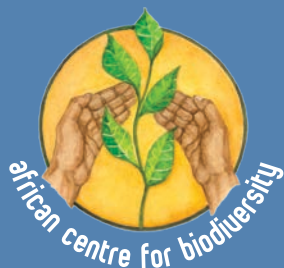




Farm Input Subsidy Programmes (FISPs): A Benefit for, or the Betrayal of, SADC's Small-Scale Farmers?

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On 7 April 2015 the African Centre for Biosafety officially changed its name to the African Centre for Biodiversity (ACB). This name change was agreed by consultation within the ACB to reflect the expanded scope of our work over the past few years. All ACB publications prior to this date will remain under our old name of African Centre for Biosafety and should continue to be referenced as such.

We remain committed to dismantling inequalities in the food and agriculture systems in Africa and our belief in peoples' right to healthy and culturally appropriate food, produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.

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Acronyms and Abbreviations

ACB	African Centre for Biodiversity
ADBG	African Development Bank Group
AGRA	Alliance for a Green Revolution in Africa
AU	African Union
BCA	Botswana College of Agriculture
CAADP	Comprehensive Africa Agricultural Development Programme
DAPEES	Directorate for Agriculture, Production, Extension and Engineering Services (Namibia)
DPME	Department of Planning, Monitoring and Evaluation
DRC	Democratic Republic of Congo
EU	European Union
FANR	Food, Agriculture and Natural Resources (a directorate of the SADC)
FARA	Forum for Agricultural Research in Africa
FARM	Farm Animal Reform Movement
FAO	Food and Agriculture Organisation (United Nations)
FAOSTAT	The Statistics Division of the FAO
FISP	Fertiliser Input Subsidy Programme
GDP	Gross domestic product
GoM	Government of Mauritius
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Corporation
IPES	International Panel of Experts on Sustainable Food Systems
IRIN	Integrated Regional Information Networks (former name)
ISPAAD	Integrated Support Programme for Arable Agriculture Development
Kg	Kilogram/s
MoA	Ministry of Agriculture
MoAIFS	Ministry of Agro-Industry and Food Security
MoAL	Ministry for Agriculture and Livestock
MoAWF	Ministry of Agriculture, Water and Forestry
MoESD	Ministry of Education and Skills Development
NAFSN	New Alliance for Food Security and Nutrition
NAIVS	National Agricultural Input Voucher Scheme (Tanzania)
NEPAD	New Partnership for Africa's Development
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
RoB	Republic of Botswana
SADC	Southern African Development Community
SAMP	Seeds and Markets Project
SFWF	Small Farmers Welfare Fund
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WFP	World Food Programme
WTO	World Trade Organization

About This Paper

This paper reviews the farm input subsidy programmes (FISPs) within countries belonging to the Southern Africa Development Community (SADC), to ascertain whether input subsidies have benefited small-scale farmers, have increased food security at the household and national levels, and have improved the incomes of small-scale farmers. It does this by exploring the re-adoption of input subsidies in countries belonging to SADC, describing the programme designs, providing an analysis of the respective in-country effects, and providing an overarching review of input subsidy programmes within SADC countries.

Key Findings

- Of the 15 countries that make up the Southern African Development Community (SADC), Angola, the Democratic Republic of Congo (DRC), Madagascar, South Africa and the Seychelles do not have large-scale subsidy programmes, but may practice ad hoc subsidisation. Both Botswana and Lesotho offer universal input subsidy schemes. Malawi, Mauritius, Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe provide targeted and large-scale programmes.
- FISPs consume large parts of agricultural and even national budgets: Zambia's agricultural budget allocation was equal to 13.6% of the national budget in 2011; and Malawi's agricultural budget allocation was equal to 6.3% of its national budget in 2013.
- FISPs are implemented over three- to ten-year periods, cost between US\$ 100–160 million a year and are largely funded by national governments.
- By 2011, ten African countries had spent about US\$1 billion on these programmes, close on 30% of their agricultural budgets.
- The motivation for these programmes is aligned to non-economic rationales for subsidy use; i.e. enhancing food security and reducing poverty. But in Malawi there is a net transfer away from rural households who have embraced Green Revolution inputs, because the additional cost is not always recouped from the sale of the harvest. In Mauritius it is only the organic compost subsidy scheme that effectively lowers prices for producers, while also providing direct environmental benefits to those outside the target group.
- FISPs are largely ineffective, social transfer schemes that create dependency. This is particularly true in the case of Botswana, where increasing numbers of rural farmers are receiving subsidies, and in Madagascar, where the subsidy scheme is part of a social protection safety net.
- Some subsidy schemes in SADC are used as tools to gain political favour. This is the case especially for the Malawian, Tanzanian and Zambian schemes.
- There is significant elite capture, leakage and diversion (vouchers and/or fertilisers are stolen before reaching the intended beneficiary group, or they are sold on by beneficiaries) in Botswana, Zambia, Malawi and the United Republic of Tanzania. About 60% of subsidised fertiliser is diverted/ leaked in Tanzania, 35% in Zambia and 33% in Malawi, representing a significant loss of public funds.
- Claims that the subsidy programmes have contributed directly to increased yields in Lesotho, Malawi, Tanzania and Zambia are disputed. There is evidence that data has been manipulated in Malawi and there is a lack of effective monitoring and evaluation of these programmes in all SADC countries. Poverty levels in Malawi increased following introduction of the subsidy and the country has remained a net importer of maize— despite the claims of record yields due to the subsidy.
- Subsidies have not significantly reduced the price of food. Maize prices actually increased in Zambia from below US\$ 100 per ton in 2005 to US\$ 400 per ton in 2015, possibly because of storage losses, changes in informal cross-border flows and over-estimates of national maize production.
- Direct beneficiaries of FISPs include input suppliers such as multinational seed and agrochemical companies who do not bear the costs of administration, distribution or marketing. Input suppliers to South Africa's Massive Food Production Programme made about US\$ 60 million from the scheme and

cartels operate throughout Africa's fertiliser market.

- FISPs do not directly benefit the poor and most vulnerable, who are mostly women and who are often side-lined as beneficiaries by district officials and village chiefs. These people often cannot afford to pay the balance of the subsidy or the membership fees of farmer organisations. They also cannot meet FISP criteria, such as a minimum land allocation for planting subsidised maize, or provide proof of land tenure and access to labour.
- FISPs do not help build resilient, sustainable farming and food systems, which is what is required in a world facing diverse ecological, economic and social challenges.

Executive Summary

In the 1990s the World Bank, through its structural adjustment programmes, put an end to the large-scale subsidy programmes implemented by independent African countries to assist small-scale farmers. However, the food crisis of 2007/2008, brought about by increased food insecurity, rural poverty and significant increases in food prices and agricultural inputs, motivated a return to FISPs (World Bank 2014). FISPs are also promoted in regional policies—the Comprehensive Africa Agriculture Development Programme (CAADP) and the Abuja Declaration (2006)—as tools to encourage the adoption of synthetic inputs, especially fertilisers, so as to raise yields (Food and Agriculture Organisation (FAO) 2014).

This review of FISPs in countries belonging to SADC paints a disturbing picture of growing food insecurity in many countries (African Development Bank Group (ADBG) 2013; World Food Programme (WFP) n.d.); increasing inequality in countries such as Lesotho (Ratti 2016); and an increasing dependence by farmers on the subsidy for their livelihoods (BCA Consult 2013; World Bank 2014c; Oxfam 2015). The way in which the programmes are designed is problematic in that they sometimes have contradictory objectives; for example, relieving rural poverty and significantly increasing yields to boost

national food security are not necessarily complementary goals. Despite the intentions of some governments, such as in Tanzania and Malawi, to direct inputs to those who could use them most productively, the backlash from the public has forced these programmes to revise their targeting criteria to include the most vulnerable, particularly women (Farm Animal Reform Movement (FARM) 2013; Lunduka et al. 2013; Chinsinga & Poulton 2014). There is a clear expectation that subsidies will serve broader social objectives (FARM 2013). This means that most FISPs are aligned to non-economic rationales, as opposed to the economic motivations envisioned by initial supporters such as the World Bank (2014b). The Abuja Declaration called for the use of smart subsidy systems that encourage private-sector entry, target the productive poor and have clear exit strategies (Lunduka et al. 2013). Systems in both Malawi and Tanzania were launched as such, but have exceeded their projected time frames, do not have exit strategies, and, as noted above, have been forced through public pressure to expand their target criteria.

Besides the partial economic safety net that the subsidy provides to subsistence and small-scale farmers, it also traps them on a technological treadmill. In many cases, such as in Malawi and Zimbabwe, farmers do not have the financial resources to leave the subsidy system and return to localised and cheaper farming methods (African Centre for Biodiversity (ACB) 2016a). This treadmill will become increasingly expensive (Swanepoel 2014), both for farmers having to pay the balance of the subsidy costs and for governments who need to sustain the subsidies. Field work conducted by the ACB in Malawi indicates a net transfer away from rural households who have adopted Green Revolution technologies to agribusinesses supplying the inputs (ACB 2014d). In addition, subsidies do not necessarily benefit the poorest and most vulnerable farmers, usually women, who often cannot afford to pay the balance of the costs (or who do not have access and/or proof of tenure to the minimum requirement of land (Molatole & Xiaoyun 2016) or labour (Siyanga 2009).

This begs the question: Who is deriving benefit from the subsidies? Answer: Those who can

use the FISPs to gain political favour—as evidenced in Malawi (Lunduka *et al.* 2013), in Zimbabwe (The *Zimbabwe Independent* (theindependent.co.zw) 2012), and in Zambia (Ricker-Gilbert *et al.* 2012)—and those input suppliers or multinational seed and agro chemical companies who gain large procurement contracts, but who do not bear the administration, distribution or marketing costs (Chinsinga & Poulton 2014).

Added to this, cartel behaviour is evident in some countries. In Zambia, Omnia and Nyiombo Investments, who supplied fertiliser to the country's FISP between 2007 and 2012, have been found guilty of bid rigging (Roberts, Vilakaz & Simbanegavi 2014). Despite assertions of significant yield increases related to FISPs, these claims have been disputed in Malawi (ACB 2014d), Tanzania (Government of Tanzania (GoT) 2013) and Zambia (ACB 2016a). There is evidence in Malawi that data has been manipulated and overestimated (FARM 2013); in Lesotho the increases in yields do not correlate to years in which the subsidy has been implemented (Ratii 2016); and in Tanzania the World Bank has noted that yield increases are likely the result of expansion onto virgin or fallow land (Finmark Trust 2016).

There is also little evidence that FISPs have benefitted the larger rural population: grain prices have increased in Zambia while the FISP has been operational (Lunduka, Ricker-Gilber & Fisher 2013), and studies conducted there and in Malawi indicate that even if the scope of FISPs were doubled (to increase production), food prices are likely to be affected by an insignificant average of 3% (Ricker-Gilber, Mason, Jayne, Darko & Temb 2013).

The significant costs of FISPs (up to 30% of agricultural budgets in some cases (Chinsinga & Poulton 2014) divert much-needed public funds away from known drivers of agrarian reform, such as research and development, improved extension services, upgrading rural roads and infrastructure, and access to electricity and health and education (ACB 2015b). Further, the top-down nature of the programme design effectively excludes farmers from participation in decisions made at the policy level, which will affect their viability to farm in a future threatened by climate

change. Agrarian reform and food policies should take into account the realities of rural farmers and address structural challenges that will help them to build resilience in their own way within their own systems (Grain 2008). Moreover, the level of funds leached through FISPs is astounding. About 60% of subsidised fertiliser is diverted (pilfered) by government officials or leaked by beneficiaries onto secondary markets in Tanzania (Dailydevelopment.org 2015); the figure is roughly 33% in Botswana (Ricker-Gilbert *et al.* 2012); and leakage reaches significant levels in countries such as Malawi, Zambia and Botswana (United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP) 2012).

FISPs tend to direct farming households towards hybrid maize production even in marginal conditions, thus reducing the diversity of food available and negatively affecting ecological zones and soil health (ACB 2015b; 2016b forthcoming). Declining soil fertility results in declining yields, which places a further financial burden on poor communities (ACB 2015b). Without a clear idea of the condition of the soil across a myriad of agroecological zones, the likelihood of correctly analysing any findings is doubtful. This raises serious questions about the wholesale advocacy surrounding large-scale fertiliser adoption initiatives (ACB 2015a). In Malawi, despite an agricultural policy that encourages a diversity of crop cultivation, the FISP has contributed to a significant increase in maize cultivation and a concurrent reduction in the land planted under other crops (Ricker-Gilbert *et al.* 2012). This indicates a narrowing of agricultural biodiversity, which has negative implications for environmental and human health.

Perhaps the biggest failing of SADC's FISPs is that they are not directing investment towards building the sustainable and resilient agricultural and food systems that will holistically address issues such as hunger, poverty and inequality.

Overview of the Agricultural Landscape in the SADC

The SADC is a regional economic community comprising 15 member states: Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, the United Republic of Tanzania (Tanzania), Zambia and Zimbabwe (Sadc.int 2016). Within the SADC region, about 180 million people (60%) rely on agriculture for their livelihoods (Food, Agriculture and Natural Resources (FANR) 2013); there are high levels of poverty and food insecurity throughout the region; up to half the population in countries such as Malawi and Zambia is chronically undernourished (Oxfam, 2015).

A range of initiatives have attempted or are attempting to increase the productivity levels of subsistence and small-scale farmers in Africa. These initiatives are based mostly on the assumption that if a small-scale farmer can increase her/his productivity levels (yield and labour), this will improve her/his food security and enable her/him to generate an income from the sale of surplus harvest, which would raise the income levels of farming households (World Bank 2015). This would allow households to purchase more goods and services and thus enhance the local economy and create space for value-added processing, as well as enable households to spend more on education and capital requirements, and to save, to offset future shocks (World Bank 2015). In addition, increased productivity should ameliorate or reduce high food prices, thus enabling broader access to food (World

Bank 2015). Some of these initiatives are international developmental efforts, such as those driven by the United Nations (UN), i.e. the Food and Agriculture Organization (FAO) and the UN Development Programme (UNDP); others are policies and plans generated on the African continent by bodies such as the African Union (AU) and SADC, such as Comprehensive Africa Agricultural Development Programme (CAADP).

Most of these enterprises are shaped by the Green Revolution ideology that promotes the intensive use of improved hybrid seed and synthetic fertiliser to drive yield increases (ACB 2015a), and focuses on increasing calorific, as opposed to nutritional, intake (International Panel of Experts on Sustainable Food Systems (IPES) 2015).

Most SADC countries have extensive levels of donor investment, particularly in the agricultural sector. Donors such as the United States Agency for International Development (USAID), the Alliance for a Green Revolution in Africa (AGRA), the World Bank, the FAO and the International Fund for Agricultural Development (IFAD) implement projects on their own or shape and support existing government strategies. For example, USAID supports the CAADP implementation process in Zambia (ACB 2015b). Donors also influence the national research and development agenda—AGRA's Soil Health Programme provides funds for mainly public and parastatal institutions (ACB 2015a). Between 2007 and 2014 it provided about US\$ 3.6 million to Zambian public research institutions and between 2007 and 2012 it provided about US\$ 6.3 million to similar institutions and a local economic development agency in Mozambique (ACB 2015a).

Policies and plans

The CAADP Compact

The compact calls on signatories to adopt the following core principles (UNDP 2013d):

- To pursue an agricultural sector growth rate of 6%.
- To allocate 10% of the national budget to agricultural development.
- To strengthen local ownership and promote interventions based on each country's opportunities and priorities.
- To build partnerships with a broad stakeholder group.
- To promote dialogue and build consensus among key stakeholders on priority issues.
- To enhance peer-review and sound analytical work to inform stakeholders in the sector.
- To enforce mutual accountability to ensure sustainable resource utilisation.
- To favour regional complementarities within the framework of regional economic communities, such as SADC.
- To enhance policy reforms for a more favourable environment for agricultural growth.

Maputo Declaration, CAADP and the Abuja Declaration

Member States of the African Union signed the Maputo Declaration in 2003, committing to increasing agricultural budget allocations to 10% of the national budget (Oxfam 2015) and to designing CAADP. CAADP was intended as a policy framework to transform the region's agriculture sector and create wealth and food security while generating economic growth (NEPAD-CAADP.net 2016). Then, in 2004, SADC member states signed the Dar-es-Salaam Declaration that established priority focus areas for achieving food security in the region, including short-term measures such as increasing the availability of and access to improved seeds, fertilisers and agrochemicals (Oxfam 2015). Two years later, in 2006, together with the New Partnership for Africa's Development (NEPAD), the AU hosted the Africa Fertilizer Summit which resulted

in the Abuja Declaration on Fertiliser for the African Green Revolution (Lunduka, Ricker-Gilbert & Fisher 2013). Signatories resolved to increase the intensity of fertiliser use in their countries to an average of 50 kilograms (kg) per hectare. One of the ways in which this was to be implemented was through smart subsidy programmes aimed at improving access to fertilisers for small-scale farmers (Lunduka et al. 2013; FAO 2014). The commitment to the Maputo Declaration was reaffirmed in 2014 and forms the basis for SADC's Regional Indicative Strategic Development Plan (Oxfam 2015).

SADC's Regional Indicative Strategic Development Plan

The Regional Indicative Strategic Development Plan aims to encourage and support a structural transformation of the region's agriculture-dependent economies (Oxfam 2015). It intends achieving this by prioritising access to, and utilising improved inputs, including seed and synthetic fertilisers. It also focuses on public-private partnerships and harmonisation of seed, fertiliser and agrochemical regulatory and policy frameworks (FANR 2013).

Despite the good intentions, only 2 of 15 countries, Malawi and Madagascar, spend more than 10% of their national budgets on agriculture; only 5 of 15 countries, Angola, Madagascar, Mozambique, Namibia and Zambia, have consistently exceeded the 6% annual growth rate; and only South African and Zambian farmers use more than 50 kilograms per hectare (50 kg/ha) on average of fertilisers (Regional Strategic Analysis and Knowledge Support System (ReSAKSS) (ReSAKSS.org 2016). Practices that emanate from the Plan and which have been implemented by African governments, such as input subsidies, have not always had the desired effect—they have not proved economically or ecologically sustainable, nor socially just and equitable.

Table 1: Differences between universal, voucher and smart subsidy systems

	Universal	Voucher	Smart
Beneficiaries	All farmers	Targeted—normally to poor and vulnerable farmers	Targeted—normally to poor and vulnerable farmers
Distribution	Predominantly state distribution systems	State or private distribution through retailers	Private retailers
Spill-over effects	Crowding out of private sector	Potentially can crowd out private sector depending on design	Crowds in private sector for distribution
Exit strategy	No	Not necessarily	Yes
Complementary measures	Stand-alone programme	Complementary	Complementary within a suite of responses that favour market-based development
Objectives	Increase food security and decrease poverty	Increase food security and decrease poverty more efficiently	Pro-poor growth, encourage market development, food security

Source: Compiled from information drawn from Minot 2009; Ricker-Gilbert, Jayne & Shively 2012; Lunduka et al. 2013.

SADC's Agricultural Input Subsidy Systems

A farm input subsidy programme (FISP), which is funded by a payment made from public resources, is intended to reduce the production costs of small-scale farmers (FAO 2014). The objectives of FISPs include: to drive pro-poor economic growth; decrease food prices, enhance food security and input adoption, increase the efficiency of input use, develop the input supply system, boost producer welfare, improve soil fertility and provide political benefits (Dorward 2009). These objectives can be categorised as economic and non-economic rationales for the implementation of subsidy programmes.

Ten of the fifteen subsidy programmes implemented in Africa since 2000 are large-scale programmes. Some are universal subsidies that target specific crops (Lesotho, Nigeria, Swaziland) and some are targeted at beneficiary groups and crops (Botswana, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe). All the programmes are implemented over three- to ten-year periods,

cost between US\$ 100–160 million per year and are funded largely by national governments (Druilhe & Barreiro-Hurlé 2012). By 2011 ten African countries had spent about US\$ 1 billion on these programmes, close on 30% of their agricultural budgets (Chinsinga & Poulton 2014). Table 1 illustrates the differences between universal, voucher and smart subsidies. Very few African programmes qualify as pure 'smart' subsidy programmes (Lunduka *et al.* 2013).

Voucher subsidy schemes

Input vouchers are certificates that farmers use to buy inputs at the subsidised price; the input supplier redeems the certificates for cash from the government. Inputs can also be distributed through private distribution networks, as opposed to state distribution systems. It also facilitates beneficiary targeting and can reduce administrative costs.

Source: Minot 2009.

Evaluating the Input Subsidy Programmes of SADC Countries

SADC countries with inactive or no input subsidy schemes

Angola:

Angola signed the CAADP Compact in 2014. Agricultural spending reached a high in 2009, at 5.6% of total public spending (Resakss.org 2016), but decreased to 0.41% in 2015 (World Bank 2016). It has however, exceeded the 6% annual growth target for the sector (Resakss.org 2016). The country has an official fertiliser subsidy programme but it is largely ineffective (Jul-Larsen & Bertelsen 2011; SADC 2011) and no official evaluation of the programme is available.

The Democratic Republic of Congo (DRC):

The DRC signed the CAADP compact in 2011 (UNDP 2013d) but government funding of agriculture remains low, dropping to an average 1–2% since 2005 (Resakss.org 2016). The agricultural sector grew at an average rate of 2.2% from 2003 to 2013 (Resakss.org 2016). The National Agricultural Investment Plan makes provision for a Small Scale Farmers Initiative that provides farmers with direct input support (UNDP 2013c) but it is not clear how this works. There is no evidence that the DRC provides input subsidies to small-scale farmers; if it does, this may be on an ad hoc basis, such as when it waived fertiliser import tariffs for a project run by the International Fertilizer Development Corporation (IFDC) (Aluma 2016).

Madagascar:

Madagascar signed the CAADP Compact in 2013. Agricultural spending in the country increased significantly from 4% in the mid-2000s to about 25% in 2009; on average it has exceeded the 10% commitment to date and has grown its agricultural sector at an average rate of 3.2% a year (Resakss.org 2016). In 2009, the country decided to double production and announced a 50% subsidy on fertilisers (SADC 2011). There is

no information available on this and it is possible that the scheme was shelved following the 2009 political crisis and resultant economic collapse.

Republic of Seychelles:

The Seychelles signed the CAADP Compact in 2011 but allocates an average 2.6% of its budget to agriculture. By 2012 its agricultural growth rate was in negative figures and it has not recovered since (Resakss.org 2016). There are references to subsidised inputs having been sold on to commercial and registered farmers (RoS n.d.) but the 2013 accession documents of the World Trade Organization (WTO) note the absence of input subsidies (WTO 2013).

The Republic of Botswana

Roughly 2.2 million people live in the Republic of Botswana and more than half the adult population relies on the agricultural sector (World Bank 2015), mostly the livestock sector (Forum for Agricultural Research in Africa (FARA) 2013). Botswana is classified as a middle-income country but remains one of the most unequal societies in the world; its poverty levels are highest in rural areas and are concentrated among women and youth (World Bank 2015). About 70% of rural households practice subsistence farming on farms that are, on average, 5 ha in size (SADC 2011). The country does not enjoy high levels of food security, produces only 10% of its staple grain needs and is thus a large net importer of staple crops (World Bank 2015). Agricultural policy aims to diversify the production base, increase outputs, create jobs and improve food security, among other goals (Ministry of Agriculture (MoA.gov.bw 2016) MoA.gov.bw 2016). Key support programmes include the Integrated Support Programme for Arable Agriculture Development (ISPAAD) (MoA.gov.bw 2016). In 2012 Botswana exceeded the 6% growth rate for the agriculture sector, but public spending on agriculture decreased to 2.9% in 2013 (Resakss.org 2016). Botswana has not yet signed the CAADP Compact.

Botswana's Integrated Support Programme for Arable Agriculture Development (ISPAAD) (2009)

- **Description**

ISPAAD is a universal subsidy with differing levels of benefits (MoA.gov.bw 2016). Subsistence farmers are expected to produce at least 1 ton/ha, emerging farmers 1.5 tons/ha and commercial farmers 2.5 tons/ha (Republic of Botswana (RoB) 2013).
- **Objectives**

To increase grain production, promote food security, commercialise agriculture, and improve extension outreach and access to farm inputs and credit (MoA.gov.bw 2016).
- **Implementer**

The Department of Crop Production within the Ministry of Agriculture.
- **Subsidy package (from 2013)**

Subsistence farmers qualify for 100% of the subsidy on hybrid seed and open-pollinated seeds, and are expected to plant up to 5 ha and 16 ha, respectively (RoB 2013). Seeds are sourced from the Seed Multiplication Unit within the Department of Agricultural Research (SADC 2011). They also receive a 100% subsidy for 200kg/ha of basal fertiliser and herbicides, for ploughing and row-planting, to treat up to 5 ha (RoB 2013). *Emerging* farmers qualify for a 35% subsidy on seed, fertilisers and herbicides, to plant up to 150 ha. *Commercial* farmers qualify for a 30% subsidy on seed, fertiliser and herbicides, to plant up to 500 ha (RoB 2013).
- **Beneficiary criteria**

Recipients must be resident in Botswana and have proof of ownership or access to land, and be registered with extension agents (RoB 2013).
- **Distribution**

Registered suppliers sell inputs on to farmers and reclaim the subsidy amount from the Department; input costs are capped at market prices (RoB 2013).
- **Budget**

ISPAAD cost more than twice its allocated budget in 2013, a figure of about US\$ 19.5 million (BCA Consult 2013), and received US\$ 53 million from the government in the 2015/16 budget (Dailynew.gov.bw 2015). It consumes more than 80% of the Departmental budget and more than 50% of the entire agricultural budget; about 70% of this is spent on ploughing (BCA Consult

2013).

- **Evaluation and monitoring**

There is no monitoring and evaluation framework or measurable performance targets (BCA Consult 2013). By 2013, ISPAAD had helped about 100 000 vulnerable households, 60% of them headed by women (BCA Consult 2013). A 2012 review by the UNDP–UNEP Poverty Environment Initiative mentioned ISPAAD's poor targeting criteria, limited enforcement, late delivery and significant leakage to commercial farmers.

The Kingdom of Lesotho

Lesotho is a small landlocked country, home to just more than 2 million people, of whom about 70% live in rural areas and practice subsistence farming (ADBG 2013), primarily focused on maize cultivation (The Lesotho Review 2015). An estimated quarter of the population is food insecure and dependent on food aid (The New Agriculturist (New-ag.info) n.d.) and has no means of generating a cash income (ADBG 2013). The country can meet only 30% of its cereal needs, with less than 5% of households producing enough food to feed their families (New-ag.info n.d.). The public sector provides strategic direction, chooses technologies, provides capital and assumes the major portion of agricultural risk (World Bank n.d.). The National Strategic Development Plan 2012–2017 emphasises agriculture as a key growth pillar. Between 1996 and 2008 the government provided emergency subsidies to vulnerable groups, but only in times of climatic shocks; in 2009 it established the current Lesotho National Fertiliser and Input Subsidy programme (Ratii 2016). Lesotho signed the CAADP Compact in 2013. Since 1990 agricultural spending has dropped, to an average 1.7% in 2013, and sector growth currently averages about 1.4% a year (Resakss.org 2016).

Lesotho's National Fertiliser and Input Subsidy programme (2009)

- **Description**

A universal subsidy encompassing sharecropping programmes, block farming initiatives (discontinued) and individual farming operations (Molatoli & Xiaoyun 2016). Government provides all the inputs and the mechanisation for the sharecropping programmes, and yields are

divided between the government (70%) and farmers (30%). The focus of subsidies has been expanded from crop production to other sub-sectors to support diversification (The *Lesotho Review* 2015).

- **Objectives**
To provide food security through increased production, promote fertiliser use and protect farmers from the negative effect of international price increases (Ratii 2016).
- **Implementer**
The Ministry of Agriculture and Food Security (Molatoli & Xiaoyun 2016).
- **Subsidy parcel**
A 50% subsidy on seed, fertiliser and mechanical operations such as ploughing (Molatoli & Xiaoyun 2016).
- **Beneficiary criteria**
Farmers must commit to cultivating a certain amount of land, which is verified by local authorities and extension officers (Molatoli & Xiaoyun 2016).
- **Distribution**
The government buys fertiliser inputs from South Africa and seed from the Seeds and Markets Project (SAMP) funded by the Swiss Agency for Development Cooperation (Seedsandmarkets.biz 2016). The government sells inputs to government stores or private traders at a reduced price (Ratii 2016).
- **Budget**
Costs have risen from US\$ 8 million at inception to US\$ 10.6 million in 2014 (Ratii 2016).
- **Monitoring and evaluation**
There is no formal monitoring and evaluation framework; the Ministry does not keep records on how much fertiliser is procured and distributed to suppliers (Ratii 2016); and there is no way of knowing how much is diverted. The subsidy has not boosted food supplies (Ratii 2016).

The Republic of Malawi

Malawi is home to about 17 million people, more than 75% of whom are poor (World Bank 2016b). About 11 million Malawians engage in subsistence farming on plot sizes of less than 1 ha (New-ag.info n.d.). Malawi's 2020 Vision (launched in 1998) identifies agriculture as key to growing the economy and bolstering social development (FAO 2015). In 1998 the country

reintroduced input subsidies and in 2005 it merged three major input subsidy programmes to form the FISP, which has a primary focus on maize, legume seeds and fertiliser (ACB 2014b). Malawi harvested more than 500 000 tons in excess of its food requirements in 2006, and became the poster child of African FISPs (Chinsinga & Poulton 2014). The country signed the CAADP Compact in 2010, has exceeded 10% sector investment, and has grown the sector to surpass the 6% target on several occasions (Resakss.org 2016).

Malawi's Farm Agricultural Input Subsidy Programme (2005)

- **Description**
A 'smart' subsidy programme that uses vouchers and does not have an exit strategy. (FARM 2013).
- **Objectives**
To increase maize production, food security and rural incomes (Lunduka et al. 2013).
- **Implementer**
The Ministry of Agriculture and Food Security.
- **Subsidy package**
100 kg of fertiliser at 20% of the cost price (Minot 2009).
- **Beneficiary criteria**
Vouchers target the 'productive poor', the definition of which shifts from time to time but, following social pressure, now includes vulnerable households (Lunduka et al. 2013). The government announced in 2016 that it would consider shifting the subsidy to farmers with irrigation, and its emphasis to drought-tolerant crops (Times.mw 2016).
- **Distribution**
The Ministry issues vouchers that are given to beneficiaries identified by village chiefs and committees; tenders are issued for the procurement and distribution of inputs to designated outlets that sell to farmers (Lunduka et al. 2013). Farming households redeem vouchers (for 100 kg of fertiliser) and pay 36% of the total cost. In 2006 the government provided, free-of-charge, 2–5 kg of maize seed (hybrid and open-pollinated varieties) and increased the volume of fertiliser provided to farmers (Lunduka et al. 2013). Tender beneficiaries include parastatals and corporations: Farmers World, which owns Demeter Seed; Yara, TransGlobe, Omnia and Rab Processors, which owns

the Kulima Gold agrodealer network (ACB 2014b).

- **Budget**

The Malawian government funded the FISP from its national budget, which is bolstered by significant donor support (just more than 43% in 2007/08). In 2005/06, the FISP accounted for 5.6% of the national budget; by 2010/11 the figure had reached 6.5% (Lunduka et al. 2013). More than 20% of this goes to transport and logistics costs (FARM 2013).

- **Monitoring and evaluation**

Monitoring of Malawi's FISP has been poor. The number of supplementary vouchers printed is not tracked, which makes them vulnerable to diversion; the initial list of potential beneficiaries may have been significantly inflated; and an estimated one third of vouchers are lost to leakage and diversion (Lunduka et al. 2013). Claims of record yields are disputed as the data is unreliable (FARM 2013) and Malawi remained a net importer of maize during the FISP years (Lunduka et al. 2013). The programme has not reduced rural poverty, nor did it prevent the food crisis that manifested at the end of 2012 (FARM 2013).

The Republic of Mauritius

Approximately 1.2 million people live on the islands of the Republic of Mauritius and slightly more than 40% of the land is allocated to agriculture, mostly to sugar production (Statistics Mauritius 2014). Fewer than 1% of the population live below the absolute poverty line but relative poverty is increasing as equality indicators worsen (UNDP 2013). Mauritius produces roughly 23% of the staples it needs and about 8 000 small-scale farmers in the non-sugar sector practise rain-fed agriculture on plots that average 0.25 ha in size (Ministry of Agro-Industry and Food Security (MoAIFS) 2016). Farmers find it difficult to access agricultural land, to find affordable labour and to secure financing for production costs (MoAIFS 2016). The sector's strategic plan (2016) aims to increase production, to satisfy local demand and reduce import dependencies, by shifting its focus to sustainable agricultural practices (bio-farming and permaculture) (MoAIFS 2016).

Mauritius has implemented a range of interventions to increase productivity, including partial funding for rainwater harvesting equipment, sheltered farming, crop nurseries, agricultural and processing equipment, and seed purchase schemes (MoAIFS 2016). It also offers small-scale farmers a compost subsidy scheme (MoAIFS 2016). Mauritius signed the CAADP Compact in 2015 and spends about 2.5% of its national budget on the sector, which averaged 1.5% growth per year between 2003 and 2012 (Resakss.org 2016).

The Mauritian Compost Subsidy Scheme (2013)

- **Description**

The compost subsidy scheme is part of a broad aim to reduce organic waste in landfills, reduce production costs for farmers, and enhance soil fertility.

- **Objectives**

To reduce production costs, decrease the use of chemical fertiliser, and improve soil quality (Budget Speech 2013).

- **Implementer**

The Small Farmers Welfare Fund (SFWF), a parastatal body (SFWF n.d.).

- **Subsidy package**

Farmers receive a subsidy for up to 5 tons of organic fertiliser per year (MoAIFS 2016). This saves farmers about US\$ 530 per ton of fertiliser (Budget Speech 2013).

- **Beneficiary criteria**

Farmers must register with the SFWF, farm on less than 10 ha of land, and be able to provide a copy of a title deed or lease agreement (SFWF n.d.). Compost is allocated on a first come, first served basis, to the value of the allocated budget (SFWF n.d.).

- **Distribution**

Farmers recoup vouchers from registered private suppliers and the suppliers reclaim costs from the government (SFWF n.d.). Compost is procured from Solid Waste Recycling Ltd, which is contracted to compost municipal waste. Two other private composting projects have been approved (Ministry of Education and Skills Development (MoESD) & UNEP 2013).

- **Budget**

In 2013 and 2014 the government provided US\$ 1.1 million in subsidies (Budget Speech 2013; Government of Mauritius (GoM) 2014). There is no mention of the Compost Subsidy

Scheme in the 2015 budget but it seems that this now falls within a broader agricultural support structure (InvestMauritius.com 2015) which has a particular focus on bio-farming (MoESD & UNEP 2013).

- **Monitoring and evaluation**

Mauritius is an outlier compared with other African countries regarding subsidy policies. While the country uses subsidisation to help small-scale farmers (by reducing input costs) and also to increase productivity (through improved soil health), it has linked the compost subsidy to longer-term sustainable development goals. This is part of attempts to mitigate the damage caused by the large-scale application of synthetic fertilisers and to shift farmers towards more sustainable production methods. It is not clear how many farmers have been reached through this programme.

The Republic of Mozambique

About 70% of Mozambique's population of roughly 24.5 million people (BBC.com 2016) live in rural areas (UN.org 2015) and rely on the agricultural sector for their livelihoods (World Bank 2016c). The civil war (1977–1992) had severe consequences for Mozambique's economy and agricultural productivity (World Bank 2016a). The country remains one of the poorest in the world (UNDP n.d.) and the current regional drought is increasing malnutrition and food insecurity levels (World Bank 2016c). Small-scale farmers cultivate plots of 1.2 ha, on average, which are often subdivided into smaller plots (ACB 2015a). More than 80% of farmers plant maize (Deininger, Mate & Payongayong 2015) and produce less than 1 ton/ha (World Bank 2014). Mozambique does not produce enough maize to feed its population and relies increasingly on imports (ACB 2015a).

Mozambique's Strategic Plan for Agricultural Development, known as PEDSA 2010–2019, outlines priority actions to increase fertiliser use in the country (ACT 2015a) and has developed a fertiliser strategy and launched a fertiliser platform (ACB 2015a). Mozambique signed the CAADP Compact in 2011 (Nepad-caadp.net 2016). Spending on the agricultural sector averaged about 5% of the national budget for 2003–2013 and the sector has

grown by more than 6% per year since 2005 (Resakss.org 2013).

Mozambique's Farm Input Subsidy Programme (FISP) (2009)

- **Description**
Targeted, voucher-based pilot study intended to stimulate fertiliser demand (ACB 2015a) and test the uptake and effects of improved inputs (World Bank 2014b).
- **Objectives**
To increase maize production and reduce import dependency (Carter et al. 2016).
- **Implementer**
The Ministry of Agriculture in partnership with the FAO and the IFDC.
- **Subsidy package**
73% of the cost of 12.5 kg of hybrid or open-pollinated seed and 100 kg of fertilisers (World Bank 2014b). More than 15 000 farmers were given vouchers, mostly for maize production, the balance being for rice production (World Bank 2014b).
- **Beneficiary criteria**
Farmers needed to cultivate between 0.5–5 ha of maize or rice, be interested in modernisation and commercialisation, have access to extension services and input and output markets, and be able to pay the balance of the subsidy. The government held a lottery that randomly selected 25 000 beneficiaries from a larger list of qualifying beneficiaries, selected by extension officers, local leaders and input suppliers (World Bank 2014b).
- **Distribution**
Extension officers distributed vouchers (with expiry dates) to the winning beneficiaries (farmers); farmers redeemed the vouchers at private suppliers; and the suppliers redeemed the voucher value from participating international donor organisations (World Bank 2014b). The Mozambique Fertiliser Company gave fertiliser on credit to suppliers (ACB 2015).
- **Budget**
The European Union (EU) funded the pilot study (Carter et al. 2016). From 2007 to 2013 the Mozambican government spent about US\$ 1.1 billion on fertiliser programmes; 93% of this went into the subsidy scheme (ACB 2015a) and roughly US\$ 150 million was used for inputs.

- **Monitoring and evaluation**
A commissioned research team monitored the first phase of the subsidy (World Bank 2014b). There were some positive findings of direct and indirect benefits (World Bank 2014b) and there is evidence that maize yields increased (ACB 2015). The scheme proved unwieldy to manage as stockists had to redeem funds from international organisations (ACB 2015). The programme has been amended to include banking partners who guarantee payment to suppliers (ACB 2015).

The Republic of Namibia

Namibia has a population of about 2.4 million people (World Bank.org 2016), about 55% of whom live in rural areas. Roughly 30% live below the poverty line, 30% are unemployed and 30% rely on agriculture for their livelihoods (KPMG 2014). Half of these people are subsistence and small-scale farmers who practise rain-fed agriculture (UNDP 2015) and most of the subsistence farmers do not produce enough to feed themselves (Government of Namibia 2015). The country is characterised as ‘highly unequal’ (World Bank.org 2016) despite its classification as an upper-middle income country (QuartAfrica.com 2015). It is also the world’s seventh most at-risk country in terms of climate change-related agricultural losses (UNDP 2015). The agricultural sector’s policy is aligned to Namibia Vision 2030 (Government of Namibia 2015). The sector grew by 13.1% in 2011, 13.5% in 2012 (Resakss.org 2016) and 9.6% in 2014 (UNDP 2015). It contributes 3.7% to Namibia’s gross domestic product (GDP) but 60% of this is from livestock farming (Government of Namibia 2015). Agricultural spending in Namibia declined to about 2.4% of public spending in 2013 (Resakss.org 2016).

While the Ministry of Agriculture, Water and Forestry is responsible for the strategic direction of these industries, the Directorate for Agriculture, Production, Extension and Engineering Services (DAPEES), within the Department of Agriculture, is more directly linked to agricultural support programmes (Ministry of Agriculture, Water and Forestry (MoAWF) 2014).

Namibia’s various input subsidy programmes Dryland Cropping Production Programme (2012)

- **Description**
Supply of subsidised inputs to specified communal farming areas.
- **Objectives**
To accelerate the provision of farm inputs (Newera.com.na 2014).
- **Implementer**
DAPEES (MoAWF 2014).
- **Subsidy package**
Subsidised inputs; land preparation support (Newera.com.na 2014).
- **Beneficiary criteria**
Registered subsistence farmers in communal growing areas (Newera.com.na 2014).
- **Distribution**
The Directorate procures and distributes fertiliser and seeds (maize, pearl millet, sorghum and cowpeas) (MoAWF 2014). In 2012/13 it distributed nearly 7 000 x 50 kg bags of fertiliser to 3 451 farmers (43% more than in the previous season) and 149 tons of seed (nearly 40% more than in the previous season) (MoAWF 2014).
- **Monitoring and evaluation**
While information is available on the amounts procured and distributed, as well as farmers reached, it is not clear whether this intervention improved yields and thus incomes and food security.

Comprehensive Conservation Agriculture Programme (2015)

- **Description**
A comprehensive subsidy programme for inputs and services targeted at communal farmers in all crop growing areas of the country.
- **Objectives**
To increase food production and the use of improved seed (AllAfrica.com 2015).
- **Implementing agency**
The Directorate for Agriculture, Production, Extension and Engineering Services (DAPEES) (MoAWF 2014).
- **Subsidy package**
Households can access improved seeds and fertilisers for up to 3 ha, together with ploughing and planting services (AllAfrica.com 2015).

- **Budget**
Estimated to be about USD\$ 6 million over five years, up to 2019, with financial support from the FAO, the EU and Germany (UNDP 2015).
- **Monitoring and evaluation**
It is too early to determine the effects of the scheme.

Drought relief subsidies 2016

- **Description**
A targeted once-off voucher subsidy scheme.
- **Objectives**
To provide respite from the effects of the drought.
- **Implementer**
Agro Marketing and Trade Agency working with DAPEES and the Directorate of Agricultural Research and Development (Economist.com 2016).
- **Subsidy package**
50% of the cost of dryland maize, pearl millet, groundnut and bean seeds, and fertilisers (Economist.com 2016) for up to 50 ha (The Villager.com 2015).
- **Beneficiary criteria**
All farmers in the drought-affected areas, including commercial farmers. Farmers must register at the regional agricultural offices to apply for the subsidy and provide proof or a sworn declaration of input costs (Economist.com 2016).
- **Distribution**
Farmers can access the subsidised inputs through registered suppliers. This is a once-off allocation and vouchers cannot be transferred or redeemed for cash (Lelamobile.com 2016). Suppliers need to register with the Agro Marketing and Trade Agency.
All suppliers must have good standing certifications, comply with the affirmative action requirement, and be able to supply inputs on receipt of the vouchers, which are redeemable from the government on proof of supply (Lelamobile.com 2016).
- **Budget**
The government approved US\$ 1.27 million for the 2015/16 planting season.
- **Monitoring and evaluation**
This scheme has a monitoring and evaluation plan but it is too early to determine the scheme's effectiveness (Economist.com 2016).

The Republic of South Africa

South Africa is classified as a middle-income country (Resakss.org 2016) and is one of the most unequal countries in the world (World Bank.org 2016). In 2014 about 45% of households were living below the poverty line (Department of Planning, Monitoring and Evaluation (DPME) 2014). There are an estimated 200 000 small-scale farmers who produce for home consumption and local markets, and about 2.7 million households that practise subsistence agriculture (Swanepoel 2014). Relevant policy documents that influence the sector include the National Development Plan (2011) that provides a framework for 'radical socio-economic transformation' for the country. South Africa has not yet signed the CAADP Compact, although it has started to develop implementation plans (Nepad-caadp.net 2016). Average contributions to GDP from the agricultural sector are a low 2.5% (Finmark Trust 2016). While South Africa has not met the CAADP spending target and only 1.6% of its national budget was allocated to the agricultural sector in 2013 (Resakss.org 2016), it is the only country that for many years has exceeded the 50 kg/ha target for fertiliser utilisation, although use has recently begun to decrease (Finmark Trust 2016). The agricultural sector has grown by more than 6% only once, in 2008, when it recorded growth of 16.1% (Resakss.org 2016). South Africa does not have a large-scale subsidy scheme but it does have targeted input support programmes, for example, the Massive Food Production Programme that was initiated in 2002.

South Africa's Massive Food Production Programme (2002)

- **Description**
A targeted and location-specific intervention.
- **Objectives**
To increase agricultural production and generate economic development.
- **Implementer**
Provincial agricultural departments in partnership with agribusiness and local contractors (Grain 2008).
- **Subsidy package**
Seed, fertilisers and pesticides are provided free-of-charge in year one; a part payment must be made by farmers in years two to four; and full payment by year five (Grain

2008).

- **Beneficiary criteria**
Rural villages with the best farming potential, i.e. that have at least 500 mm of rainfall or reliable irrigation, specific rooting depths and slopes with less than a 6% gradient, and plot sizes of at least 50 ha (Grain 2008). Farmers must use minimum tillage techniques and utilise herbicides (Grain 2008).
- **Distribution**
Government procured inputs from multinational corporations, including Monsanto (Masifunde 2010), which has acted as both supplier and technical advisor (Nilsson & Karlsson 2008).
- **Budget**
US\$ 27 million for 2008/09, for 420 projects (Grain 2008).
- **Monitoring and evaluation**
This programme followed a top-down approach with little to no consultation with farmers, many of whom have not been able to service their debts (Grain 2008). Participating farmers were introduced to Green Revolution packages that included genetically modified seed, and were encouraged to produce monocultures (Masifunde 2010). There was evidence of corruption among contractors and significant leakage (Grain 2008). Inputs often arrived late and farmers were not adequately trained on how to prepare the soil or apply the chemicals (Grain 2008). The Programme has contributed to the destruction of agrobiodiversity and the loss of indigenous knowledge; and has created a market for genetically modified seed in the rural small-scale sector with no adequate preparation on how to control spreading and health risks (Grain 2008).

The Kingdom of Swaziland

Swaziland is a landlocked country surrounded by South Africa except for a border shared with Mozambique. It is home to about 1.1 million people (WFP n.d.). Nearly 80% of the population rely directly on subsistence agriculture for survival, with more than 60% living below the poverty line (WFP 2016). The country is not able to produce enough food to support its population (WFP n.d.). A state of emergency was declared in Swaziland in 2016

when climatic conditions led to extensive crop losses and cattle deaths (WFP 2016). Emergency food programmes are being implemented by organisations such as the UN and WFP (WFP 2016). Swaziland signed the CAADP Compact in 2010 and between 2007 and 2013 it spent about 2–3% of its national budget on agriculture (Resakss.org 2016). The country has never surpassed or come close to meeting the 6% growth rate for the agricultural sector (Resakss.org 2016).

Swaziland's Farm Input Subsidy Programme (2014)

- **Description**
Targeted programme in partnership with India.
- **Objectives**
To improve productivity and grow the economy (SwaziObserver.org.sz 2015).
- **Subsidy package**
Registered farmers pay 50% of the cost for one 25 kg bag of maize seeds, four 50 kg bags of LAN fertiliser and six 50 kg bags of NPK fertiliser (FAO 2015).
- **Beneficiary criteria**
Farmers must register and are expected to produce at least 80 bags of maize from one hectare (SwaziObserver.org.sz 2015).
- **Distribution**
Farm Chemicals Ltd is the sole importer and distributor of inputs (FAO 2015).
- **Budget**
India has provided about US\$ 35 million to initiate the project (FAO 2015).
- **Monitoring and evaluation**
The programme aimed to reach 21 750 farmers but only 3 723 (roughly) received inputs in the 2014/15 season, because the programme was implemented in just two regions (FAO 2015). It is expected to reach more farmers as it expands to more regions.

The United Republic of Tanzania

Tanzania's population is estimated at 39.4 million, about 80% of whom live in rural areas and depend on rain-fed agriculture, cultivating less than 2 ha (World Bank 2014). The country's National Agricultural Policy 2013 pledges to support farmers to access modern inputs, and to develop agrochemical and fertiliser manufacturing industries (GoT 2013). Tanzania signed the CAADP Compact in 2010, decreased

its public spend on agriculture to about 3.7% in 2013, and has never exceeded the growth target of 6% (Resakss.org 2016). Tanzania's National Agricultural Input Voucher Scheme (NAIVS) was designed in response to the increase in global grain and fertiliser prices in 2007/08 (World Bank 2014).

Tanzania's National Agricultural Input Voucher Scheme (NAIVS) (2008)

- **Description**
A targeted, voucher-based subsidy programme (World Bank 2014) initially aimed at farming households that would use fertiliser in the most economically efficient way (FARM 2013). By the end of 2009, the Scheme was made available to all, in order to cater to social objectives (Finmark Trust 2016).
- **Objectives**
To popularise fertiliser use and to increase productivity and boost food security.
- **Subsidy package**
The Scheme provides a 50% subsidy for maize/rice seed and fertiliser, to be planted on 0.4 ha (World Bank 2014). About 70% of the funds are spent on maize (Finmark Trust 2016).
- **Beneficiary criteria**
Farmers must farm full-time, cultivate 0.4 ha or less, grow maize or rice, be able to pay the 50% balance of input costs and be willing to cooperate with field offices (Finmark Trust 2016). It is not clear what this cooperation will entail.
- **Distribution**
Village voucher committees choose the farmers; and village executive officers receive, distribute and administer the vouchers (Finmark Trust 2016), which can be redeemed at private retailers (Minot 2009). Input companies collect the vouchers from dealers and apply for reimbursement from the government (World Bank 2014c).
- **Budget**
About US\$ 300 million to reach more than 2.5 million small-scale farmers, between 2008–2013 (World Bank 2014). Fertiliser subsidies cost the Tanzanian government US\$ 7.1 million in 2005/6, and US\$ 63.6 million in 2010/11 (at the exchange rate then). Current estimates expect a spend of about US\$ 30 million a year (Finmark Trust 2016). There is a significant amount of donor

funding (Finmark Trust 2016).

- **Monitoring and evaluation**

A review of the scheme by the World Bank noted high levels of dependency (World Bank 2014c). Yields increased by an estimated 2.5 million tons of maize and rice (World Bank 2014c) but whether this arises from NAIVS or expansion onto new lands is disputed, because fertiliser use has actually declined in the country (Finmark Trust 2016). The FAO notes inaccuracies in official statistics on maize production: numbers provided by different sources do not correlate, there are significant levels of illegal cross-border trade, and there is little demand from government for up-to-date verified information (Finmark Trust 2016). The Scheme has tended to benefit more productive households who are able to afford the 50% balance of subsidy cost (World Bank 2014c). Through a pilot project launched in early 2016, the country is exploring the use of e-vouchers to minimise diversion and leakage although the system will remain reliant on 'middlemen' to decide who benefits (Finmark Trust 2016).

The Republic of Zambia

About 13 million people live in Zambia (World Bank 2012), which is classified as a low-to-middle-income country. However, the benefits of recent economic growth have been unevenly distributed and two-thirds of the population live in poverty (ACB 2015b), particularly those living in rural areas (Mason, Jayne & Mofya-Mukuka 2013). Most rural Zambians depend on subsistence and small-scale farming, using plot sizes of less than 2 ha; in 2008, 36% of the small-scale farming population had to buy maize to feed their families (Ministry for Agriculture and Livestock (MoAL) 2013). Nearly 1 million hectares is dedicated to maize cultivation and 75% of fertiliser use is directed towards this crop (The Statistics Division of the FAO (FAOSTAT) 2013). The National Agricultural Investment Plan 2014–2018 aims to re-orient policy and legislation for the private sector to revitalise the agricultural sector (MoAL 2013). Zambia signed the CAADP Compact in 2011. The spend allocated to the agricultural sector was about 5% in 2013 and has not increased significantly since; the sector has, however, grown at more than 6% a year (Resakss.org

2016). It is also the only country (besides South Africa) that has exceeded the 'desired' 50 kg/ha, reaching an average 90 kg/ha in 2010/11 (ACB 2015b). The government operates three subsidy programmes: The Food Security Pack Programme, the Food Reserve Agency and the Fertilizer Input Support Programme.

Zambia's Fertilizer Input Support Programme (2009)

- **Description**
A targeted input subsidy programme (Mason *et al.* 2013).
- **Implementing agency**
The Food Reserve Agency (FAO 2014).
- **Subsidy package**
The subsidy package comprises 80% for fertilisers and just over 50% for seed, to plant one hectare of maize (Mason *et al.* 2013). The input pack (for farmers) comprised 200 kgs of fertiliser and 10 kgs of seed in the 2011/12 season (ACB 2015b).
- **Beneficiary criteria**
Farmers must be registered with a farmers' group, be able to cultivate between 1–5 hectares of maize and be able to pay towards the cost of the inputs (World Bank 2010).
- **Distribution**
Local leaders select beneficiary farmers who pay prior to delivery; private input companies are selected by tender and deliver to the district level; inputs are distributed by local transporters to farmer groups (Mason *et al.* 2013). A recent shift is the inclusion of agrodealers as delivery agents (ACB 2015b).
- **Budget**
The amount spent on FISP from the agricultural budget decreased to about 23% by 2013 (ACB 2015b). Contributions by farmers were doubled in the 2013/14 season to mitigate against rising costs. This enabled farmers to barter two bags of maize for a 50 kg bag of fertiliser (Agricultural Consultative Forum 2013). The 2015 national budget allocates about US\$ 200 million (Shula 2015).
- **Monitoring and evaluation**
There has been a marked increase in the volume of fertilisers distributed, supported by a shift in donor funding towards direct budget support (Mason *et al.* 2013). The Programme is highly politicised, tends to benefit better-off farmers (Mason *et al.*

2013) and there is significant leakage (an estimated 65%) (Ricker-Gilbert *et al.* 2012). In 2012–2013 a pilot e-voucher scheme was implemented to devolve delivery to local agrodealers and involve private-sector players (IFDC 2013).

The Republic of Zimbabwe

Zimbabwe's population is estimated at about 15 million, 70% of whom live below the poverty line (WorldBank.org 2016). There are about 1.5 million small-scale farmers (communal, old resettlement and small-scale commercial farmers) (FAO 2012). Food production in Zimbabwe has been devastated by natural disasters and economic and political instability, which has led to increasing levels of food insecurity (WFP n.d.). By 2009, nearly 33% of Zimbabweans depended on food aid (International Poverty Reduction Centre in China 2012). In early 2016 the government declared a state of emergency due to the drought. About 80% of the population relies on agriculture, to some extent, so the drought has had significant implications for national food security levels (Finmark 2016). Zimbabwe signed the CAADP Compact in 2013. Its agricultural spend has fluctuated significantly, at 13–15% from 2009 to 2011, to 3.7% in 2013 (Resakss.org 2016). The sector has not grown consistently at 6% or more (Resakss.org 2016). In 2009, the Zimbabwean government launched a farming inputs subsidy scheme to enable communal, old resettlement and small-scale farmers to buy a 50 kg bag of fertiliser for US\$ 7.00, and maize and sorghum seed for less than US\$ 1.00 per kg (AllAfrica.com 2009). In 2012 this began shifting to the use of voucher systems which require part-payment by the farmer (FAO 2012).

Zimbabwe's Agricultural Input Support Programme (2012) [

- **Description**
A targeted voucher programme with additional measures for non-qualifiers.
- **Objectives**
To improve productivity, food security, livelihoods and incomes (FAO 2012).
- **Implementing agency**
A partnership between government, NGOs, development organisations, donors and the communities (FAO 2012).

- **Subsidy package**
A 90% subsidy on seeds and fertilisers to farm 1 ha (FAO 2012).
- **Beneficiary criteria**
Communal, old resettlement and small-scale commercial farmers.
- **Distribution**
The system provided food (as an asset) to Category A farmers (those with limited land and labour); input vouchers to Category B farmers (those who could achieve food security with support); and market linkages and credit support for Category C farmers (those with land and labour, but no access to credit) (FAO 2012). Vouchers are issued and distributed by ward and village committees, assisted by NGOs (FAO 2012). Farmers redeem the vouchers from rural agrodealers (FAO 2012) who claim from government.
- **Budget**
In 2013 the Programme received US\$ 161 million to cover government debt to suppliers (US\$ 11.8 million); to procure fertiliser (US\$ 40 million) and seed (US\$ 10 million) for the season (Chifera 2013). Private funding amounted to roughly US\$ 120 million (Chifera 2013).
- **Monitoring and evaluation**
Fertiliser use has increased from an average of 29.5 kg/ha (from 2001–2005) to 36.8 kg/ha (from 2011–2015) (Finmark 2016) but it is not clear whether there is a correlation with fertiliser subsidy support. Critics note that the scheme has encouraged a dependency syndrome (TheIndependent.co.zw 2012). The financial burden is not sustainable and the Zimbabwean government is looking to encourage the development of credit schemes (Finmark 2016). A separate Presidential Well-Wishers Input Scheme has been criticised as being a means to gain political favour (Finmark 2016). Zimbabwe is piloting an e-voucher system in partnership with the FAO, USAID and the EU (Finmark 2016).

Input Subsidies: A Benefit for, or a Betrayal of, SADC's Small Scale Farmers?: Analysis

With the exception of the scheme in Mauritius, which bears further investigation, the input subsidy schemes outlined in this study tend not to lay the groundwork for a climate resilient, ecologically sustainable and socially just future for small-scale farmers in the SADC region. While some encouraging approaches have been adopted in various countries, the large-scale implementation of FISPs has not brought about desired increases in food security levels, nor has it reduced poverty levels. This is because they are not grounded in an understanding of food systems as complex systems. The IPES 2015 report notes that issues of hunger, malnutrition, biodiversity loss, ecosystem degradation, cultural erosion and social conflict cannot be viewed or treated in isolation (IPES 2015). Sustainable food systems are defined as those that deliver “food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised” (FAO n.d.).

Significant findings from this study appear below.

Problematic programme design

Contradictory objectives and inefficient targeting mechanisms

FISPs are often designed with contradictory objectives (Druilhe & Barreiro-Hurlé 2012); for example, to increase the adoption of synthetic fertilisers and improve soil fertility, or to increase production and help the most vulnerable people to subsist, are not necessarily complementary goals (ACB 2016d forthcoming). Also, targeting mechanisms do not always align with the programme's primary objectives; for example, achieving significant increases in production will require directing subsidies to those farmers *with the means* (land, labour and cash surpluses) to make the most productive use of them. (These farmers are termed the ‘productive

poor'.) This approach directly contradicts the social expectation that subsidies should go to *the most vulnerable farmers*. If provided to the most vulnerable farmers, subsidies could act as social transfer and poverty alleviation programmes, as opposed to being catalysts to drive yield increases, only (Lunduka *et al.* 2013; Chisinga & Poulton 2014).

To serve both objectives, governments would need to provide differentiated support—as is being provided in Botswana and Zimbabwe—to different scales of farmers. But the administrative burden and monitoring and evaluation capacity, to ensure this process works as intended, is generally lacking. In both Malawi and Tanzania, where large-scale voucher systems were implemented to target the 'productive poor', social pressure has forced these governments to broaden their beneficiary criteria, so as to include the most vulnerable and to cater to broader social objectives (FARM 2013; Lunduka *et al.* 2013; Chisinga & Poulton 2014; Finmark Trust 2016). However, even when they are meant ostensibly to benefit the poor (especially women- and child-headed households, and people living with disabilities or chronic illnesses) FISPs have been shown to be largely ineffective. Poor people often cannot afford to pay the balance of the subsidy (Molatoli & Xiaoyun 2016) or, as in some cases, make the necessary down payment to access the FISP or pay membership fees to farmer organisations (Siyanga 2009). Also, many small-scale farmers cannot meet the minimum land requirements (Molatoli & Xiaoyun 2016) and are unable to hire the necessary labour (Siyanga 2009).

Distribution mechanisms and their consequences

Distribution mechanisms and poor levels of monitoring and evaluation have led to FISPs being used to gain political patronage and personal profits. In Zambia, households in districts allied to the incumbent political party are more likely to receive the subsidy (Ricker-Gilbert *et al.* 2012) and, in Zimbabwe, FISPs have helped the incumbent party gain political popularity (The Independent.co.zw 2012). Similarly, in Malawi the timing and distribution of the subsidy was clearly aligned with the prevailing political agenda, in that it was provided significantly more often to

people living in districts that supported the ruling party (Lunduka *et al.* 2013). The same is true for Ghana and Tanzania (Chisinga & Poulton 2014). The inherent unfairness of the system, which prevents or obstructs access to the full subsidy by small-scale farmers, who demonstrate no political connections or contrary views, also creates dependency on the subsidy as a key to unlock political patronage. It will be difficult to restructure or dismantle such systems without substantial political fallout.

There have been several scandals related to procurement deals for fertiliser in SADC countries. In 2011, Malawi's FISP was criticised for allocating most of its contracts to bidders who were more expensive than other competitors (TrademarkSA.org 2011); this was ascribed to its weak framework for choosing bidders (TrademarkSA.org 2011). In addition, a number of fertiliser cartels have been found to be operating across Africa; for example, a cartel between Omnia and Nyiombo Investments was uncovered in the Zambian market between 2007 and 2012 (Roberts, Vilakaz & Simbanegavi 2014); and in South Africa Omnia and Kynoch have been found guilty of cartel behaviour with Sasol (Roberts *et al.* 2014). The unethical behaviour of these and other dominant market players distorts the economic development of countries in the SADC region.

Diversification and leakage

Given the lack of transparency regarding fertiliser deals, it is difficult to gauge how much money private fertiliser companies generate through procurement bids for fertiliser subsidy programmes. Also, because monitoring and evaluation frameworks are weak or non-existent, it is not known what quantities are diverted or leaked before subsidised fertiliser reaches beneficiaries. All the programmes show significant losses, with subsidised inputs being stolen by government officials prior to distribution (diversion), or by beneficiaries redeeming vouchers for cash (leakage) or claiming and then selling to other farmers or the commercial market (leakage).

• Tanzania

The country estimated a 60% loss of fertiliser to diversion (Dailydevelopment.org 2015).

- **Zambia**
Farmers received about 65% of the official quantity available (Ricker-Gilbert et al. 2012)
- **Malawi**
An estimated 33% was diverted or leaked into secondary markets (Lunduka et al. 2013).
- **Botswana**
Has reported significant leakage (UNDP-UNEP 2012).
- **South Africa**
It is estimated that South Africa's Massive Food Production Programme has rewarded private seed and fertiliser suppliers to the value of about US\$ 60 million in stock purchases. (Grain 2008). Also, inputs are often diverted at the wholesale level and while most of these may end up being sold to farmers, or be smuggled across borders to countries with higher input costs, the amount that is distributed to intended beneficiaries is considerably less than planned (Jayne *et al.* 2013). This practice distorts market analyses of local seed and fertiliser markets and has implications for the claims that FISPs have contributed to increasing yields (Jayne *et al.* 2013).

Top-down universal solutions

The CAADP framework for agriculture is problematic in that it uses economic indicators only as a measure of agricultural growth. This aligns with the Green Revolution measure of increased productivity. These quantitative indicators—percentage of national budget allocated to agriculture, and percentage of annual sector growth—do not in any way provide information regarding food security (particularly nutritional levels), poverty levels and other social development indicators. CAADP has been shaped through interactions with major donor countries that combine development and philanthropic aid with the advancement of the interests of their own private sectors, such as the G8 New Alliance for Food Security and Nutrition (NAFSN) (ACB 2015a). Farmers mostly are not involved in the design of the programmes (ACB 2015a). Zambia is an example of a programme using a top-down model of technology transfer, with limited farmer participation in the development or implementation of the technology (ACB 2015b). The wealth of local

and tacit knowledge lodged among small-scale farmers is thus lost to a process that seeks to impose uniform solutions on a complex set of interrelated challenges (IPES 2015). Farmers in Zimbabwe described their FISP as myopic and largely ineffective, because of this lack of consultation (Molatoli & Xiaoyun 2016), while South Africa's Massive Food Production Programme is a clear example of the failure of top-down, non-consultative approaches—with negative impacts for everyone involved (Nilsson & Karlsson 2008).

Farmers should be engaged in processes of this nature and their context-specific knowledge should be harnessed (IPES 2015); this will ensure that the considerable funds that are poured into FISPs are aligned with their context-specific needs. The framework of science and knowledge cannot be defined with any accuracy by dominant actors (IPES 2015) *without any input* from the people who actually grow Africa's food. Countries such as Mozambique show evidence of participatory extension approaches, and sharing and learning, that takes place between farmer associations, with links to technical knowledge in the public sector (ACB 2015a). This kind of interaction is what IPES considers crucial to the co-production of relevant, context-specific knowledge, emanating from people with a profound understanding of their own food systems (IPES 2015).

The marginalisation of Africa's farmers

Public and private sector intervention often is based on the assumption that only private, commercial entities have the capacity and motivation to generate improvements in the agricultural sector (ACB 2015a). The top-down approach followed by FISPs marginalises farmers by denying them direct control over their land and responsibility for its management, including soil fertility and food production. The increasing use of demo plots and farmer field schools serves to demonstrate pre-determined technologies that drive the adoption of synthetic inputs in Africa, rather than provide small-scale farmers with a diverse range of options from which to choose (ACB 2015b). In 'lead farmer' models external technicians train a set of farmers

on predetermined technologies. The visible success of the plot is used to increase the rate of adoption by the broader farmer group (ACB 2015a). The use of demo plots is not always a good reflection of how the inputs will produce in different, non-ideal conditions (ACB 2015a) and often do not reflect the interests and needs of farmers, but rather those of commercial producers wanting to increase sales (ACB 2015a). Farmers must be re-skilled to manage the inputs and the additional costs they entail (2015b). Those who follow a Green Revolution agenda, including African governments, increasingly influence decisions that marginalise actual food producers and preclude their say in the wider socioeconomic and political space (IPES 2015). As one of its '10 Principles to guide the transition to Sustainable Food Systems', the Panel notes that "decision-making in food systems must be democratised in ways that empower disadvantaged actors and help them realise the human rights of all, including the right to food" (IPES 2015). The voices of small-scale farmers must not be overshadowed by powerful actors with vested interests in African agriculture.

The misuse of public funds

A common critique of all the programmes explored in this study is that the significant funding directed towards subsidies could be better utilised to fund known pro-poor drivers of agricultural growth, such as research and development, improved extension services, upgrading rural roads and infrastructure, electrification and health and education (ACB 2015b). A review of Malawi's FISP shows that the state simply transfers money in the form of vouchers to recipients and also bears the costs of managing the programme—but this money could be better spent on interventions that have greater development benefits (Chinsinga & Poulton 2014). Countries in sub-Saharan Africa are spending at least US\$ 1 billion a year on fertiliser subsidy programmes alone (Jayne et al. 2013). This is a significant cost, particularly in a period when governments are struggling to fund education and health initiatives, and they are escalating:

- **Botswana**
The costs for the FISP grew from nearly US\$ 20 million in 2013 to US\$ 53 million in 2015 (Dailynews.gov.bw 2015) and is consuming more than 50% of the agricultural budget (BCA Consult 2013).
- **Tanzania**
Tanzania spends about US\$ 30 million per year on NAIVS (Finmark Trust 2016).
- **Malawi**
Malawi's FISP accounts for 6.5% of its national budget (Lunduka et al. 2013).
- **Zimbabwe**
Zimbabwe's 2013 input scheme cost US\$ 50 million and three quarters of this came from private funds (Chifera 2013).
- **Zambia**
Zambia's FISP absorbs 75% of its agricultural budget.

These types of input subsidy programmes channel public resources into a narrow set of technologies that are not applicable to the diversity of agroecological zones in the region (ACB 2016a). The input subsidy model provides commercial goods that benefit individual farmers and supply companies, as opposed to providing public goods (ACB 2014b). A study of Malawi's system indicates that the programme does not generate enough revenue (through increased grain production to offset imports) to cover its costs (Lunduka et al. 2013).

Frequently, state extension services become subsumed into mere conduits for a defined set of inputs (ACB 2015a). In Botswana the administrative burden (monitoring farmer registration, supervising farmers, verifying the area planted, monitoring payment and capturing data (RoB 2013)) placed on the extension service by ISPAAD, has led to a deterioration in the quality of services offered, and a decrease in the worker-to-farmer ratio (BCA Consult 2013). There is also a focus on developing private agrodealer networks as opposed to empowering government agricultural extension officers as transfer agents of technical knowledge and resources (ACB 2015b), to comply with the principles of smart or voucher input subsidy schemes and to encourage private sector entry into Africa's agricultural economies.

Input subsidy programmes show a tendency to lean on synthetic fertilisers as a quick fix. This means that farmer training and extension is oriented away from broad agroecological techniques and towards the narrow, correct way to handle and apply poisons (ACB 2015b).

Entrenching a culture of dependency

FISPs that encourage the large-scale uptake of hybrid seeds and fertilisers can result in high levels of farmer dependency. In Lesotho, the FAO notes that its input schemes have led to beneficiaries expecting a perpetual supply of free and subsidised inputs (IRIN 2010). In Zimbabwe, critics of the programme note that farmers are so reliant on government support that this is referred to as a 'syndrome' (TheIndependent.co.zw 2012). The same can be said for Zambia, where small-scale farmers lost up to 30% of their income when the subsidy was temporarily removed in 2013 (Oxfam 2015). Botswana's ISPAAD has not shifted farmers from subsistence to commercial levels of production but has actually significantly increased the number of subsistence farmers in the country (World Bank 2015), from 31 000 in 2007 to 118 000 in 2010 (BCA Consult 2013). A World Bank (2014c) review of public expenditure on Tanzania's NAIVS noted that many beneficiaries had become reliant on the subsidy; up to 60% of farmers who received the subsidy in 2011/12 were receiving it for the fourth or fifth time (World Bank 2014c). This extensive reliance on a subsidy for the purpose of farming, is concerning—if/when the subsidy is eliminated many rural households could revert to lives of extreme poverty.

Besides the partial economic safety net that the subsidy obviously provides, it also lures farmers into dependency on synthetic inputs. This effectively traps them on a technological treadmill that they may not have the financial reserves to escape, to return to less expensive forms of production (ACB 2016a). This is true in Zimbabwe where, after three decades of input subsidies, farmers are forced to keep paying to maintain yields, but still cannot afford to wean themselves off the external inputs (ACB 2016a). Given the significant increases in the price of hybrid seed and fertiliser in recent years, this treadmill will become increasingly expensive (Swanepoel 2014). ACB's field work in Malawi in

2014 found that many farmers were locked into a cycle of input dependency and debt, while at the same time they faced an eroding natural resource base, including increasingly infertile soils (ACB 2014b).

Encouraged by FISPs to adopt improved technologies, small-scale farmers are starting to abandon the diversity of local seeds (ACB 2014b) and traditional soil fertility management techniques, to enter a system that has none of the resilience offered by locally adapted inputs and practices.

For most small-scale farmers in the SADC region, reliance on the subsidy has contributed to a loss of income because farmers tend to produce the same crop in the same area at the same time, which leads to a glut on the market and reduced prices. A report by The World Bank, titled *Agricultural Sector Assessment and Agribusiness Development Strategy* (n.d.), indicates that the subsidisation of seed and fertiliser, as well as the provision of tractor services, can actually increase the unit cost of producing maize, consequent to the reduced market price for the crop. The increased productivity is not enough to compensate for the increased capital costs (World Bank n.d.). ACB's work in Malawi indicates a net transfer away from farming households to agribusinesses involved in supplying and distributing Green Revolution technologies, because the higher return on increased yields from hybrid maize seed planted with fertiliser is cancelled out by the high cost of the seed, fertiliser and urea (ACB 2014b). A World Bank (2014) report notes that high input costs and low prices for surplus grain in Tanzania has limited the profitability of using fertilisers (World Bank 2014c). In Zambia, problems arising from market glut and the resultant reduced prices cannot be overcome because the FISP, as with all the countries does not help farmers to reach markets where there is a demand (ACB 2015b).

It is highly irresponsible for African governments to foster this culture of dependency on external inputs, with prices that are set on a volatile international market—particularly, as they might not be able to sustain these significant investments in a tough global economic climate. This type of

investment, often made at the cost of funding longer-term public resources, does not build the resilient agricultural systems needed to weather economic downturns and the predicted effects of climate change. External inputs are not a sustainable investment in a tough economic climate and certainly do not contribute to building sustainable food systems.

Effects on the broader rural economy and ecology

Increased yields, but at what cost?

There is little empirical evidence that increased yields in Malawi, Tanzania and Zambia, for example, can be linked to the FISPs and increased adoption of Green Revolution technologies. The claims of record maize yields in Malawi are disputed because of the lack of reliable data, believed to have been manipulated and overestimated by as much as 30% (FARM 2013), and because Malawi has effectively remained a net importer of maize (Lunduka *et al.* 2013). The same can be said for Lesotho, where farmers were granted subsidies but corresponding yields point to little or no causal relationship between them (Ratii 2016). In Tanzania there are disputes about yield increases arising from the FISP or from expansion onto new lands, because fertiliser use has declined (Finmark Trust 2016). In addition, the FAO has noted that official statistics on maize production in Tanzania are not accurate—the numbers provided by different sources do not correlate, there is significant illegal trade across borders, and there has been little demand for up-to-date verified information from government (Finmark Trust 2016).

Costs for subsidy programmes have risen significantly with negative implications for other agricultural development priorities (World Bank 2010). The focus on primary inputs tends to marginalise other constraints on the success of small-scale farming, such as insecure tenure rights, barriers to entry in high-value supply chains, exclusion from financial and commodity markets (Oxfam 2015) and training in ecologically friendly integrated soil fertility management and/or conservation farming techniques (Druilhe & Barreiro-Hurlé 2012).

None of the programmes have achieved the desired objectives of increasing food security and reducing poverty. In Zambia, despite significant increases in fertiliser use since 2009 (Mason, Jayne & Mofya-Mukuka 2013), there has been no concurrent sustained or significant increase in yields, or any decrease in poverty levels (MoAL 2013). Maize prices have actually increased in Zambia, from below US\$ 100 per ton in 2005 to US\$ 400 per ton in 2015, possibly as a result of storage losses, changes in informal cross-border flows and overestimates of national maize production (Lunduka, Ricker-Gilbert & Fisher 2013). Studies conducted in 2011 in Malawi and Zambia note that even if the FISP were doubled in size in each country, this is likely to result in a price reduction of only 1.2 % in Malawi and 2% in Zambia (Ricker-Gilbert, Mason, Jayne, Darko & Tembo 2013). A 2012 government report notes that rural poverty levels actually increased in Malawi after the introduction of the FISP in 2005 (FARM 2013).

Implications for soil health

In most cases yield increases are linked to expansion onto fallow or virgin lands (World Bank 2014a; 2014b; ACB 2015b), which has implications for soil health. In some countries, yields have not increased at all, possibly because subsidies targeted towards hybrid maize seed and accompanying fertilisers encourage planting, even in marginal lands, in order to qualify for the subsidy. Many of these ecological zones are unsuitable for maize production and its cultivation contributes to declining soil fertility (Mason, Jayne & Mofya-Mukuka 2013). In Botswana, for example, the input package of hybrid maize seed and fertiliser is simply inappropriate for many of the agroecological zones in the country, and there have been high levels of crop failure and reduced yields (UNDP-UNEP 2012). In Zambia, application of the formulaic NPK product in the subsidy package is not suitable for that country's acidic soils, which require liming (ACB 2015b). In Malawi, despite years of fertiliser application in test areas, the soils are technically infertile with low levels of key nutrients and nutrient-holding capacity (ACB 2014b). In Mozambique, the subsidised NPK blend with hybrid maize seed is not suitable for the country's soils or climate (ACB 2015a).

Declining soil fertility results in declining yields, which places a further financial burden on poor communities (ACB 2015b). Without a clear idea of the condition of the soil across a myriad of agroecological zones, the likelihood of correctly analysing any findings is doubtful. This raises serious questions about the wholesale advocacy surrounding large-scale fertiliser adoption initiatives (ACB 2015a).

Soil testing tends to focus on chemistry because the dynamic nature of macro- and micro-organisms is difficult to measure, but much more attention should be paid to localising soil testing technologies and bringing them under the control of farmers (ACB 2016a). ACB's field work in Zambia, Mozambique, Zimbabwe and Malawi identified the need to find and share simpler methods and technologies that farmers can use, to assess their soil's nutrient requirements and to find the required nutrients within the locality (ACB 2015b).

Reducing dietary diversity and agrobiodiversity

The obsession with maize in subsidy programmes is also linked to a net reduction in the cultivation of other crops, which compromises nutritional diversity. In Malawi, up to 45% more land is cultivated under improved maize while less land is farmed under traditional varieties of maize and other crops. This contradicts the country's own agricultural policy that specifically promotes diversification (Ricker-Gilbert, Jayne & Shively 2012). In Lesotho, the fixation on maize has led to the country using scarce public resources to plant maize, despite it being more feasible, given its soils and climatic conditions, to plant sorghum and wheat—which are also more profitable crops (World Bank n.d.). Focusing on maize to the detriment of diversity, which includes drought-tolerant crops such as cassava and sweet potato, leaves farmers vulnerable in the face of drought, pests, diseases and markets (Ricker-Gilbert *et al.* 2012). It also entrenches the need for escalated fertility management or the enhanced use of fertilisers, because maize, together with cowpea, has the largest nutrient removal footprint of all crops (ACB 2015a).

Alternative FISP pathways

There are alternative ways to implement subsidy programmes and Mauritius provides an inspiring example in this regard. Mauritius is an outlier compared with the subsidy policies of other African countries. While it also uses subsidies to help small-scale farmers (by reducing input costs) and increase productivity (through improved soil health), it has linked the compost subsidy into longer-term sustainable development goals by attempting to mitigate the damage caused by the large-scale and historical application of chemical fertilisers, and to shift farmers towards more ecologically friendly production methods. The compost subsidy scheme also fits within a broader attempt to solve environmental problems, such as reducing the amount of organic waste that ends up in landfills. In 2006 the government launched a composting project in about 40 primary schools; by 2010 all primary schools were running composting projects (MoESD & UNEP 2013). In 2013, it launched a large-scale domestic composting programme as part of its Maurice Ile Durable Fund, funded through a fuel levy and which focuses also on the uptake of renewable energy sources, such as solar geysers, and rainwater harvesting, among other initiatives (Panapress.com 2015). More than 11 000 composting bins were procured and distributed to households who paid about US\$ 5.00 for a two-hour training session on how to make compost from household organic waste (GoM n.d.). This scheme is designed to encourage and increase community participation in environmental conservation and management and reduce the amount of waste that reaches landfills (an estimated 35 000 tons a year) (GoM n.d.). Government support for the establishment and development of private composting companies, to help reduce municipal waste and produce compost that can be utilised by the farming sector, effectively has created an efficient closed loop system that benefits both the private and public sectors.

Conclusion: A Dismally Failed Revolution

Thus far the Green Revolution has been a dismal failure in Africa: the sheer size of the region, its diversity of agroecological zones and deep history of traditional farming practices, the depth of rural poverty and development challenges, and the lack of domestic markets mitigate attempts to provide a unitary solution to a complex challenge. The danger for small-scale farmers is that numerous attempts to influence African agricultural systems are severely undermining the resource base. This is accomplished through efforts to privatise land, which reduces communal access; to persuade farmers into adopting costly external inputs, which leads to the need for credit, which leads to indebtedness; to encourage the use of hybrid and genetically modified seeds, which shifts control over the source of food from farmers into the hands of scientists and seed/agrochemical companies; and to motivate for the adoption of synthetic fertilisers, which further damage soil health and water sources (ACB 2014b).

Input subsidy programmes are an essential element in the expansion of Green Revolution technologies. They institutionalise an approach to agriculture that is inherently not sustainable in their almost mono-focus on maize (to the detriment of dietary diversity and agrobiodiversity), their wholesale promotion of synthetic fertiliser (which does not address improvements to soil health), and entry into a commercial agricultural market (which does not address issues of social and economic exclusion and inequities).

A comprehensive review of these programmes is difficult because few evaluations have been published. Those that have been published—mainly for Malawi, Zambia and Tanzania—use different methodologies and evaluation tools that frustrate efforts at a comparative analysis. This study, however, draws comparative conclusions that are based on publicly available material.

FISPs do not contribute to building sustainable (ecological, social and economic) farming

systems capable of adapting to a changing climate and global economic market. Instead, they act to shift farmers further away from independent choices based on their own lived experience and inherent and practical knowledge of their soil, seeds and social systems. As noted in the 2015 IPES report, the knowledge necessary for a transition to resilient and sustainable food systems can be generated only in partnership with food producers (IPES 2015). Local, regional and global food systems must be shifted dramatically to encompass the principles of “diversity, multi-functionality and resilience” (IPES 2015). This means that mobilising against the current Green Revolution framing of Africa’s agricultural future, supporting agroecological initiatives and working actively to place the sustainable option at the centre of policy debates.

By not investing in public goods that serve the broader public interests, FISPs tackle price constraints only, and only some of them, and do so temporarily (Druilhe & Barreiro-Hurlé 2012). For example, the World Bank notes that Lesotho’s FISP has not lifted small-scale farmers out of their ‘poverty trap’, because it focused on the same crops, production methods and constrained market access, throughout (World Bank n.d.). The significant level of funding that is directed towards encouraging the adoption of Green Revolution technologies, with few added benefits for small-scale farming, must be redirected to building participatory research and extension relationships between scientific and research institutions and farmers. In short, public funds should be directed to activities that offer collective benefits (ACB 2014b).

FISPs that have targeted distribution mechanisms and are subject to political manipulation, diversion and leakage, tend to entrench or create new rural elites. This will further marginalise poor and vulnerable farmers, in particular women. For example, the apparent bias of extension officers in Lesotho, towards providing the subsidy to better-producing households and local elites (Molatoli & Xiaoyun 2016), further entrenches inequality in the country (Ratii 2016). It is often the poorest and most vulnerable people—who are the intended beneficiaries of most of these programmes—who derive no benefit

at all (Molatoli & Xiaoyun 2016). The focus by FISPs on moving small-scale farmers to commercial farming models will lead inevitably to a restructuring of the rural economy. The people who cannot compete, yet who are reliant on the land for a livelihood, are likely to be displaced. They will be forced to swell the growing ranks of urban poor communities or be forced into accepting poorly-paid and insecure work on commercial farms (ACB 2016d forthcoming).

The mono-focus on maize, accompanied by the use of synthetic fertilisers, is detrimental for soil health, which is already declining. It diminishes agrobiodiversity and leads to decreasing levels of dietary diversity, with implications for human health (ACB 2016d forthcoming). The blanket promotion of applications of synthetic fertiliser is not scientifically based and appears rather to be about creating a market for hybrid maize seed and synthetic fertiliser (ACB 2015b). Support should be directed towards identifying and expanding the means of increasing organic content in the soil, implementing programmes that nurture soil life as a basis for fertility, and supporting agroecological methods for

improving soil and water retention, rather than towards the application of synthetic fertiliser (ACB 2014b). Farmers must play a leading role in designing suitable intervention strategies that help them to source local, ecologically friendly inputs and access viable markets.

ACB's field work in Zambia in 2015 has identified the need to find and share simpler methods and technologies that farmers can use, to assess nutrient requirements on their lands, and to enable them to source required nutrients within their immediate localities.

It appears that subsidies are relegating farmers to "welfare recipients ... passive receivers of technical advice, beneficiaries of public sector subsidized inputs and price takers in local markets", as stated in an undated report by the World Bank on Lesotho's farming sector. Urgent transformative action is required, now, to bring about the sustainable food systems of the future, formed through the collective, inclusive and democratic co-generation of the knowledge held by farmers, consumers and African governments, who are meant to serve the interests of their (farming) populations.

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