivity and participate more fully in the market economy, but can also incentivize the local machinery manufacturing industry to supply their needs (FAO, 2016).

Another major challenges that has been identified is most agricultural machinery is either imported or manufactured locally. A key observation, however, is that locally produced machinery has often been found to be of low quality and is usually very expensive. This is due to the underdeveloped nature of the machinery manufacturing industry. Moreover, supply chains providing support to owners of tractors and agricultural machinery with spare parts, advice and other services (especially clean fuel) are often underdeveloped and do not easily reach remote rural areas (ibid). As discussed later in this paper, this presents an opportunity for closer cooperation between China and SADC in this regard.

The majority of countries in SADC lack access to agricultural extension services, a development that affects their ability to make use of mechanised farm equipment. In the majority of cases public and private extension and training services do not easily reach rural and remote areas, as distances are great and sometimes transport is not readily available.

As in most of Africa, the farm machinery industry in SADC – comprising manufacturers, importers, distributors, retailers and hire services business enterprises – is usually constrained by a number of issues. Some of the impediments to the development of a vibrant farm equipment private sector in the region include prohibitive or lack of enabling laws to facilitate business start-ups and enterprise operations, complex fiscal systems, and punitive import regulations. In most of the countries private sector agricultural machinery manufacturing is at an early stage.

SADC industrialisation: Leveraging region's agricultural potential

SADC's long-term food security requires a transformation of the region's agriculture, diversifying and orienting it towards markets as well as scaling up investments and innovation for its sustainability (SARDC, 2015). For any meaningful contribution of agriculture to sustainable human development, an integrated approach is needed that structurally transforms the sector while at the same time fostering rural development to equitably distribute the gains of such a process. The process will of consequence trigger backward and forward linkages between the sector and other key sectors such as manufacturing, and mining, thereby unleashing significant growth potential for the economy as a whole.

It is, therefore, quite apparent that agriculture wields great potential to drive economic development, especially since most countries in the region are still in the early stages of industrialisation. This is because agriculture possesses strong growth linkages and multiplier effects of agricultural growth to the non-agricultural sectors. Furthermore, the sheer size of the agricultural sector with its attendant role in creating employment for over two thirds of the populations of most SADC countries should make agriculture the leading sector for economic transformation (SARDC: 2015).

The important role of agriculture is acknowledged in the SADC Industrialisation Strategy and Roadmap approved in 2015 as well as its Costed Action Plan in March 2017. Agriculture-led industrialisation is one of the main priorities outlined in the Action Plan, with agro-processing identified as one of three value chain growth paths to be pursued during implementation of the strategy. In fact, the agro-processing cluster contributes 10 sectors to the identified regional value chains.

Table 6: Potential sectors under the SADC agro-processing value chain

Sectors	Countries
Soya	South Africa, Zimbabwe, Zambia, DRC, Malawi, Madagascar
Sugar	Malawi, Mozambique, South Africa, Swaziland, DRC, Tanzania, Zambia, Zimbabwe, Mauritius, Botswana
Meat products (poultry and beef)	Botswana, South Africa, Zambia, Zimbabwe, Namibia, Swaziland, Madagascar, Tanzania, DRC
Cassava	Angola, DRC, Mozambique, Tanzania, South Africa, Malawi, Madagascar, Zambia, Zimbabwe
Dairy products	Madagascar, South Africa, Namibia, Tanzania, DRC, Malawi, Botswana, Zambia, Zimbabwe, Swaziland
Other food and drinks	Angola, DRC, Lesotho (maize), Mauritius (sea food), Zambia (oil seeds and livestock products), Malawi (oil seeds), South Africa, Zimbabwe, Swaziland, Madagascar (Rice, maize, black eyed beans, pea), Namibia, Tanzania (maize, rice, oil seeds)
Fish and fish products	Angola, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Zambia, Madagascar, Malawi, Tanzania, DRC, Zimbabwe
Horticulture (Fruits, Vegetables and Flowers)	Swaziland, Lesotho, Zambia, South Africa, Malawi, Madagascar, Zimbabwe, DRC, Namibia, Tanzania

Wildlife (game meat and hide processing)	Botswana, Namibia, South Africa, Zambia, Zimbabwe, DRC
Forestry – Timber and non-timber forest products (medicinal, cosmetics, essential oils and other	DRC, South Africa, Angola, Madagascar, Swaziland, Mozambique, Zimbabwe, Zambia, Namibia, Tanzania, Malawi, Mauritius

Source: Action Plan for the SADC Industrialisation Strategy and Roadmap, 2017

Depending on economic context, the agricultural sector can play a major role in the development process. This will, to a large extent, also depend on how the agricultural sector integrates with the rest of the economy during the transformation process. A developed agriculture sector will trigger significant multiplier effects through backward and forward linkages with the industrial sector by providing inputs (agricultural produce) for manufactures, while the latter supplies key inputs such as fertilizers and farm implements.

In the case of China, agriculture made three major contributions to development; that is (a) it satisfied the increased demand for agricultural products created by rapid growth of both the economy and the population, which stabilised commodity prices and wages, (b) it provided the labour that the industrial sector needed to proceed with economic development, and lastly (c) it provided the capital needed for industrialisation.

However, SADC's agricultural sector has been fraught with challenges that have constrained its ability to meaningfully contribute to industrialisation, and hence sustainable income earnings for countries. As indicated in Box 1, most of the constraints relate to low productivity and limited capacity to develop and absorb technology.

Box 1: Factors Constraining Realisation of Regional Agricultural Industrial Potential

- Low labour productivity,
- Low land productivity,
- Weak market linkages,
- Low cereals yields
- Limited capacity to absorb technology
- Weak research and development capacity to expand innovation frontiers
- Limited mechanisation
- Limited financial inclusion weakens access to credit and capital
- Infrastructure bottlenecks constraining farmers' access to markets
- Weak land tenure and regulatory frameworks to facilitate investment and capital accumulation.

Source: Prospects for Industrial Transformation in SADC: Towards a Regional Strategy and Roadmap, SARDC, 2015

Prospects and opportunities for China-SADC cooperation

Many African countries have suffered in international development terms from characterisation as Heavily Indebted Poor Countries, and the development paradigm resulting from that status has been one of poverty alleviation rather than investment for economic growth. There is need for a new look at development planning in which the focus is on sustainable economic growth (UNIDO and FAO, 2008), The combination of a largely under-utilised agricultural sector and the blossoming partnership with China is perhaps the right tonic for auctioning that paradigm shift. .

Agriculture has been identified as a priority area of development in the China-Africa strategic partnership. Chinese Premier Li Keqiang reaffirmed his country's commitment to assisting Africa increase agricultural productivity and improve food security during a visit to Africa in May 2014. He announced plans to train 2,000 agricultural technicians and management personnel in Africa by 2019. Under the Forum on China-Africa Cooperation (FOCAC) launched in 2000, the two sides also agreed to work together in boosting agricultural production in Africa and ensuring food security for its citizens.

There is great scope for the development of a mutually beneficial partnership between China and SADC. Southern Africa could take a few lessons from China's experience in achieving an agriculture-led economic transformation. China can play a major role in assisting SADC to mechanise its agricultural sector – and build industrial capacity through the agro-processing channel. This can be achieved through a number of initiatives, one of which is through technology transfer. China could set up agricultural equipment manufacturing factories in selected SADC countries that could supply neighbouring states. This will be crucial in ensuring that tractors and other farm equipment are easily available at affordable prices.

As access to credit is one of the impediments to efforts to improve farm mechanisation in SADC, a complementary initiative to the agricultural equipment manufacturing programme would be the introduction of a credit facility for farmers in SADC countries. This is something that the Chinese government could consider working on in partnership with the governments of SADC member states as well as financial institutions from both China and Southern Africa.

As mentioned earlier, a negligible six percent of the arable land in SADC is under irrigation. This presents an excellent opportunity cooperation between China and SADC. There is an opportunity for Chinese agricultural concerns to cooperate with Southern African companies. Such joint ventures would benefit both the Chinese and SADC in that they would assist in the implementation of the former's "Going Out Policy" while helping SADC countries improve their food security and build industrial capacity.

Of course, for all these initiatives to succeed requires that SADC creates a conducive agricultural investment climate that will assist to attract investment and credit, which can facilitate the acquisition and use of advanced technology, modern crop varieties, and farming methods to boost agricultural production. Alternatively, this would require government-to-government arrangements that would see both sides working together to promote farm mechanisation, and ultimately industrial revolution in Southern Africa.

There is need to build on the existing cooperation between China and Africa with respect to agriculture technology demonstration centres. China has launched the demonstration centres in 20 African countries. Seven of these countries are in the SADC region – the Democratic Republic of Congo, Madagascar, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe. Chinese agricultural professionals are organising training on issues such as modern cultivation methods and the use of agricultural machinery. Cooperation between China and SADC in this area has the potential to contribute to the green revolution in Southern Africa.

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