

Indicative Lost Income due to Limited Technology use in Irish Potato Production

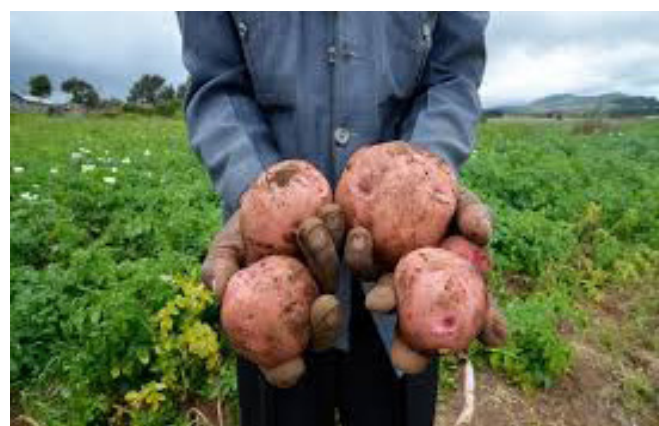
Executive Statement

Low Irish potato yields negatively affects growth of the agriculture economy, and consequently the incomes of population dependent on potato production in Kigezi sub-region. The low yields are largely driven by non-adoption of productivity enhancing technologies - fertilizer, improved seed, and agro chemicals. Estimates from IITA agronomic survey data indicate that use of high quality seed with fertilizer increases potato yield from 6.4 MT per hectare to 16.5 MT per hectare, which leads to an increase in potato production, at national level, from 867 thousand metric tons to 2,234 thousand MT annually. This would increase by 157% fold the monetary value potatoes produced from Ugx 628 billion (USD 187 million) to Ugx 1,619 billion (USD 484 million) per annum. The estimated loss of potential income by farmers is approximately Ugx 991 billion (US\$ 298 million). The loss is due to limited intensification, such as low application of fertilizer and improved seed, at the production level of the value chain. Further analysis of profit margins along the potato value chain suggest that commercialization, and value addition are income enhancing.

Introduction

Uganda's vision 2040 envisions transformation of the country from a predominantly peasant and low income country to a competitive upper middle income country by the 2040. Transformation of agriculture remains central to fostering economic growth and poverty reduction consistent with vision 2040. However, the agricultural sector has been growing at a dismal rate of 1.5 percent, which threatens the future prosperity of more than 72 percent of the country's population dependent on agriculture.

The poor yields and productivity largely driven by low adoption of productivity enhancing technologies, namely; fertilizers, improved seed, irrigation, pesticides etc is largely responsible for this poor performance in agriculture. This brief uses the *Irish* potato as a case study, to demonstrate how agricultural transformation through crop intensification (improvements in yield) can contribute to growth in the local economy of

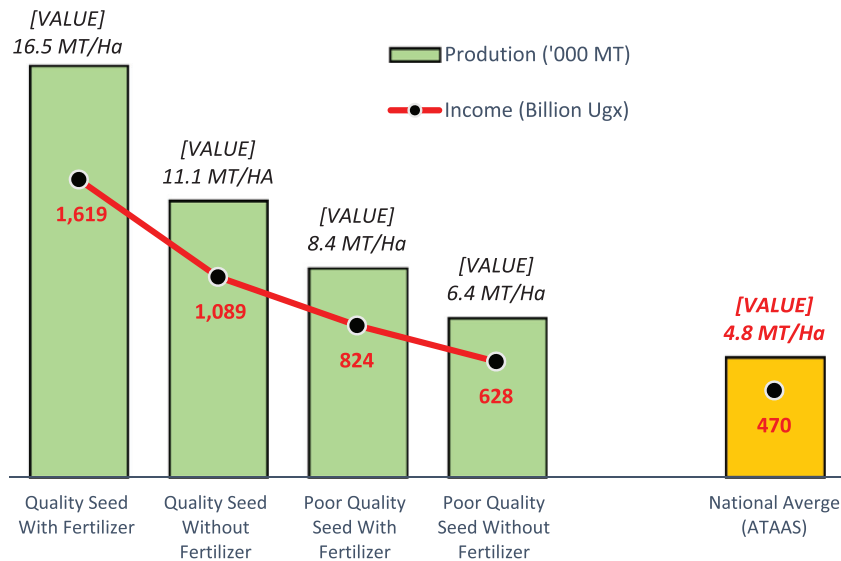


the Kigezi sub-region; dependent on Irish potato production. The detailed analysis is available in the main report

Implications of Potato Yield Gaps on agricultural incomes

Information in Figure 1 shows that use of *poor quality seed-without fertilizer* in potato farming, yields only 6.4

Figure 1: Indicative Potato Revenue With & Without intensification



Source: Author’s computations based on PASIC agronomic survey data (IITA, 2015) & NAADS (2015)

metric tons per hectare (from 135 thousand hectares known to be under potato production nationally). This level of production would result into about 867 thousand metric tons of potato per annum output valued at about Ugx 628 billion (US\$ 187 million).

Figure 1 further shows that using *poor quality seed-with fertilizer* can increase productivity in potato production to 8.4 MT per hectare (i.e. by 31% from 867 to 1,137 thousand metric tons). But use of *good quality seed-without fertilizers* can lead to 73% increase in potato production hence farm incomes country wide. Use of *quality seed with fertilizer* produces best intensification technology options with a yield of 16.5 MT per hectare hence an 158% increase from 867 to 2,234¹ thousand metric tons and farm income per annum country wide – valued at Ugx 1,619 billion (US\$ 485 million). Such estimates suggest that the country’s potato sector is losing a potential income of approximately Ugx 991 (US\$ 298 million) per annum due to limited intensification at the production level of the value chain.

An extended analysis of gross margins along the potato value chain (Table 1) shows that potato value addition into crisps and

commercialization of agriculture production can have positive effects on farmers’ incomes. Therefore gains in productivity, increased trade in quality potato, and increased value addition can upgrade (improve) the potato value chain.

Technology uptake and effectiveness

Summary results from the community survey in (Table 1) reveal that potato farmers at the community level in the Kigezi sub-region know that use of improved seed, inorganic fertilizer, and disease control chemicals, are the most effective interventions for improving potato yields, respectively. This is clearly demonstrated by the ranking of these technologies (as the most effective in improving potato yield) in the focus group discussions (FGDs) as illustrated in Table 1. This reinforces the result in Figure 1 showing that improved seed and use of fertilizer increase productivity in potato production. However, it is evident that 35% use fertilizers, 8% use improved seeds and close to 66% of farmers apply pesticides and fungicides (IFPRI, 2015). The mixed level of technology

uptake could explain the relatively low (4.8 MT per hectare) national potato yield cited in NAADS (2015). High input cost, presence of fake agro-inputs on the market, long distances and inaccessibility, and lack of knowledge on the use of agro-inputs.

Increase in productivity through intensification from individual crop commodities (like in irish potato) provides a pathway for growth in Uganda’s agricultural sector

¹ If the national average potato yield of 4.8 MT per hectare were to be used as the base to illustrate the effects of intensification in potato cropping system. The gap in productivity would widen (taking into account different technology packages)

Table 1: Percentage of farmer groups reporting the ranks of different practices

Technology Category	Rank ¹ according to the most effective					Total %
	1	2	3	4	5	
Fungicides/insecticides	32	20	30	10	8	100
Inorganic fertilizers	33	45	18	4	0	100
Improved Potato seeds	40	14	14	21	12	100
Organic fertilizer	2	22	20	39	17	100
Herbicides	3	11	14	38	35	100

Source: PASIC Community and Market Survey of potato VC actors (May, 2015)

Gross Margins Analysis in potato value chain

Table 2 shows the prices and gross margins from the 120 kg bag each actor sells. On average, farmers earn less in terms of gross profits and prices compared to traders and processors. Farmers sell a (120 Kilogram) bag of potato for an average of 82,000 Uganda Shillings (Ugx), traders sell the same bag at Ugx115, 000, while the processors sell crisps worth Ugx 304,524 from one bag. This suggests that value addition increases the gains from potato production. This implies that potential income earned by actors along the potato value chain can improve with: high farm productivity; growth in trade businesses; and value addition through processing (Table 2).

Table 2: Gross Margins at different segments of the value chain (per 120 Kg Bag)

Financial Indicator	Farmers	Traders	Processor (Crisps Makers)
Total Revenue	82,000	114,962	304,524
Total Cost	29,949	104,195	94,013
Gross Profits	52,051	10,767	210,511
120 Kg Bags Produced/ Trades/Processed	18	179	7.7
Observation (n)	422	30	30
<i>Source: Computed by authors using PASIC value chain data, 2015.</i>			

Conclusions and Recommendations

The brief demonstrates that, limited intensification and commercialization of cropping systems (in this case potato sub-sector) negatively affects the potential growth in agricultural sector in the country.

This brief proposes a two pronged approach to address identified constraints to intensification originating from the limited use of improved seed, and fertilizer:

- Directing both public and private sector investments towards making clean seed potato available and affordable through the expansion of the production capacity of basic seed potato at KAZARDI. There is need to replicate best practices and efforts initiated by IFDC of constructing screen houses to enable more farmers and other private actors to increase capacity in quality potato seed multiplication in all the sub-counties across the three districts - Kabale, Kisoro and Kanungu.
- Modalities to build the capacity of the agro input dealerships - with ownership embedded within potato farming communities to enhance easy access- need to be instituted to supply adequate amounts of requisite inputs - fungicides, fertilizers, and other critical chemicals - in potato production. This can be operationalized through promotion of group savings schemes that can purchase quality guaranteed inputs in bulk. Such saving schemes can be turned into potato production Savings and Credit Cooperatives (SACCOs) that extend financial services to farmers at relatively lower interest rates.
- It has been proven that high margins are earned by traders and processors. Therefore the two value chain activities are identified as critical in upgrading the potato value chain in particular, and growth in the potato sub-sector in general. Therefore it is urgent to build industrial level potato processing capacity through private public partnerships (PPPs) in the Kigezi sub-region.

Recent Policy Briefs

“Floating Fish Cage Farming a Solution to Uganda’s Declining Fishery Stocks”
No. 66 June 2016
Swaibu Mbowe, Tonny Odokonyero and Anthony T Munyaho

“The role of the public sector in incentivizing the uptake of climate-resilient seeds in Uganda”
No. 65 June 2016
Annette Kuteesa and Miriam Katunze

“Creating an enabling policy environment for agricultural finance to support climate risk management in Uganda”
No. 64 June 2016
Annette Kuteesa and Miriam Katunze

About the Authors

Swaibu Mbowe is a Senior Research Fellow at the Economic Policy Research Centre (EPRC)

Francis Mwesigye is a Research Fellow at the Economic Policy Research Centre (EPRC)

The views expressed in this publication are those of the authors and do not necessarily represent the views of the Economic Policy Research Centre (EPRC) or its management.

Copyright © 2016

Economic Policy Research Centre

Footnotes

- 1 The rankings were captured on a likert scale equating 1 to the most preferred variety
- 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 Mbowe 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

The Economic Policy Research Centre (EPRC) is an autonomous not-for-profit organization established in 1993 with a mission to foster sustainable growth and development in Uganda through advancement of research –based knowledge and policy analysis.

Learn more at:

 www.eprcug.org

 TWITTER: @EPRC_official

 www.facebook.com/EPRCUGanda

 eprcug.org/blog

Address:

Economic Policy Research Centre
51, Pool Road, Makerere University Campus,
P. O. Box 7841 Kampala, Uganda
Tel: +256414541023/4 Fax: +256414541022
Email: eprc@eprcug.org, Website: www.eprc.or.ug