Analysis of and recommendations for scaling cassava agribusiness seed systems models in Rwanda

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Executive Summary

The objective of this study was to analyze the scalability of the cassava seed agribusiness models that have been supported under the CASS project in Rwanda. Phone interviews with key-informants formed the basis for analyzing the agribusiness cases. The study presents general conclusions, bottlenecks and recommendations for further development and scaling of cassava agribusiness seed models in Rwanda.

General conclusions

The key-informant interviews allowed us to draw the following conclusions:

1. None of the seed agribusiness models are currently ready for scaling
2. Agribusiness models are not yet being used beyond the CASS project
3. Likelihood of continued agribusiness model development varies across models
4. There is a lack of strategies or plans that go beyond the CASS project
5. No major concerns regarding the responsible scaling of the agribusiness models are reported, but unclear how the models target different groups of cassava farmers
6. Public-private partnerships seem to be preferred modality for scaling cassava seed agribusiness models
7. The "what's in it for me" needs to be clarified for key stakeholders

Cross-cutting bottlenecks

There are a number of sector-wide bottlenecks that could negatively affect the scaling of clean cassava seed agribusiness models in Rwanda:

1. Limited investment in developing the cassava sector
2. Incentives for investing in clean cassava seed are currently not strong enough
3. There exist key capacity gaps among cassava farmers, seed multipliers and cooperatives
4. There is a lack of clear stakeholder scaling role division and coordination
5. Limited understanding of the market for seed and roots
6. Limited information flow and demand creation amongst farmers for new varieties and clean seed

Recommendations and next steps

The following recommendations and next steps could be considered by the CASS project team:

1. Distinguish between scaling within the agribusiness cases, and scaling the agribusiness models
2. Develop long-term and/or exit strategies with the agribusiness case stakeholders
3. Continued investment in fine-tuning those models that seem promising
4. Deepen understanding of stakeholder willingness to pay/invest
5. Co-investment models with scaling partners to ensure ownership and sustainability

The above conclusions, bottlenecks and recommendations are in line with the main objective of the CASS project which was to "develop, test and tailor different types of cassava agribusiness seed system models with and for different groups of farmers". The nature of development, testing and tailoring implies by default that some models will show more

potential for sustainability and scaling than others. We would like to emphasize that this is normal and what should be expected when designing and piloting new seed system models.

The scaling recommendations and bottlenecks identified in this report should therefore be interpreted as giving an early indication of how key-informants perceive the scalability potential of the various cases and models. Bottlenecks or risks should not necessarily stop agribusiness case or model development, but taken into account when making decisions on which case and model development to continue and how. What is very important is to see projects such as CASS as temporary interventions that can support capacity sharing, stakeholder collaboration or independent agribusiness seed model testing. Project teams and broader stakeholders should always think beyond the project to ensure that there is ownership, sustainability and continuity to ensure diverse groups of farmers have access to clean and affordable cassava seed.

More detailed information on the conclusions, bottlenecks and recommendations can be found in Section 4.

1. Introduction

Cassava (*Manihot esculenta*) is a major staple crop in sub-Saharan Africa with over 200 million people depending on it for a large part of their calorie intake (Manyong et al., 2000). The overdependency on local cassava varieties and informal seed sources by farmers in Rwanda has contributed to the spread of cassava viral diseases. Cassava Mosaic Disease (CMD) and Cassava Brown Streak Disease (CBSD) are currently the most threatening biotic stresses to cassava production in East and Central Africa (Legg et al., 2001; Tumwegamire et al., 2018).

The use of improved planting materials made available through formal seed sources, that assure seed quality, is one way to prevent future disease outbreaks. In order to increase the availability of, and farmers' access to, such materials there is increasing interest to develop seed agribusiness models (Kilwinger et al., 2021).

Seeds of vegetatively propagated crops (VPC), such as cassava, differ significantly from those of legume and cereal crops in many ways. VPC seed is a vegetative plant part (e.g., a stem) rather than seed (e.g., maize grain) and because of this, it is usually big in size and perishable. This makes the multiplication and distribution of VPC seed different and more challenging than that of non-VPC seeds. Despite the above-mentioned challenges, in places where cassava is very important, one would still consider producing and distributing VPC seed through for-profit or non-for-profit agribusiness models.

An agribusiness model can be defined as a representation of how an organization views, creates, distributes, and captures value for itself (via a profit formula), and for users (defining the value proposition). Although agribusiness models are often associated with profit making, this is not necessarily true. It can be argued that non-profit organizations, including farmer organizations or those focusing on agricultural development, can also develop seed agribusiness models that are non-profit focused.

What do we mean when we refer to scaling?	
General definition *Extracted from: Schut et al., 2020. Science of Scaling*	Achieving impact at scale is one of the greatest challenges facing the development community and the term 'scaling' is increasingly popular in the world of public research for development. Scaling usually refers to the adaptation, uptake and use of innovations such as practices, technologies, and market or policy arrangements across broader communities of actors and/or geographies. In research for development, scaling is usually perceived to be the result of deliberate efforts and interventions that lead to defined societal outcomes such as securing public health, sustaining food availability, living within planetary boundaries, creating jobs and growth, and promoting equality of opportunity. In that sense, scaling is associated with positive change and high target numbers have become an indicator for those funding, implementing, and evaluating research for development to assess the success of projects, policies, programs and other types of interventions.

CASS project definition	In the context of the CASS project, scaling refers to the ambition to expand or apply the agribusiness models and learning beyond the original scope of the project. This may include tailoring the agribusiness models to work in other locations, with other partners to increase access to and use of clean cassava seed in Rwanda.

As part of the Cassava Agribusiness Seed System (CASS) project, 3 agribusiness models for cassava seed multiplication and distribution were explored in Rwanda. Each agribusiness model had 1 or 2 specific agribusiness cases.

Business model 1: Private company led agribusiness model

The private company led agribusiness model focused on identifying a private entrepreneur interested in cassava seed agribusiness, provide them with entrepreneurship competencies, and help them to network with other stakeholders to produce and market quality seeds to the user farmers. The assumption is that seed demand would be high enough to give the entrepreneur, and indeed the agribusiness, sufficient market for seed. The company could choose to produce seed itself or source it from existing individual seed multipliers and market it.

As part of the CASS project activities, the following agribusiness case has been supported in Rwanda:

- Business case 1.1: INGABO Syndicate

Business model 2: Processor led agribusiness models

Cassava processors provide a market for root producers. It is assumed that they have sufficient influence to motivate farmers to use clean seed from approved sources. They can influence/motivate them through a price incentive, input credit, or other incentives. The clean seed would be acquired from private seed multipliers or produced by producer cooperatives. By doing so, farmers would create a market for clean seed for seed entrepreneurs while achieving better yields. The processor would also benefit from more quantities and better quality of roots i.e., targeting certain varieties.

As part of the CASS project activities, the following agribusiness cases have been supported in Rwanda:

- Business case 2.1: KINAZI Cassava Plant
- Business case 2.2: KIAI Cooperative

Business model 3: Community entrepreneurs led agribusiness models

Cassava seed is mostly produced and used locally due to its bulky, perishability and storability challenges. This gives advantage to entrepreneurs within the community to produce and market seeds to their neighbors. The community led model is designed to do this. It is anticipated that the cooperative and private seed entrepreneurs will, thanks to networks with

research programs i.e., RAB and other partners, drive introduction of new improved varieties and multiply clean seed for farmers around them.

As part of the CASS project activities, the following agribusiness case has been supported in Rwanda:

- Business case 3.1: CDAN Cooperative

The below map provides an overview of where in Rwanda the agribusiness cases are located.

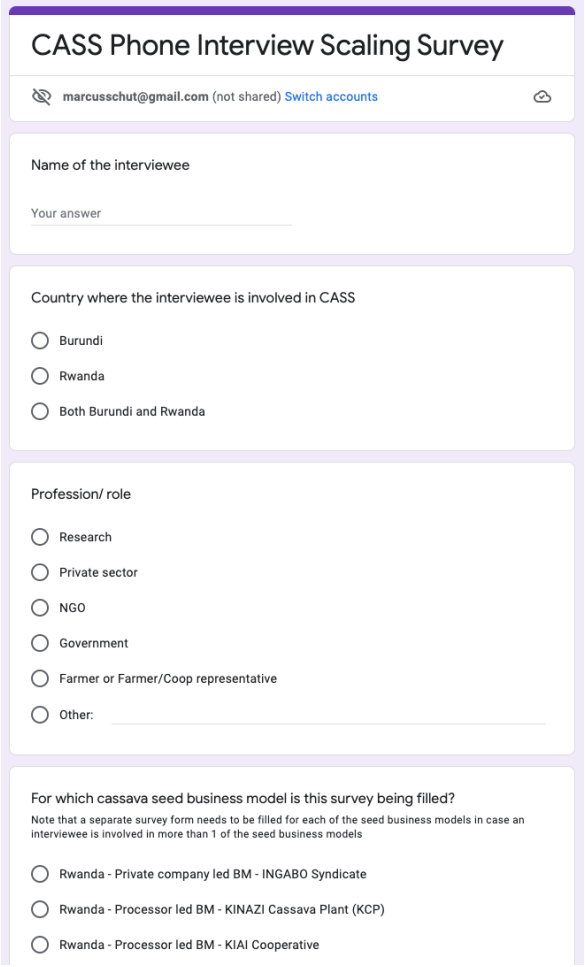
Agribusiness model	Agribusiness case	Province	District	Map
Private company led	INGABO	Southern	Muhanga	
Processor led	Kinazi Cassava Plant	Southern	Ruhango	
	KIAI Cooperative	Eastern	Gatsibo	
Community entrepreneurs led	CDAN	Eastern	Bugesera	

Map and Table: Existing CASS agribusiness models and cases in Rwanda.

2. Objective and methodology

Objective:
The objective of this study was to analyze the scalability of the cassava seed agribusiness models that have been supported under the CASS project in Rwanda. Through the analysis of the agribusiness cases, the study aims to generate scaling recommendations and identify bottlenecks for the further development and scaling of the agribusiness models.

Methodology:
The methodology employed in this assessment focused on collecting data through structured phone interviews with key-informants and other purposefully sampled stakeholders involved in the development or working of the agribusiness models and cases. Annex A provides an overview of these key-informants. Data was analyzed mainly qualitatively.


CASS Phone Interview Scaling Survey

marcusschut@gmail.com (not shared) Switch accounts

Name of the interviewee

Your answer

Country where the interviewee is involved in CASS

- Burundi
- Rwanda
- Both Burundi and Rwanda

Profession/ role

- Research
- Private sector
- NGO
- Government
- Farmer or Farmer/Coop representative
- Other:

For which cassava seed business model is this survey being filled?

Note that a separate survey form needs to be filled for each of the seed business models in case an interviewee is involved in more than 1 of the seed business models

- Rwanda - Private company led BM - INGABO Syndicate
- Rwanda - Processor led BM - KINAZI Cassava Plant (KCP)
- Rwanda - Processor led BM - KIAI Cooperative

Interviews were conducted between mid-February and early March 2022. A typical phone interview took between 15 and 25 minutes for key-informants involved in agribusiness case and 60 to 90 minutes for project staff, involved in many agribusiness cases. The information was captured in a GoogleSheet: https://forms.gle/9MU56BTsRduhwFx18.

In total, 29 interviews were conducted. In some cases, the same respondents were interviewed multiple times due to their involvement in multiple agribusiness models and cases. Respondents represented farmer cooperatives and syndicates, non-governmental organizations (NGOs), private sector, research organizations and government.

The collected data was complemented with other documentation and knowledge generated by the project throughout its implementation. These include scientific publications, project reports, and field visit observations and conversations with partners.

3. Rwanda CASS agribusiness cases

In the below sections, basic information is provided for each of the four CASS agribusiness cases, followed by a scalability analysis based on data collected through the phone interviews.

3.1. Business Case 1.1: INGABO Syndicate

3.1.1. Basic agribusiness case information

Country	Rwanda
Province	Southern Province
District	Muhanga District
Type of agribusiness model	Private company led agribusiness model
Business case description	In this agribusiness model, the INGABO-established private company negotiates agribusiness arrangements with individual and cooperative seed multipliers that would have seed multipliers multiply seed and INGABO markets it. Through these arrangements, INGABO would market the seed and get commissions for its services while seed multipliers would benefit from increased market opportunities as well as less investments in marketing the seed. Since INGABO has existing good working relationship with farmers (including seed multipliers) and is known as an advocate for them, this was expected to enable the initial negotiations. Other stakeholders such as financial institutions and processors were expected to be involved as their services would be needed to finance and create more agribusiness opportunities, respectively.
Partners involved	• SPARK • IITA • INGABO Syndicate • RAB • WUR
Additional information	• Not available

Photo 1: Mbakungahaze Cooperative members preparing basic seed for further multiplication.

Photo 2: Multiplication of pre-basic seed in a screenhouse at Mbakungahaze cooperative.

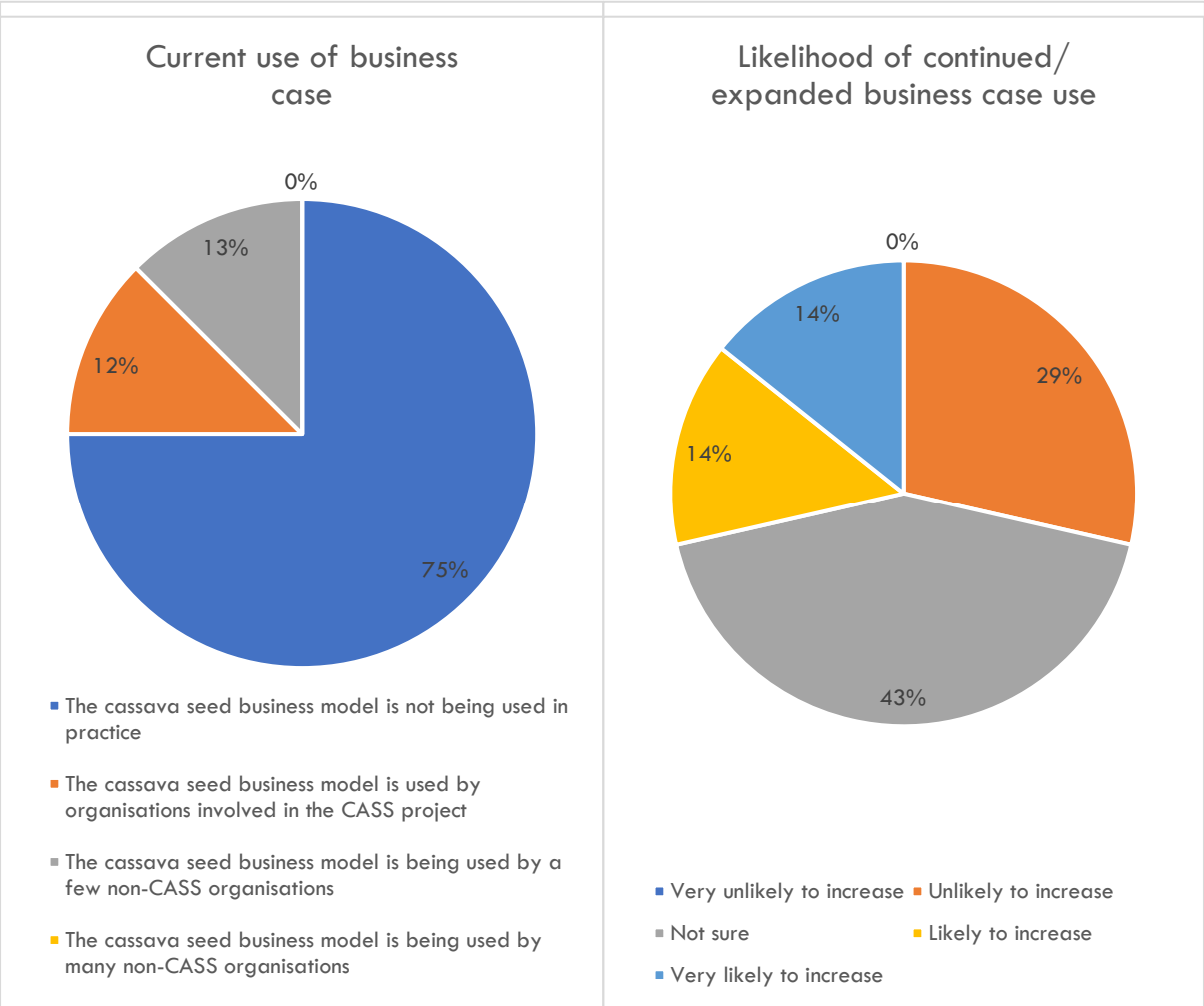
3.1.2. Scalability analysis

Eight key-informants were interviewed in February and March 2022. They included representatives of farmers and farmer cooperatives/ syndicate (4), research organizations (2) and NGOs (2). Based on their views and perspectives, the following analysis can be provided:

Agribusiness case development stage

Current development stage of the cassava seed agribusiness case is perceived to be not ready for scaling. None of the respondents indicated that the model is proven to work, but is still in ideation (12%), design (25%) or testing stage (63%) (below left graph).

Interviewees have mixed opinions about whether agribusiness case development will continue beyond the CASS project. 24% Thinks it is (very) unlikely that the case development will continue, and 38% thinks it is likely that case development will continue. Another 38% is not sure. None of the interviewees is fully convinced that agribusiness case development will continue beyond the CASS project (above right graph).



Business case use

Key-informants are of the opinion that the model is not operational and mainly used by/ within the project. This implies that we do not yet see other non-CASS project organizations copying or using the private company led agribusiness model (below left graph).

The majority of key-informants is either not sure (43%) or think the agribusiness case is unlikely to expand (29%) beyond the CASS project. The remaining 28% is a bit more optimistic about the likelihood of the case to continue or grow after the CASS project (above right graph).

Responsible scaling

Key respondents generally feel that within the agribusiness case, equal opportunities are created for male and female farmers, for young and old farmers, and for subsistence- and market-oriented farmers. There are no immediate concerns about gender, age or other types of inequalities in relation to scaling the agribusiness model.

One key-informant mentioned a potential risk in when cassava seed would be traded, poor farmers may not have access to clean seed. This is in line with findings by Kilwinger et al., (2021) who concluded that commercial-oriented farmers have better access to formal seed sources compared to subsistence-oriented farmers.

Scaling partner

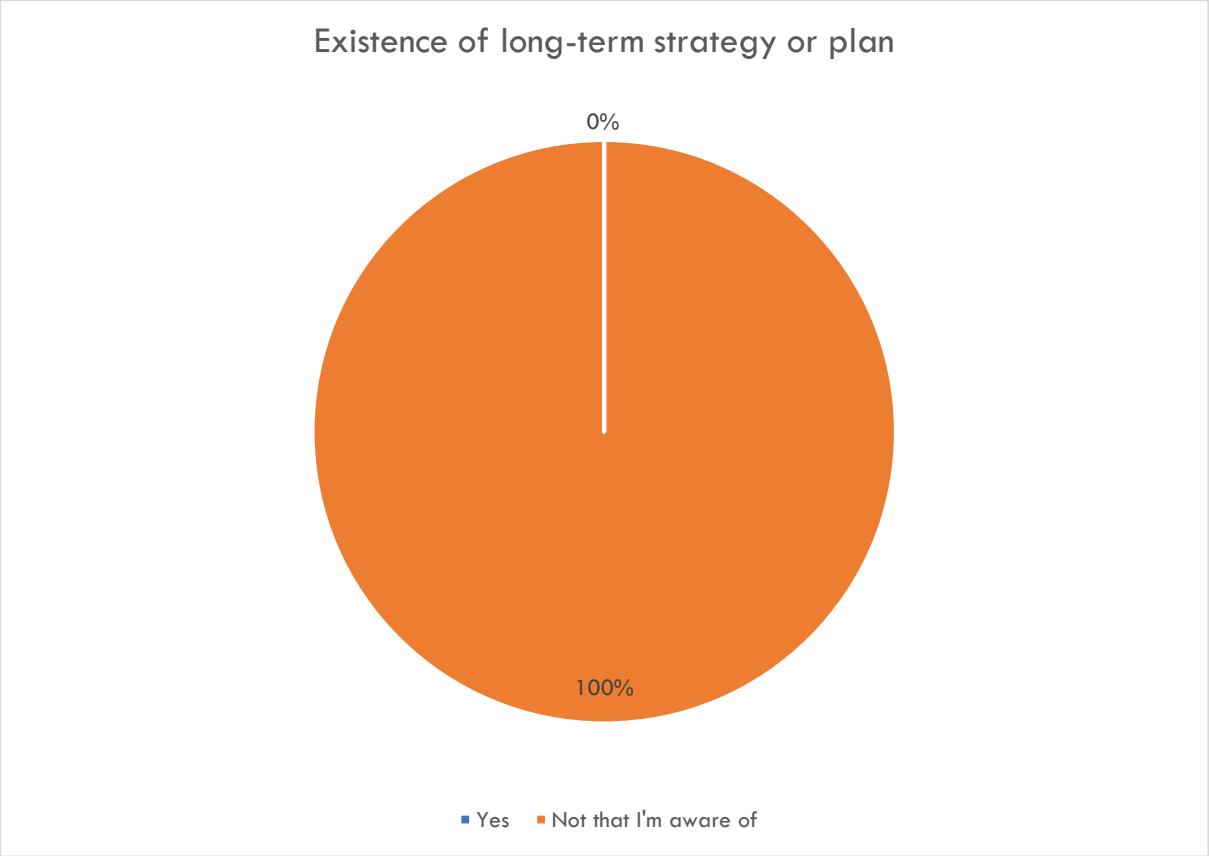
The dominant majority of respondents feels that government will play an important role in scaling this private company led agribusiness model. However, government would need to work in partnership with private sector and/or NGOs and development organizations. It seems that a public-private partnership model is most suitable. 50% of the respondents was unsure whether scaling partners would be willing/ able to invest their own resources in scaling the seed agribusiness model. 37.5% was more optimistic and could see partners invest their own resources.

Other organizations that could be involved in further developing and scaling the agribusiness model include:

- FAO
- One Acre Fund
- Private Sector Federation (PSF)

Opportunities and risks

Opportunities	Risks
Availability of new seed that is still strong (genetically)	If INGABO does not have a vision to continue it will not work
The model would bring money and livelihoods to rural people	Low seed market; there is not enough pull from the root market to motivate seed buyers
Cassava seed degenerates quickly which is an opportunity for seed agribusiness	Seed market is still a problem leading to poor agribusiness around seed; capacity building and coaching is still needed for actors in seed sectors
Cassava is very important to rural economy	Farmers do not understand seed degeneration and continue to use degenerated seed; farmers do not want to buy seed
Rising agribusiness-oriented mindset	Limited investors and willingness to invest in cassava seed
Availability of seed for market in which competition for seed trading is still low	As a private company, they may not ensure quality control
INGABO Syndicate has farmer network and trust	Certification being a government responsibility is a risk, private certifiers could help
	Existing seed multipliers need a donor funded intervention to support its development



The biggest risk is perhaps the lack of long-term strategy or plan on how to sustain the cassava seed agribusiness model beyond the lifetime of the CASS project. Such a strategy could support

Next steps

The interviewees identified the following key next steps for the agribusiness case:

- Validate the model if it works because we are not yet there;
- Invest in developing the market for clean cassava seed (mentioned 3x);
- Continuous support and advise needed for farmers;
- Involving private seed certifiers, strengthen INGABO management and expand their reach;
- Engagement of local authorities to actively support cassava production including use of clean seed (awareness raising around cassava issues to authorities and MINAGRI). Authorities need to understand that even if there is no crisis now, clean seed is needed.

3.2. Business Case 2.1: Kinazi Cassava Plant

3.2.1. Basic agribusiness case information

Country	Rwanda
Province	Southern Province

District	Ruhango District
Type of agri-business model	Processor led agribusiness model
Business case description	Kinazi Cassava Plant would influence production and use of clean seed by motivating root producers to use clean seed of improved varieties. It was assumed that through its potential influence on producers as the biggest buyer of roots, Kinazi Cassava Plant can motivate producers, through price incentive or other means, to acquire and use cassava clean seed. The clean seed can be acquired from private seed multipliers or produced by producer cooperatives. Once Kinazi Cassava Plant understands and accepts the role it can play to help its root suppliers to achieve better yields and become more resilient to disease outbreaks through use of clean seed, it is believed that it has the capacity to do it. This agribusiness model was designed to engage Kinazi Cassava Plant and its partners to achieve this goal.
Partners involved	• SPARK • Kinazi Cassava Plant • IITA • RAB • WUR
Additional information	• LinkedIn: https://www.linkedin.com/company/kinazi-cassava-plant-ltd/ • Instagram: https://www.instagram.com/kinazicassavaplant/ • YouTube Channel: Kinazi Cassava Plant Ltd

Photo 3: Packaging of cassava flour at Kinazi Cassava Plant in Ruhango district.

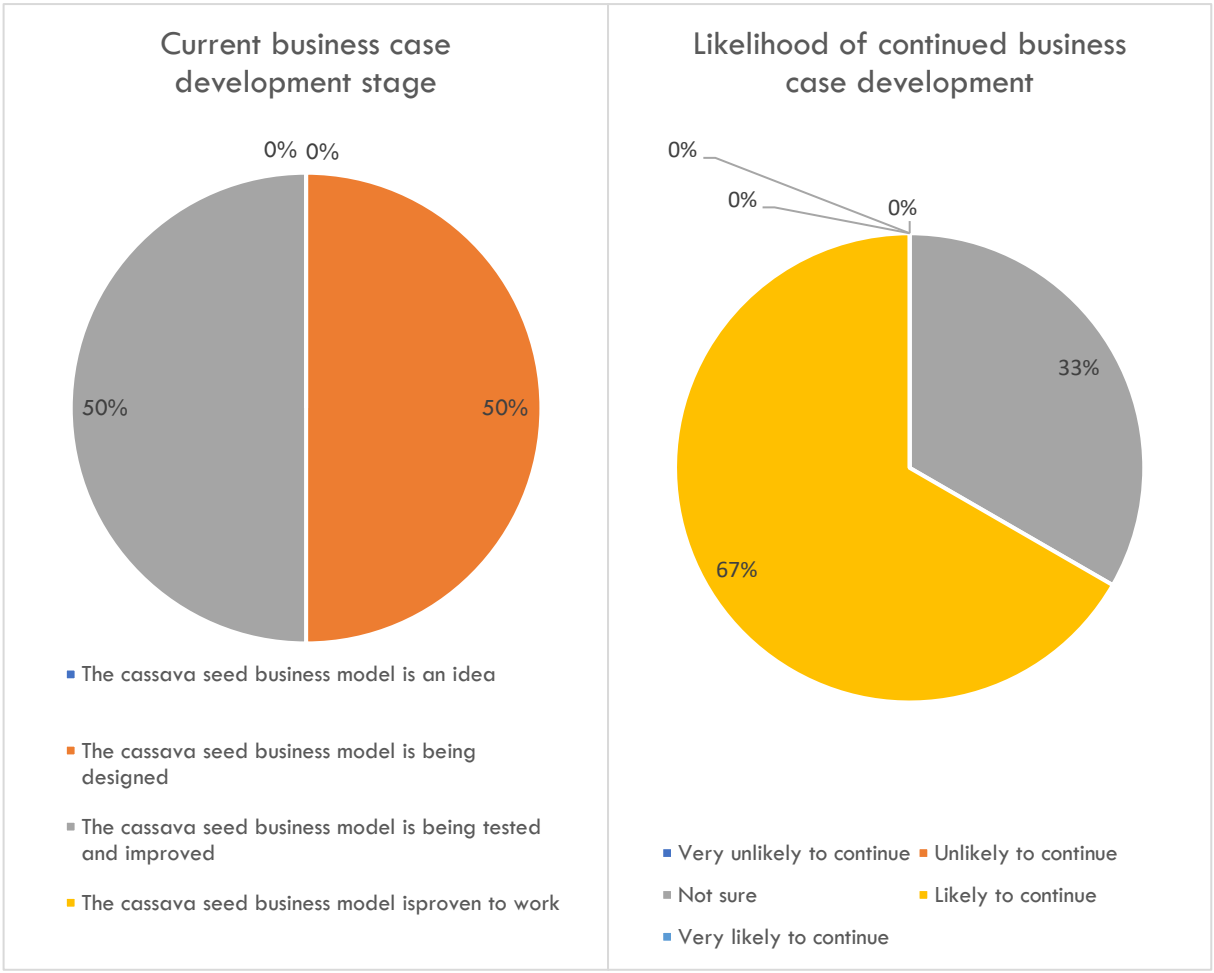
Photo 4: Cassava roots collected from smallholder farmers by the Kinazi Cassava Plant truck.

3.2.2. Scalability analysis

Six key-informants were interviewed in February and March 2022. They included representatives of farmers and farmer cooperatives (2), research organizations (2) and NGOs (2). Based on their views and perspectives, the following analysis can be provided:

Business case development stage

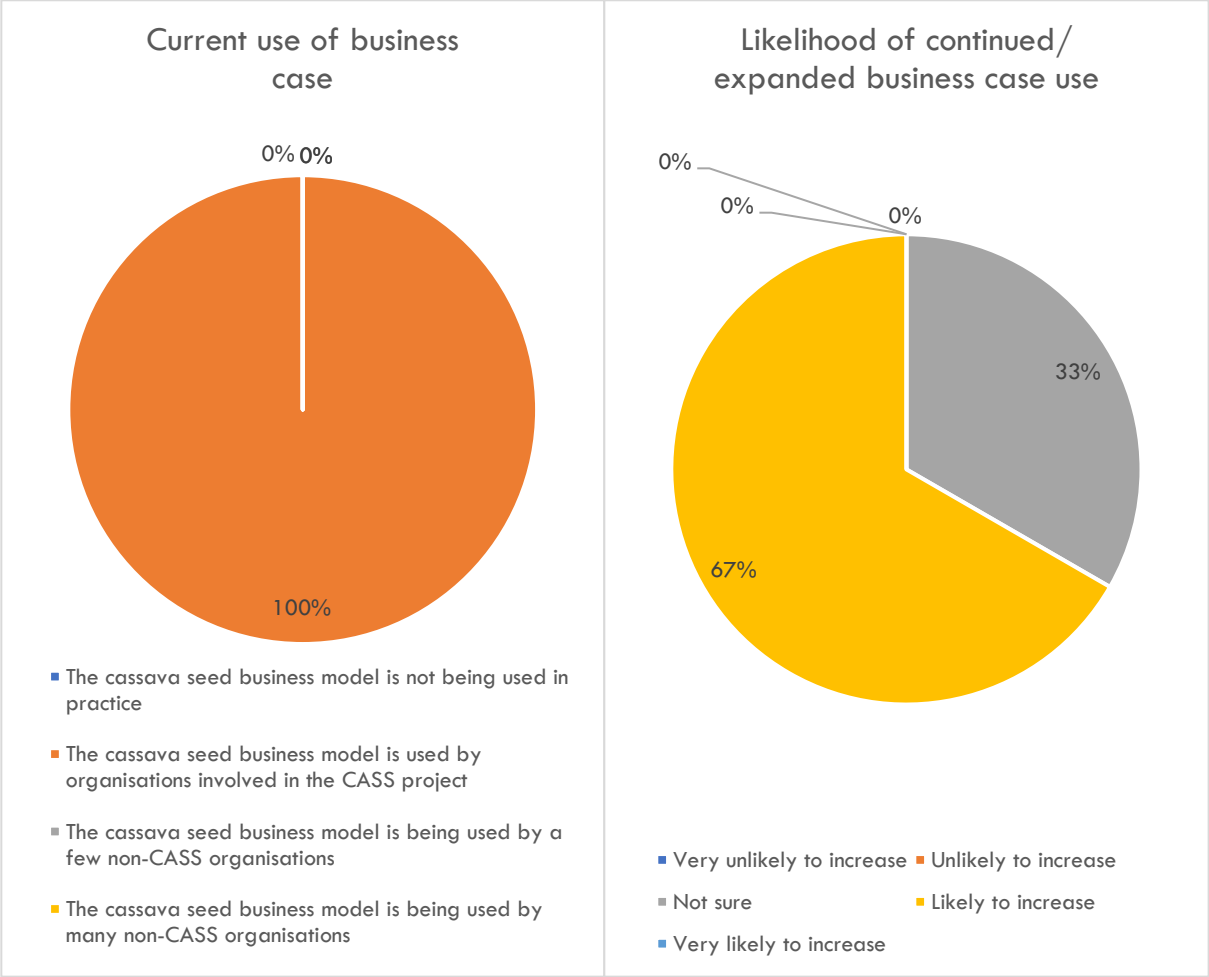
The current development stage of the cassava seed agribusiness case is perceived to be not ready for scaling. None of the respondents indicated that the model is proven to work. Rather, the model is being designed, tested and improved according to the key-informants (below left graph).



Interviewees are quite optimistic that the agribusiness case development will continue beyond the CASS project (above right graph).

Business case use

Current use of the cassava seed agribusiness model is exclusively by the CASS project and its direct partners. This includes Kinazi Cassava Plant. The model is not yet used by other cassava processors (below left graph).



Again, the informants are optimistic about the likelihood that cassava seed agribusiness case use would increase beyond the CASS project (above right graph).

Responsible scaling

Respondents generally feel that within the agribusiness case, equal opportunities are created for male and female farmers and for young and old farmers. Two respondents feel that the model may benefit market-oriented farmers more than subsistence-oriented farm households.

Scaling partners

Most respondents feels that government will play an important role in scaling this agribusiness model, in partnership with the Kinazi Cassava Plant and NGOs/ development organizations. It seems that a public-private partnership model is most suitable. 66.6% of the respondents were unsure whether scaling partners would be willing/ able to invest their own resources in scaling the seed agribusiness model. 33.3% was more optimistic and could see partners invest their own resources.

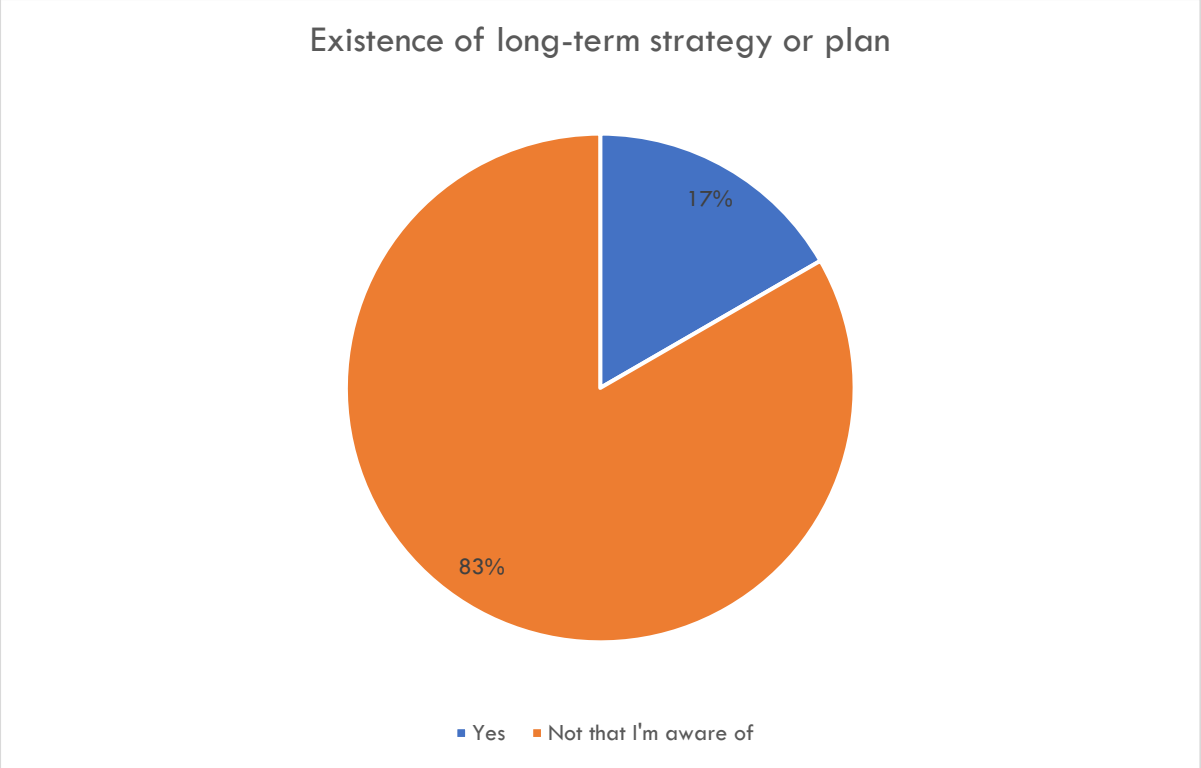
Other organizations that could be involved in further developing and scaling of the agribusiness model include:

- Agricultural research organizations (such as CGIAR and RAB)

Opportunities and risks

Opportunities	Risks
Greater incomes for cassava farmers	Kinazi Cassava Plant failing to invest in clean seed multiplication
Kinazi Cassava Plant can support farmers technically with extension services to improve yield and quality of roots	Processors are not motivated to be involved in seed issues; processors do not see direct benefits in involvement in seed; processors' reluctance to invest own money in seed
The plant has sufficient capacity for processing roots	Risks of diseases from neighboring farmers; not all farmers are at the same level of understanding within and outside the partner cooperatives
The main actor (processor) is the key driver for root market and farmers also the potential market for seed producers, thus agribusiness interests are already strong; Existence of seed multipliers	Unwillingness to invest in clean seed by root producers
Government plans to modernise agriculture; availability of supporting partners	Frequent change of leadership in Kinazi Cassava Plant
Availability of root market which encourages investment in clean seed	There is no sufficient capacity for early Generation seed production at the cooperative/farmer level

An additional challenge could be that farmers interests would be more directed to root production than seed in the future.



According to the majority of the respondents there is no long-term strategy or plan on how to sustain the cassava seed agribusiness model beyond the lifetime of the CASS project. Such a strategy should be co-created with the Kinazi Cassava Plant, seed multipliers and regulatory authorities.

Next steps

The interviewees identified the following key next steps for the agribusiness case:

- Validating the model because we are yet to know the viability;
- Improve affordability of clean seed, it's currently too expensive for most farmers;
- Kinazi Cassava Plant need to work more with research organization. Better collaboration between breeders and processors could lead to processor-preferred varieties;
- Continuous engagement of Kinazi Cassava Plant;
- Continuous support to engaged farmer cooperatives;
- Encourage processors to play a role in seed use by farmers (demand creation);
- Capacity development (trainings) on importance of using clean seed, quality assurance issues, management of seed per their different classes; exchange visits.

3.3. Business Case 2.2: KIAI Cooperative

3.3.1. Basic agribusiness case information

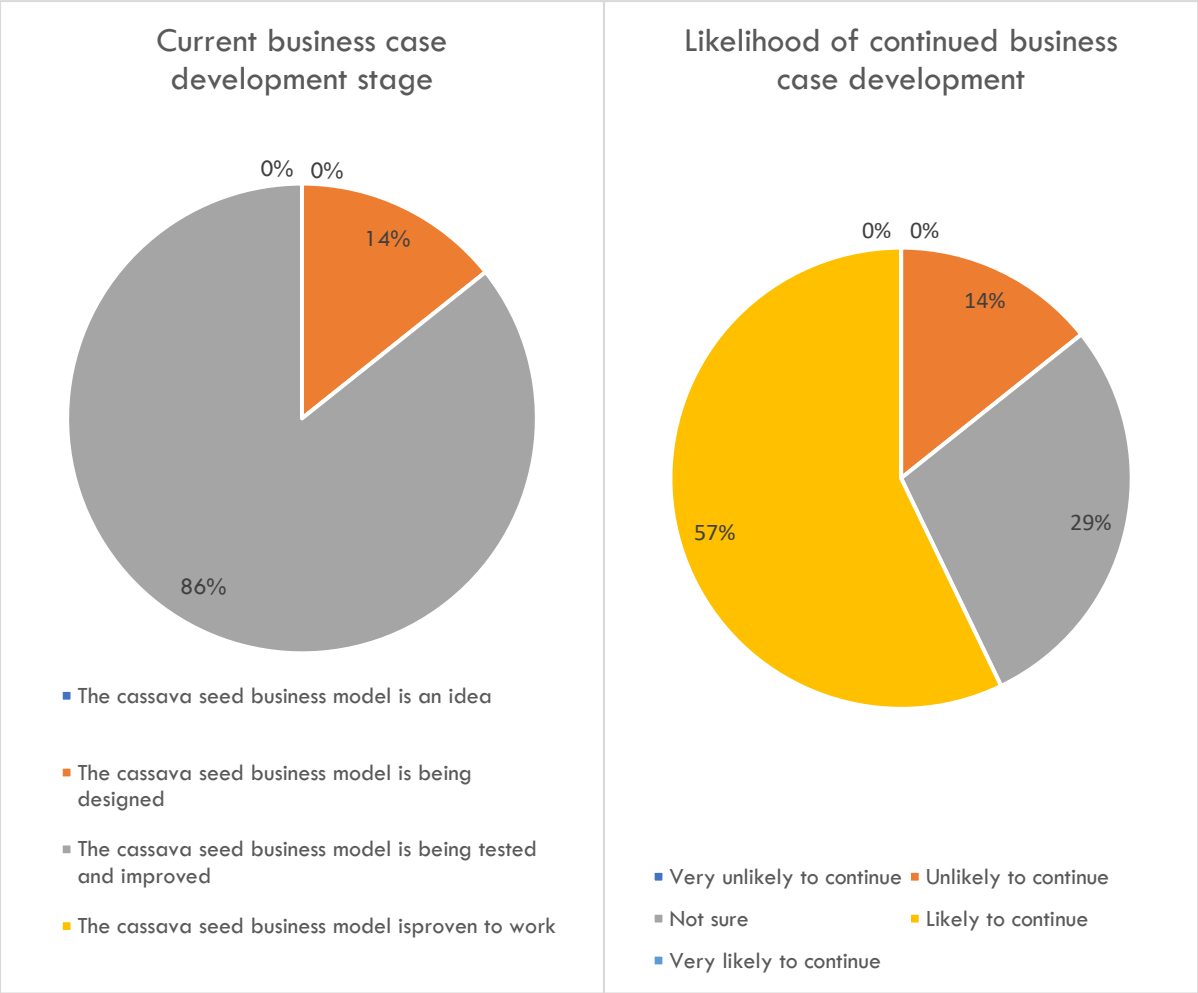
Country	Rwanda
Province	Eastern Province
District	Gatsibo District
Type of agribusiness model	Processor led agribusiness model
Business case description	KIAI is a cooperative of 72 members (24 women) located in Gatsibo district. Although they operate a small-scale processing machine, their processing capacity is enough for the flour market they currently have. The quality of flour is not very good, but it is better than other locally produced flours, mostly home-made. However, their flour price is also much higher than that of other – locally or home-made – flours. The packaging capacity is low, making their flour not appealing and not proving the difference in price. KIAI usually encourages members and other farmers to grow cassava which it buys from them and processes. The coop also provides technical information for root production to producers. The assumption with this agribusiness model, and KIAI as an agribusiness case, was that the cooperative would be engaged and strengthened in terms of management to play a role in introduction of new varieties, (clean) seed multiplication and use by members. This would also result in better storage root yields and supply for processing.
Partners involved	• KIAI Cooperative • SPARK • IITA • RAB • WUR
Additional information	• Not available

3.3.2. Scalability analysis

Seven key-informants were interviewed in February and March 2022. They included representatives of farmers and farmer cooperatives (2), research organizations (2), government (1) and NGOs (2). Based on their views and perspectives, the following analysis can be provided:

Business case development stage

Current development stage of the cassava seed agribusiness case is perceived to be not ready for scaling. None of the respondents indicated that the model is proven to work but is still under design (14%) or testing stage (86%) (below left graph).

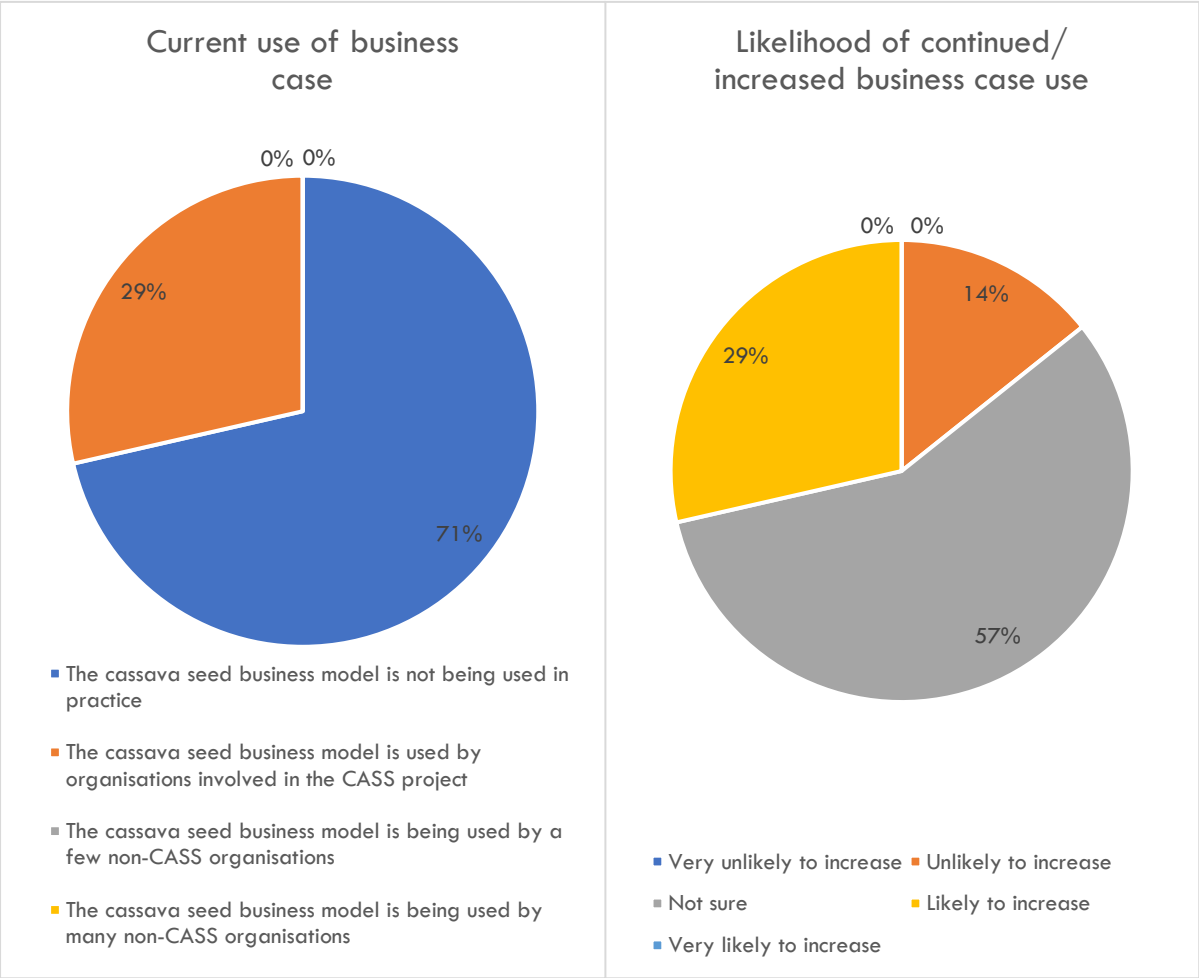


Interviewees are rather optimistic about whether agribusiness case development will continue beyond the CASS project. 57% thinks it is likely that the agribusiness case development will continue compared to 14% who believe it is unlikely that agribusiness case development will continue. 29% is unsure (above right graph).

Photo 5: Small-scale milling machine owned and used by KIAI cooperative.

Business case use

The majority of the key-informants are of the opinion that current use of the agribusiness case is limited to project partners or not-existing for other partners/actors (below left graph).



The majority of key-informants are not sure the agribusiness case use would continue or increase beyond the CASS project. Two informants expect use to increase whereas one informant thinks this scenario is unlikely to happen (above right graph).

Responsible scaling

Respondents generally feel that within the agribusiness case, equal opportunities are created for male and female farmers, for young and old farmers and for market- subsistence- and market-oriented farm households. No real equality issues are foreseen when scaling this processor-led agribusiness model.

Scaling partners

Most respondents feel that NGOs or development organizations will play an important role in scaling this agribusiness model. Partnerships with government and/or private sector are proposed a model in fewer cases. Respondents were unsure whether scaling partners would be willing or able to invest their own resources in scaling the seed agribusiness model, though 2 out of the 7 respondents believe this is a realistic scenario.

Other organizations that could be involved in further developing and scaling the agribusiness model include:

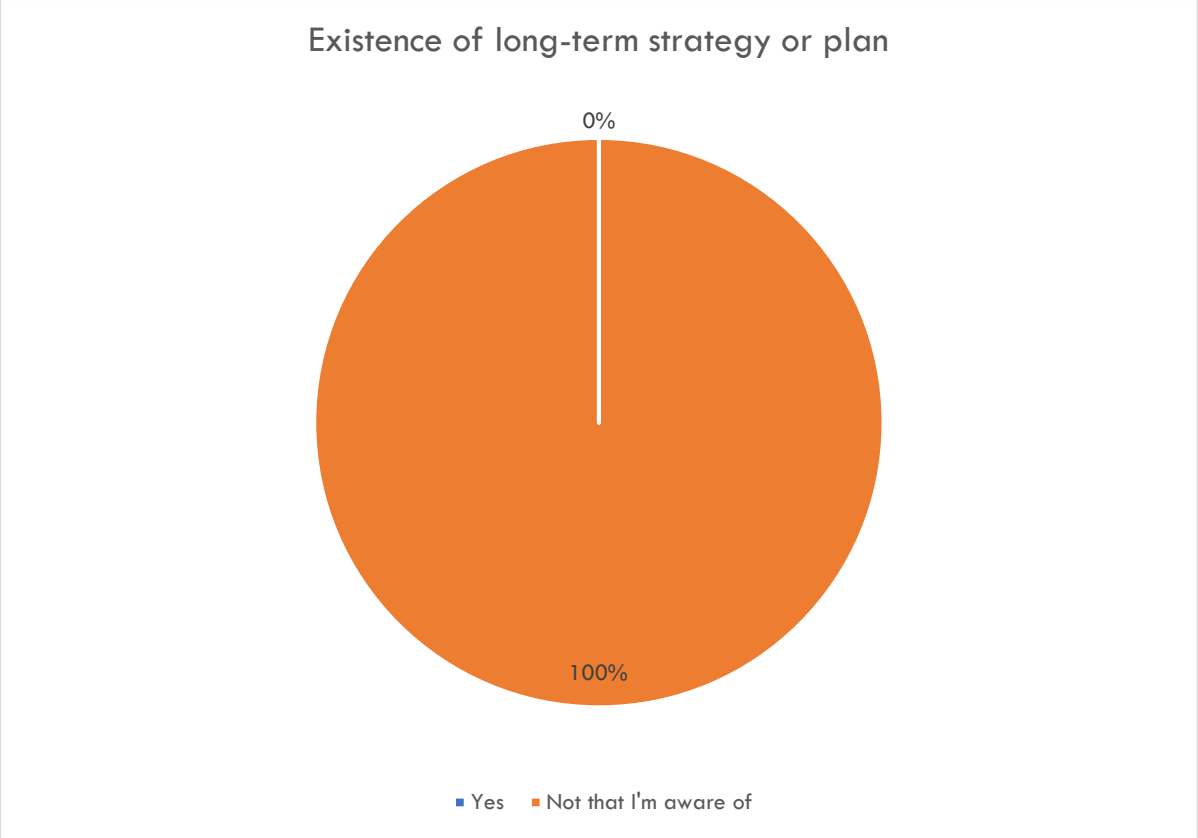
- Agricultural research organizations (such as CGIAR and RAB)

- Ministry of Agriculture
- World Vision
- ADRA

Photo 6: Packaged cassava flour produced by KIAI Cooperative.

Opportunities and risks

Opportunities	Risks
Potential cassava production and market in the area	(Assuming it worked) insufficient market for products; poor conditions for cassava production
There are many small-scale cassava processors in the country	Limited market for clean cassava seed
Job creation to many people; wealth creation; resilience to cassava diseases	Limited market for cassava flour
Farmers would get increased incomes; international market can be exploited	Complicated management (member based) which delays decision making; management issues
They had a big market share for cassava flour before, so, they can regain it; the current cooperative management is good and strong	Root production may surpass the coop capacity to process which may disturb the agribusiness model altogether
Members are the first market for seed and other products; easy dissemination of information	
Cooperative is based around root market and members are seed market	



According to the respondents there is no long-term strategy or plan on how to sustain the cassava seed agribusiness model beyond the lifetime of the CASS project. This creates the risk that the ongoing investments by the CASS project will come to a standstill when the project stops.

Next steps

The interviewees identified the following key next steps for the agribusiness case:

- Validating the model;
- They need a good agribusiness plan, building seed multiplication capacity
- Funds to support cooperatives to continue trainings (that took too long to start up)
- Need for financial support because cooperative capacity is very limited; trainings need to continue (mentioned 3 times);
- More linkages with other value chain actors including research & extension organizations are key.

3.4. Business Case 3.1: CDAN Cooperative

3.4.1. Basic agribusiness case information

Country	Rwanda
Province	Eastern Province
District	Bugesera District

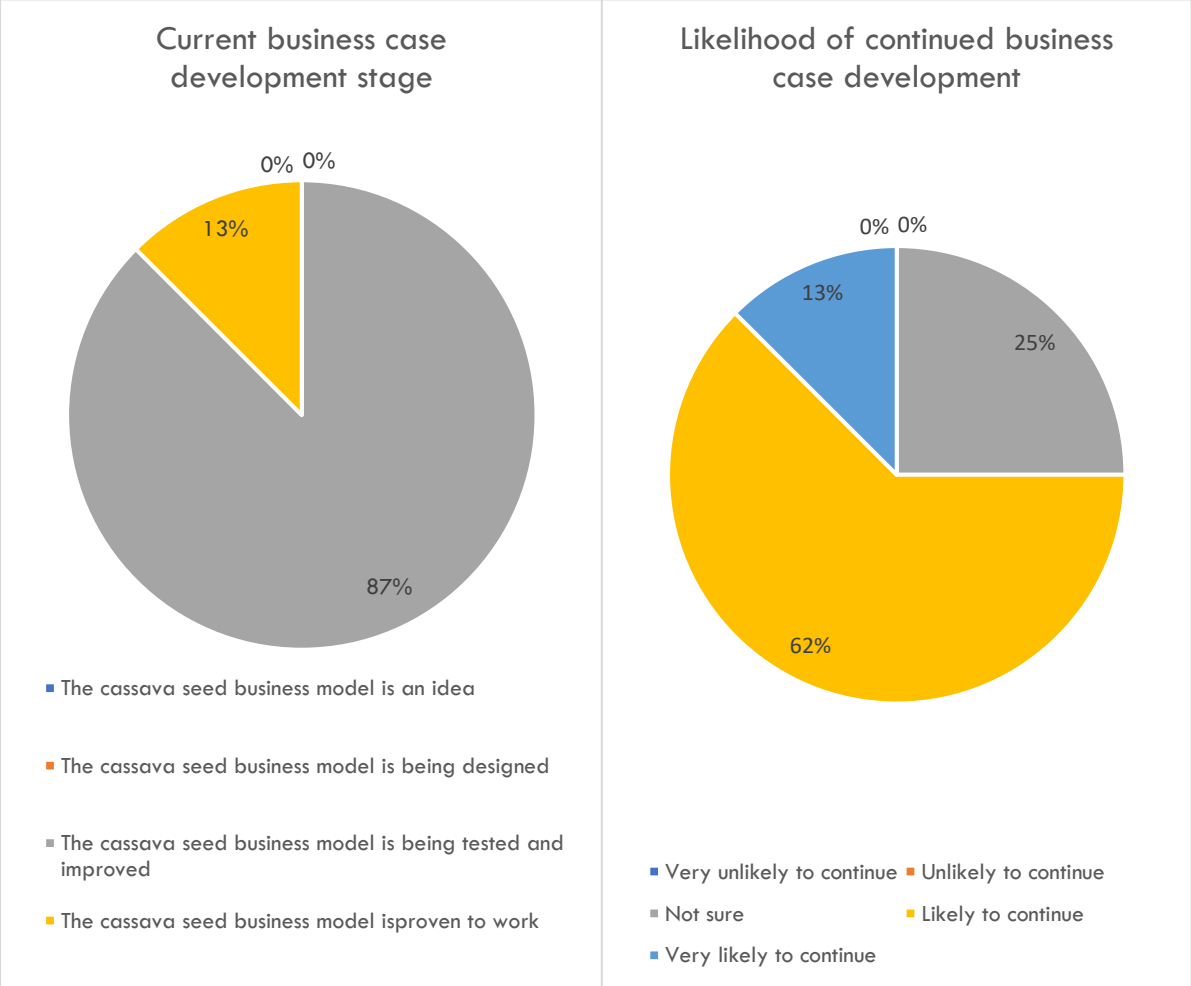
Type of agribusiness model	Community entrepreneurs led agribusiness model
Business case description	The CDAN Cooperative supports multiplication and use of clean cassava seed amongst members. The Cooperative is originally for cassava root producers. They have in the past multiplied cassava seed but on an ad-hoc manner e.g., motivated by a donor-funded intervention/project. CDAN has 38 members in total (22 women) and seems not to have management issues. It is located in a high cassava growing area of Bugesera, where limited rainfall also encourages cassava farming. The coop has 3 hectares of communal land used for cassava farming. It is anticipated that the cooperative will, thanks to networks with RAB and other partners, drive introduction of new improved varieties to the area and multiplication and use of clean seed. The cooperative can use the communal land as well as members' fields to multiply clean seed and market or disseminate it to members and their neighbors.
Partners involved	• CDAN Cooperative • SPARK • IITA • RAB • WUR
Additional information	Not available

3.4.2. Scalability analysis

Eight key-informants were interviewed in February and March 2022. They included representatives of farmers and farmer cooperatives (4), research organizations (2) and NGOs (2). Based on their views and perspectives, the following analysis can be provided:

Business case development stage

The majority of key-informants see this model as still being under testing and improvement (87%), with one informant convinced that the model is already proven to work (13%) (below left graph).

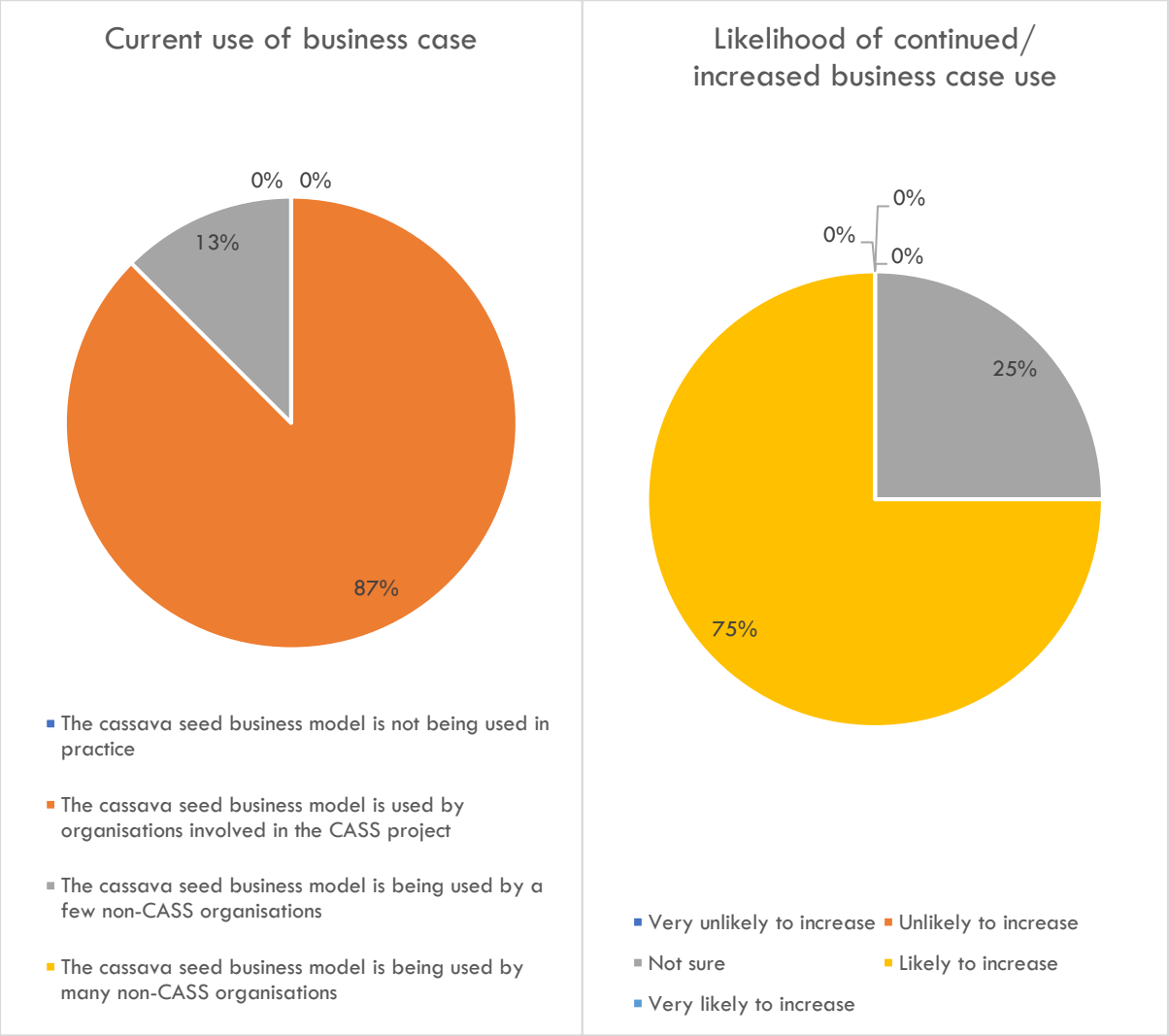


Key-informants are very positive about the likelihood of continued agribusiness development, with 62% being optimistic that case development will continue beyond the CASS project (above right graph).

Photo 7: CASS partners visiting a cassava seed field owned by a seed entrepreneur in Bugesera district.

Business case use

Current use of the cassava seed agribusiness case is mainly benefitting CASS project partners. One informant believed this agribusiness case is already benefitting organizations that are not part of the project (below left graph).



The likelihood that cassava seed agribusiness case use would increase beyond the CASS project is relatively high according to 75% of the key-informants. The remaining 25% is unsure whether expansion would actually happen beyond the project (above right graph).

Responsible scaling

Respondents generally feel that within the agribusiness case, equal opportunities are created for male and female farmers, for young and old farmers and for market- subsistence- and market-oriented farm households. No real equality issues are foreseen when scaling this agribusiness model.

Additional responsible scaling issues mentioned:

- Seed market reduces when you grow and scale (competition);
- In case of absent control of quality, they can spread disease in the community.

Photo 8: CASS partners meet CDAN cooperative members in Bugesera district.

Scaling partners

Respondents have divergent thoughts about what type of organization should ideally scale the cassava seed agribusiness model. Both government and NGOs are frequently mentioned, so a scaling partnership should probably include both. Also private sector is mentioned by 2 respondents. Fifty percent of the respondents are not sure whether the scaling partner would be willing/ able to invest their own resources in scaling the agribusiness model. The other 50% is more positive on scaling partner investment.

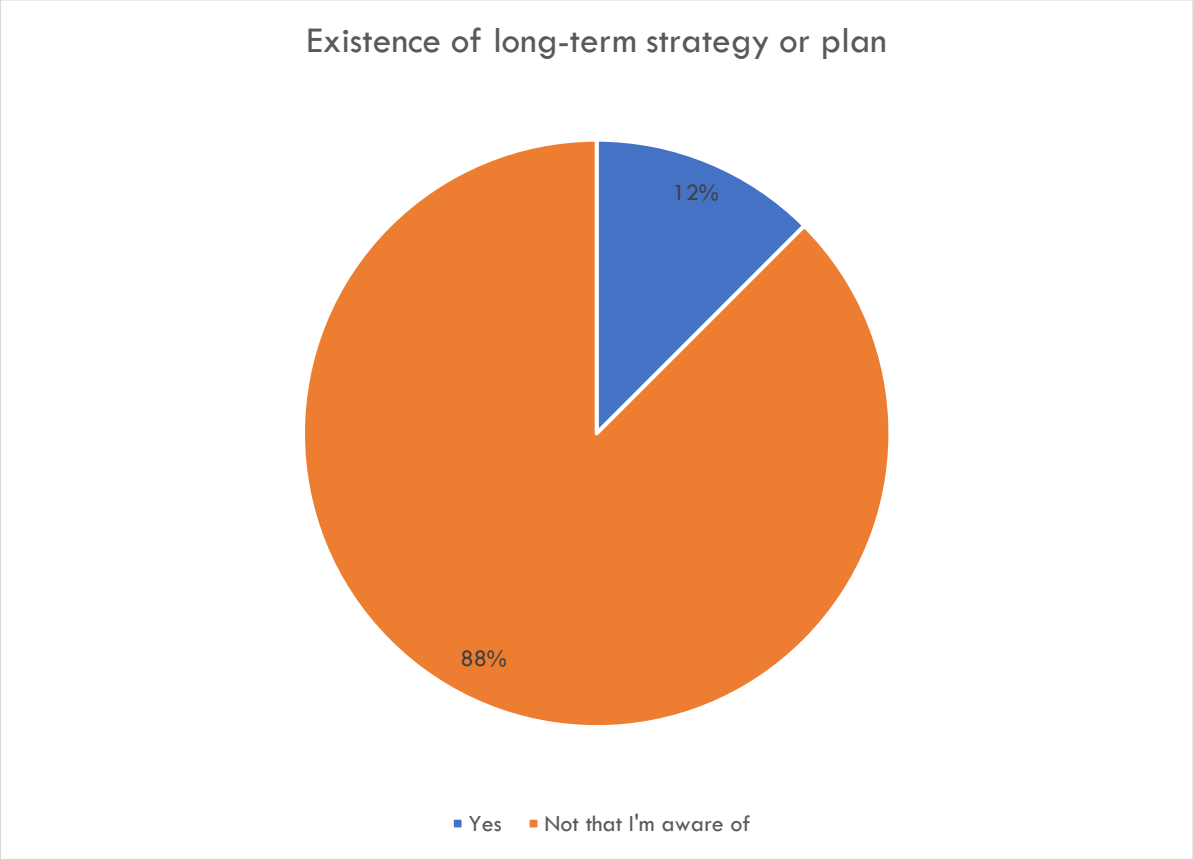
Other organizations that could be involved in further developing and scaling of the agribusiness model include:

- Agricultural research organizations (such as CGIAR and RAB)
- Ministry of Agriculture
- Rwanda Institute for Conservation Agriculture (RICA)
- One Acre Fund

Opportunities and risks

Opportunities	Risks
Created linkages with other actors e.g., linkages with other entrepreneurs from other sectors and districts	Mobilization of other influential people in the community
This model can increase root production and use of clean seed amongst cassava farmers	Lack of continuous support
The region is very good for cassava; Cassava cooperatives are already existing	Widespread use of unclean seed

Insufficient post-harvest technologies and value addition which would all improve root market as well as seed market	The agribusiness model is region specific, testing and adapting it to new location is very important
Majority farmers are cassava growers; open to entrepreneurs outside the cooperative	Limited market for cassava roots which influence seed market
New improved varieties like NAROCASS; availability of market such as Kinazi Cassava Plant and schools for sweet varieties	Lack of/ limited seed market
Members are seed producers and seed market	



According to most of the respondents there is no long-term strategy or plan on how to sustain the cassava seed agribusiness model beyond the CASS project.

Next steps

The interviewees identified the following key next steps for the agribusiness case:

- Validating it for longer to see whether or not it is viable;
- Access to information about varieties and agronomy;
- Cassava seed multipliers association needs to be strengthened because it is very important (mentioned 2 times);
- Continuous support for training and proximity coaching;
- Better marketing of seed and activities;
- Develop the market for root which has capacity to influence seed production;
- Linkages with other actors including financial institutions;

- Considering how infrequent weather patterns affect the cassava sector more generally.

4. Scaling conclusions, bottlenecks and recommendations

In line with Kilwinger et al. (2021), we would like to reiterate different types of seed agribusiness models are required to provide clean cassava seed to different groups (types/categories) of farmers. Therefore, the objective should not be to identify one best model, but to explore what combination of cassava seed agribusiness models is most likely to deliver clean seed and combat cassava pest and diseases at scale. Careful coordination is needed to ensure that one approach or intervention does not contrast with and/or undermine the others.

4.1. General conclusions

When critically reviewing the key-informant assessment of the agribusiness models and cases, we can draw the following conclusions:

1. None of the agribusiness cases/ models are currently ready for scaling

According to the majority of the key-informants, all CASS Rwanda agribusiness models need further design, testing and validation. None of the models is currently ready for scaling. This implies that further research/ development investment is needed to improve or finetune the models before investments in scaling should be considered.

2. Business models are currently mainly used by CASS project partners

According to the key-informants, the current use of the agribusiness models is limited to the CASS project partners. We do not yet see other partners or organizations using or replicating the model. This is quite normal given the fact that the models are still being tested and validated.

3. Likelihood of continued agribusiness model development varies across models and cases

Key-informants have varied opinions about the likelihood that agribusiness model and case development will continue beyond the CASS project. They seem to be a bit more optimistic about the continued development of the processor-led and community entrepreneur-led agribusiness models.

4. There is a lack of strategies or plans that go beyond the CASS project

There is a general absence of long-term strategies or plans on how to sustain the cassava seed agribusiness model (development) beyond the CASS project. For those agribusiness models and cases where there is no clear strategy or plan, the CASS project should develop an exit-strategy that provides clarity and manages expectations among key public and private stakeholders.

5. No major concerns regarding the responsible scaling of the agribusiness models

Key-informants have no major concerns with regards to potential inequalities that scaling the cassava seed agribusiness models could create. Key-informants mentioned that the Kinazi

Cassava Plant processor-led agribusiness model is likely to benefit commercially-oriented farmers' more than subsistence-oriented farmers. Continuous monitoring of responsible agribusiness case/ model development and scaling should be a priority.

6. **Public-private partnerships seem to be preferred modality for scaling cassava seed agribusiness models**

In scaling the agribusiness models, government, private sector and NGOs are expected to play a role. It is quite remarkable that a number of key-informants sees government playing a key role in scaling the private- and processor-led agribusiness models. In most cases, public-private partnership will be needed to address the various issues related to scaling cassava seed agribusiness models (e.g. certification, market creation, multiplication, capacity development, etc.).

7. **The "what's in it for me" needs to be clarified for key stakeholders**

Key-informants find it unlikely that scaling partners will invest their own resources in scaling the agribusiness model development and scaling. This implies that key stakeholders currently do not see sufficient benefits in investing, which is problematic. The "why should we invest our company, project or government resources in this?" needs to be clear.

4.2. Cross-cutting bottlenecks

From the identified risks and opportunities, we were able to identify a number of cross-cutting bottlenecks for developing and scaling cassava agribusiness seed system models in Rwanda:

1. **Limited investment in developing the cassava sector**

Several key-informants mentioned that developing the cassava seed sector requires continuous investment in the overall cassava sector, which includes making the sector more climate resilient, improving crop management, market development, etc. The Rwandan government could incentivize and promote investment in the cassava sector in a continuous manner, not only during crises.

2. **Incentives for investing in clean cassava seed are currently not strong enough**

Currently, incentives for farmers to invest in clean cassava seed are insufficient. There are no 'push' mechanisms (e.g. policies, subsidies or other incentive mechanisms) that stimulate farmers to regenerate their cassava seed regularly, and there are also no 'pull' mechanisms (e.g. incentives emerging through the cassava root market) that motivate farmers and multipliers to invest in having and using clean seed. Lessons learned from other countries show that 'pull' mechanism often emerge from having a stable and profitable market for cassava products.

3. **There exist key capacity gaps among cassava farmers, seed multipliers and cooperatives**

Key-informants identified key capacity gaps that hamper the development of a cassava clean seed sector. Capacity gaps include limited understanding of how cassava seed degeneration influences productivity and pest and disease pressure, need for collective action to reduce pest and diseases, efficient seed multiplier cooperative management and growing cassava as

agribusiness which includes having access to new cassava varieties and novel agronomic practices.

4. There is a lack of clear stakeholder scaling role division and coordination

In line with the conclusion that scaling most of the agribusiness models would require public-private partnerships, there is a need among stakeholders to agree on roles and responsibilities. It was quite concerning to read that key-informants believe government should play a lead role in scaling private company led agribusiness models. Government should definitely play a role, but the private partner should be leading. A potential role division for different stakeholder groups could look as follows:

- **Government**: seed certification, create (tax) incentives, enabling policy environment, incentivize cassava market development.
- **Private sector**: seed multiplication, market development, contract farming arrangements
- **Farmer entrepreneurs/ cooperatives**: seed multiplication, collective action
- **Research organizations**: ensure continuous genetic innovation (new varieties), test and validate models, advance cassava agronomy/ pest and disease management
- **Development organizations**: capacity sharing and training, kick-start/ facilitate collaboration and coordination mechanisms
- **National agricultural extension**: provide access to information that can improve cassava agronomy, pest and disease management, improved harvesting and storage techniques, etc.

Depending on the specific agribusiness model, these stakeholder roles and responsibilities should be specified. Roles and responsibilities should align with the key mandates and interests of the different organizations. This will have the highest change of success.

4.3. Recommendations and next steps

1. Distinguish between scaling within the agribusiness cases, and scaling the agribusiness models

During the interviews with the key-informants, scalability was often perceived to be sustaining the agribusiness cases (beyond the CASS project), or increasing seed production within the agribusiness case. This is only one dimension of scaling; focused on increasing the direct seed production capacity or direct seed market for those who multiply the seed. However, real impact at scale can be achieved through scaling the models rather than scaling within the specific agribusiness cases. Scaling the agribusiness models implies going from having 1 seed multiplication cooperative to having 50 of those cooperatives, or supporting the entrepreneur led model in 100 communities rather than 1 community. Here new challenges and risks will emerge, such as inter-cooperative or -community multiplier competition, market saturation, etc. Business case stakeholders may not always be interested in supporting the scaling as it may go against their direct agribusiness interest (e.g. scarce product/ high demand drives up seed market prices).

The most important thing is to first ensure that the aspired agribusiness model shows sufficient potential (does it work and can it sustain itself under the current conditions), before considering such a model to be scaled. Some models may be difficult to scale, due to the

unique features of model or partners involved. The processor led model set up around the Kinazi Cassava Plant is quite unique in the sense that there are no comparable plants that operate in a same way or at the same scale as Kinazi.

2. Develop long-term and/or exit strategies with the agribusiness case stakeholders

In order to manage expectations it is important to either develop longer-term strategies for seed agribusiness model/ case development and scaling (for those that show sufficient potential) or exit strategies (for those that show insufficient potential). It is extremely important that the agribusiness case stakeholders have clarity about what kind of support they can still expect (or not) from the CASS project team.

3. Continued investment in fine-tuning those models that seem promising

As most of the models are not ready for scaling and are still undergoing testing and validation, we would recommend the following next steps:

- Step 1: Decide which models show sufficient potential to further develop. Keep in mind that models should be able to sustain themselves on the long-term (without an external project support)
- Step 2: Co-create concept notes to ensure a joint vision on next steps and division of roles and responsibilities among CASS partners and agribusiness case stakeholders
- Step 3: Mobilize funding to conclude testing and validation to find out whether the model could work in uncontrolled conditions (again this means without external project support)

4. Deepen understanding of stakeholder willingness to pay/invest

There is an overall lack of willingness to pay/ invest in clean cassava seed. This is not limited to farmers, but also applies to government and private processors. For the successful expansion of clean seed use in Rwanda, it is essential to understand the existing barriers that different stakeholder groups experience for investing in clean seed, and what could lift such barriers. For government this could focus on exploring how investments in clean cassava seed could reduce cassava import, earn foreign currencies, improve food security and income for smallholder farmers. For private sector this could focus on exploring how investments in clean cassava seed could improve productivity, reduce losses due to pest and diseases, or provide access to premium markets. For private sector and cooperatives this could focus on market analyses and return on investment projections. There is a need to go beyond concluding that there is unwillingness to pay or invest, towards exploring what could trigger such willingness. Research could play an important role in doing this.

5. Co-investment models with scaling partners to ensure ownership and sustainability

There is an overall concern of whether key agribusiness case stakeholders are able to invest their own resources in continuing agribusiness case development and use. In addition, there is not a lot of optimism with regards to scaling partners being able to invest their own resources in scaling the agribusiness models. In terms of ownership and sustainability, it is extremely important that scaling partners co-invest in projects or initiatives aimed at scaling the models. When co-investing there is a higher likelihood that model development is to align with their strategic needs and interest (e.g. that there are profitable), which increases the scalability potential. Co-investment may be in-kind (e.g. providing staff capacity and land), but preferably are complemented by in-cash investments as well. Cash investments usually

trigger internal “what is in it for us?” or “why should we invest our scarce resources in this?” discussions which are essential for developing models that can provide actual benefit and can sustain beyond project investment. Here again, research could support foresight analysis and ex-ante assessments of projected benefits for different public and private stakeholders if the model would be used at scale.

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Annex A: Overview of key-informants

Overview of key-informants per agribusiness model and case:

Agri-business model	Agri-business case	Proposed interviewees	Name	Tel number	# Survey forms
Processor led	KCP	Coop. 1 representative	MUKABARISA Chantal	0782914635	1
		KCP management	RUTAGUNGIRA Yves Nicolas	0788558098	1
		Coop. 2 representative	MATABARO David	0788986350	1
	KIAI	Coop president	NDAHAYO Evariste	0783319069	1
		Coop committee member 1	KALINDA Jean Claude	0784302933	1
		Sector Agronomist	HAKIZIMANA Anastase	0782554228	1
Private company led	INGABO Syndicate	Ingabo secretary general	MBABAZI Francois Xavier	0788303140	1
		Ingabo Agronomist	MANARIYO Victor	0785764482	1
		Coop. 1 representative	Etienne Nzuginze	0788687021	1
		Individual seed multiplier	NIYONGIRA Jacques	0788521038	1
Community led	CDAN	Coop1 President	MUTANGANA Innocent	0788886097	1
		Coop1 committee member	MBAGURIRIKI Alphonse	0783513941	1
		Coop2 committee member	MUHIRE Christophe	0783171664	1
		Community entrepreneur	MAHIRANE MUSEVENI Benoit	0788868326	1
CASS Project staff	ALL	CASS Project - SPARK	Oscar Nzayimbaho		1
		CASS Project - SPARK	Sylvie Bambara		1
		CASS Project - RAB	Dr Athanase Nduwumuremyi		1
		CASS Project - RAB	Severin Ntivuguruzwa		1