# Early generation seed production for roots, tubers and bananas is financially viable for private sector seed companies in East Africa

- CIP conducted a financial feasibility study for a private seed company engaged in early generation seed (EGS) production for root, tuber and banana crops.
- The study showed that the business is financially viable in the long-run based on the existing business for production and sale of banana, cassava, sweetpotato and potato planting materials.
- The business required an initial total investment of US$1 million and running costs of US$0.15 million during an eight-month establishment period.
- The payback period for this level of investment would be between three to seven years, with an average annual return of between 34-70%.
- Inclusion of sweetpotato in the business increased its financial viability over time.

SASHA Sweetpotato Action for Security and Health in Africa

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## What was the problem?

In the past, there has been limited engagement from the private sector in seed production of vegetatively propagated crops in part due to limited understanding of the return to investment, profitability, cost of production and the challenge of reliably forecasting demand. To date, the public sector has been more involved in EGS seed production for root, tuber and banana (RTB) crops, and also faces similar constraints. However, with the increasing prioritization of RTB crops as their essential contribution to livelihoods is recognized, together with major threats to food security from seed-borne diseases such as cassava brown streak virus and banana bacterial wilt, opportunities for business to profit from the growing demand for quality planting material are increasing. For example, studies have shown potential markets for banana tissue culture derived planting material in Uganda is US$4.8 million and US$5.8 million in Tanzania. However, with the increasing there has been no study to determine the potential capital required and the financial viability of private sector investment in EGS seed production for RTB crops.

## What objectives did we set?

Our hypothesis was that a multi-crop enterprise may be a more attractive option for private seed companies to spread their risk and expand their market base than a single crop enterprise. Therefore, a financial feasibility study to produce EGS for multiple RTB crops was conducted for a private seed company based in East Africa.

## What did we achieve during SASHA Phase 2?

We conducted the study using "Financial Cost-Benefit Analysis (FCBA)" with real and hypothetical data on technical and financial operations, collected from key informants within the company.

The FCBA includes selected decision indicators to understand the feasibility of a multi-crop EGS business:

**1. Net Present Value (NPV).** The NPV is the difference between: the value of all present and future benefits and, the value of all present, and future costs over a defined period, after accounting for initial capital investment in the business. If the NPV is positive, it indicates that the investment made in the proposed business might add financial value to the company and hence, it is worthwhile to invest. If the NPV is negative, then the business is not a financially viable option. It shows how much value an investment in the business adds value to the company.

**2. Internal Rate of Return (IRR).** The IRR is a discount rate at which the NPV of future cash flows is equal to the initial investment. It should be greater than or equal to the discounted rate used in the cash flow for an investor to invest their money into the business.

**3. Sensitivity analysis.** A sensitivity analysis is carried out to determine whether NPV would still be positive if there is a percent reduction in revenue, or percent increase in total running costs and investment or percent increase in discount rate.

In addition, the study also estimated the payback period to measure the length of time required for an investment to recover its initial outlay and become profitable. The Return on Investment (RoI) determines the gain or loss generated from an investment relative to the value invested. It is normally used to compare the efficiency of different investments under different scenarios.

**The seed company's business was focused on the following products:** tissue culture plantlets, pre-basic and basic planting materials (the next level of multiplication in net tunnels or in open fields in low virus-pressure areas). The study showed that the business is financially viable in the long-run based on the existing business model for production and sale of banana, cassava, sweetpotato and potato planting materials. The business required an initial total investment of US$1 million and running costs of US$0.15 million during an eight-month establishment period (Table 1).

The payback period for this level of investment would be between three to seven years, with an average annual return of between 34-70%. Inclusion of sweetpotato in the business increased its financial viability over time. Sensitivity analysis shows that the business is more financially viable in the long-run, even when it experiences shocks such as increased cost of production or reduction in revenue due to various factors (Table 2). The cash flow was based on a 15-year life of the business.

## Were there any key challenges or lessons learned?

- The EGS business requires start-up financial support as the initial investment for establishing the EGS business is high and private seed companies are reluctant to invest due to uncertainty.
- The private sector faces challenges in maintaining cleaned up and pathogen tested tissue culture "mother" plantlets due to the high costs of undertaking virus cleaning and indexing.
- Private seed companies interested in investing in the EGS business should identify potential areas of common interest with public sector seed producers. A public-private sector partnership has high potential to lower costs for the business, reduce risk and be more efficient.
- Small and medium scale private seed companies struggle to identify and to source breeder seed of the varieties required by the market. Therefore, it is necessary to establish linkages with research organizations who are developing new varieties targeting different market segments, and with traders and relevant agro-processors.

## What's next?

There is potential to adapt the current business model to:

- include more crops for EGS production;
- introduce novel technologies to reduce the cost of production;
- optimize use of resources (for example, using solar power and florescent lights and low-cost tissue culture media); and
- expand open field multiplication of basic seed to increase the economies of scale.

The International Potato Center (CIPS) seeks to identify and broker potential business partnerships between interested private sector seed companies and the public sector. By identifying common interests among the parties, the EGS business sector can optimize potential opportunities and minimize threats.

Data collection was undertaken on the condition of confidentiality of source.

Table 1: The total investment made by seed company in East Africa at a discount rate of 17%

| INDICATOR | TOTAL COST (US$) |
|---|---|
| Land Infrastructure | $87,719 |
| Infrastructure Facilities | $775,821 |
| Irrigation Equipment | $9,613 |
| Office Equipment | $9,370 |
| Motor Vehicle | $32,780 |
| Lab Equipment | $129,017 |
| Electrical Equipment and Fittings | $27,956 |
| Safety Equipment | $200 |
| Other Establishment Expenses | $877 |
| Growth Room | $15,000 |
| Field Equipment | $30,000 |
| Miscellaneous Expenses (5% of total initial investment) | $51,532 |
| Total Initial Investment | $1,082,166 |
| Total Running Costs during Establishment Period | $147,949 |
| TOTAL INVESTMENT (Investment and running costs during establishment period) | $1,230,115 |
| Share of Grant Contribution to the Total Investment (Approximate figure) | 18.2% |

Table 2: Financial Feasibility Indicators

| S.No | Scenarios | NPV | IRR | Discount Rate | Payback period (Years) | Return on Investment (RoI) per year (%) |
|---|---|---|---|---|---|---|
| 1 | Base scenario (Status-quo) | $1,983,799 | 39% | 17% | 3.4 | 70 |
| 2 | 20% increase in production & investment costs | $1,440,808 | 31% | 17% | 4.4 | 52 |
| 3 | 20% reduces in revenue | $1,044,048 | 29% | 17% | 4.1 | 40 |
| 4 | 20% increase in production & investment costs & 20% reduction in revenue | $501,057 | 22% | 17% | 6.8 | 34 |
| 5 | Increases in discount rate by 5% | $1,208,428 | 39% | 22% | 3.4 | 57 |


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CGIAR RESEARCH PROGRAM ON Roots, Tubers and Bananas


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