

The future of smallholder farmer support in Tanzania:

Where to after the National Agricultural Input Voucher System (NAIVS)

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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 people's right to healthy and culturally appropriate food, produced through ecologically sound and sustainable methods, and their right to define their own food and agricultural systems.

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Acronyms

| | |
|---------|---|
| ACB | African Centre for Biodiversity |
| ADP | Agrodealer Development Programme (AGRA) |
| AGRA | Alliance for a Green Revolution in Africa |
| AFAP | African Fertiliser and Agribusiness Partnership |
| AFSP | Accelerated Food Security Program |
| ANSAF | Agriculture Non State Actors Forum |
| ASA | Agricultural Seed Agency |
| ASDP | Agricultural Sector Development Programme |
| ASDS | Agricultural Sector Development Strategy |
| CAADP | Comprehensive Africa Agriculture Development Programme |
| CNFA | Citizen Network for Foreign Affairs |
| DALDO | District Agricultural and Livestock Officer |
| DANIDA | Danish International Development Agency |
| DAP | Diammonium phosphate |
| FAO | Food and Agriculture Organization of the United Nations |
| FISP | Farm input subsidy programme |
| FMSS | Farmer-managed seed systems |
| FtF | Feed the Future (USAID) |
| IDA | International Development Association |
| NAFSN | New Alliance for Food Security and Nutrition |
| NAIVS | National Agriculture Input Voucher System |
| NMB | National Microfinance Bank |
| NVFC | National Voucher Steering Committee |
| MAFAP | FAO's Monitoring and Analyzing Food and Agricultural Policies |
| MAFC | Ministry of Agriculture, Food Security and Cooperatives |
| MALF | Ministry of Agriculture, Livestock and Fisheries |
| MVIWATA | Mtandao wa Vikundi vya Wakulima Tanzania |
| PASS | Programme for Africa's Seed Systems (AGRA) |
| PELUM | Participatory Ecological Land Use Management |
| NAIVS | National Agricultural Input Voucher System |
| OPV | Open-pollinated variety |
| QDS | Quality Declared Seed |
| REPOA | Research on Policy Alleviation |
| SADC | Southern African Development Community |
| SAGCOT | Southern Agricultural Growth Corridor of Tanzania |
| SHP | Soil Health Programme (AGRA) |
| TASAF | Tanzanian Social Action Fund |
| TASFIP | Tanzania Agriculture and Food Security Investment Plan |
| TFC | Tanzania Fertiliser Company |
| TFRA | Tanzania Fertiliser Regulatory Authority |
| TOSCI | Tanzania Official Seed Certification Institute |
| URT | United Republic of Tanzania |
| USAID | United States Agency for International Development |
| VVC | Village Voucher Committee |



About this paper

In this paper, we discuss farm input subsidies in Tanzania highlighting the impacts on smallholder farmers – the intended beneficiaries of these programmes. While we do acknowledge that there are various input subsidies supported by the government of Tanzania, including subsidised inputs for cotton production, cashew production, sunflower, sorghum, cotton and tea among others, this paper deals exclusively with a World Bank funded National Agricultural Input Voucher Scheme (NAIVS). The NAIVS is a large-scale input subsidy programme in Tanzania, which was based on the supply of improved maize and rice seed and synthetic fertiliser through the distribution of vouchers to smallholder farmers.

Since the formal completion of NAIVS in 2013/14, government funds have been unable to sustain such large-scale input subsidies, with the last vouchers being distributed in 2015/16. It is, thus, crucial and timely that a conversation on the impacts of NAIVS and input subsidies be had, including what kind of support should be provided to smallholder farmers who adopt diversified farming approaches. This may include short-term economic benefits for (predominantly male) smallholder farmers and long-term considerations, such as conservation of agrobiodiversity through farmers' seeds systems, sustainable local natural resource use, and stimulation of locally appropriate markets for improved health, wellbeing, and food sovereignty.

It is within the context of large and growing support for a transition away from an industrial agricultural model to agroecology, which is supported by the ACB, that this paper aims to stimulate discussions in Tanzania, as well as the continent, on the future of input subsidy programmes for smallholder farmer support.

Methodology

This paper is based on desktop and field research conducted by ACB researchers, in collaboration with the smallholder farmers' organisation, Mtandao wa Vikundi wa Wakulima (MVIWATA) in Tanzania. In August 2017, the research team visited farmer groups in Mvomero (Mbogo village), Makambako (Lyamkena Village) and Babati (Halla village), in order to understand the perceptions, impacts, and interests of farmers who have received subsidies through the voucher system over the years. A total of 69 farmers took part in the farmer group discussions: 17 from Makambako, 35 from Mvomero and 17 from Babati. Of these farmers, 42% were female, and 57% male. Among these farmers were also members of the Village Voucher Committees (VVCs) from respective villages.

Interviews were conducted with agrodealers, ward and district extension officers, international donors, as well as civil society organisations, to get a range of opinions and information on the successes, failures, status and direction of the subsidy programme in Tanzania. In particular, this included interviews with a Professor at Sokoine University of Agriculture, Irish Aid, SeedCo, International Fund for Agricultural Development (IFAD), Food and Agriculture Organization (FAO) Tanzania, Participatory Ecological Land Use Management (PELUM) Tanzania, and Research on Policy Alleviation (REPOA).

Key findings

The National Agricultural Input Voucher Scheme (NAIVS) was the largest component of the Accelerated Food Security Program (AFSP). The voucher system, i.e. the use of vouchers accessed by selected farmers to purchase inputs (generally fertiliser and seeds) at a subsidised price, was first piloted in two districts within Mbeya and Rukwa regions, in 2007/2008. This was later expanded to 53 districts across 11 potential regions in 2008/09.

The short-term goal of NAIVS was to immediately increase food production, while the criteria for voucher distribution were designed with a longer-term goal to initiate a market-driven agricultural input distribution system.

Funded through the World Bank, the government had invested approximately US\$300 million between 2008 and 2013 on NAIVS, supplying more than 2.5 million smallholder farmers with subsidised chemical fertilisers and improved maize and rice seed. The planned budget for NAIVS was between US\$60 million and US\$100 million per year, between 8.4% and 33% of total annual agricultural budgets, depending on the number of vouchers distributed and the shifting year-to-year cost of fertiliser imports. Up to 50% of funds were used for covering the high administrative costs associated with the mechanisms for distribution.

External funding gradually declined over the implementation period, and was finally terminated in 2014, the official closure of NAIVS. The government, however, continued providing subsidies through different approaches in 2014/15, 2015/16 and 2016/17, shifting the nature of the subsidy, including credit-based subsidies by providing loans and credit to farmer groups and cooperatives to access inputs, the use of vouchers for a period of one season, and entering into contracts with seed and fertiliser companies to supply inputs of improved seed and fertiliser. Due

to lack of external funding and programme inefficiencies, government funding for input subsidies has declined over the years.

The NAIVS programme primarily targeted farmers with little to no experience in using improved seed¹ and fertilisers, but with the resources needed to co-finance the purchase and application of inputs. To qualify, the applicant must be a full-time farmer, cultivating less than one hectare of land, and be willing to co-finance the inputs, follow advice of extension officers, and verify his/her use of the inputs. Mostly, farmers meeting the criteria were to be selected by the Village Voucher Committee (VVC), consisting of three men and three women, elected by the Village Assembly to facilitate voucher distribution.

Female-headed households were supposed to be given preference. However, only 14.7% of women were actually reached. The criteria of the NAIVS programme indicate that it was not intended to reach the poorest households, such as those headed by women, as they would be unable to afford the financial top-up required to purchase inputs. Although the NAIVS programme did not target wealthier farmers, it has been primarily the wealthier farming households that have benefited from it.

The package generally included three vouchers: 10kg of improved maize or 15kg paddy rice seed, both roughly enough for one hectare of land; basal fertiliser; and top dress fertiliser. Vouchers were intended to cover 50% of the input costs, although in some cases farmers had to pay up to 60% of the input cost.

Initially, a large-scale programme of agrodealer training was organised through the Citizen Network for Foreign Affairs (CNFA) under a previous project funded by Alliance for a Green Revolution in Africa (AGRA), where 1 000 agro-input dealers had been trained. In 2007/8, AGRA, in collaboration with the Ministry of Agriculture, Food Security and Cooperatives (MAFC), had also supported the training of 319 agrodealers from 14 district

1. An improved seed could include any crop variety for which some form of deliberate selection or breeding together of different varieties has been adopted, in order to achieve desirable traits. The use of 'improved' seed in this paper refers primarily to seed that has been bred or selected, registered and certified under a formal seed system.



councils. The World Bank funding included support for the training of about 3 855 agrodealers who registered to participate in the programme, which took place before the 2009/10 input distribution season. As a result of the NAIVS programme, the total number of agrodealers have increased substantially nationwide.

Early in the NAIVS programme, the government had contracts with agrodealers. In 2012/13 seed and agro-chemical companies began to take a bigger role in the selection of agrodealers. At this time, agrodealers in a sense became agents of larger seed and agrochemical companies, encouraged to provide technical assistance and run demonstration trial plots. A major outcome of the programme has been the strengthening of the national maize and rice input distribution system, designed specifically as conduits for corporate inputs.

There are 19 local and eight foreign active seed companies either producing or importing seed in Tanzania. SeedCo Ltd (Kenya) and Pannar Seed² (South Africa), made up 26% and 28% of the market share of the maize seed market in 2010/11. It is estimated that domestically produced, formally improved seed is about 30 000 metric tons per year, with the private sector contributing about 75%, and public institutions 25%. Throughout the NAIVS years, improved seed imports rose drastically due to the secured market, ranging from 10.2% of seed in 2007/8, and reaching 89.3% in 2010/11. SeedCo and Pannar were among the main seed suppliers of seed during the NAIVS programme period.

Related to agricultural inputs such as seed and fertiliser in Tanzania, AGRA has two main programmes, the Soil Health Programme (SHP) and the Programme for Africa's Seed Systems (PASS), which have allocated huge grants for production and distribution of certified seed and synthetic fertiliser. Total AGRA grants to Tanzania from 2007–12 amounted to US\$54.6m, with 60.2% being allocated to the SHP. During this period, which also correlates to the NAIVS years,

AGRA spent US\$12.4 million on 33 grants of seed to 19 recipients in Tanzania.

Only ten of the 62 registered fertiliser companies are active in the market. Of these, three companies, namely Yara Tanzania, Export Trading Group (ETG) and Premium Agro Chem Ltd account for 80% of the imports. Between June 2012 and December 2013, nearly half of fertiliser imports were handled by Yara. Yara invested US\$20m in establishing a fertiliser terminal in the port of Dar es Salaam, which was officially launched and became operational in September 2015.³ Small quantities of phosphate fertiliser are produced in the northern part of the country. These are Minjingu Mines Fertilisers, based in Manyara, and Keen Feeder, based in Arusha.

The fertiliser push in Tanzania is strong and pervasive throughout public and private institutions. African Fertiliser and Agribusiness Partnership (AFAP), established by AGRA in 2011, has widespread reach in the country, from national to grassroots levels, supporting oversight in fertiliser activities in collaboration with Tanzania Fertiliser Regulatory Authority (TFRA), training agrodealers and extension officers, and establishing demonstration plots.

Although there was widespread awareness of the NAIVS programme, there was limited awareness of the criteria to become a beneficiary of the programme, and a lack of awareness of how the programme operated. The fact that there was significant investment in raising awareness of the NAIVS programme itself (US\$5.2m had been spent on this by 2009), but not of the criteria by which to benefit, indicates the political nature of the programme. It demonstrates government's intention to win the support of smallholder farmers (a significant constituency) through such a large-scale project; but not communicating the limitations of participation, or how the programme operates.

NAIVS increased productivity of maize and rice, although varying throughout the programme, peaked in 2011/12, years that

2. Pannar was acquired by Pioneer Hi-Bred (owned by DuPont) in 2012, which has been merged further with Dow Chemical in 2017.

3. www.yara.com



Agrodealer Shop in Morogoro

saw the lifting of the grain export ban. By the end of the project it was estimated to have added 2.3 million tonnes of maize, and 82 800 tons of rice to production. Average yield increased from a baseline of 0.9 tons of maize per hectare to 2.5 tons per hectare, and from 2 tons of rice per hectare to 3 tons per hectare. This said, it has been shown that it is primarily the wealthier farming households that benefited from the programme. Profits were only achieved by the top 30% of households, while the bottom 50% of targeted farmers had little or no profits from using improved seed and chemical fertiliser. This signifies the variability of outcomes and impacts of the programme. Its success depended on the capital farmers had prior to the programme and their ability to co-finance inputs, manage risks associated with delays in input provision, gain access to extension support and access to market, manage transport costs, as well as farm gate prices, amongst others key variables.

The promotion of standardised, hybrid maize and improved rice varieties has, in some cases, resulted in the flooding of local markets with single seed varieties, and displaced local varieties, which are

often preferred locally (as expressed by farmers). The expansion of maize and/or rice production over other crops has had further effects on food and nutritional security.

The future of large-scale agricultural input subsidy programmes such as NAIVS in Tanzania is unclear. There seems to be a shift towards a new approach, focusing on bulk fertiliser importation to reduce fertiliser costs. This would further emboss a guaranteed market for large scale fertiliser companies, while continuing to marginalise resource-poor smallholder farmers, who are unable to take advantage of reduced fertiliser costs, yet are now reliant on previously subsidised external inputs. Therefore, the time is opportune for farmers, farmer organisations, and NGOs to convene and discuss appropriate farmer support programmes that improve on the narrowly framed, and ultimately short-lived NAIVS. Input subsidy programmes have the potential to support locally relevant, empowering and sustainable agricultural practices, particularly through redistributing investments to achieve beneficial short-and long-term outcomes.

Introduction

Since the 2007/08 global food crisis, which saw rapidly increasing food prices and a resultant rise in food insecurity and rural poverty, the world has experienced a renewed emphasis on agricultural production support measures, with policies and programmes aimed particularly at increasing agricultural productivity by smallholder farmers (Demeke et al, 2014; World Bank, 2014b). In some African countries such as Malawi, Zambia, Ghana and Tanzania, just to mention a few, this has commonly taken the form of subsidised agricultural inputs – among other agricultural interventions – targeting smallholder farmers, who are the primary producers of food consumed on the continent. Farm input subsidy programmes (FISPs) consume large parts of agricultural, and even national budgets, with ten African countries having spent around US\$1 billion on these programmes between 2000 and 2011, close to 30% of their agricultural budgets (Chinsinga & Poulton, 2014; Demeke et al, 2014; ACB, 2016b).

Agricultural subsidies, although highly controversial, may be important vehicles to support rural livelihood security. Historically, agricultural subsidies were aimed at facilitating the greater adoption of inputs, in order to increase agricultural production, primarily of staple food crops. These programmes have been maintained, despite extensive documentation of serious concerns, including high administrative costs, the tendency to benefit the already economically better-off, political and elite patronage, corporate capture of the agriculture input value chain, and distortion of agricultural markets (DANIDA, 2012; ACB, 2016b). Despite the failures of such programmes to have sustainable, long-term and equitable agricultural and economic gains, they continue, mainly due to their highly political nature, providing governments with the opportunity to demonstrate publically their commitment to smallholder farmers in Africa, who represent the majority of the population across the continent.

Inherent in these programmes is the trade-off between, on the one hand, objectives of raising national food production, with

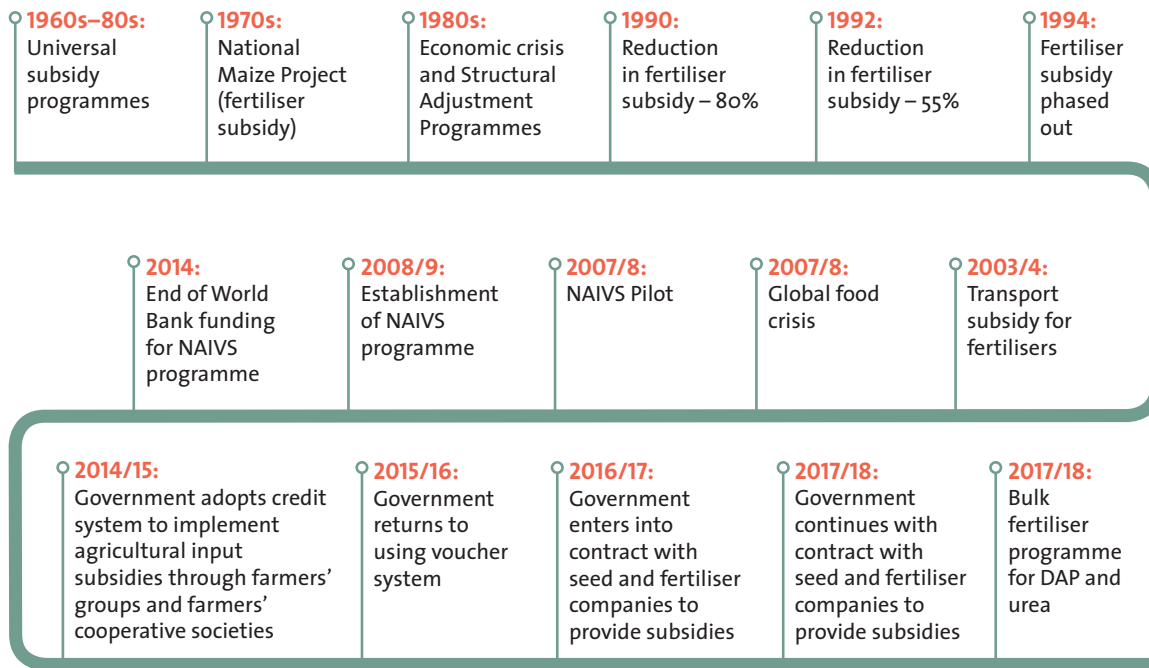
its attendant negative environmental impacts, and, on the other hand, benefiting the poor and vulnerable households. FISPs are believed by many African governments in the grip of proponents of the Green Revolution agenda to be an essential part of the solution, enhancing livelihood and food security of large agrarian communities, by increasing access to modern inputs by poor, smallholder farmers, while developing commercial input supply chains. Programmes are narrowly designed to tackle food and nutritional security issues through such market-oriented approaches, which tend to focus on few, staple, calorie-dense foods. This tends to disproportionately benefit large-scale seed and agrochemical companies, and an artificially constructed input supply network, over resource-poor, smallholder farmers who ultimately become dependant on subsidised inputs. In the end, rather than building on the social capital of resource-poor smallholders farming communities, these externally imposed one-size-fits-all programmes suppress diversified approaches to support small-scale farmers building-on and strengthening local seed and farming systems.

While input subsidy programmes have increased production in developing countries, the effects on food security and poverty reduction are unclear (Finmark Trust, 2016). What is clear is that a sole focus on increasing food production will be insufficient and ineffective to meet future food and nutritional needs.

A brief history of agricultural input subsidies in Tanzania

Subsidies were common in a number of sub-Saharan countries in years before the mid-1970s, where the aim was to develop food security programmes by providing agricultural inputs, farm credits, extension services and marketing facilities to farmers, while at the same time controlling market and food crop prices (Kato and Greely, 2016). In Tanzania, there were large-scale ‘universal’ subsidy programmes between the 1960s and the 1980s. These were largely done under the Tanzania villagilisation programmes, as outlined in the Arusha Declaration of 1967, where extension services, tractors and subsidised inputs were made available

Farm Input Subsidy Programmes in Tanzania



(Cagley et al., 2009). Fertiliser subsidies in the 1970's were provided through the National Maize Project⁴ (URT, 2012b). With the economic crisis in the mid-1980s that led to economic reform programs, fertiliser subsidies were greatly reduced, from 80% in 1990, to 55% in 1992, and to no more than 20% by mid-1992 (World Bank, 2014b). These subsidies were ultimately phased out after market liberalisation between 1991 and 1994 (DANIDA, 2012; Mather and Ndyetabula., 2016). As a result, many farmers were unable to afford synthetic fertilisers due to its lack of availability and thus increased cost.

In 2003/2004, after a decade without subsidised external inputs, the government reintroduced input subsidies in the form of a transport subsidy for fertilisers. This only covered five regions out of 31⁵, and accounted for 4% of the agricultural budget in 2003 (Cagley et al., 2009). The subsidy covered the transport cost and part of the cost of the consumer price of the fertiliser (Cagley et al., 2009). The government entered into contractual agreements with different companies to distribute fertiliser to major

selling points, which sold the fertiliser at a cost agreed by the government and companies (URT, 2012b).

Inefficiencies were associated with this system: agro-input companies did not adhere to their contracts with government; there were improper modalities of selecting agrodealers, who had low capacity to distribute and set fertiliser prices in each district; input delivery was delayed; fertilisers were re-packaged in warehouses; inputs were ineffective, due to quality deterioration; large farmers were able to access most of the fertilisers, resulting in shortages for smallholder farmers; and fertiliser were smuggled out of the country (Aloyce et al., 2014a; URT, 2012b). Thus, fertilisers failed to reach the targeted farmers.

This subsidy was eventually phased out, due to the concerns around inefficiencies, cost effectiveness, targeting and distribution of benefits, and replaced with a voucher-based subsidy – NAIVS – which aimed to enhance the buying power of targeted groups of smallholders with the greatest potential to

4. The National Maize Project was initiated in 1974 with assistance of the United States Agency for International Development (USAID). The project's objective was to promote maize production in pursuit of food self-sufficiency. This is after Tanzania experienced a severe food shortage because of drought and the 'villagisation' campaign, which displaced farmers and prompted the nation to launch several campaigns with the objective of food self-sufficiency.
5. There are currently 31 regions in Tanzania and before 2007 there were 20 regions.

expand maize and rice production, based on specific selection criteria (World Bank, 2014b). Smallholder farmers in Tanzania produce 69% of the country's food, represent about 80% of the population, and make up a significant untapped market for agro-chemical and seed companies to expand.

The Green Revolution agenda in Tanzania: Policies, programmes and initiatives paving the way for input subsidy programmes

The United Republic of Tanzania (URT) is largely an agrarian economy. Tanzania's population is estimated to be about 55 million, of which over 75% live in rural areas and depend on rain-fed agriculture. The majority of these are women smallholder farmers, with farm sizes ranging between 0.2 and 2.0 hectares (World Bank, 2014b; ACB, 2015c; Finmark Trust, 2016).

The Tanzanian government is determined to transform Tanzania from a predominantly agrarian economy to a semi-industrialised economy, as outlined in Tanzania's Development Vision 2025, and the National Strategy for Growth and Reduction of Poverty (also known as MKUKUTA I & II), and has developed policies, programmes and initiatives towards this end. The overarching policy that governs agriculture is the National Agricultural Policy (NAP) of 2013, which is explicitly aimed at transforming agriculture into a modern, commercial and competitive sector to ensure food security and poverty alleviation through increased volumes of competitive products (NAP, 2013).

The Agricultural Sector Development Programme (ASDP) operationalising the Agricultural Sector Development Strategy (ASDS) of the country was launched in 2006. The aim of the ASDS is to achieve a sustained agricultural growth rate primarily through the transformation of agriculture, from subsistence to commercial (URT, 2006). The

ASDP Phase II launched in June this year will be implemented in two periods of five-years each (2017/18 to 2027/28). The first period is set to start in 2017/18 and the second in 2022/2023.

Other policy frameworks include Kilimo Kwanza, meaning 'Agriculture First', launched in 2009 in order to modernise and commercialise agriculture and seen as a central pillar in achieving the country's modernity vision 2025 (Ngaiza, 2012). Kilimo Kwanza is a framework for public-private partnerships and investment in the commercialisation of agriculture through: the expansion of Green Revolution technologies; the launch of the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) programme, established as an international public-private partnership; the Growth Africa Forum in 2011; the launch of the Tanzanian Agricultural and Food Security Investment Plan (TAFSIP)⁶, Tanzania's national investment plan under the Comprehensive Africa Agriculture Development Programme (CAADP)⁷; the launch of the G8's New Alliance for Food Security and Nutrition (NAFSN) in Tanzania in 2012; the Big Results Now (BRN) in 2013; and the operationalisation of the SAGCOT Catalytic Fund in 2014 (ACB, 2015c). However, the BRN initiative, which was under the state house was formally dismantled in 2017.⁸

With the transformation of agriculture in Tanzania, part of a strategic and coordinated effort across the continent to 'modernise' African agriculture, key to the Green Revolution agenda on the continent are a range of public and private actors and partnerships. These include USAID, through the Feed the Future (FtF) initiative and the Alliance for a Green Revolution in Africa (AGRA), among others.

The Green Revolution model in Africa urges and coerces small-scale farmers to adopt 'improved' seed varieties and synthetic

6. TAFSIP, which seeks to achieve an annual 6% agricultural GDP growth (URT, 2011a) is an expanded version of Tanzania's previous ASDP I incorporating issues of climate change, nutrition and a greater role for the private sector.

7. In 2010, the government signed the Tanzanian Compact for the Comprehensive Africa Agriculture Development Programme (CAADP) reaffirming its commitment to the Maputo Declaration, which the government has committed to allocating 10% of the national budget to agriculture and rural development.

8. *The Citizen*, 29 June 2017. Lessons in BRN Cessation. <http://www.thecitizen.co.tz/oped/LESSONS-IN-BRN-CESSATION/1840568-3991632-136qnoxz/index.html>

fertilisers to increase yields and agricultural production. High-input costs tend to be beyond the reach of the majority of smallholder farmers without subsidies or loans (ACB, 2014a; ACB, 2014b).

Input subsidy programmes have become a major point of entry for smallholder farmers to access fertilisers and improved seed. Despite the limitations of these programmes, such approaches drive the Green Revolution agenda and remain the main discourse in African agricultural policies, programming and financing.

Seed system in Tanzania

Farmer-managed seed systems (FMSS) provide at least 90% of the seed used by farmers in Tanzania, while the formal seed sector accounts for 4–10% of seed supply and uptake (Majamba and Longopa, 2014; ANSAF, 2017), depending on the crop. According to a report commissioned by the Bill and Melinda Gates Foundation, only 5% of seed used in Tanzania is certified (ASARECA and KIT, 2014). About 5% of total cultivated area is planted with certified seed, primarily maize, sorghum, sunflowers, and wheat, to a lesser degree. For all other crops, including major food and nutritional security crops, such as grain legumes, millets, cassava and sweet potatoes, farmers rely on farmer-managed seed systems (FMSS) for seed. Women are the main actors in FMSS. Landrace varieties, which are not formally registered and are not certified, are generally preferred varieties for many crops by farmers. Despite this, FMSS remain unrecognised, unprotected and unsupported, while the formal sector receives the lions' share of public financial and regulatory support (ACB, 2016a).

This is illustrated in the agricultural programmes and initiatives, including input subsidy programmes such as NAIVS,

and also in the seed and plant variety protection laws, which are skewed in favour of the private seed sector, as well as public sector breeding programmes. There are no provisions or support measures provided to protect farmers' rights, farmer seed systems, or farmer varieties, which are the primary and most sustainable source of seed in the country,⁹ contributing to the maintenance of agricultural biodiversity and healthy ecosystems.

The Tanzanian Seed Act (2003) provides limited avenues for smallholder farmers and for only a small group of small-scale seed producers to participate in seed production through Quality Declared Seed (QDS) production systems. However, even these avenues are restricted to production of formally registered varieties and targets only a handful of farmers who are registered under QDS schemes. QDS is not recognised as a seed class under the Seed Regulations of 2007 and has been restricted for sale and distribution only at the ward level – a geographical jurisdiction which normally comprises of four villages – where it was produced. Current revisions being made to the seed legislation may see this expanded to the district level.¹⁰ Table 1 describes the production trends of QDS of various crops. The Second Schedule of the seed regulations of 2007 provides for Seed classes – Pre-basic, Basic, Certified 1 and Certified 2 – which can be marketed nationally and can be exported.

There are 19 local and eight foreign active seed companies either producing or importing seed, with the largest being SeedCo, Pannar Seed, Suba-Agro, Kibo Seed, Highland Seed and Monsanto. SeedCo Ltd¹¹ (Kenya) and Pannar Seed¹² (South Africa) made up 26% and 28% of the maize seed market share in 2010/2011. It is estimated that domestically produced, formally

9. For more information on the Tanzanian laws, see ACB, 2016.

10. Farmers and farmer seed producers have continuously made proposals to the government to specifically allow the expansion of QDS seed selling operations from the ward to the district level. In 2015, at a seed law review meeting that was taking into account revision of the whole Seed Act of 2003 and its regulations, this recommendation for expansion to the district level was included as a provision in the draft Seed Act. However, at the moment, the draft Seed Act is still at Cabinet level, awaiting for approval to effect this and many other changes.

11. Large parts of SeedCo, one of Africa's largest seed companies, have been acquired by French seed giant, Groupe Limagrain in 2014. SeedCO also sold 49% of its shares to Africa's only cottonseed company, Quton, to Mahyco of India – which is 26% owned by Monsanto. See <http://afsafrika.org/acquisition-of-africas-seedco-by-monsanto-groupe-limagrain-neo-colonial-occupation-of-africas-seed-systems/>

12. Pannar was acquired by Pioneer Hi-Bred (owned by DuPont) in 2012, which merged with Dow Chemical in 2017.

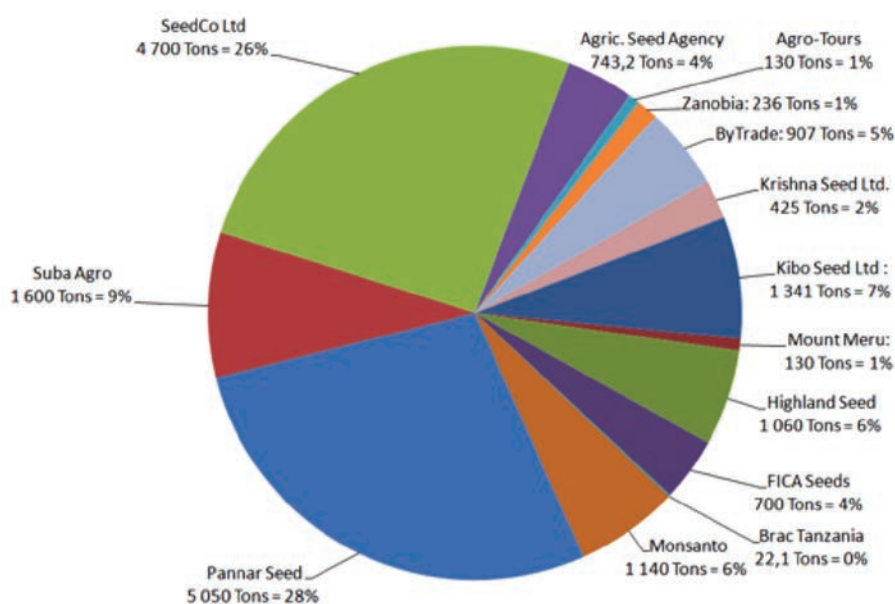


Table 1: QDS production from 2009/10 to 2012/13

| S/N | Crops | Production 2009/2010 | Production 2010/2011 | Production 2011/2012 | Production 2012/2013 |
|-----------------------|-------------|----------------------|----------------------|----------------------|----------------------|
| 1 | Maize | 79.5 | 114.1 | 192.3 | 114.5 |
| 2 | Rice | 21.0 | 107.0 | 83.5 | 79.4 |
| 3 | Sorghum | 23.3 | 35.9 | 38 | 56 |
| 4 | Wheat | 4.7 | 1.8 | - | - |
| 5 | Sunflower | 32.3 | 41.1 | 66.2 | 72 |
| 6 | Sesame | 4.8 | 7.7 | 0.4 | 3 |
| 7 | Beans | 4.0 | 9.0 | 16.7 | 22 |
| 8 | Cowpeas | 8.3 | 4.7 | 10.8 | 4 |
| 9 | Green gram | - | 0.6 | - | - |
| 10 | Pigeon peas | 3.7 | - | 7.1 | 2 |
| 11 | Vegetables | 4.4 | 0.4 | 0.3 | 1 |
| QDS-Production | | 194.4 | 322.2 | 415.3 | 354 |

Source: World Bank, 2014b

Figure 1: Market shares in the maize seeds market (2010/11)

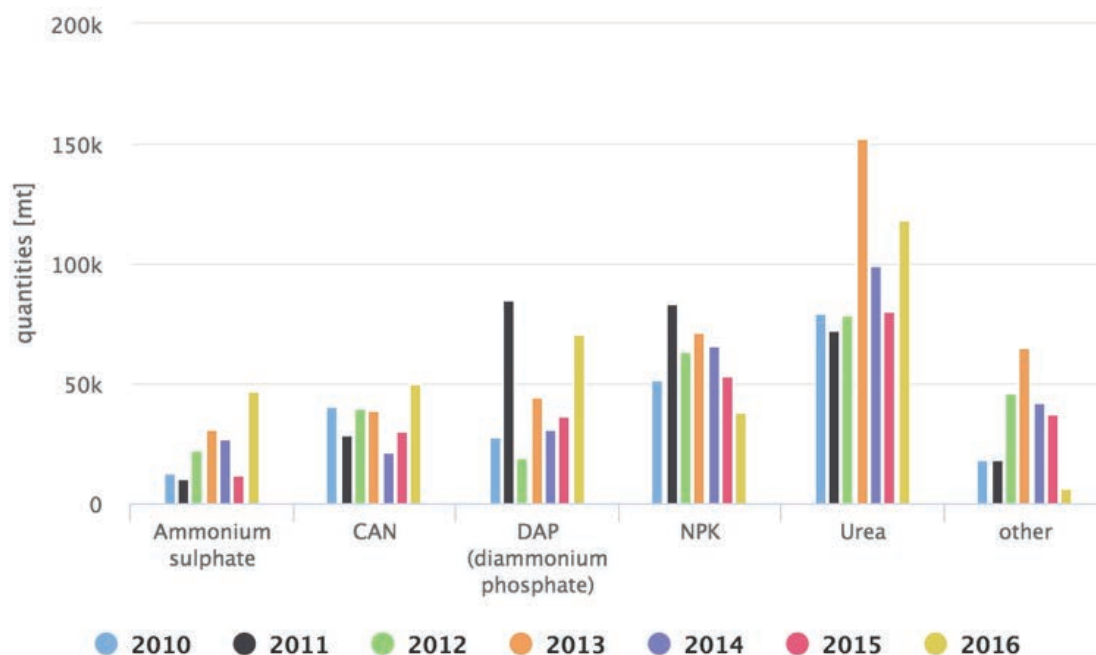


Source: World Bank, 2012

improved seed is about 30 000 metric tons per year, with the private sector contributing about 75% and public institutions 25% (ANSAF, 2017). Throughout the NAIVS years improved seed imports rose drastically, due to the secured market, ranging from 10.2% of seed in 2007/8 to 89.3% in 2010/11 (World Bank, 2012).

The Agricultural Seed Agency (ASA) which produces, processes and markets seed (including foundation seed), and the Tanzania Official Seed Certification Institute (TOSCI), responsible for managing seed production quality and regulation, are among the main institutions managing the formal seed sector in Tanzania. There have been concerns in the past, of the capacity of each of these

Figure 2: Top fertiliser consumption Tanzania, 2010–16



Source: Africafertiliser, 2015

institutions, which have failed to prevent fake seed¹³ from being formally marketed through the input supply chain by seed dealers and, in particular, agrodealers, and even distributed through the NAIVS programme (USAID, 2013).

Fertiliser in Tanzania

The Abuja Declaration on Fertilisers for an African Green Revolution (2006) saw African Union member-states agreeing to increase fertiliser use to an average of 50kg/ha by 2015. Currently, the average usage for Tanzania is 19kg/ha (URT, 2017), which is a marked increase from the previous estimation of 8kg/ha in 2012 (Aloyce et al., 2014b). This fertiliser usage can be attributed to the government's commitment to the Abuja Declaration through a shift in agricultural and fertiliser policies and the NAIVS programme.

Commonly used fertilisers in Tanzania are; (i) Nitrogen (N-Straights): urea, SA and CAN; ii) Phosphates: DAP, TSP and Rock Phosphates; iii) Potassium: MOP and SOP; and (iv) Mixed or Complex: NPKs – 10:18:24; 20:10:10; 25:5:5;

17;0;17. These fertilisers are also essential to the NAIVS programme, discussed in more detail below.

The supply and distribution of fertiliser in Tanzania is primarily in the hands of the private sector, where 90–100% of fertilisers being used in the country are imported. The policy environment is conducive to private business, with benefits such as zero-rated duties for fertiliser imports (ACB, 2015d). In 2009, a new Fertiliser Act was passed by parliament to regulate the fertiliser sector and monitor the quality of both imported and domestically manufactured fertiliser with fertiliser regulations in place in 2010 to govern demand, establishment, availability, distribution and utilization (ACB, 2015d). The Act provides for TFRA to register and license fertiliser dealers, issue import permits, train inspectors and collect and maintain data on fertiliser imports and use (ACB, 2015d). TFRA has existing 311 agents and by March 2017, it had given 172 permits to allow for the importation of fertiliser, where 297 000 tonnes were imported and 140 000 tonnes

13. Fake seed includes seed varieties that: (1) are of poor quality with low germination; (2) are of poor quality with mixtures of other varieties; (3) have been altered with grain; (4) have been repackaged in fake containers; (5) are sold with expired labels; and (6) are not registered in the National Variety Catalogue.

Figure 3: Fertiliser imports Tanzania



Source: Africafertiliser, 2015

were exported (MAFL, 2017). In addition to the 2010 regulations, in 2017 a set of new regulations, known as The Fertiliser (Bulk Procurement) regulations, which apply to the importation of fertiliser through bulk procurement, were developed and approved. Complex fertilisers containing NPK and micronutrients are sourced mainly from Western Europe, while urea and phosphate fertilisers are procured from North America, North Africa, the Middle East and South Africa. Fertiliser imports have increased over the years, which can also be attributed to the NAIVS programme, see Figure 3 below for details. Local fertiliser costs are subject to the increasing price of fertilisers on international markets, along with taxes and surcharges.

Only ten of the 62 registered importing companies are active in the market. Of these, three companies, namely Yara Tanzania, Export Trading Group (ETG) and Premium Agro Chem Ltd account for 80% of the imports (ANSAF, 2017). Between June 2012 and December 2013, nearly half of fertiliser imports were handled by Yara (ACB, 2014). Yara invested US\$20m in establishing a fertiliser terminal in the port of Dar es Salaam, which was officially launched and

became operational in September 2015.¹⁴ The Tanzania Fertiliser Company (TFC) a parastatal company, which in the past was responsible for importing and distributing fertiliser, in particular in the 1990's through subsidy schemes, has remained to focus only on in-country distribution and works as a trading company on behalf of the state (ACB, 2015d).

Small quantities of phosphate fertiliser are produced in the northern part of the country. These are Minjingu Mines Fertilisers based in Manyara, and Keen Feeder based in Arusha. Of the 140 000 tonnes of fertiliser exported in 2017, 74 000 tonnes were of Minjingu and these were exported to Kenya, Uganda and South Africa (URT, 2017). FAO suggests that given the domestically available phosphate rock and natural gas resources, urea and ammonia, fertiliser production is possible (Cameron *et al*, 2017). Although the relocating of input supply, from imported to locally-sourced products has some positive attributions, the reliance on unsustainable resources, with ecological, political and social implications, remains deeply concerning.

14. www.yara.com

AGRA's influence on seed and fertiliser landscape in Tanzania

Tanzania is one of the Alliance for a Green Revolution (AGRA)'s four priority countries for its breadbasket strategy. The Southern Highlands and Kilombero regions are AGRA's focus areas, linked to the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). The strategy focus of AGRA is on 'increasing yields and expanding cultivated land in fertile areas already endowed with a minimum of essential infrastructure' (ACB, 2015c). Related to agricultural inputs such as seed and fertiliser in Tanzania, AGRA has two main programmes; the Soil Health Programme (SHP) and the Programme for Africa's Seed Systems (PASS) which have allocated huge grants for production and distribution of certified seed and synthetic fertiliser. Total AGRA grants to Tanzania from 2007–12 amounted to US\$54.6m, with 60.2% being allocated to the SHP. During this period, which also correlates to NAIVS years, AGRA spent US\$12.4 million on 33 grants of seed to 19 recipients in Tanzania. The reliance on synthetic fertiliser in AGRA's Soil Health Programme (SHP) and even in Conservation Agriculture – where both synthetic fertiliser and agroecological techniques are used – is misguided, and reaffirms a violent and unsustainable agricultural system. It brings to question whether the nutrients supplemented by the synthetic fertiliser cannot be sourced locally or replenished using agroecological practices.

An Agrodealer Development Programme (ADP) was a major sub-programme sponsored by AGRA. ADP grants were provided to establish a national agrodealer network (CNFA), provide a credit facility through the National Microfinance Bank (NMB), and develop an official agrodealer strategy. The Tanzania Agrodealer Strengthening Programme (TASP), managed by CNFA, operated in 13 districts, including Mvomero, between 2007 and 2010. According to AGRA, 71% of agrodealers were involved in the supply and distribution of agro-inputs, and all certified agrodealers participated in NAIVS.

The African Fertiliser and Agribusiness Partnership (AFAP), based in Tanzania, was established by AGRA in 2011 in collaboration with New Partnership for Africa's Development (NEPAD), the African Development Bank, the International Fertiliser Development Company and the Agricultural Markets Development Trust. Its aim is to increase the use of synthetic and inorganic fertilisers by African small-scale farmers. Tanzania was one of the three initial countries AFAP focused on, together with Ghana and Mozambique. The selection of these three countries was due to each of them having potential to increase agricultural productivity, an amenable policy and regulatory environment, functional ports and substantial markets for fertiliser. It has since expanded its operations to include Cote d'Ivoire, Ethiopia, Malawi, Nigeria and South Africa (ACB, 2015d).

In Tanzania, AFAP's programme took off in 2013, and between 2014/15 to 2015/16 farming seasons, they have been able to support hub-agrodealers with guarantees, capacity building sessions and networking/business linkages. According to AFAP, this has enabled the distribution of 103 950 tons of fertiliser worth US\$57m to 1.75 million smallholder farmers (AFAP, 2018). In addition, a volunteer programme has also trained over 30 staff members from TFRA, TFC and Minjingu Mines and Fertilisers Ltd on different components, ranging from fertiliser quality control to marketing and agronomy (AFAP, 2018). AFAP's reach in the country is wide: from the national to the grassroots level; from supporting oversight in fertiliser activities, in collaboration with TFRA, to training agrodealers and extension officers; to establishing demonstration plots. Although information from AFAP reveals collaboration on the use of improved legume technologies, the question remains on the sole intention of the organisation in scaling up sustainable solutions, rather than pushing for expensive synthetic fertilisers.



The National Agricultural Input Voucher System in Tanzania

Overview of programme

The National Agricultural Input Voucher Scheme (NAIVS) was introduced by the government in 2008/9, to replace and overcome the limitations of the previous fertiliser transport subsidy programme (Aloyce et al., 2014a). The basic premise of a voucher subsidy system is the use of vouchers by selected farmers to purchase inputs (generally fertiliser and seeds) at a subsidised price. The input supplier then redeems the voucher for cash from the government, or a financial institution linked to the subsidy programme (Minot, 2009). At this time, the government approached the World Bank, who negotiated the Accelerated Food Security Program (AFSP), which consisted of three components – of which NAIVS was the largest component – each designed to improve both short- and long-term food security needs in Tanzania (Mather and Ndyetabula., 2016). The first component of the AFSP was NAIVS, the second and third components consisted of additional financing credit of the existing Agricultural Sector Development Programme (ASDP) and the scaling up of the Tanzanian Social Action Fund (TASAF).

The voucher system was first piloted in two districts within Mbeya and Rukwa regions in 2007/8. This was later expanded to 58 districts across 11 potential regions – i.e. areas with large-scale production of maize with favourable climate, soil, etc. – in 2008/9,¹⁵ and to areas where rice farmers have access to irrigation. It ultimately became a nationwide programme (World Bank, 2014b).

The short-term goal was to immediately increase food production, while the selection of beneficiaries and establishment of agrodealerships to supply inputs at village level were designed with a longer-term goal to initiate a market-driven agricultural input

distribution system (Mather and Ndyetabula., 2016).

This decentralised distribution of input vouchers initially aimed to expand maize and rice production and to improve both household and national food security, in response to the rapid rise in grain and fertiliser prices in 2007 and 2008, combined with drought and food price increases (URT, 2014b; Pan and Christiaensen, 2012). Other objectives were to introduce and increase access to and availability of improved maize and rice seed and fertiliser, and to strengthen input supply chains for improved seed and fertilisers through established agrodealerships (World Bank, 2014b).

According to World Bank reports, the project's closing date was extended three times, resulting in an overall project implementation period of five years, from 2009 to 2014 (World Bank, 2014b). These extensions were to enable the redemption of outstanding subsidy vouchers, incomplete contracts, completing a performance audit, and preparation of a pilot electronic voucher system.

Ultimately, by the end of the project, 2.5 million rural smallholder farmer households received vouchers, of which 14.7% were women, with an estimated number of 6.9 million vouchers being distributed over the five-year period (World Bank, 2014b). The low number of female beneficiaries, due to their inability to contribute financially, illustrates the divergent and somewhat contradictory programme objectives and selection criteria. This will be discussed in more detail below.

In this system, three rounds of beneficiaries would have received vouchers for three years, but this did not go as planned, due to the increased coverage of the subsidy programme and expansion of the number of beneficiaries. According to the World Bank, a significant number of farmers continued to receive input subsidy vouchers for a fourth and even a fifth consecutive year, while some received vouchers for one season only (World Bank, 2014b).

15. Iringa, Mbeya, Ruvuma and Rukwa in the southern highlands; and Kilimanjaro, Arusha, Manyara, Kigoma, Tabora, Mara and Morogoro in the central and northern parts of the country. Pwani was added in 2009/10.

Table 2: Number of farmers/households who benefited from input subsidy programmes in Tanzania through vouchers, 2008–14

| Year | Farmers/households | Number of vouchers distributed | |
|---------|--------------------|--------------------------------|-----------|
| | | Planned | Actual |
| 2008/09 | 737 000 | 740 000 | 730 667 |
| 2009/10 | 1 500 000 | 1 500 000 | 1 511 900 |
| 2010/11 | 2 011 000 | 2 040 000 | 2 011 000 |
| 2011/12 | 1 780 000 | 1 800 000 | 1 779 867 |
| 2012/13 | 940 783 | 1 000 000 | 940 783 |
| 2013/14 | 932 100 | 500 000 | 932 100 |

Sources: Minister of Agriculture Budget Speeches (2013/14 and 2017) and World Bank (2014a)

The World Bank and agricultural support in Africa

The World Bank Group, established in 1944, and headquartered in Washington DC is an international institution that provides financial and technical assistance to developing countries around the world.¹⁶ Originally called the International Bank for Reconstruction and Development (IBRD), it was established alongside the International Monetary Fund (IMF) and a new set of agreed rules for the global financial system as part of the Bretton Woods Agreement between the United States, Canada, Western Europe, Australia and Japan after the Second World War.

The World Bank's role was to be that of an international investment bank, mandated to channel productive investments to regions of the world devastated by war (Varoufakis, 2011:59). It provided loans to African governments for development. However, the expected outcomes of industrialized economies and rapid improvements in standards of living did not materialize. Instead African governments were left with debts denominated in dollars. When the Bretton Woods global financial architecture collapsed after 1973, the value of the dollar rose sharply. Outputs from the World Bank's development projects could not generate sufficient income for African governments to repay these debts.

At the same time, neoliberal policies were taking hold in the US under Reagan and England under Thatcher. These imperialist policies sought to loose unregulated 'market forces' (powerful actors in the market) onto the world in an effort to boost profitability. For Africa this meant intensification of extraction of wealth from land and labour. The World Bank and the IMF, together with their political masters in the US and Europe, imposed draconian Structural Adjustment Programmes (SAPs) onto African governments in the 1980 and 1990s. These were based on privatization, state deregulation, reduction of public spending, export orientation, and enforced debt repayment as conditions for receiving loans (Oakland Institute, 2014a).

The result was a sharp drop in public sector expenditure on agriculture, and efforts to promote global value chain integration, either 'traditional' export crops such as coffee, cotton and tobacco, or 'new' export crops such as horticulture with limited overall success. Terms of trade were against small-scale African producers in global markets dominated by large, often subsidized multinational corporations. Diverse African agriculture entered a lost decade of limited support or interest from outside. Public sector support and services collapsed in many places and farmers were left to fend for themselves.

16. See <http://www.worldbank.org/en/about/what-we-do>





However, this lack of interest did not last forever. The capitalist core requires constant growth and it needs fuel for this growth. This fuel takes the form of labour and natural resources where value can be extracted in the process of harvesting. But as the core continues growing, it requires an ever-greater amount of fuel. The World Bank eyed Africa's Guinea Savannah, stretching from West Africa through the centre of the continent in a vast swathe and down to southern Tanzania and Mozambique. It proclaimed this area unproductive and underexploited and proposed a model of commercial large and smallholder production linked to global corporate value chains, using a Green Revolution production model (World Bank, 2009b).

The 2008 global food price spike boosted attention from the international financial institutions and donors. The World Bank along with others such as AGRA, FAO, IFAD, governments aid agencies such as USAID, philanthropies and private investors are investing in many agricultural initiatives across Africa through implementing projects directly or with governments (ACB, 2016b). The G8 New Alliance for Food Security and Nutrition (NAFSN) was launched in 2012 to combine and coordinate public and private sector investments in agriculture with a corporate agenda. Some African governments have signed onto the programme which requires neoliberal changes to laws and policies, and creation of friendly conditions for foreign investment and profit repatriation. The New Alliance has been criticized by several African and international CSOs for its skewed policy commitments which enable private corporations to dictate agricultural policy to advance their own interests (Herre et al, 2014).

Also in 2012, the G8 countries asked the World Bank to “develop options for generating a Doing Business in agriculture index,” which led the Bank to implementing the Enabling Business of Agriculture (EBA) formerly known as Benchmarking the Business of Agriculture (BBA) project (Oakland Institute, 2014b; Oakland Institute, 2016). EBA benchmarks areas including seeds, fertilisers, markets, transport, machinery and finance to determine whether a countries' laws facilitate doing business in agriculture according to World Bank criteria (Oakland Institute, 2016). The World Bank uses the EBA and Doing Business indexes to promote the use of commercial agricultural inputs – hybrid seeds and synthetic fertilisers and pesticides among farmers – by rewarding a decrease in regulation and opening of input markets in Africa (Oakland Institute, 2014c).

World Bank and support for FISPs in Africa

In the 1990s the World Bank and IMF, through the SAPs, put an end to the large-scale subsidy programmes implemented by independent African countries to assist smallholder farmers. However, the food crisis of 2007/08 brought increased food insecurity, rural poverty and significant increases in food prices and agricultural inputs, and motivated a return to FISPs (ACB, 2016b). The World Bank has financed and supported 'smart' FISPs in several countries including as part of the Accelerated Food Security Project (AFSP) in Tanzania, which ran from 2009 to 2014.

The World Bank remains stuck on the Green Revolution model with all its limitations and failures in Africa and elsewhere. The Bank gives the solution as improved seed, synthetic fertiliser use and agrochemicals. When uptake is limited, it is not the inputs that are at fault but something that farmers are not doing. So renewed efforts are placed in trying to get farmers to adopt these inputs.

It was expected that, after the three years, targeted farmers would have sufficient experience and income to continue purchasing fertiliser and improved seed (REPOA, 2017). This graduation strategy was not implemented consistently, and in many cases the vouchers were distributed on a rotational basis, giving new beneficiaries the chance to receive vouchers annually. In our discussion with farmers, they mentioned that each year a new set of beneficiaries would be chosen. However, this also depended on the ability of beneficiaries to afford the financial top-up required.

Initially, a large-scale agrodealer training programme was organised through the CNFA, under a previous project funded by AGRA, where 1 000 agro-input dealers had been trained (World Bank, 2009). This was in support of the pilot NAIVS (see textbox on AGRA, above). In 2007/8, AGRA, in collaboration with the Ministry of Agriculture, Food Security and Cooperatives (MAFC) had also supported the training of 319 agrodealers from 14 district councils. The World Bank funding included support for the training of about 3 855 agrodealers who registered to participate in the programme, which took place before the 2009/10 input distribution season. Of these, 2010 agrodealers remained active in agricultural input distribution (World Bank, 2014b).

Budget, expenditure and donor funding

For Tanzania, the 10% targeted agricultural expenditure, as outlined by CAADP under the Maputo Declaration, is yet to be reached. The budget allocation to the agricultural sector peaked in 2009/10 at just below 6.5%, after which this fell to 4% in 2012/13 (World Bank, 2014b). In 2012/13, input subsidies made up about 42% of the total expenditure of MALF,¹⁷ and about 19% of the government's total expenditure in the sector. Budget allocations to MALF declined from 10% in 2007/8 to 7% by 2013/14 (MAFAP, 2016). The government had invested approximately US\$300 million

on NAIVS between 2008 and 2013. It is estimated that up to 50% of funds were used for covering the high administrative costs associated with the mechanisms for distribution.¹⁸

The planned budget for NAIVS was between US\$60 million and US\$100 million per year, between 8.4% and 33% of the total agricultural budget, depending on funding, the number of vouchers distributed and the shifting year-to-year cost of fertiliser imports (URT, 2014b), see Table 3 below. During the first two years of the project, the International Development Association (IDA)¹⁹ financed 50% of the subsidy cost with the remaining 50% being financed by the government of Tanzania. Due to significant delays in the release of government funds, the IDA increased its contribution to 83% for the 2010/11 cropping season (World Bank, 2014b). External funding gradually declined over the implementation period, and was finally terminated in 2013/14, thereby severely limiting the government's ability to continue implementing the programme (Cameron et al, 2017). Due to funding constraints and programme inefficiencies, funding for input subsidies now singlehandedly financed by the government, was reduced in the 2016/17 budget, with indications that funding will cease in the future (Cameron et al, 2017). The government continued providing subsidies in 2014/15, 2015/16 and 2016/17 through different approaches, shifting the nature of the subsidy, including: credit-based subsidies, by providing loans and credit to farmer groups and cooperatives to access inputs; the use of vouchers for a period of one season; and entering into contract with seed and fertiliser companies to supply inputs of seed and fertiliser.

Implementation of NAIVS

The NAIVS programme primarily targeted farmers with little to no experience in using improved seed and fertilisers, but who seemingly had the resources needed to co-

17. The Ministry of Agriculture, Livestock and Fisheries (MALF) formerly known as the Ministry of Agriculture, Food and Cooperatives was merged together with the Ministry of Livestock and Fisheries after the entering of the new government in 2015.

18. Personal interview with Professor of Sokoine University, 29 August 2017

19. The International Development Association (IDA) is a part of the World Bank that helps the world's poorest countries. It is overseen by 173 shareholder nations and aims to reduce poverty by providing loans (known as 'credits') and grants for programmes that boost economic growth, reduce inequalities and improve people's living conditions.



Table 3: Ministry of Agriculture: Budget Expenditure

| Year | Approved budget (Tsh) | Released budget | Total budget expenditure | Expenditure on NAIVS/subsidies | % |
|---------|-----------------------|-----------------------|--------------------------|--|--------|
| 2007/08 | 131 912 102 600.00 | | | | |
| 2008/09 | 163 531 050 758.00 | 160 722 290 138.00 | 158 638 654 743.00 | 53 750 000 000.00 | 33.88% |
| 2009/10 | 283 564 247 000.00 | 184 046 287 427.00 | 182 026 741 782.00* | 50 793 128 636.00 | 27.90% |
| 2010/11 | 294 286 040 971.00 | 176 761 149 378.00 | 269 014 573 336.00 | 40 540 407 897.00 | 15.06% |
| 2011/12 | 258 350 877 100.00 | | 126 137 200 047.00 | | |
| 2012/13 | 296 669 574 632.00 | 202 865 205 779.66 | 200 129 693 055.67 | 23 643 533 234.00 | 11.81% |
| 2013/14 | 363 928 459 888.00 | 257 969 897 893.40 | 255 524 663 059.83 | 21 494 828 400.00 | 8.40% |
| 2014/15 | 354 055 154 795.00 | 283 435 045 913.26 | 276 595 848 239.05 | 46 275 497 572.00* | 16.70% |
| 2015/16 | 298 406 733 607.62 | 106 506 594 343.13*** | 67 295 908 405.62 | 6 810 995 924.97 | 10.10% |
| 2016/17 | 305 714 963 669.46 | 78 343 621 086.01**** | 65 357 773 133.53**** | 20 000 000 000** was to be spent out of the approved budget and not expenditure | 30.00% |

Notes:

* Unverified figures ** This is % of the approved budget but not of the expenditure

*** Budget released by 30th April 2016 **** Budget released by 4th May 2017

Sources: (Ministry of Agriculture Annual reports and Budget Speeches 2007 to 2017)²⁰

finance the inputs. To qualify, the applicant had to be a full-time farmer, cultivating less than one hectare of land, willing to co-finance the inputs (generally 50%), be willing to follow the advice of extension officers, and verify his/her use of the inputs (World Bank, 2014b). Female-headed households were supposed to be given preference. However, only 14.7% of women were actually reached. The criteria of the NAIVS programme indicate that it was not intended to reach the poorest households, such as female-headed households, as they would be unable to afford the financial top-up required to purchase inputs; but neither did it target wealthier farmers and, thus, a middle group of farmers were the main target. Although consideration was also given to needy and deserving households, family households that were not able to afford the top-up failed to benefit. Social safety nets through AFSP and Tanzania Social Action Fund (TASAF) were intended for the most marginalised and destitute.

Mostly, farmers meeting the criteria were selected by the Village Voucher Committee (VVC), a committee of three men and three women elected by the Village Assembly to facilitate voucher distribution. In the three villages visited, farmers were selected in this way.²¹ Selection was also done through voluntary registration, and through local leaders (REPOA, 2017). Eligible farmers were provided with vouchers that entitled them to buy inputs from agro-input dealers at a subsidised price. Agrodealers applied for a tender and then were selected and assigned villages by the district council.²² Farmers would sign for their three vouchers at the village office and then take them, together with their cash payments, to the designated agrodealer to exchange them and obtain the inputs (World Bank, 2014a). Agrodealers would set up temporary shops close to villages between November and 31 May, for easy access by farmers.²³

20. Annual report 2007/08 to 2014/15 and Budget Speeches 2015 to 2017.

21. Interviews and farmer group discussions in Mvomero, Babati, Makambako, August 2017

22. Interview with agrodealer, Babati, 17 August 2017

23. Interview with agrodealer, Babati, 17 August 2017

Table 4: Description of seed type and variety and fertilisers distributed as part of NAIVS in three sites visited

| Village | Seed | Fertiliser |
|------------------------|--|---|
| Mbogo Village, Mvomero | Hybrid maize Rice: TXD 306 (SARO 5) | Minjingu mazao, urea, Booster, DAP |
| Halla Village, Babati | Maize: Zamseed variety; Meru | Minjingu mazao, DAP, urea ²⁴ |
| Makambako, Iringa | Hybrid maize: SeedCo 719; Pannar 6195; Uyole 615; Uyole 6303; Kitale 614; Kitale 625 | DAP, urea |

Contents of package

The focus of NAIVS was on maize and rice, two of the main staple crops in Tanzania. Maize accounts for 40% of the total land area planted, and 67% of the cereal grains planted in 2011/12. Maize is both a subsistence and cash crop, with 80% of all maize being consumed by producing households (Finmark Trust, 2016). 60% of smallholder households cultivate maize. In 2011/12 rice accounted for 8% of total area planted, and 13% of planted cereals in the country. The total area harvested in 2016/17 for maize was 40 000 km², and for rice was 10 000 km², 4% and 1% of Tanzania's total land area (GAIN, 2017).

The package generally included three vouchers: 10kg of maize seed (either improved OPV or hybrid maize) or 15kg paddy seed, both roughly enough for one hectare of land. Of the vouchers, 80% were allocated to maize farmers, while the remaining 20% offered paddy seed. The second voucher was for basal fertiliser (either 150kg bag of diammonium phosphate, i.e. DAP, or two 50kg bags of Minjingu Rock Phosphate), and the third voucher was for top dress fertiliser, generally 50kg urea (Pan and Christiaensen, 2012).

In our field research, in Babati, agrodealers mentioned SeedCo, Monsanto, Suba Meru, Pannar and Kibo trading as their main seed suppliers, and MEA fertilisers and Tanzania Fertiliser Company as main fertiliser suppliers. A description of the package received in each village is outlined in Table 4.

Villagers in Mbogo Village and Halla Village stated that they were not given a choice on the seed varieties that included in the NAIVS programme and mentioned that, despite the fact that varieties of SeedCo and Pioneer are commonly cultivated and preferred in the area, during one particular season the subsidy programme provided a variety from Zamseed (Zambia Seed Company), with which farmers in the area are unfamiliar. Many farmers refused to take this seed and opted rather to purchase the desired varieties, separately from the programme, using their own funds. Farmers in the area have a long history of using improved hybrid maize seed. In Makambako, farmers suggest they did have a choice on which varieties to use, depending on their needs; yet all the maize seed was hybrid seed, and OPVs were limited and not advised by extension officers. Agrodealers need a range of varieties to meet the needs of different farmers, as explained by an extension worker based in Makambako.²⁵

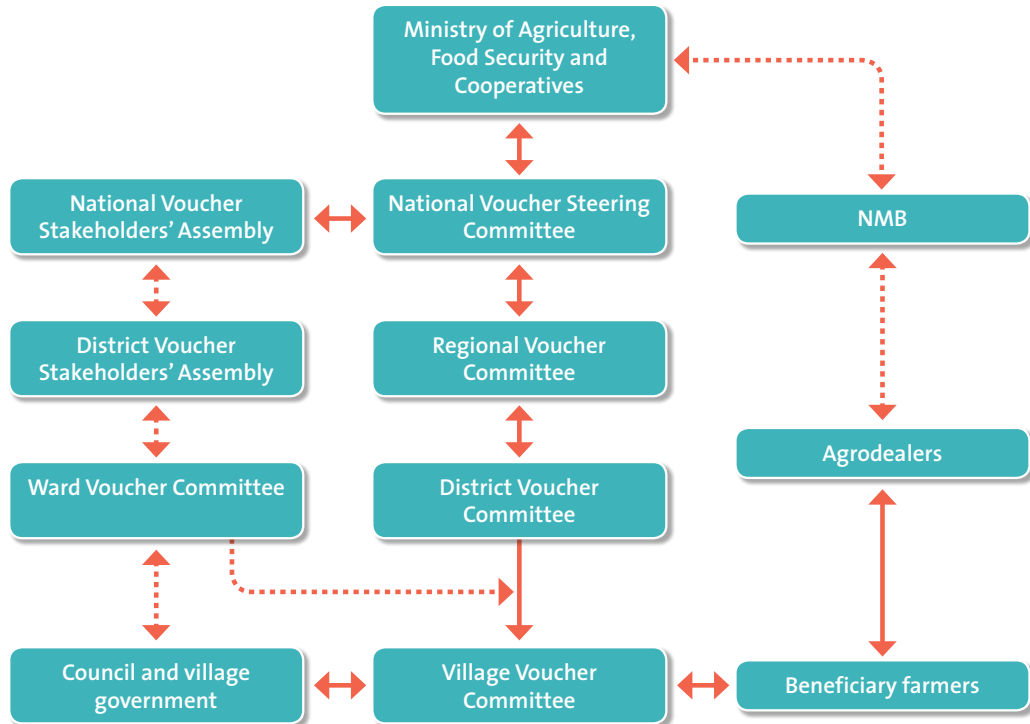
Although vouchers were intended to cover 50% of the input costs, in some cases farmers (particularly those in more remote areas), had to pay up to 60% (World Bank, 2014b). From our interactions with farmers, in Halla Village, in 2015/16, farmers mentioned they would contribute 29 000 Tsh of the total 50 000 Tsh (58%) for urea, and 38 000 Tsh of the 60 000 Tsh total (63%) for 10kgs of seed. The agrodealers in the area mentioned that in 2015/16 the government subsidy contributed 35 000 Tsh for DAP, 25 000 Tsh for urea, and 20 000 Tsh for seed, while farmers contributed 108 000 Tsh – 50% of the cost

24. Farmers mentioned that they receive only DAP and Minjingu Phosphate, while the agrodealers mentioned they supply only DAP and urea, and indicate inconsistencies with the package.

25. Interview with extension officer in Makambako District Council, August 2017



Figure 4: NAIVS implementation framework



Source: Aloyce et al., 2014

of fertiliser and 60% of the cost of seed. In Lyamkena, farmers contributed 42 000 Tsh of the total 65 000 Tsh for DAP (65%), 30 000 Tsh of the 55 000 Tsh for urea (55%) and 29 000 Tsh of the total 40 000 Tsh for 10kgs of hybrid maize seed (72%). Figures estimate that around 85% of smallholder households in Tanzania live below the poverty line, earning under \$1.25 a day (around 2 830 Tsh/day) (Anderson et al., 2016).

Institutional arrangement and tender procedures

MAFC was the official implementer of NAIVS. NAIVS National Forum was mandated to endorse the voucher share between targeted districts, based on the adopted guidelines and selection criteria for NAIVS implementation; discuss and endorse proposed NAIVS annual work plan and budgets; review the implementation progress report; and recommend changes/improvements to the National Voucher Steering Committee (NVSC) (World Bank, 2014b). The NVSC was the overall overseer of NAIVS, chaired by the permanent secretary of MAFC. The NVSC was responsible for developing policies, guidelines and

procedures for the implementation of NAIVS, particularly agricultural input vouchers; submitting criteria for allocation of vouchers to regions; ensuring financing of the scheme; releasing funds on time; and reviewing the NAIVS progress report.

Regions allocated vouchers to districts and monitored implementation of the scheme, while districts did the same at the ward and village level. There was also a District Voucher Forum, similar to the one at the national level.

The VVCs and the national and district forum consisted of government officials at the relevant administrative level (regional, district, ward, village), agrodealers, seed and fertiliser companies, representatives from agribusiness, members from the NMB in the respective region, farmer groups, civil society organisations and community based organisations. Figure 3 illustrates NAIVS implementation framework.

A private company selected by the Ministry through a bidding process printed national agricultural input vouchers according to specifications set by the two parties (World

Bank, 2014b). These vouchers would then be distributed to various regions, according to the shares discussed and agreed upon.

The district council, notified by the central government on the plan for the subsidy for that particular season, notified village councils, who then made announcements to farmers, to raise awareness and so they could make necessary preparations. At the same time, the agrodealers, notified by the district councils, submitted applications to the villages. The selection of agrodealers was done jointly by the village and district officials, in order to ensure the agrodealers were trusted by the local communities. However, the district took the leading role in the selection process.

It was the role of the VVC to supervise the distribution of the inputs by the agrodealers. The extension officers were meant to advise farmers on the use of the inputs, prior to receiving the inputs. In the NAIVS programme, the government had contracts with agrodealers, who selected seed based on farmers' demand. The agrodealers sourced the inputs from designated seed and fertiliser companies on credit, and supplied the inputs to villages. In 2012/13 seed and agro-chemical companies began to take a bigger role in the selection of agrodealers (World Bank, 2014b). At this time, agrodealers, in a sense, became agents of larger seed and agrochemical companies, encouraged to provide technical assistance and run demonstration trial plots.

The government reported a number of factors that affected the implementation of NAIVS. An evaluation done in 2010/11 revealed: low supervision of the vouchers at the district and village levels; selection of agrodealers by the district voucher committees who had not met the criteria; limited awareness and understanding on the importance of use of agro-inputs among farmers; and limited awareness of the guidelines to accessing subsidies, which led to most farmers being conned by agrodealers and village executive officers (URT, 2011b). This led the government to conduct a special audit to identify officials who did not follow set procedures, so that they could be held accountable.

Seed and fertiliser companies took a larger role in the selection and training of agrodealers, to curb the irregularities that the voucher scheme was still facing – particularly the loss of government funds – and to enable timely access to inputs (URT, 2013b). Farmers would sign for vouchers, and using vouchers with their own additional contributions, would purchase the inputs from rural retail shops (agrodealers). The agrodealers would submit the vouchers to the District Agricultural and Livestock Officer (DALDO) and then to the NMB to redeem them. Following this, vouchers were collected by seed and fertilisers suppliers, or their respective agents, for submission and payment by the NMB. Smaller companies did participate, but it was primarily the large firms, with existing, well-developed distribution networks, who were the main beneficiaries of these government subsidised programmes. On the one hand, the mushrooming of small businesses, i.e agrodealers, provided a livelihood for many, on the other hand, the systemic integration of agrochemicals became the norm, and could be seen right down to the village level.

A study commissioned under the soil health policy node under AGRA sought to propose an electronic monitoring system of NAIVS to minimise inefficiency caused by fraud and cheating. In this case, the use of an electronic voucher (e-voucher) would be redeemable by commercial retailers (Mwaijande, 2013b). There is no further information of the development of an e-voucher system in Tanzania at this stage.

After NAIVS

Although NAIVS was planned end in 2013/14, the government of Tanzania committed to continue providing input subsidies to farmers. It embarked on a plan to provide loans to farmers, in order to buy inputs. In the period of 2014/15, 4 990 groups of farmers comprising of 974 030 households were identified. By March 2015, 712 groups that had met the loan requirements received credit from NMB, CRDB and community banks. NMB released loans to 281 farmer groups and cooperatives comprising of 28 700 farmers. CRDB bank released a total of 247 groups and cooperatives with 24 700 farmers in



Table 5: Groups and members that loaned from Community Banks

| Bank | Group/s | Members | Value of the loan (Tsh) |
|------------|---------|---------|-------------------------|
| Mbinga | 28 | 400 | 78.1 million |
| Njombe | 56 | 594 | 125.4 million |
| Mufindi | 25 | 374 | 45.3 million |
| Kagera | 26 | 1 560 | 585.7 million |
| Tandahimba | 26 | 387 | 474.4 million |
| Total | 184 | 3 315 | 1,308 million |

Source: URT, 2014b

Tabora (145 groups) Kigoma (35 groups), Shinyanga (16 groups in Kahama), Mbeya (16 groups in Chunya), Katavi (Mpanda 6 groups in Mpanda), Ruvuma (12 groups), Iringa (5 groups) and Singida (12 groups). Community banks of Mbinga, Njombe, Mufindi, Kagera, and Tandahimba released loans to groups of 184 farmers with a total of 3 315 members. A total of some 1,3 billion Tsh were released to farmers to access loans for inputs. However, this, too, faced its own challenges, due to lack of bank networks across the country and many farmers could not organise themselves into groups or cooperatives. Although the shift towards supporting cooperatives has been shown to improve the access to credit and reduce risks for smallholders, a large proportion of farmers are not organised, and therefore remain stuck at the margins.

In 2015/16, government returned to the use of the vouchers, reaching a total of 999 926 households that were funded by government. The money spent for input subsidies was nearly 7 billion Tsh (URT, 2016). At this time, many companies were not paid, due to embezzlement of funds and corruption. Investigations are still pending, and this issue remains unresolved.

In 2016/17, 20 billion Tsh were set for fertiliser subsidies and a total of 378 900 households were provided with subsidised fertiliser through TFC. This time around, the government entered into contracts directly

with seed companies, primarily with SeedCo, Agriseed, Beula Seed, Kipato Seed, Meru Agrotours, Suba Agro, Aminata and Kibo Trading – an agent for Monsanto – among others. Much of the seed imports originated from Zambia, South Africa and Zimbabwe. The main fertiliser companies included Yara, Export Trading Group, and TFC.

In the 2017/18 budget speech the government reaffirmed that it will continue to provide subsidies for maize and rice through contracts with seed companies. However, there appears to be a shift towards subsidising fertiliser as well, making it available and affordable to farmers; again prioritising those cultivating maize and rice. In order to do this, consolidation of procurement of fertiliser is seen as a cost-effective measure, through the Fertiliser (Bulk Procurement) Regulations of 2017²⁶ (following the enactment of the Fertiliser Act of 2009) for only two types of fertiliser, urea and DAP. This will change the fertiliser input supply chain, especially for DAP and Urea, making it more competitive, where it is perceived that most local companies and business will participate in the marketing and distribution of fertiliser. The government has projected that this will result in an increase in fertiliser usage in the country; however, it will also impact on local production and sustainable farming systems.

26. See the Fertiliser (Bulk Procurement) Regulations, 2017, Government Notice No. 49, Supplement No. 7, 17 February 2017, ISSN 0856-034X.

The bulk fertiliser procurement programme

The bulk procurement fertiliser regulations of 2017 facilitate the procurement of fertiliser in bulk under the supervision of TFRA for only two types of fertiliser, urea and DAP, through competitive bidding, while other fertilisers continue with the existing procurement procedures. This is not a subsidy, as such, but a mechanism to ensure fertiliser is acquired at a reduced price and is ultimately more affordable to farmers. This, however, was first met with resistance from the private sector (particularly Yara), who have made huge infrastructural investments of around US\$200 million²⁷, who feared that this will impact the competitive market price of fertiliser and also lamented on lack of proper consultations on the regulations. This may be true, yet the opportunities of a secured market outweigh the negative impacts that it may have on the largest agricultural input companies.

In April 2017, the TFRA announced a tender for the bulk importation of DAP and urea fertilisers for the period of July 2017 to June 2018. This tender was open to both local and international companies registered in the country. In 2017, two companies won import tenders: the OCP Group of Morocco through OCP Africa, which is the world's leading producer and exporter of all forms of phosphates won the tender for DAP; and a local company, Premium Agro Chem Ltd, won the tender for urea. By September 2017, 23 000 tonnes of DAP fertiliser and another 32 000 tonnes of urea had arrived at the Tanzanian port (Giliard, 2017) and by February 2018, OCP Africa had sold 57 000 tonnes of DAP in the country²⁸. The TFRA reported that the government had saved 5.3 billion Tsh and 6.2 billion Tsh for DAP and urea, respectively. The fertiliser bags are labelled with the word 'subsidy' to prevent unscrupulous agents from selling at high prices. According to TFC, 32 000 tonnes had already been distributed in 20 regions in the last season of 2017²⁹. The cost of fertiliser would vary depending on the distance from the port for the different regions in the country. However, it is yet to be seen how this initiative will progress in light of previous challenges, as delays have already been experienced.³⁰

Impacts of NAIVS on smallholder farmers

Yield, productivity and profitability

The first objective of NAIVS/AFSP (2008–14), to raise domestic grain production levels in the face of rising global grains and fertiliser prices, had been mostly successful, where between 2009/10 and 2011/12 2.5 million metric tons of additional grain was produced from the NAIVS programme, resulting in

the lifting of the grain export ban³¹ (World Bank, 2014b). This has, however, varied over the course of the programme. The report by ANSAF (2017) challenges these claims, suggesting the agricultural sector has remained relatively stagnant, and productivity has remained significantly low as a result of minimal investment along the agricultural value chains. The figures below illustrate variations in grain and maize productivity.

While the NAIVS scheme resulted in increased productivity and area under cultivation, it has been shown that it is

27. Yara, DCG team up with TPSF to complain introduction of fertiliser. IPP media, 17 April 2017. <https://www.ippmedia.com/en/business/yara-dcg-team-tpsf-complain-introduction-fertiliser>

28. Moroccan giant supplies Tanzania with 57,000 tonnes of DAP fertilizer. IPP media, 23 April 2018. <https://www.ippmedia.com/en/business/moroccan-giant-supplies-tanzania-57000-tonnes-dap-fertiliser>

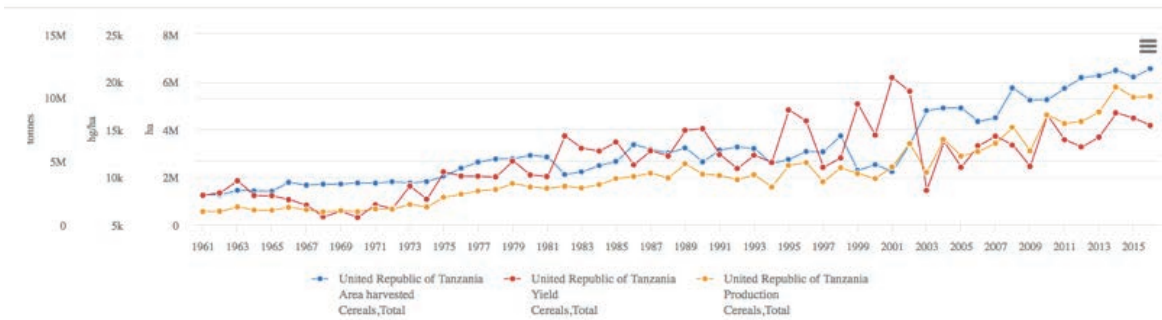
29. Distribute fertiliser to farmers on time or be ready to resign, Magufuli tells agricultural officials. Azania Post, 9 January 2018. <http://www.azaniapost.com/economy/distribute-fertilisers-to-farmers-on-time-or-be-ready-to-resign-magufuli-2-h11330.html>

30. Ibid.

31. The Tanzanian government has exercised bans on food, especially maize, on several occasions since the 1980s. These bans are implemented in an attempt to secure domestic food supply and protect Tanzanians from international food price hikes. Before NAIVS, the government banned export of maize in 2008. The ban was lifted in 2010 but was again imposed in May 2011, but lifted in October the same year, after complaints from farmers and traders. See report <https://ageconsearch.umn.edu/bitstream/235499/2/AAEA%202016%20Makombe%20Kropp.pdf>

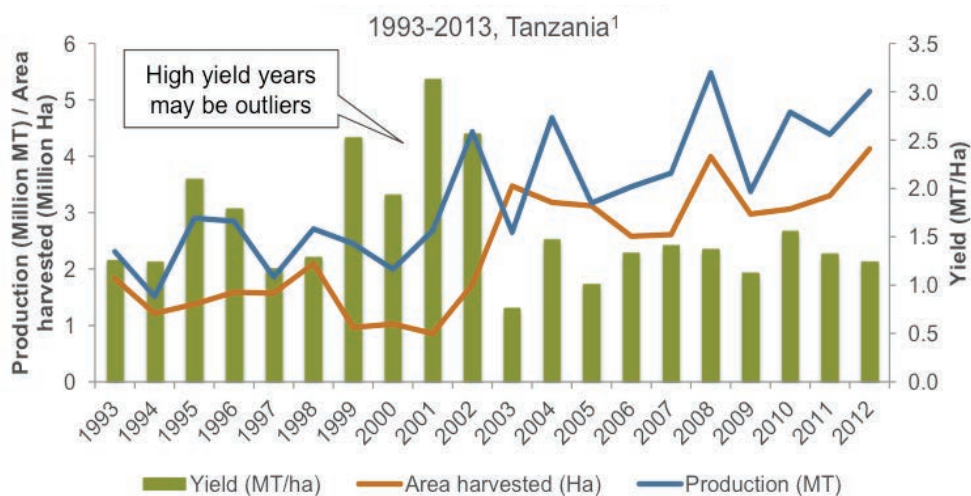


Figure 5: Area, yield, and production of total cereals in Tanzania, 1961–2016



Source: FAO, 2017

Figure 6: Maize production and yields between 1993-2013



Source: Bill & Melinda Gates Foundation, 2014

primarily the wealthier farming households that benefit, compared to poorer farmers (REPOA, 2017; Hepelwa et al., 2013).

The average yield increased from 0.9 tons/hectare to 2.5 tons/hectare for maize, and from a baseline average of 2 tons/hectare to 3 tons/hectare for paddy rice (World Bank, 2014b). It is estimated that maize production increased from 5 bags/ha to 12 bags/ha, and 4 bags of rice/ha to 20 bags/ha (URT, 2013b). About 6.9 million vouchers were distributed during the six-year programme, intended to benefit about 2.5 million households. Unfortunately, there is no monitoring and evaluation system to determine the number of households that actually benefited (World Bank, 2014b). From the available data, only 15% of the voucher recipients were women, much lower than the 29% target, due to their inability to meet the programme's criteria.

This will be discussed in more detail below.

The government of Tanzania estimated that the 2009/10 subsidy volume covered 5% of total crop land, produced 14 700 metric tonnes of maize and 450 metric tons directly from NAIVS in the same year (Agri Experience, 2016).

The World Bank (2014) found that for both maize and rice producers, profits were only achieved by the top 30% of households, while the bottom 50% of targeted farmers had little or no profits from using improved seed and chemical fertiliser. This underscores the variability of outcomes, impacts and limitations of a one-size-fits-all input supply model, and may depend on the capital farmers already had to begin with. Diverse factors were in play, such as the capital farmers already had to begin with, the delays

experienced, access to extension support, farm gate prices, access to market and transport costs, amongst others.

Yield is also interrelated with other environmental/ecological and climatic conditions, making it difficult to make direct correlations between input provision and productivity.

It is important to note that, in some cases, such as in Makambako, markets for priority crops were secured through the National Food Reserve Agency (NFRA), but this was not expressed by farmers in other regions we visited. In regions that were not always able to absorb the produce, farmers were left with products they themselves didn't want to consume and that were not demanded in the local markets.³² This suggests that food security was being mediated through income, rather than direct improvements in production, distribution and consumption of diverse, locally produced products.

Supply, demand and adoption of improved seed and synthetic fertilisers

Despite the fact that there has been increased supply and availability of improved seeds (maize and rice), which then doubled between 2007/8 and 2015/16, demand for improved seed remains drastically higher than what can be supplied through the formal sector, whether through local formal production or imports (ANSAF, 2017).

There are large variations in adoption, depending on location, variety suitability, socio-economic conditions and crop type. The study conducted by ANSAF (2017) found 66,4% adoption of what farmers termed as 'improved seed' of prioritised crops during the 2015/16 season, reaching far above the 25% national average in the 10 regions³³ where they conducted the study. Maize, cotton and coffee had high usage of 'improved seed', with more than 50% of farmers in the study, compared to only 26,3% of rice (ANSAF, 2017). This may signify preferences of local or traditional

rice varieties, due to the range of use-related characteristics, such as taste and aroma, or possible other challenges in reaching rice-producing areas. A previous study conducted by ACB found that farmers were still using local maize varieties in Mvomero.³⁴

NAIVS has had significant impacts on farming practices across the country. The World Bank study (2014b) found that 57% of farmers continued to purchase improved seed from the market, and many continued to plant improved OPVs saved from previous harvests. The same study found around 37% of farmers continued to purchase fertiliser inputs with their own resources. These represent substantial shifts in type of seed and priority crops being produced, and in agricultural practices on the ground. Low fertiliser adoption relates to the fact that many farmers have negative perceptions of using synthetic fertilisers, believing that these will, in the long-term, reduce soil fertility (REPOA, 2017), something we also encountered in our discussion with farmers in Babati. Therefore, the one-size-fits-all approach results in inputs that have little local demand and limited long-term benefits.

There are concerns over the wholesale advocacy of standard, large-scale fertiliser adoption initiatives. The universal supply of phosphate and urea does not address the different soil nutrient requirements across Tanzania's diversity of soils and agroecological zones (Mwaijande, 2013a). This one-size-fits-all package, such as the blanket promotion of applications of synthetic fertilisers, results in short-term productivity increases, with long-term negative ecological impacts (reduced soil fertility and declining yields), is not context specific and scientifically based, and appears, rather, to be about creating a market for hybrid maize and synthetic fertiliser, placing further burden on poor farming households and communities (ACB, 2015a; ACB, 2015b).

Although the range of seed varieties differed throughout localities, farmers had limited choice on the packages offered, as discussed

32. Interview with Professor of Sokoine University, August 2017

33. Ruvuma, Kagera, Kilimanjaro, Simiyu, Shinyanga, Iringa, Rukwa, Manyara, Morogoro and Mbeya

34. See ACB's 2016 report: Farmer Managed Seed Systems in Morogoro and Mvomero: The disregarded wealth of smallholder farmers. <http://www.acbio.org.za/sites/default/files/2016/08/Tanzania-Field-Report.pdf>





above. The selection of which crops and varieties were included in the programme, and the volumes of each, rested largely on the formal-sector seed suppliers (Agri Experience, 2016). For example, REPOA found out that in Chamwino, farmers would have preferred maize, sunflower, sesame and groundnut seeds, as these crops perform well and have high market values compared to other crops in their district. In addition, other farmer preferred the supply of farm inputs, such as ploughs and wheelbarrows over fertilisers (REPOA, 2017). No information is available on how specific seed varieties are selected to be included in the programme, how input subsidies influence varietal choice, varietal turnover, and the spatial and temporal diversification of varieties (Spielman and Smale, 2016).

Targeting, affordability and access

Officially, NAIVS prioritised the poorest and most vulnerable households, yet these groups were excluded due to relatively large co-financing requirements, and conflicting or vague targeting criteria (DANIDA, 2012). An example of the divergent targeting of NAIVS is the fact that the project focused on farmers cultivating on one hectare or less, that is, what may be understood as Tanzania's rural poor, despite that many of these farmers would be unable to afford the 50% top-up, and, therefore, could not participate in the programme. This speaks to the dichotomous nature of the programme. Aloyce et al. (2014b) found that women and disadvantaged groups who were given priority as stipulated in the guideline, were unable to benefit from NAIVS. This is likely due to the fact that female-headed households are often poorer than average, and therefore unable to pay the financial contribution (World Bank, 2014b). There may be other factors contributing to poor participation of female-headed households, particularly due to the focus on maize and rice, both for food and commercial crops, while women are custodians of a diverse range of seeds and plants that are essential for household nutritional security, and hold significant medicinal and cultural value. Programmes such as TASAF exist as a food security net for the poorest households, and were therefore, ultimately, not the focus of NAIVS.

A limited, and decreasing, number of farmers continued to benefit from the NAIVS programme, as explained by farmers in the field. In Mvomero, farmers mentioned that the previous year, only 35 out of 2 000 households were benefiting from this programme. Although data is poor and contested, according to MAFC records, it is estimated that about 1.5 million households had received vouchers for the mandated three consecutive years, while over a million received vouchers for one or two years only (World Bank, 2014b).

Essentially, the input subsidy reduces overall costs of seed and synthetic fertilisers, making them more accessible and aiming to increase their usage amongst smallholders across the country. Despite this, farmers have expressed the need for loans and credit services to be made available to be able to access inputs (Aloyce et al., 2014a). During our discussions with farmers, they continuously asked for loans to be made available, to purchase (subsidised) inputs. According to the farmers in the discussions, loans should be provided, which should be repaid following the harvest, when they have cash flow. There are other examples in Tanzania where such payment schemes are offered, such as the Expanding Rice Production Project, where the farmer contributes 20% before planting, receives all the inputs, and pays 30% after harvest, with the government subsidising the remaining 50%. Affordability will be an issue, and in discussions, farmers suggested that savings and credit cooperatives – informal, trust-based credit and savings schemes – can serve a vital role in smallholder farmers gaining access to funds. This said, there are other factors that may have intersecting impacts on smallholder farmers' productivity, such as access to markets and agricultural practices. Further to that, the logic behind farmers getting enough profit to be able to repay the loans they would have acquired, while still supporting their families, is mostly flawed, as they are most likely to have little influence on the farm-gate prices. Issues around access to credit and savings systems for smallholder farmers require further unpacking but are beyond the scope of this paper.

The concern is that NAIVS establishes and entrenches inequitable and unsustainable seed, agricultural and food systems. The high



Biofertiliser factory in Brazil

Source: La Mierda de Vaca <http://lamierdadevaca.com>

costs of inputs on which this system relies reduces profit margins, and demands access to credit and risk-based insurance. It depends on indefinite public support through subsidy programmes. The upfront costs (land, seed, agro-chemicals and irrigation) are based on an industrial model, and the biggest, most well-resourced, and most capitalised farms will be the ultimate beneficiaries (IPES-Food, 2016). This pushes smallholders to the margins.

It is necessary to question the need for indefinite subsidisation of agricultural inputs, under the Green Revolution paradigm, and to broaden the approach to integrate more economically, socially, and environmentally efficient and sustainable options, as we move forward towards increasingly uncertain economic and ecological times.

Assessing NAIVS and input supply programmes

Inefficiencies in delivery of NAIVS have been reported in many studies, including: delays in the delivery of the vouchers and inputs; misuse of the vouchers; and lack of proper awareness among smallholder farmers of the way in which the programme operates. These are discussed briefly below, in relation to their impact, particularly on small-scale farmers, and illustrating the deep, systemic problem with this model.

Delays, dependence and sustainability

A major underlying challenge of the NAIVS programme was the timely delivery of vouchers and inputs. The main cause for delays was the slow release of counterpart funding from the government of Tanzania (World Bank, 2014b). The delays in voucher and/or input delivery resulted in delayed planting of crops and was a major complaint by farmers (World Bank, 2014b). There was



also a failure to communicate to farmers when delivery would take place, making decisions on planting difficult or near impossible. In some cases, such as 2011/12, inputs only arrived way into the rainy season (World Bank, 2014b). Farmers were either unable to plant, or planted traditional seeds instead (REPOA, 2017). When inputs were delayed, farmers were still required to purchase the entire package.

In 2011, 2012 and 2013, government payment to agrodealers and input suppliers was delayed. Such delays reduced yields in the short-term; reduced trust between and amongst government, input suppliers, agrodealers and farmers; and would likely lead to increased costs to farmers (World Bank, 2014b). Many agrodealers had to close, due to not being able to repay loans, as a consequence (Aloyce et al., 2014b).

The reliance on input suppliers creates multiple levels of risk for small businesses and smallholder farmers. Shifting farmers away from local varieties and local resources towards external, and increasingly expensive, high-yielding seeds and chemical fertilisers, becomes a great concern when farmers no longer have access to local varieties, which serve as a risk-reducing strategy.

Farmers not only become dependent on using improved maize and rice seed and chemical fertilisers, but they also become entitled to receive input subsidies (World Bank, 2014b). The increasingly high costs of improved seeds and chemical inputs reduce profit margins, and farmers are likely to demand an indefinite continuation and expansion of subsidies, or access to affordable credit (IPES-food, 2017).

Misuse of vouchers

There are divergent reports of corruption and leakage. It is difficult to ascertain actual levels of fraud and elite capture due to poor monitoring and documentation of the distribution and reconciliation of vouchers (World Bank, 2014b). Where complaints of misallocation arose, MAFC would send an investigation team, followed by the halting of the redemption process and vouchers being withdrawn. The study by Pan and Christiaensen (2012) found that elected

officials received about 60% of distributed vouchers, and other political connectedness also significantly increased the likelihood of receiving vouchers.

There were challenges in the selection of beneficiaries and agrodealers. Beneficiaries were ultimately selected by the VVC and the Village Council, with claims of unfair selection and nepotism displayed by hamlet leaders. What is clear, is that those responsible for selecting beneficiaries had significant discretion over voucher allocations, with the potential result being political patronage, corruption and favouritism (DANIDA, 2012). This maldistribution was more pronounced in villages with more unequal distribution of land and in more remote villages.

Farmers have limited financial resources, and may desire only certain inputs (Aloyce et al., 2014a). In a few reported cases, farmers would sell vouchers, likely due to their inability to afford the top-up (and sometimes needing money to buy food), not wanting to take the entire package, or when inputs were delayed. In other cases, farmers were asked to sign for all the vouchers but failed to receive all their inputs (World Bank, 2014b). The agrodealers were selected by seed/fertiliser companies, rather than villagers, making it difficult for farmers to hold them accountable in cases of poor performance (REPOA, 2017).

Awareness and extension support

Extension officers played a vital role throughout the implementation and operationalising of NAIVS, supporting the selection of beneficiaries, and monitoring the distribution and application of inputs. Yet, surveys conducted by Patel (2011) and the World Bank (2014b) revealed that only 25% of farmers had access to extension services. There is clearly a large gap in the ability of extension services to serve the large agricultural base. Another question is the type of extension support provided. In many ways, extension workers operate as a technical arm of the Green Revolution agenda. Farmers and extension officers repeatedly mentioned that extension officers advised farmers not to use their local varieties or OPVs, but rather to use hybrid seed.



Improved pigeon pea demo plots in Uyole Agricultural Research Institute

Although difficult to conclude, it can be suggested that the overall focus of agricultural budgets being directed to supply inputs at scale has resulted in a knock to funding for core public goods, such as agricultural research and extension (Mink, 2016). Farmers emphasised the need for greater access to training on 'good agricultural practices', a term which would need to be clarified, as it currently refers to the use of external inputs, rather than a range of agroecological and regenerative agricultural techniques.

Although there was widespread awareness of the NAIVS programme, there was a noted limited awareness of the criteria to be a beneficiary of the programme, and a lack of awareness of how the programme itself operates. This brings to light the political nature of the programme, as, despite large investments in awareness-raising on the programme (by 2009, this had already reached US\$ 5.2 million), little information was disseminated on the selection criteria or the how the programme works (Edward, 2013). Farmers tended not to go through the intended graduation process after three years, and operated on a yearly rotational basis instead (Aloyce et al., 2014a).

Research and development

Current research is highly skewed towards the promotion of improved seeds and high agrochemical input usage. Farm demonstration sites are used primarily to persuade farmers of the 'good performance' of improved varieties. Improved varieties are cultivated under irrigation and fertilisers are applied (these are called 'good agricultural practices'), while the landraces are not tended. This skewed research fails to show fairly the agronomic performance of local varieties, and fails to provide real-life evidence of limited inputs and adverse conditions.³⁵

In terms of the capacity in seed production, by the end of the AFSP programme in 2014, 20 private companies and the ASA were producing maize seed, which was estimated by the World Bank to represent 87% of total seed supplied in the country (World Bank, 2014b). These produced 288 tons of basic maize seed by the end of the project, compared to the 44 tons before the project, and 99.4 tons of basic rice seed, compared to the 46 tons initially. Capacity was strengthened in three research stations in Arusha, Morogoro and Mbeya

35. Interview with Pelum Tanzania coordinator, 24 August 2017



regions to produce basic seed, resulting in the production of 18 000 tons of pre-basic breeder maize seed, compared to the 700 tons before the project, and 40 000 tons of rice of pre-basic breeder rice seed, compared to the 1200 tons (World Bank, 2014b). TOSCI was also equipped and capacitated to process regional seed marketing certificates. Between 2007 and 2015, 23 144 metric tons of certified maize seed was produced (Agri Experience, 2016). Enhanced capacity is a positive outcome, but this is limited to a narrow range of crops, often being hybrid varieties, with little benefit for smallholders.

There is a need by the government to allocate public resources towards support to research and development in public research institutions, and for public goods. Exploring the use of OPVs, and strengthening local capacity in production of seed that farmers can afford and save for the next season should be a priority. This should be accompanied by including farmers in the research from the onset, through participatory plant breeding, promoting the adoption of introduced varieties, including farmers' varieties. This will require flexible standards that will accommodate characteristics of farmers' varieties and provide space for smallholder farmers to breed and produce seed. Without this, the cost of seed will remain unaffordable and unfavourable for most farmers and they may not achieve economic empowerment.

The role of research institutions and extension is key towards diversifying FISPs through an agroecological systems approach. Unfortunately, the current mandate of research and extension in Tanzania is skewed towards modern and industrial modes of agriculture focused on the production and distribution of improved seed especially of hybrid seed, which require use of agrochemical application, and repurchasing annually.

With changing climatic conditions, associated with shorter and less predictable rainy seasons and subsequent longer dry spells, shorter maturing and drought tolerant varieties are needed. Improved varieties are important to adapt to an uncertain

future, and many traditional varieties hold favourable traits, such as in Lyamkena, where farmers mentioned the local variety **lomba** (yellow and black), which are drought tolerant and pest resistant, but low yielding. A responsive breeding programme that works with farmers to address these needs could be made available through a subsidy programme. Varieties that are drought and pest tolerant and that are preferred locally should be further researched and made available to farmers. It is important that public research institutions work closer with communities to develop varieties suitable for dynamic, local agroecological and socio-cultural conditions.

Agricultural biodiversity and nutritional security

Through NAIVS, farmers were directed towards hybrid maize production, even in marginal conditions, with long-term implications of reducing agricultural biodiversity, and less food becoming available locally. This, potentially, would have negative effects on ecological and soil health, as well as reduce dietary diversity and nutritional security (ACB, 2016b).

Due to limited commercial markets and frequent export bans, these limited varieties flood local markets. Most of the incentives and justifications for the focus on few, commercially lucrative crops in NAIVS must be questioned, especially where local markets fail to absorb excess grain, and as food insecurity persists.

The shift towards standardised, hybrid maize and improved rice varieties displaces local varieties, often preferred in local markets. The diversion of local resources towards external, increasingly expensive, high-yielding seeds and chemical fertilisers becomes a great concern when farmers no longer have access to local varieties, which serve as a risk-reducing strategy.³⁶ There are farmers who still produce traditional varieties, which are in high demand, but the farmers need to be protected and supported, as they currently operate at the margins. How can these varieties be integrated into the national production and distribution system?

The general shift towards maize cultivation results in the reduction of land planted under other crops, and thus narrowing agricultural biodiversity, has negative impacts on environmental and human health (ACB, 2016b). There is evidence that genetic and agricultural biodiversity is diminishing, due to the adoption of modern varieties. Although these may have some advantages over local varieties, they depend on the provision of public infrastructure and finance for external inputs, which is proving itself inefficient and unsustainable.

The future of input subsidies in Tanzania?

As the future of input subsidies in Tanzania remains unclear, we reflect on the challenges and possibilities regarding the future allocation of scarce public resources. What is clear is that continued government support to smallholder farmers is essential to meet the global 2030 agenda of the Sustainable Development Goals (SDGs).³⁷ In particular, SDG 2 aims to 'end hunger, achieve food security and improved nutrition and promote sustainable agriculture'.

Looking at the NAIVS programme, many questions remain. Should the Ministry of Agriculture invest 30–40% of its annual budget in input subsidies, or would these be better invested through diversification and strengthening other forms of support? Should subsidies serve better-resourced farmers, or include those less-resourced and in more marginal environments? Should subsidies primarily benefit private and foreign seed and agrochemical companies, developing input supply chains, or should the focus be on strengthening and supporting local markets, based on diverse production of seed and crops by farmers themselves? What are the most sustainable, agroecological inputs and practices that could be considered for subsidy?

Smallholder farmers face diverse and interrelated challenges. To address these, a set of specific support could be undertaken by government, farmer and civil society organisations and other stakeholders. Particularly, there is need to have a discussion on the reform of the current Green Revolution agenda specifically in terms on shifting resources towards agroecology. Reforms could include holistic innovations and support on seed, soil and water and such as:

- Promoting soil organic matter through use of organic fertilisers, compost, cattle and chicken manure, tea manure, agroforestry;
- Recognising, promoting, supporting and distribution of local and indigenous seeds through seed fairs, seed shows, seed exchanges;
- Considering local and indigenous seed as part of the FISP package;
- Water conservation through promoting irrigation and water harvesting technologies such as boreholes, rivers and dams;
- Integrated crop, livestock and agroforestry production through use of organic and botanical biopesticides;
- Promotion of local food markets that support wholesome, nutritious local food and;
- Addressing social and economic dimensions of agroecology including women, environment and climate change, water and agriculture, food, seed and land rights
- Direct incentives from FISP to independent farmers who adopt locally appropriate set of agroecological practices;
- Movement building and awareness and campaigns on agroecology from local to regional level;
- Evidence based agroecology as an alternative to current FISPs sharing of indigenous knowledge of seed value;
- Farmer to farmer training and exchange visits;
- Local agroecology hubs and;
- Policy engagement and dialogue with policy makers at all levels.

36. Farmer group discussions, August 2017

37. See Sustainable Development Goals: 17 goals to transform our world <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>





Source: La Mierda de Vaca <http://lamierdadevaca.com>

Agroecology can contribute to meeting many of SDG 2's specific targets, as it embodies sustainable food production systems and resilient food production practices that increase productivity and production; help maintain ecosystems; strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters; and progressively improve land and soil quality (Lim, 2018). There is a long history of comparative research illustrating the resilience of organic and **agroecological practices**, and their ability to outperform conventional agriculture across multiple indicators, particularly in times of drought (IAASTD, 2009; Rodale Institute, 2011; IPES-Food 2016). Many of these methods, such as mulching or intercropping, are inexpensive, simple and have no health implications.

The role of **research and extension** is key towards diversifying FISPs by directing support towards agroecological practices. Unfortunately, the current mandate of research and extension in Tanzania is skewed towards modern and industrial modes of agriculture, promotion of commercial agriculture based on land consolidation and

economies of scale, and integration into global value chains that syphon resources and wealth out of the continent.

As we start to formulate ideas about how to reimagine agricultural subsidies for smallholder farmers, there are a few important aspects that can be considered at the outset. The Chair of the Food and Agriculture Organisation (FAO) Second International Symposium on Agroecology, has recommended developing family, farmer-led and **participatory research and co-innovation** that is people centred, builds collective capacities to solve systemic problems, is climate resilient and low cost, enhances family farmers' autonomy and livelihood, is locally adapted, uses natural resources sustainably and evolves according to feedback (FAO, 2018).

This can include empirical research **comparing various improved, traditional and farmer varieties**, based on context specific variables and practices. It could also include **developing varieties with farmers through participatory plant breeding and participatory variety selection**, responsive to the interests

and intersecting needs of farmers (ACB, 2018). Initiatives such as these would help provide options for farmers, conserve and maintain agricultural biodiversity, and strengthen farmer seed systems and local markets.

This requires going beyond the primary **indicators** used to assess varieties and their potential: yield/hectare, calories, and income. Indicators could be extended to include a broader range of criteria reflecting longer-term societal and ecological imperatives, such as:

- soil health especially measured by nutrient analysis, moisture content, soil organic matter, and macro and micro soil life;
- nutrient content/ha;
- nutrient availability and quality;
- total output/ha;
- total biomass;
- resource efficiency;
- impact on biodiversity; provision of ecosystem services; and
- impact on livelihoods resilience and social equity (IPES-Food, 2016).

Legal and regulatory frameworks should be adapted to a transition to agroecology that is based on integrated and coherent multi-sectoral food policies. Long-term objectives and planning that respect human rights, particularly the right to food, should be central. In relation to inputs such as seed, there is a need to address Tanzania's **seed laws** and those of the region, which restrict the trade, exchange and sale of seed that has not complied with commercial requirements. Although **QDS** is recognised in Tanzania, such seed is not being supported or utilised in the input subsidy programmes. In 2015, during a seed review process, QDS was proposed for expansion to the district level, which would open possibilities for QDS having a broader geographical reach (ESAFF, 2014; TOAM, 2015; ACB, 2016a). QDS may provide an opportunity for production of farmer varieties, if the requirements of distinctiveness, uniformity, and stability (**DUS**) are reformed to allow for more flexibility for breeding materials based on farmers' varieties, and to incorporate greater heterogeneity. This is central to agricultural biodiversity conservation, maintenance and dynamic adaptation.

The Southern African Development Community (SADC) provision for the **registration of landrace varieties** could be explored and engaged with, towards finding suitable avenues to accommodate farmer varieties (SADC, 2008). SADC has the provision for labelling QDS for trade, with the vision to cater for registered landrace varieties. These provisions should be explored in greater detail.

There are many ways that the government of Tanzania could use these programmes to support and strengthen existing seed production in the country, as well as farmer seed networks. Farmers and organisations such as MVIWATA, Sustainable Agriculture Tanzania (SAT), Eastern and Southern Africa Farmers Forum (ESAFF), Participatory Ecological Land Use Management (PELUM), Tanzania Alliance for Biodiversity (TABIO) and Tanzania Organic Agricultural Movement (TOAM) are working on conservation, seed selection, and variety development, QDS and other areas. ESAFF, for example, has been working towards certifying a local maize variety under DUS criteria, so that it can be marketed.³⁸ Such case studies provide potential for learning from these experiences as we move towards finding seed systems suitable and appropriate for smallholder farmers, and farmer varieties.

Integrated soil fertility management practices is a recognised and practical aspect which can be integrated into extension work. The expansion of Conservation Agriculture (CA) and Climate Smart Agriculture (CSA) across the region and in Tanzania (Rioux, 2017; Jayne, Sitko et al, 2018) opens a window to a healthier production system. At their core these approaches seek to improve soil health through the nurturing of the soil. Three core techniques are minimum or no till, crop rotation/intercropping, and permanent ground cover through mulching and legume cover crops. The promotion of such techniques is a positive step.

Some proponents of CA and CSA argue for continued use of herbicides and synthetic fertiliser. Sometimes the argument is that a transition is needed where people have

38. Interview with Pelum Tanzania Coordinator 24 August 2017.





already been using these inputs. Even in other areas, there may be serious soil nutrient deficiencies or pest problems and there are few other options immediately available. Manure is bulky to transport long distances and not all areas have sufficient livestock. However, when you look behind CA and CSA support is heavily skewed towards the Green Revolution inputs, while very few resources are channelled to building up the agroecological alternatives over time. Mauritius offers an example of what could be done. Due to the Mauri GAP³⁹ Level 1 standard, government subsidies are directed towards supplying organic fertilisers to farmers.

Currently even the e-voucher approach limits the farmer to what is available at the participating agrodealers. This restricts what farmers have available. A proposal from Ghana and Burkina Faso in West Africa is that farmers directly receive cash incentives for proven adoption of defined agroecological practices as an alternative to the Green Revolution input subsidies.

Although in transformation, the highly political nature of input subsidy programmes means they may not simply be discontinued. However the pathway forward is not entirely clear and this presents an opportunity for farmers, CSOs and others to propose alternative forms of farmer support incorporating diverse agroecological practices.

39. MauriGAP Level 1 standard is the basic standard for the production of crops under biofarming systems. This standard has already been gazetted. The aim is to encourage farmers to shift from conventional agricultural practices, which are based on heavy utilisation of chemical inputs to bio or organic farming, with less or no use of chemical inputs.

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