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POLICY BRIEF

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The Seed Potato Gap in Uganda: An Investment Opportunity, and a Challenge for Value Addition

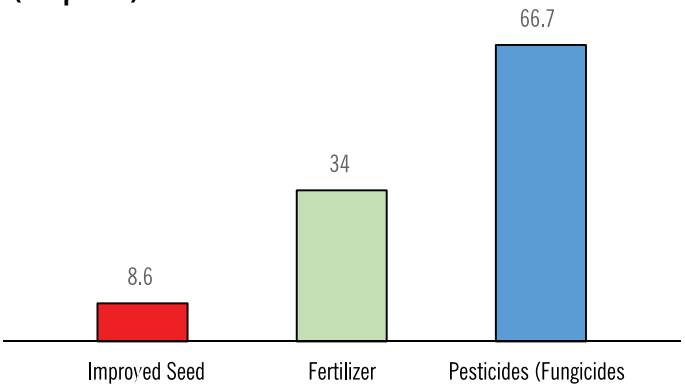
Executive Statement

Shortage in seed potato is identified as a major problem affecting quality potato production in the Kigezi sub-region. The shortfalls in supply has three dimensions (i) the limited volumes of clean seed produced, and (ii) inadequacies in the supply of the right potato varieties - to support industrial level processing of potato into crisps and quality frozen chips. A mix of both primary and secondary (FAOstat) data are used to quantify the volumes and value of basic seed potato produced through the certified sources: the Kachwekano Zonal Agricultural Research Development Institute (KAZARDI), and the private foundation seed potato multipliers. Currently it is estimated that the country needs to produce about 25,400 metric tons of quality seed worth Ugx 28.1 Billion (US$ 8.2 million) which is about 34 percent of the required amounts. In addition, some of the seed supplied by private seed producers is of low quality; only 47 percent of the seed multipliers are registered, which points to the weaknesses in the seed regulatory system.

Introduction

Potato production in Uganda is constrained by lack of inputs namely fertilizers, pesticides and clean seed[1] amongst others. Most potato producers in the Kigezi sub-region are subsistence farmers characterized by poor farming methods, which include use of poor quality inputs. For example, over 90 percent of farmers use poor quality recycled seeds (Figure 1).This leads to low productivity and yields– 4 to 7 metric tons per hectare– which is 60-80 %[1] lower than the 21 MT/Ha estimated potential. While farmers have access to a range of improved potato varieties (like *Rutuku*, *Victoria* and *Kachport1*) intensification is constrained by the numbers of organized and certified foundation seed producers (Ferris et al, 2001)[2].This brief is an extract from the main study[3], and analyses the seed potato supply gap to inform investment decisions and to shape the formulation of the sub-regional potato zonal investment plan (ZIP).

Figure 1: Indicative % Community level use of Inputs (Response)



Source: PASIC Community and Market Potato Value Chain Survey (May, 2015)

Facts about the Seed Potato Production System

Uganda's seed potato supply chain is supported by three agents: (i) KAZARDI[2]: a public agency, which produces certified basic seed in different varieties - *Victoria*, *Kachpot1*, *Rwangume*, *Kinigi*, and *Rutuku* - used in the propagation of the foundation seed planted

1 Figures from IITA PASIC agronomic survey results show that: Potential potato yield is about 37 MT/ha; on station yield under best practices (25 MT/Ha). With high quality propagation materials, pest and disease management & fertilization the yield is 18 Mt/Ha.

2 An agency of the National Agricultural Research Organization (NARO)

by farmers to produce ware (table) potato; (ii) the private seed potato multipliers: A team of fairly sophisticated farmers, whom approximately 53%[3] are registered by Uganda National Seed Potato Producer' Association (UNSPPA); and (iii) Farmers who recycle seed potato from the previous harvest. The recycled seed potato is of poor quality. From figure 1, close to 90 percent of farmers use this recycled seed potato. From the above it is evident that each of the three actors play a unique role in the seed potato supply chain in country, albeit with different levels of expertise in upholding standards of the quality of seeds supplied to the farmers.

Nonetheless, seed potato production is a profitable business, with average production cost of about Ugx 2.1 million per acre with an expected gross revenue Ugx 6 million (Table 1). This leads to an estimated gross profit of Ugx 3.9 million per acre. Moreover, the results also indicate that farms with higher yields per acre could earn a gross profit as high as Ugx 8 million per acre. Table 1 suggests that very small seed potato producing farm units are likely to make losses; therefore economic viability of a seed farm unit is dependent size of the land operated[4].

Inadequate Quantities of Seed Potato

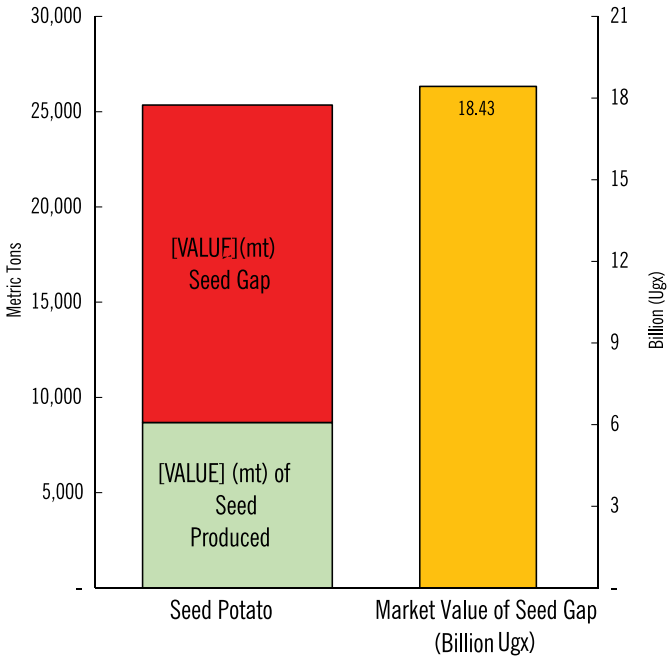
It is estimated (Figure 2) that the country requires about 25,400 metric tons- worth US$ 8.2 million- of certified quality seed per annum. However, an unexploited gap of about 17,000 metric ton– worth US$ 5.6 million-of seed potato production annually remains due to limited capability in the seed potato supply chain. The second dimension of constraints to seed potato supply chain relates to potato varieties the seed system produces as illustrated on figure 3.

3 Approximately 47% are not registered (refer to main report for details)
4 Average land size is about 0.6 acres in the Kigezi sub-region. This may explain why most of the potato farmers can not engage in seed potato production.

The Indequacies in the Supply of Varieties for Processing

From Figure (3a), during the main season KAZARDI produces about 364 bags -80 Kgs- of certified basic seed in different varieties - *Victoria*, *Kachpot1*, *Rwangume*, *Kinigi* and *Rutuku.* This production pattern responds to the attributes of potato preferred by producers: *fast maturing; highly demanded; disease resistant; availability of basic seed; and high yielding (Figure 3c).* The production pattern at KAZARDI mirrors that followed by the private seed multipliers. This reinforces the view that the capabilities and priorities of KAZARDI for producing basic seed potato varieties are interlinked with those of private seed multipliers.

Figure 2: Estimated Seed Potato gap in volume (metric tons) and Value (billion (Ugx)



Source: PASIC community and market potato value chain survey (May, 2015)

Table 1: Indicative Costs and Revenues from Seed Potato Multiplication Business.

Variable	Mean	Std. Dev.	Minimum	Maximum
Area (acres)	1.2	1.2	0.1	6.0
Yield (120 Kg bags/acre)	45.2	30.9	3.0	120.0
Gross Revenue (per acre) Ugx million	6.0	3.8	0.4	14.4
Unit Price (per bag) Ugx	132,664	23,930	75,000	180,000
Cost of Inputs (per acre) Ugx million	2.1	1.4	0.4	6.4
Gross Profit (per acre) Ugx million	3.9	-	(0.0)	8.0
Sample size (n)	30			

Source: PASIC Community and Market Potato Value Chain Survey (May, 2015)

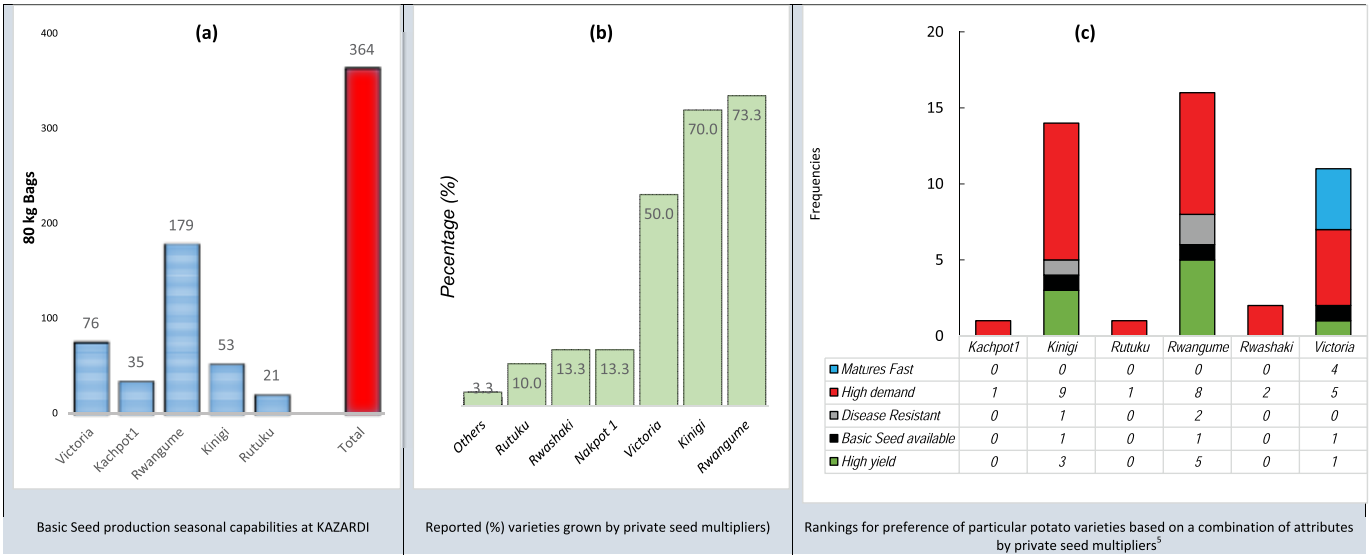
Value addition is constrained by unreliable supply of potato seeds of varieties (*like Kachpot 1*) suitable in the processing of potato into crisps. Figures (3a and 3b) show that both KAZARDI and the private seed multipliers produce more of varieties like -*Rwangume, Kinigi, and Victoria* that tend to match more of the preference criteria in Figure 3c. While seed for *Kachport1*- a highly demanded variety for processing, is not adequately produced (figures 3a and 3b). In this regard, there is a perpetual shortage in the supply of seed potato suitable for processing.

Preference for Kachpot 1 (in Pic 1) is explained by its high dry matter content and the smooth red skin, which is suitable for making of crisps (Pic 2). Some industries such as those owned by Uganda Industries Research Institute (UIRI) process potatoes into quality crisps branded 'EMONDI' (Pic 2). However, inadequate and unreliable supply of *Kachpot1* potato variety was cited as a major constraint to the value addition business operations of UIRI. Varieties such as Victoria (Pic 3) are not suitable for processing crisps because it has low dry matter and have "deep eyes" that leads to wastage on peeling. Other varieties like *Kinigi* are unsuitable for industrial level processing. However, the crisp produced using *Kinigi* are of poor quality due to 'blemish rings colouring' (Pic 4).

Conclusions and Recommendations

One of the major challenges slowing down increased productivity in the potato sub-sector is partly due to limited supply in seed for propagation. The shortfall in supply of improved seed is estimated to be 17,000 metric tons- valued at Ugx 18 Billion in the country. This challenge can be an investment opportunity because seed potato production is a profitable venture with relatively high profit margins. Constraints facing the seed potato supply chain is in two dimensions:

Figure 3: Seed potato varieties grown (% of private seed multipliers)



Source: PASIC Community and Market Potato Value Chain Survey (May, 2015

Pic1: Kachpot1 has a Smooth & Red Skinned Varieties with high dry matter content preferred in Making of Crisps

Pic 2: Industrial Processed High Quality Crisps by Uganda Industries Research Institute (UIRI) in Kabale

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Pic 3: 'Deep eyed potato varieties with low dry matter content like Victoria are not preferred by processers.

Pic 4: Kinigi produces crisps with a blemish ring couloring

(1) the limited volumes of quality seed produced; and (2) production of the right potato varieties to support industrial level processing of potato into high value products like crisps. The constraints are exacerbated by the limited capacity at KAZARDI to produce adequate amounts of certified quality basic seed. It is worth noting that in the past 3 years, there has been decentralization in seed multiplication to reduce public control and allow private seed potato multipliers to technology fill the gap, however this initiative to bridge the seed gap also faced with the same constraints facing KAZARDI.

To address the inadequacies in the seed potato supply chain, the government and the private sector should aim at building capacity in seed multiplication that would increase not only the quality of seed produced, but also generate potato varieties that can be processed for value addition. The study proposes that investments (both public and private) should be directed towards narrowing the gap in seed potato supply by:

- Expand the production capacity of basic seed potato at KAZARDI that is overwhelmed by the growing demand for quality seed;
- Replicate efforts initiated by the International Fertilizer development Centre (IFDC) by constructing screen houses to enable more farmers, in all the sub-counties across the three districts (Kabale, Kisoro and Kanungu), to become foundation potato seed multipliers. Priority must be directed towards production of market-demanded potato varieties- *Kinigi*, *Rwangume* and *Victoria*- and other varieties that are high yielding, fast maturing, disease resistant, and can support industrial scale processing businesses.
- The rankings were capture on a likert scale equating 1 to the most preferred variety

Endnotes

1 Okoboi G. & Ferris, R.S.B. (2002). The export marketing potential of seed and ware potatoes in Uganda, Tanzania and Kenya with respect to the Rwandan market. IITA – FOODNET, pp. 57.
2 Ferris, R.S.B., Okoboi, G., Crissman C., Ewell, P. &Lemaga, B. (2001). Uganda's Irish potato sector. Report prepared for Government of Uganda's Conference on Competitiveness of Selected Strategic Exports. IITA-FOODNET, CIP, PRAPACE CGIAR and ASARECA
3 Mbowa Swaibu and Mwesigye Francis (2016). Investment Opportunities and Challenges in the Potato Value Chain Uganda. Draft report produced by Economic Policy Research centre (EPRC) under the PASIC project

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