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Cost of Production for Irish Potatoes for the 2018 Main Cropping Season in Kenya

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Policy Brief

SUMMARY

Tegemeo Institute conducted an assessment of the cost of production for Irish potatoes in September 2018. The assessment captured the costs under rainfed production system for small-scale farmers in Nakuru and Nyandarua counties, which are two major production areas in the country. The cost of producing a bag of potatoes in 2018 was KES 3,937 for farmers in Nakuru and KES 4,325 for those in Nyandarua. The primary drivers of the high production costs were low productivity of about 1.4 tons/acre (due to excessive rainfall) and high cost of seed. Excessive rain led to waterlogging and in some areas increased prevalence of potato blight. If farmers had recorded yields equivalent to the long-term average, the production costs per bag would have been significantly lower, at about one-third of the costs in 2018. Farmers also faced market prices that were much higher due to production shortages. Despite the high market prices, farmers barely attained the breakeven point, with those in Nakuru registering losses. Nonetheless, simulations with the good year average yields and market prices indicate that farmers would make profits.

Farmers faced challenges in accessing quality certified seed. In addition, they were constrained in participating in the market, with the marketing of Irish potatoes dominated by brokers and traders. The study recommends policies for increasing productivity and competitiveness. First, there is need to enhance access to quality seeds through multiplication of seed using technologies such as tissue culture as well as importation of certified seeds. Second, to improve market access, there is need for support in the construction of cold storage facilities in the production areas. Use of such facilities will reduce post-harvest losses and overcome the need to sell immediately after harvest when prices are at their lowest. Further, organising farmers into producer associations around aggregation centres will increase their marketable volumes and bargaining power. Finally, there is need to resolve laws on potato packaging to benefit producers.

BACKGROUND

Kenya is the fifth largest Irish potato producer in Sub-Saharan Africa and had an output of 1,335,883 tonnes in 2016 (FAO, 2018). The crop is the second most important staple food after maize with approximately 800,000 growers in 2015 and it plays a crucial role in national and nutrition security (MoAI, 2016). It is produced mostly by small-scale farmers under rain-fed conditions. The number of cropping seasons per year ranges between three and four depending on varieties planted and weather conditions. The production seasons are on average 3-4 months long. Irish potatoes is critical for addressing food insecurity, unemployment and low incomes in rural areas due to its high productivity and versatility in utilisation.

Irish potato farmers face several challenges: high production costs that make them uncompetitive; high price variation across seasons; and, competition from imports from neighbouring countries, mainly Tanzania, although data on volumes that are imported into the country remains scarce. It is, therefore, necessary to establish the production costs that farmers face to evaluate their competitiveness and profitability and also inform government interventions for the commodity.

Tegemeo Institute conducts an assessment of the cost of production for key staples annually. It is against this background that the Institute included Irish potatoes in the 2018 assessment. The year was characterised by above normal rainfall that was well distributed in time and space.

Data and Methods

The assessment for the cost of production for Irish potatoes follows the typical farm approach described by Deblitz & Zimmer (2005). First, the major Irish potato growing regions were identified. Secondly, a prototype farm was established characterising the production system practices in the selected areas. The final step was to validate the results generated and attain consensus on the information collected. This approach involved farmers, extension officers, and other experts in the selected regions including input suppliers and other relevant actors in the Irish potato value chain.

The 2018 assessment was carried out in Nakuru and Nyandarua counties that were purposively selected based on their high production of Irish potatoes. The county agricultural officers were involved in choosing the specific locations for the assessment. Kuresoi South Sub-county in Nakuru County and Kipipiri Sub-county in Nyandarua County were selected for the assessment.

Data was then collected through the use of focus group discussions with farmers and various experts in Irish potato production such as the Ward extension officers, input suppliers and traders.

Results

Table 1 shows the farm level characteristics of Irish potato farmers in Nakuru and Nyandarua counties. The producers are smallholder farmers cultivating less than 2 acres. Farmers in Nakuru had more land under Irish potato cultivation (2 acres) than in Nyandarua (0.5 acres). Farmers in the two regions used fertilizers at an intensity of 100 kg of basal fertilizer per acre. They cultivated the Shangi variety and mainly used recycled seed. The application rate for seed was eight 110-kg bags per acre. Notably, farmers in the two counties had similar systems only differentiated by the scale in terms of the size of land under Irish potato cultivation.

Majority of the farmers produced for the market, with farmers selling 75 and 64 percent of the total quantity produced in Nakuru and Nyandarua, respectively.

Table 1: Characteristics of Irish potato farmers

Characteristics	Nakuru	Nyandarua
Total acreage	5.0	2.0
Acreage under potatoes	2.0	0.5
Seed variety	*Shangi*	*Shangi*
Commercialization	75%	64%
Seed (110kg bags/acre)	8.0	8.0
Fertilizer (kg/acre)	100	100

Table 2 presents the cost of production per acre for Irish potatoes. As mentioned earlier, above normal rainfall was received in 2018. This had a negative impact on Irish potato productivity in both counties. Yield for farmers in Nakuru was 1.35 tons/acre (12.3, 110-kg bags/acre), while Nyandarua recorded 1.43 tons/acre (13, 110-kg bags/acre). These yields were very low compared to the long-term average yield of 4.4 tons/acre (40, 110- kg bags/acre). Excessive rainfall led to waterlogged soils that affected the Irish potatoes and other crops.

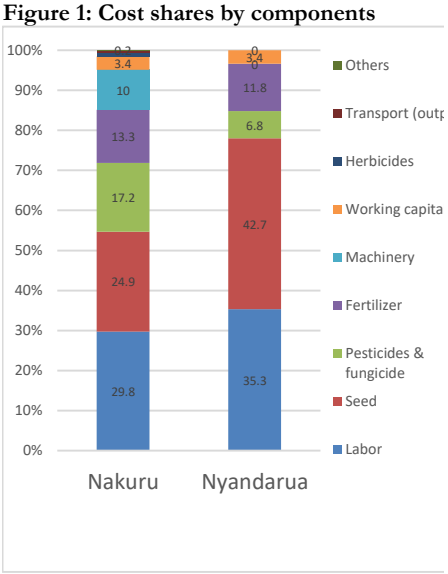
Per acre cost of production in Nakuru was KES 48, 234, while it was higher in Nyandarua at KES 56,221, bringing the cost per 110-kg bag to KES 3,937 and 4,325 for the two areas, respectively. In both counties, planting was by far the most expensive activity mainly due to the cost of seed. Notable differences in production costs between the two counties were due to: pest and disease control, where farmers in Nakuru suffered from a higher prevalence of pests and diseases mainly due to agroecology; land preparation since farmers in Nakuru used mechanised equipment for land preparation due to availability of tractor hire services, which, are not available in Nyandarua.; and, cost of weeding.

Table 2: Per acre cost of production for Irish potatoes in 2018

Item/activity	Nakuru	Nyandarua
Yield (110 kg bags)	12.3	13.0
Land preparation	4,800	3,600
Planting	22,000	35,800
Weeding	5,500	4,800
Foliar and application	400	640
Pest & disease control	9,100	4,680
Harvesting & handling	4,803	4,800
Working capital	1,631	1,901
Total costs	48,234	56,221

Figure 1 shows the contribution of different components to the total cost of production.

Figure 1: Cost shares by components



In Nakuru, labour, seed and pesticides contributed the highest to cost in that order, while in Nyandarua, seed accounted for the largest cost component followed by labour and fertilizer. Despite seemingly similar systems, farmers in these two counties had different production environments and practices that ultimately affected their production costs. Nakuru is also are more susceptive to pests such as aphids and cutworm possibly due to a warmer environment compared to Nyandarua. Aphids are vectors of diseases such as leaf roll disease. Therefore, farmers in Nakuru spent more on pesticides.

Farmers in both regions sold potatoes to middlemen although Nyandarua farmers had a better price of KES 4,500 compared to KES 3,500 in Nakuru. From these market prices, farmers in Nakuru were unable to recover their production costs, while those in Nyandarua made a small margin. It is plausible that this higher price led to the higher cost of seed in Nyandarua since farmers used recycled seed from own production.

It is typical of smallholder Irish potato farmers to use own land for production. However, in a model where they lease in land for production, the costs are higher. On average the land rent in both counties was KES 10,000 per acre. Table 4 presents

the production of potatoes with and without land rent. With land rent, the cost of production rises to KES 55, 234 (KES 4,509 per 110- kg bag) and 63,221 (KES 4,863 per 110-kg bag) per acre for Nakuru and Nyandarua, respectively.

Table 4: Production costs with and without land rent

	Item	Nakuru	Nyandarua
Scenario I	Yield	12.3	13
	Cost/acre	45,234	53,221
	Cost/bag	**3,937**	**4,325**
Scenario II	Land rent	10,000	10,000
	Cost/acre	55,234	63,221
	Cost/bag	**4,509**	**4,863**

The 2018 main cropping season was characterized by low potato production. If the year had been favorable for production, farmers would have made profits. Table 5 shows the simulation of the costs based on a good year harvest holding the production costs per acre constant.

Table 5: Simulations: good year average yields and market prices

	Nakuru	Nyandarua
Yield (bags/acre)	40	40
Cost per acre	48,234	56,221
Cost/bag	**1,206**	**1,406**

The average cost per bag, if farmers had registered yields equivalent to the good year average yield would have been KES 1,206 and KES 1,406 in Nakuru and Nyandarua, respectively. However, this is an upper bound for costs since it is likely that the cost of seed would have been much lower than in 2018. Farmers would be able to break even and make reasonable margins given that at the good year average yield, the market price for a 110-kg bag would be KES 2,000.

Key Findings

- Yields were suppressed during the main season with farmers achieving 12.3 and 13 bags of 110-kg for Nakuru and Nyandarua, respectively. These yields very low when compared against the good year average yield of 40 bags per acre in these areas. This was attributed mainly to water logging due to above normal rainfall received in 2018.
- The production costs per 110-kg bag were KES 3,937 and KES 4,325 in Nakuru and Nyandarua, respectively. These costs were much higher than farmers would expect to face in a good harvest year. This emphasizes the role of increasing productivity in competitiveness at the farm level.
- Similarly, market prices were much higher due to constrained supply. On average the prices would be almost half of the market prices in 2018. The prices are more reflective of the production shock in the market and are expected to go down once production improves.
- The cost of seed in 2018 was very high. This is likely influenced by the low production and high market prices since farmers mainly recycle seed from own production.
- There is an acute shortage of clean seed for improved varieties for Irish potatoes in Kenya and hence farmers mainly use recycled seeds, which compromises yields.
- The cost of labour was also significant, with farmers experiencing shortages during peak periods in the production cycle. Mechanization by Irish potato farmers is only practised for land preparation. There is room to promote appropriate mechanization for critical activities.
- Pest and disease control varied by the environment. In Nyandarua, the was lower prevalence of pests and diseases. Their control is also affected by the farmer's liquidity position, which underscores the need to ensure farmers can access credit where they are financially constrained.
- Land rent has also been rising annually. There is need to monitor rental costs of land for a sustainable business model.
- The marketing channel is controlled by middlemen, who usually finance farmers during harvesting. Lack of cold storage facilities implies that farmers are not able to store the produce and look for better markets.
- Although a law on standard packaging for Irish potatoes was passed in 2016, the Act was challenged and is currently not enforced. The current packaging helps traders more than farmers.

Policy Implications

- There is need to improve access to certified seed. Strategies such as tissue culture should be promoted to enhance production of clean seed to enhance access to improved varieties. The country also needs to put in place necessary mechanisms to enable importation of certified seeds.
- Where certified seed is not available, access to quality seed can be enhanced by training farmers on practices such as positive selection. Also, farmers need to be sensitized on the need to use recycled seeds of medium size rather than the small leftover tubers. This will ensure that when farmers used recycled seed, the seed planted will have vigour and higher productivity.
- Promotion of climate-smart agricultural practices is required in order to build resilience to effects of climate variability and change. The role of research and extension in providing advisories based on weather forecasts is critical. The advisories should be broader than weather forecasts to include agronomic practices that farmers should adopt given expected prevailing weather conditions.
- Farmers should be supported with cold-storage facilities. The development of such facilities can be through public-private partnerships and should include market linkages as well. These facilities will play a critical role in reducing post-harvest losses as well as ensure that farmers can aggregate their produce and attract improved terms from players up the value chain. Where possible, farmers should be supported to form producer associations around the aggregation centres.
- The law on Irish potato packaging standards need to be resolved as soon as possible to protect producers' interests.

REFERENCES

Deblitz, C., & Zimmer, Y. (2005). A standard operating procedure to define typical farms. Available at: http://www.agribenchmark.org/methods_typical_farms.htm

FAO (2018). Food and Agriculture Organization of the United Nations. Statistical database (FAOSTAT).

MoALF,2016, The National Potato Strategy, 2016-2020. Available at: http://npck.org/Books/SeedPOLICY.pdf

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