



**Sustainable early
generation seed business
analysis tool (SEGSBAT)**

RTB User Guide

User Guide to the
Sustainable Early
Generation Seed Business
Analysis Tool (SEGSBAT)

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Acronyms

CIP	Centro Internacional de la Papa (International Potato Center)
CRI	Crops Research Institute, Ghana
DARS	Department of Agricultural Research Services, Malawi
EGS	Early generation seed
ICT	Information and Communication Technology
IIAM	Instituto de Investigação Agrária de Moçambique (Agrarian Research Institute of Mozambique)
INERA	Institut de l'Environnement et de Recherches Agricoles (Environmental Institute for Agricultural Research), Burkina Faso
KEPHIS-PQBS	Kenya Plant Health Inspectorate Service, Plant Quarantine and Biosafety Station
LZARDI	Lake Zone Agricultural Research and Development Institute, Tanzania
NaCRRI	National Crop Resources Research Institute, Uganda
NARI	National agricultural research institutes
NRCRI	National Root Crops Research Institute, Nigeria
RAB	Rwanda Agriculture and Animal Resources Development Board
RF	Revolving fund
RTB	CGIAR Research Program on Roots, Tubers and Bananas
SARI	Southern Agricultural Research Institute, Ethiopia
SASHA	Sweetpotato for Security and Health in Africa project
SEGSBAT	Sustainable Early Generation Seed Business Analysis Tool
SRI	Sugarcane Research Institute - Kibaha
SSA	Sub-Saharan Africa
TARI	Tigray Agricultural Research Institute, Ethiopia
VPC	Vegetatively propagated crop
ZARI	Zambia Agricultural Research Institute

Abstract

The sustainable early generation seed business analysis tool (SEGSBAT) is a Microsoft Excel-based tool to help early generation seed producers to estimate their total production costs, customer seed requirement, and production calendar to determine a budget, and amount of source seed needed, among other functions. The step-by-step excel-platform requires some accounting skills, but it is moderately easy to use, and users can adjust it to fit their own situation. SEGSBAT allows an enterprise to set prices for early generation seed that are low enough to attract customers, but high enough to cover production costs and make the seed business financially sustainable. The tool generates two financial scenarios, one with and one without external funding, so that a company can create a revolving fund that will eventually replace donor support. The tool has been used mainly for sweetpotato, but is being adapted for cassava and other crops. In the future, non-economic functions can be added, e.g. to plan for environmental sustainability.

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User Guide to the Sustainable Early Generation Seed Business Analysis Tool (SEGSBAT)

INTRODUCTION

A consistent supply of quality Early Generation Seed (EGS) is the basis for a sustainable seed value chain. Public institutions mandated to produce EGS in sub-Saharan Africa (SSA) are constrained by unreliable funding flows and by the lack of a clear business case, which is especially true for vegetatively propagated crops (VPC). Therefore, 11 National Agricultural Research Institutes (NARIs) have collaborated with the International Potato Center (CIP) through the Sweetpotato for Security and Health in Africa project (SASHA II) in nine sub-Saharan African countries, where they have conducted technical assistance programs to strengthen the sweetpotato seed system. As part of the project, for the first time 11 NARIs developed a business model for sweetpotato EGS business between 2016 and 2019. This was a step towards an effective business orientation, with support from CIP scientists. Sweetpotato is the first root crop in sub-Saharan African countries for which NARIs developed business plans to ensure sustainable EGS production. The plan provides a rationale for why the institution should pursue seed production, a strategy to reach production targets and the potential revenue from the seed enterprise. The business plan also focuses on technical, financial, administrative, socio-cultural and policy components to improve and sustain EGS production and sales. The successful implementation of the business plan requires establishing a Revolving Fund (RF) so that the proceeds from seed sales can be channeled back to cover future production costs. The business plan guides the institution to ensure that recurring production costs can be met from the revolving fund by linking all four components and their functions to improve overall seed systems (Rajendran et al 2017).

For the first time in Africa, in 2017 CIP scientists developed a tool called “Sustainable Early Generation Seed Business Analysis Tool (SEGSBAT) version 1.0” to analyze the financial sustainability of sweetpotato EGS business, linked to a RF mechanism. This tool facilitates the interconnection of financial performance and the sustainability of the Early Generation Seed (EGS) business which is measured by five indicators: i. accurate cost of EGS production; ii. determine appropriate price, profit margin and markup; iii. identify potential market for the product; iv. increase revenue and maintain the positive net cash flow and v. ensure adequate cash balance to meet total cost of EGS production from the RF (Figure 1).

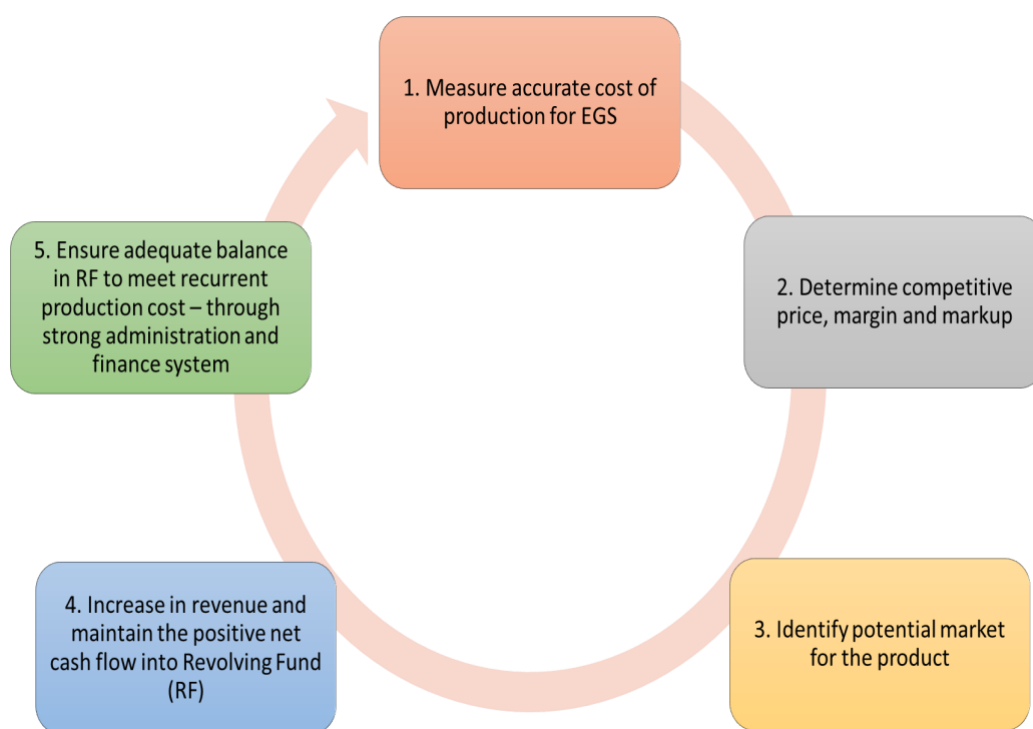


Figure 1. Interconnection of financial performance and financial sustainability of sweetpotato EGS business.

Source: Rajendran and McEwan (2018)

The financial sustainability of sweetpotato EGS businesses, run by 11 NARIs across sub-Saharan African countries were analyzed using SEGSBAT. During this process, CIP scientists have also used this tool for other crops, particularly cassava, through the CGIAR research program on Root, Tubers and Bananas (RTB).

DATA AND METHODS

This tool can measure the financial performance of an EGS business under two different scenarios: with and without project support. It links data on existing seed stocks, customer seed requirements, unit production costs, administration and marketing costs with availability of funds from the RF and project grant funds. The data can be sourced from key informant interviews with scientists, or financial experts. Secondary data can come from financial and project reports.

This tool identifies gaps in supply and demand and analyzes financial performance. First, this tool identifies the requirement of quality seed from the customer. Currently there are no standard methods to calculate seed requirements for VPCs. However, the current practice to measure seed requirement is by conducting stakeholder meetings or in a one-to-one meeting with potential buyers and then plan for production to meet the requirement. So, the tool captures the seed requirement data and then measures the quantity of EGS that needs to be produced to meet that requirement. If the public sector cannot conduct the workshop, the user of this tool can use other methods to measure the requirement of EGS. Recently, CIP scientists are developing a user-friendly tool to estimate the requirements for EGS (Rajendran and McEwan 2019).

In order to understand the business's supply and demand requirements, the tool has two types of scenarios. On the demand side, once seed requirements have been estimated using the above approaches, the EGS production plan must be designed, but it is important to first understand the current availability of seed. Thus, the production design starts by identifying the current availability of starter seed stock. In the second step, if the existing stock cannot meet the demand from the customers, the tool maps out a production plan for additional supply according to a seed multiplication calendar. Once the production plan is completed, the tool will calculate

the total cost of production (using cost data) and analyze the financial performances to showcase the long-term sustainability of the business. During this process the tool will help the users of the tool to develop a EGS business model, using the business model canvas approach.

The following section describes the functions of SEGSBAT in detail.

FUNCTIONALITIES OF SEGSBAT

This tool is based on eight Microsoft Excel worksheets, organized according to the steps that the user must systematically follow in order to plan and understand the performance of EGS activities. The tool is provided in the form of an Excel file (Rajendran and McEwan, 2021). The steps are depicted in Figure 2. The numbers shown in the Excel sheets are fictional. The users must replace these figures with their own numbers. Some cells contain formulas, so if users want to see the steps for calculations, they should follow the steps described below for a better understanding.

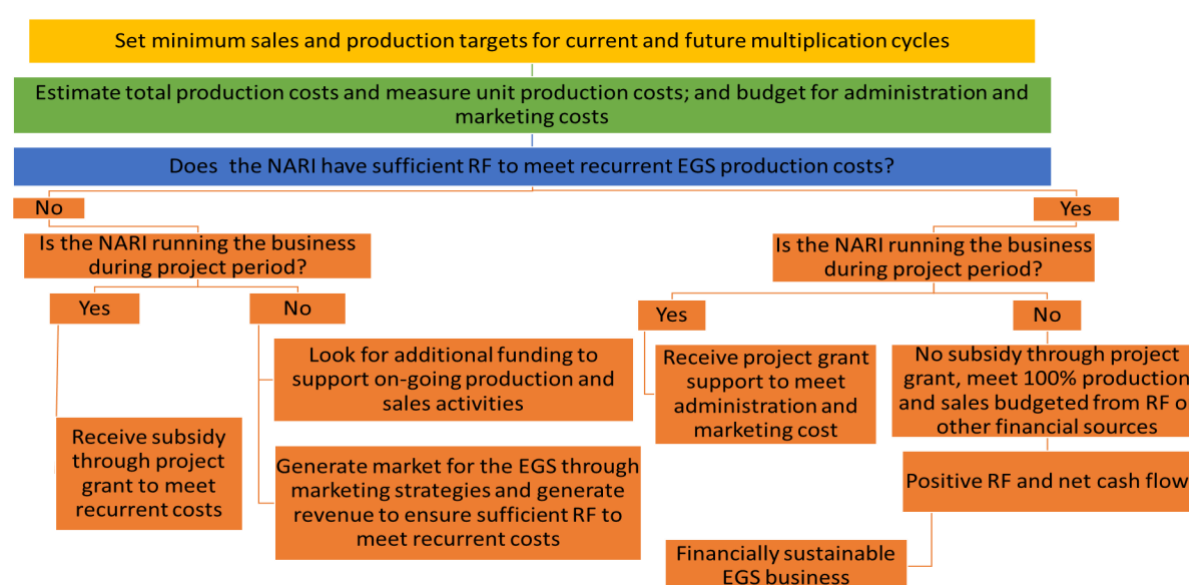


Figure 2. Steps for the financially Sustainable EGS Business Analysis Tool (SEGSBAT).

Source: Rajendran and McEwan (2018)

SEED STOCKS AND CLIENTS' SEED REQUIREMENTS

Step 1 & 2 (sheet 1 - 01A. SEED MULT CAL-SA¹ & sheet 2 - 01B. SEED MULT CAL-SB²):

Sheet 1: 01A. SEED MULT CAL-SA: seed multiplication calendar for scenario A that identifies existing seed stocks and expected seed quantities at every stage of EGS production; Sheet 2: 01B. SEED MULT CAL-SB: seed multiplication calendar for scenario B on future production planning. When the user plans to map out the existing seed supply and production activities, it is appropriate to enter the quantity of seed planted and the amounts that will be produced in upcoming months at every stage.

The users can also draw their own multiplication calendar based on a similar approach, but the idea of doing this activity is to understand how much seed is expected to be produced based on the existing production capacity. To meet expected consumer demand, it is necessary to take into account the current availability of seed and

¹ SA: Scenario A – existing situation

² SB: Scenario B – future plan

future production capacity. If users can calculate this information on their own, they can skip this step and move on to the next step, using the next sheet called 01B. SEED MULT CAL-SB: seed multiplication calendar for scenario B, on future production planning. During this next step, if the tool users find that there is not enough seed to meet customer requirements, then the users need to use this sheet, otherwise, they can move on to the next step in SEGSBAT, which is measuring the cost of producing the estimated seed supply. The Excel sheet comes with some example numbers, but the users can make changes and fill their own numbers. As mentioned above, users can estimate seed requirement through key informant interviews or during a workshop or by using CIP's seed requirement tool, before developing seed multiplication calendars systematically.

PRODUCTION TARGETS IN BOTH SCENARIOS A & B

Step 3 & 4 (sheet 3 - 02A. Production Targets-SA³, sheet 4 - 02B. Production Targets-SB⁴ & sheet 5 - 03. Consl. Production Target):

Once steps 1 and 2 are completed, the user will be able to identify the minimum production capacity and calculate production targets for each stage of EGS production to meet the sales targets for each product (e.g. pre-basic and, or basic cuttings). Take into consideration the percentage of wastage during the production and postharvest of the vines. This can be determined from previous experience. The minimum production targets need to be identified in both scenarios A & B based on a seed multiplication calendar using sheets 1 & 2. However, if producers are aware of their production targets in both scenarios, they can skip these two steps and enter the values directly in sheets 3 and 4, which will help producers to consolidate production targets. Finally, the production figures can be consolidated and reported by project period in sheet 5 (i.e., 03. Consl. Production Target). This is done if the user of the tool received investor or donor support, so that the performance of the EGS activity can be monitored according to “with and without project support” to show the sustainability of the EGS activity. This step helps the tool users to generate a financial performance report for investors and to show how EGS activities can operate without financial support after external funding ends. It will help the user of the tool to measure the total recurrent production costs per unit for the final seed product that will be sold.

The users can use any format to measure these total recurring production costs, however CIP scientists have developed a basic template for measuring them, including variable and fixed costs and then calculating the unit cost (presented in a manual by Sathers et al. 2018). The consolidated production targets should be the same as the sales targets, to ensure that the expected production level meets 100% of consumer demand. Tool users (seed producers) should set minimum production targets to make sure that they are able to sell all of their production. The key is to set production targets using the seed requirement tool and the seed multiplication calendar. If this is not possible, seed producers should have the flexibility to adjust a percentage of their production in the next step while estimating the total revenue using the pricing strategy.

PRICING STRATEGY

Step 5 (04A. Proposed & actual Price & Rev): Pricing strategy

The tool allows users to formulate pricing strategies by determining the unit price based on the type of customer and time of order. The users can forecast revenue, based on projected sales volume for each price category. There are various types of pricing strategies such as markup pricing, fixed pricing, periodic sales and high-low pricing. An EGS business is a monopoly and largely dominated by public sector, so its pricing strategy differs from a company in a competitive market. In a monopoly, the price is greater than the marginal cost and the company makes a profit. A classic monopoly designs a pricing strategy that maximizes profits. The market price is a function of demand for goods or services, but the monopoly wants the highest possible price while still being able to sell its stock of products. If competition increases in this market through the entry of more dealers, then the price becomes more

³ SA: Scenario A – existing situation

⁴ SB: Scenario B – future plan

competitive. Monopolies may also determine the price by segment, with different prices for different types of customers (e.g. institutions vs farmer seed multipliers), or a discount may be offered to customers who make advance payments. However, EGS seed businesses are not classic monopolies. They are usually started with public-sector support to provide as much seed as is appropriate to many customers. An EGS producer may also provide other products (e.g. certified seed) and will want to maintain a good neighbor policy with buyers, by setting reasonable prices for EGS seed. So, an EGS business does not charge as much as the customers will bear, but calculates a price that covers recurrent production costs, while providing a socially-acceptable profit to the company. A public-service monopoly should set prices that attract customers, while being able to operate without subsidies. Once seed prices are determined, SEGSBAT will estimate total revenue and proposed sales volume by project reporting period and price segments (i.e. low price, medium price and high price).

MARKETING, ADMINISTRATION, TRAINING COSTS AND REVENUE

Step 6 (04B.MKT, ADMIN&TRAIN COST&REV): Marketing, administration, training costs and revenue

Once the total recurring cost of production is calculated, if sufficient RF is available to cover these costs, the tool will enable its users to use their RF to cover their recurring costs. However, if the tool user does not have sufficient RF to cover recurring costs, project grants (or other funding) can be used to cover these costs. During project life, all administration, marketing costs and other costs can be met by grants. If the NARI uses the RF appropriately during the project period, the NARI can allocate some grant from the project to buy equipment and other fixed assets by asking permission from the donors/investors.

FINANCIAL PERFORMANCE OF EGS BUSINESS

Step 7 (05A. PBS UnitCost&Budget): financial performance of EGS business

This spreadsheet is entirely automated with formulas. If the NARI (users) successfully meet their sales targets, the spreadsheet can generate a positive RF and net cash flow for the period when there will be no subsidy from other financial sources. This section has four items (costs, revolving fund, revenue, and additional costs) that are not accounted for in the overall costs. At the end of the Excel sheet, a dashboard allows users to visualize the full performance of EGS activities using selected financial indicators.

The first section of the Excel sheet focuses on the total recurrent cost of production and other transaction costs (i.e., total marketing, administration and training costs). There is also a cost of risk management support: an additional cost to cover certain unanticipated expenses associated with management activities. The first section provides a comprehensive understanding of the overall budget for production activities.

The second section of this Excel sheet deals with the availability of revolving funds and the use of funds for this particular reporting period. This section provides details on the percentage of the revolving fund used for recurring costs. As mentioned before, the seller of EGS must allocate funds from the revolving fund for production. Estimating the percentage of the revolving fund used for production ensures that, at the end of the project, the seller of EGS should be able to cover all of the recurring production costs.

The third section of the Excel sheet deals with additional revenues and costs not covered in the total budget. If users are doing well, they can also invest more in marketing to promote their business for the next reporting period. There is a section where users can add additional costs associated with enhanced marketing. In another section, users can add fixed costs and recurring costs, which can be covered by grants where necessary.

Finally, the dashboard uses selected financial indicators to provide information on the performance of the EGS business. The SEGSBAT should be reviewed and updated each season to track actual performance against the projections for sales, and revenue into the revolving fund. Production costs can be updated, pricing strategies can be reviewed, and marketing strategies can be adjusted as necessary.

CONCLUSION

The first version of this tool is in an Excel format where input must be entered manually, so there is a need for basic accounting skills to manage this Excel sheet. This tool captures cost data and estimates EGS production costs using a budget analysis framework. It evaluates prices, net profit margin to develop an innovative pricing strategy to attract customers. SEGSBAT users can estimate total production costs, customer demand, and design pricing and other policies that will help them plan a profitable, self-sustaining early generation seed business.

In the future, it will be possible to incorporate financial feasibility studies and non-financial indicators of sustainability related to: environment, society and governance. Financial studies of other crops can be added to attract more investors and to increase investment in the EGS business. Finally, this tool can be fully automated using information and communication technologies (ICT) and more financial indicators can be included to produce financial reports for decision makers for strengthening the EGS value chain.

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