

A Case Study of the Chithumba Model

A non-traditional finance mechanism to improve access to farm inputs in Malawi



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About Agronomy Technology Limited (ATL)

ATL has been working on Malawian smallholder farmer value chains since 2010. The organisations' core focus has been the development and implementation of innovative digital extension tools for rural environments. The long-term goal being the facilitation of commercially viable smallholder value chains and the integration of these value chains into the formal market. The implementation of the Chithumba model and subsequent case study has provided valuable insights into the opportunities and constraints faced by smallholder soybean producers in Malawi.

About MEDA

Since 1953, MEDA has been implementing effective market-driven programs globally. MEDA combines innovative private sector solutions with a commitment to the advancement and empowerment of excluded, low-income and disadvantaged communities (including women and youth) with core expertise in market systems and value chains, climate-smart agriculture, financial services, and investment. MEDA partners with local private, public and civil society actors, strengthening individuals, institutions, communities and ecosystems, and thereby contributing to sustainable and inclusive systemic change.

INNOVATE – Adoption of Agricultural Innovations through Non-Traditional Financial Services, is a three-year initiative implemented by MEDA and funded by the International Development Research Centre (IDRC). MEDA and its partners are assessing the potential of non-traditional finance to enable large scale adoption of agricultural innovations among women and men smallholder farmers in South Asia, South America and East Africa. The research and learnings will contribute to developing policy and programming recommendations.



Executive Summary

The Chithumba model is an alternative finance mechanism implemented by the Agricultural Commodity Exchange for Africa (ACE) and launched in Malawi in 2015. It was designed to mitigate the challenges faced by smallholder farmers particularly with regards to low productivity, lack of access to credit and limited participation in the formal market. The model proposes a services bundle including pre-harvest finance for farm inputs, agricultural extension services and marketing assistance. The objective of this case study is to assess and document both the demand and adoption rates for all three services offered to Chithumba clients. In total, 214 clients participated in this case-study. The respondents of this case-study were smallholder soybean farmers from three farmer groups located in the Lilongwe, Mchinji, and Ntchisi districts of Malawi. The data collection consisted of in-field individual farmer interviews as well as focus group discussions

with the respondents. Despite the promising results of the model with regards to the loan repayment, pilot data reveal a low adoption rate for the marketing services and a varying rate of the adoption of the recommended agricultural practices. Alternative inputs distribution programs impede the demand for inputs on credit as Chithumba is perceived as too expensive and, when cheaper options are available, those are usually preferred over Chithumba. This study reveals substantial differences between farmers stated demand and actual behaviour. In particular, although respondents highly valued the knowledge on Good Agricultural Practices (GAP) received, their ability and willingness to move away from their traditional cultivation practices remain partial. Further research is required to assess the role of various barriers including but not limited to access to labour and affordability, trust and time. Adoption of marketing services is marginal. It is not clear whether this is the result of farmer misperceptions of marketing services benefits, a lack of understanding of the market principles driving prices and costs, and/or that ACE service delivery requires adjustment to better meet farmers' needs. This case-study proposes several recommendations to boost demand and improve clients' retention under the model.



Introduction

Malawi is one of the poorest countries in the world; approximately 74% of the population lives on less than \$1.25 per day.¹ The country has one of the highest population densities in Africa, with 186 people per km² in 2018 up from 138 in 2008; while 84% of the population reside in rural areas.² The Malawian economy is dominated by agriculture. Approximately 85% of Malawi's households engage in farming activities.³ The agricultural sector represents one third of the national GDP and 80% of foreign exchange earnings.⁴ It is comprised of both large estate holders and smallholder farmers. The latter constitutes more than 90% of the rural population and represents 80% of Malawi's agricultural production.⁵ Over two thirds of the farms surveyed in the Malawi Integrated Household Panel Survey (IHPS) of 2012/2013 were less than one hectare.⁶

Malawi's smallholder agricultural sector suffers from low productivity due to soil degradation, unreliable rainfall and inconsistent growing

practices.⁷ Moreover, productivity remains sub-optimal due to limited access to production technologies and farm inputs. According to Feder et al., the adoption of agricultural innovations is driven by several key factors, including access to credit, farm size, resilience and access to commodity markets.⁸ For the smallholder farmers, inadequate access to credit, smaller farm sizes, excessive climate risk exposure and a lack of reliable or formal market access contribute to a lack of resiliency and negatively impact the adoption of new technologies by smallholder producers in Malawi.

Access to affordable credit is a major constraint to agricultural productivity in Malawi.⁹ Smallholder farmers usually do not have recourse to banking services and the high upfront cost of inputs and lack of savings prevent them from accessing high quality seed and other inputs. Despite agriculture's significant contribution to GDP, less than 5% of local lending is made available to agriculture.¹⁰ Typically, commercial banks perceive the risks

¹ FAO, *Review of Food and Agricultural Policies in Malawi* (2014)

² National Statistical Office (NSO) of Malawi, "2018 Malawi Population and Housing Census – Preliminary Report" (2018)

³ FAO, *Country Fact Sheet of Food and Agriculture Policy Trends* (2015)

⁴ FAO, *Review of Food and Agricultural Policies in Malawi* (2014)

FAO, *Country Fact Sheet of Food and Agriculture Policy Trends* (2015)

⁵ World Bank, Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS), Malawi Agricultural Commercialization Project (P158434), Report No: PIDISDSA20938 (2017)

⁶ National Statistical Office (NSO) of Malawi, "Malawi Second Integrated Household Survey (IHS3) 2010-2011" Basic Information Document, Malawi. (2012)

⁷ Carr, Stephen. "The challenge of Africa's nitrogen drought: Some indicators from Malawian experience". *International Food Policy Research Institute (IFPRI) Policy Note* 19 (2014)

⁸ Feder, Gershon & Just, Richard & Zilberman, David. "Adoption of Agricultural Innovations in Developing Countries: A Survey." *Economic Development and Cultural Change*. Volume 33 (1985): pages 255-98.

⁹ FinMark Trust, "Status of Agricultural and Rural Finance in Malawi". (2012)

¹⁰ FinMark Trust, "Status of Agricultural and Rural Finance in Malawi". (2012)



inherent to smallholder producer lending as too high.¹¹ ¹² Normal production related risks such as weather, pests, and diseases, as well as price risk from fluctuating commodity markets have been compounded by high currency volatility in the Malawian Kwacha over the last decade. Lack of national identification documents and low financial literacy among smallholder producers are additional barriers to the access and use of commercial banking services.¹³ As mentioned by Hong and Hanson,¹⁴ the combination of financing, marketing and production training services reduce the financial risk and increase the potential return of a loan.

Moreover, smallholder farmers often lack knowledge on Good Agricultural Practices (GAP) and do not have adequate access to quality

extension services.¹⁵ The impact of the National Extension Policy introduced in 2000 remains limited due to partial implementation.¹⁶ On the other hand, various organizations and donors currently support and deliver extensions services, but the quality of information supplied remains inconsistent and is often contradictory between partners.

Finally, smallholder farmers face the problem of poor access to formal markets. Many smallholder crops are sold at the farm gate to intermediate buyers (vendors), with whom farmers have very little bargaining power, since prices are set unilaterally and uniformly by vendors. Although those informal markets are available and easy to access, they lack transparent systems of price discovery and instruments to manage risks. Selling at the gate often results in disagreement between the vendor and the farmers with regards to the grading of the commodity (weight, quality, etc.) with the farmer having limited ability, if any, to refute the conditions imposed by the vendor. This results in low margins for the producers, as intermediaries such as traders and final buyers realize most of the profit.¹⁷

As a response to these challenges, in 2015, the Agricultural Commodity Exchange for Africa (ACE)

¹¹ Adjognon, Serge G. and Liverpool-Tasie, Lenis Saweda O. and Reardon, Thomas A. "Agricultural input credit in Sub-Saharan Africa: Telling myth from facts", *Food Policy*, Volume 67 (2017): Pages 93-105

¹² Hong, David, and Stephanie Hanson. "Scaling up agricultural credit in Africa," Frontier Issues Brief submitted to the Brookings Institution's Ending Rural Hunger project (2016)

¹³ Mandiwa, Madalitso. "Access To Financial Services In Malawi: Policies And Challenges", Expert Meeting On The Impact Of Access To Financial Services, United Nations Conference On Trade And Development. (2014)

¹⁴ Hong, David, and Stephanie Hanson. "Scaling up agricultural credit in Africa," Frontier Issues Brief submitted to the Brookings Institution's Ending Rural Hunger project (2016)

¹⁵ Knorr, Jochen & Gerster-Bentaya, Maria & Hoffmann, Volker. "The History of Agricultural Extension in Malawi." (2002)

¹⁶ Ragasa, Catherine & Mazunda, John & Kadzandira, Mariam. "The national extension policy of Malawi – lessons from implementation". *International Food Policy Research Institute*, MASSP POLICY NOTE 23. (2015)

¹⁷ Chirwa, Ephraim & Mvula, Peter & Kadzandira, John. "Agricultural Marketing Liberalisation and the Plight of the Poor in Malawi." (2005)

introduced the Chithumba model in its offer of services. ACE is a trading platform for agricultural commodities that promotes inclusiveness and links smallholder farmers to its marketing services. ACE marketing services include the Warehouse Receipt System, trade facilitation and market information services (Appendix 1). Chithumba was designed to mitigate the aforementioned challenges faced by farmers with a services bundle including formal market access through ACE, Good Agricultural Practices (GAP) training for farmers and input loans.

Despite massive efforts on training, financing and services improvements, ACE has struggled to increase producers' adoption of its formal marketing services, the Warehouse Receipt

System. Internal and external consultations with various NGOs, clients and smallholder farmers suggested, among others, that a lack of trust and understanding of ACE's marketing services was partly responsible for the low adoption of ACE services.

In parallel, the inputs supply sector experienced difficulties finding consistent markets for their products. Many smallholder producers relied on the national Farm Inputs Subsidy Program (FISP) to access quality input seed. However, over the past 5 years, uncertainties regarding the continuation of the FISP program and its ability to cover inputs for non-maize crops forced the inputs supply sector to investigate new financing and distribution options.

The national FISP was initiated in 2005. The stated aim of the program is to enhance food self-sufficiency by increasing smallholder farmers' access to and use of improved agricultural inputs, thereby boosting the incomes of resource-poor farmers. FISP is administered through vouchers or coupons that enable eligible households to purchase fertilizer and hybrid maize seed at reduced prices. The program targets smallholder farmers who own land and are legitimate residents of their villages. Beneficiary selection, which is carried out by village heads and members of village development committees (VDCs), is supposed to give priority to "vulnerable" groups. To date FISP has had mixed results, on the one hand it has been lauded as having played a significant role in improving food security in Malawi and on the other hand it is accused of being susceptible to corruption and financially unsustainable.¹⁸

¹⁸ Nkhoma, Peter R., "The evolution of agricultural input subsidy programs: contextualizing policy debates in Malawi's FISP", *World Development Perspectives*, Volume 9 (2018): Pages 12-17.

The Chithumba Model – An Alternative Financing Mechanism

Since its inception in 2015, the Chithumba model has considerably evolved and been refined to better address client needs, reduce implementation costs and improve farmer outcomes.

Model Genesis

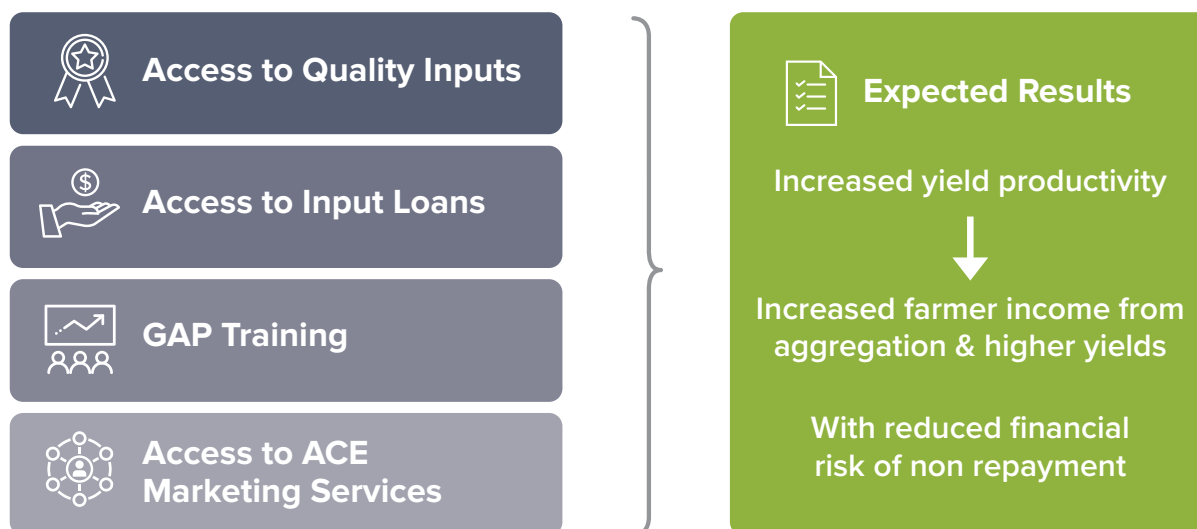
The Chithumba model hypothesized that by offering a holistic bundle of services, based on farmers' stated demand and needs, farmers would increase adoption of high-quality inputs, improve their production techniques and access marketing services through ACE. It was hypothesized that increased interaction with producers throughout the entire growing season would increase trust and uptake of services.

Focusing on soya farmers, the Chithumba model was implemented for three consecutive seasons and targeted respectively 954, 4,457 and 1,992

The following three services are offered to Chithumba clients:

1. **Pre-Harvest Finance for Farm Inputs**
2. **Agricultural Extension Services**
3. **Marketing Assistance**

soya producers located in the central region. In total, inputs worth over USD 270,000 were disbursed through loans. The model was initially supported both financially and technically by the Malawi Oilseed Sector Transformation Program, a UK-AID funded program and received additional financial support from USAID in 2017. Agronomy Technology Limited (ATL) has been involved with the implementation of the Chithumba model since 2016. ATL provided assistance to ACE on the ground to recruit clients, deliver the agricultural training and coordinate the repayment activities.



Services Offered

The Chithumba model includes three core services and, in 2017, covered the districts of Mchinji, Kasungu, Ntchisi, Lilongwe and Machinga:

1. Pre-Harvest Finance for Farm Inputs:

Selected participants received agricultural inputs on credit based on screening criteria. For example, clients must be affiliated with a pre-selected organized cooperative, have a minimum land size, and express the desire to enroll. While no deposit payment is required, clients must register with Chithumba prior to input distribution times in order to qualify. The entry package included soybean seed and inoculant.¹⁹ Upon harvest, clients repay input loans in kind with bags of grain produced. A set repayment volume is defined at the onset of the season based on the value of the inputs package received and the expected selling price of the repayment volume. The current repayment ratio of 1:5 covers the cost of inputs in full (i.e. not subsidized) but does not include other services like GAP training. To ensure affordability of the services, the repayment volume is capped at 25-30% of the total expected production. Inputs supplied under Chithumba are not subsidized and, as such, the model's repayment ratio is usually significantly higher than other agricultural input distribution programs implemented in Malawi. On average, there are 5 to 6 months between the repayment deadline and the next input distribution.

2. Agricultural Extension Services:

To ensure that the producers efficiently use the

inputs provided on credit, all enrolled producers received training on Good Agricultural Practices (GAP) using training days, field visits and/or demonstration plots. In addition, customized agronomic extension SMS messages were sent using the ACE messaging system. The training modules were delivered by Chithumba staff members, ACE Rural Marketing Advisors (RMAs) and champion farmers selected from participating clients who receive specific in-depth training. In addition, a meeting with the clients to review the model and discuss their performance occurred at the close of each season. Currently, the cost of these services is not embedded into the repayment costs, and the current model depends upon some subsidization. The justification for providing this level of training was to build social trust with farmers and at the same time responding to low farmer productivity that could impact repayment ability.

3. Market Assistance:

Since Chithumba is a non-traditional contract-farming model, farmers were required to repay the calculated repayment volume based on the value of the loaned inputs. While farmers have the option to sell their "surplus" volumes through ACE after loan repayment, there is no known buyer at the onset of the season. This level of flexibility was deliberate after previous farmer feedback and historic results suggested that the risk of side selling is significantly reduced when producers remain free to choose how to market their commodity. Clients also received trainings on ACE services, i.e. trade facilitation, warehouse

¹⁹ Chithumba introduced groundnut seed in its loan portfolio in 2016. However, the Chithumba groundnut program has faced several challenges, including germination problems and a significant rosette virus infestation, which resulted in amendments of Chithumba's terms and conditions. Therefore, this case study is focusing on soybean producers only.

receipt system (WRS) and market information. Furthermore, clients received SMS messages with market prices and trade opportunities. As of

today, the training and SMS services are free of charge for all clients receiving inputs on credit.

Methodology

ATL conducted this study. The team surveyed smallholder soybean²⁰ farmers from three farmer groups located in the Lilongwe, Mchinji, and Ntchisi districts of Malawi. Figure 1 provides an overview of the relative location of the three groups. The map also indicates relative distances of the individual farmers fields from the centralized ACE warehouses for input distribution, training activities as well as repayment aggregation.



²⁰ The Chithumba groundnut program has faced several challenges which resulted in the case-study focusing only on soybean farmers. Serious germination problems in the first season (2016-2017) resulted in revised repayment volumes for all groundnut farmers. Therefore, it was difficult to use their feedback as being representative of the model. A dry spell soon after germination in the second season (2017-2018) resulted in significant rosette virus infestation which forced Chithumba to review the repayment volumes for a second year in a row.

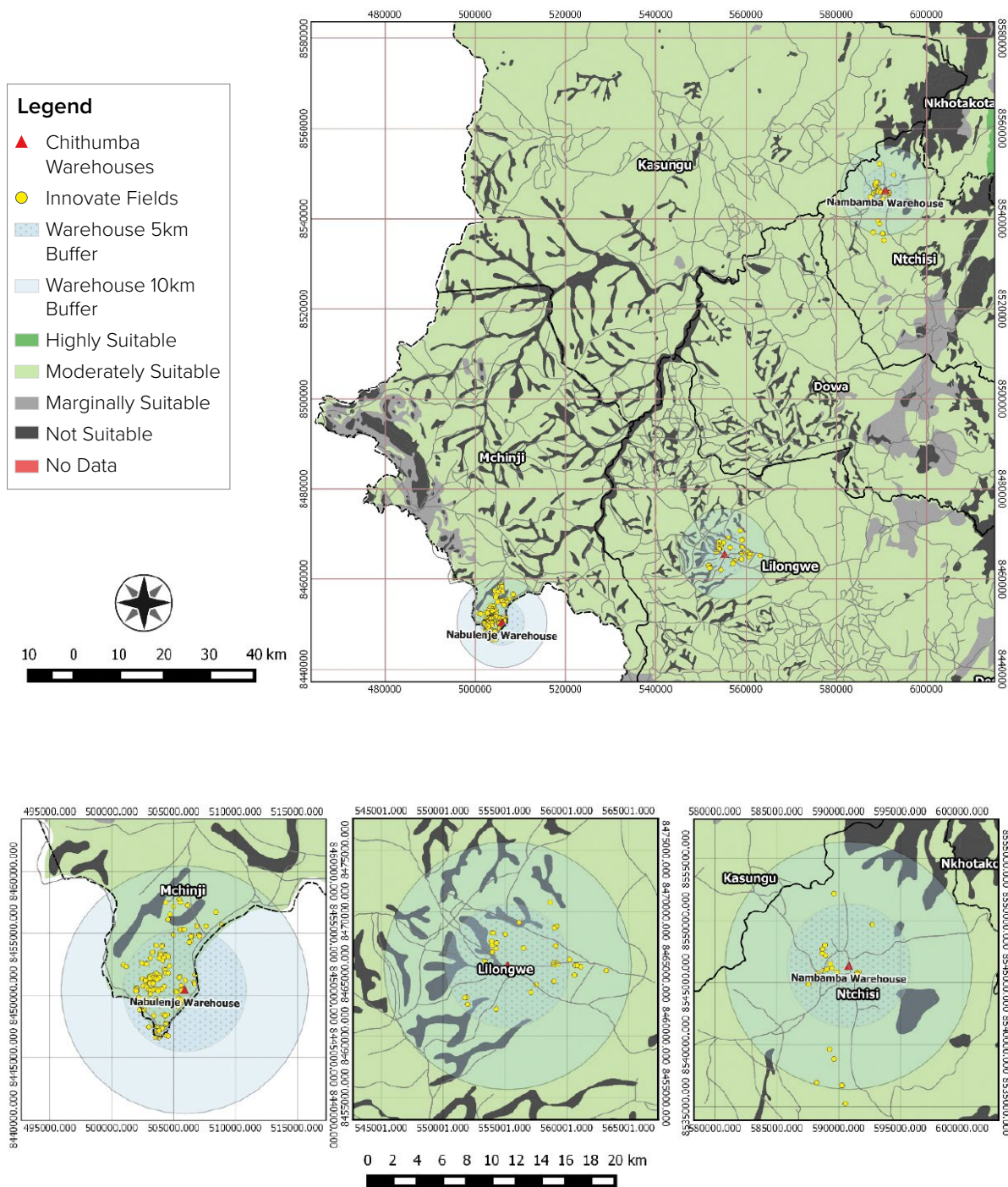


Figure 1: Location of the three farmer groups that participated in the case-study

The study sample included individuals who participated in the model for at least two seasons,²¹ since they could reflect on their experiences and provide feedback on the earlier iteration of the model and its modifications. Due to the timing of the survey, not all activities were completed for

the 2017-2018 season (e.g. marketing). Therefore, farmers who joined during this season were not able to answer all questions related to the model. In total, 214 farmers participated in the survey. Table 1 below provides a summary of the basic characteristics of the sample group.

Table 1: Characteristics of the Study Sample – S = 214

Number of Clients	Men	122	57%
	Women	92	43%
Head of households	Men	118	97%
	Women	18	19%
Location ²²	Lilongwe	35	16%
	Mchinji	150	70%
	Ntchisi	29	14%
Years of experience ²³	1	5	2%
	2	10	5%
	3	199	93%
Inputs on loan	Seed + inoculant	191	89%
	Inoculant only	23	11%
Soybean land size (Acres)	<0.5	18	8%
	0.5=< < 1	79	37%
	1=< < 1.5	59	28%
	1.5=< < 2	31	14%
	>=2	27	13%

²¹ As indicated in Table 2, five clients only had one year of experience with Chithumba but were part of the sample. It appeared that those clients used the identity of a previous client, usually a family member, to join the model. This can happen when the initial client passed away or is no longer farming but the family wants to remain client of the Chithumba model.

²² The difference in the number of participants per district is due to the massive difference in the retention rates across the districts. 74% in Mchinji vs 9% in LLW.

²³ Although the case-study targeted users with at least two years' experience in the model, five individuals in the sample were participating in the model for the first time. These individuals had used the identity of an existing member to participate in the 2017-2018 season.



A research ethics and regulatory approval and permit regarding the study protocol, participant information materials and research instruments was provided by the National Commission for Science and Technology of Malawi.

The data collection consisted of in-field individual farmer interviews as well as follow up focus group discussions with the respondents.²⁴ The individual interview comprised of two sections. Firstly, a household survey was conducted at the individuals homestead. Secondly, the interview continued with a field survey at the site where the farmer cultivated Chithumba inputs for the

current season. GPS devices²⁵ were used to measure the size of the fields planted with Chithumba inputs. The information collected included both quantitative and qualitative data. In addition to general demographics data, the survey contained questions related to the production and marketing activities carried out by the farmers as well as information relating to the farmers perception of the three core services offered by the model.

The survey was first tested in real conditions and further adjusted to ensure accuracy of answers and easy understanding of the questions. The

²⁴ See Appendix 2 and 3 for the individual survey questionnaire as well as the FGD questionnaire.

²⁵ Garmin GPSmap 62s

questionnaire took approximately 1 hour to complete with each participant. All participants were informed that their participation in the case-study was voluntary and that they could quit the survey at any time. In addition, as the data collection exercise and the focus group discussions were both conducted during the repayment period for the loan, there was a risk that the participating clients would not provide accurate and honest feedback with the intent to justify their performances in the model. Furthermore, to limit bias, the respondents were informed that the study was conducted independently of the model with the sole purpose of better understanding the model and to collect information necessary for its improvement. It was made clear that no consequence would

result from the answers and feedback provided. Overall, the participating clients appeared comfortable with the questions and happy to provide honest feedback.

Following the individual survey, respondents were invited to join Focus Group Discussions (FGD), held near their villages. The FGD questionnaire was prepared following the analysis of the quantitative data collected during the individual surveys. The purpose of the FGD was to further investigate the interesting observations in the individual surveys. Additionally, the female respondents participated in a separate FGD to understand the gender dynamics and its impact on model results. Table 2 below provides a summary of FGD attendance.

Table 2: Focus Group Discussions in Lilongwe, Mchinji and Ntchisi Districts

District	FGD	Men	Women	Total
Mchinji	1	23	14	37
	2	19	22	41
	3	20	14	34
Ntchisi	4	18	7	25
Lilongwe	5	8	21	29
Total		88	78	166

The main limitation of this data collection exercise is a direct result of the timing of the survey. The survey took place during the months of May

and June. This timing coincides with the start of the marketing season; post-harvest. Therefore, visual inspections of the fields provided

limited information and ongoing monitoring of agricultural practices were unfeasible. Thus, respondents self-reported most of the data related to productivity, adoption of GAP and production practices. Self-reported data are

associated with a lower level of confidence and less details. Data enumerators reported a few cases of confusion and uncertainty with regards to the answers.






Results

Despite the promising results of the model with regards to the loan repayment, pilot data revealed a low adoption rate for the marketing services and a varying rate of the adoption of the recommended agricultural practices. The following sections identify the specific customer

insights related to the differences for repayment, retention and between stated demand for inputs loan, marketing services and GAP training and adoption. ATL used the following indicators to assess the demand and adoption of the Chithumba core services.

Table 3: Indicators used to assess demand and adoption of Chithumba core services

Service	Demand	Adoption
 Access to inputs on credit	Retention rate Stated demand	Repayment rate
 Agricultural production	Stated demand for agricultural training	Implementation in clients' field of the recommended practices
 Marketing services	Stated demand for marketing services	Use of ACE marketing services

Pre-Harvest Finance for Farm Inputs

Despite the negative feedback from farmers that in-kind repayment ratios were high,²⁶ overall repayment rates among farmer groups were strong. Table 4 provides an overview of the repayment rates of the respondents as well as their broader farmer groups. It should be noted

that as non-repayment results in exclusion from the model, all surveyed clients repaid their loan in full in the previous seasons. No significant gender related differences were observed in the repayment rate.

²⁶ The Chithumba model has a repayment rate of approximately (1:5) seed to grain. Most development organizations implementing seed distribution/bank projects have a repayment rate of (1:2).

Table 4: Chithumba overall and sample repayment rates

Repayment Rates						
Season	2015-2016		2016-2017		2017-2018	
Location	<i>All clients</i>	<i>Interviewed clients</i>	<i>All clients</i>	<i>Interviewed clients</i>	<i>All clients</i>	<i>Interviewed clients</i>
Mchinji	100%	100%	100%	100%	90%	100%
Lilongwe	92%	100%	98%	100%	85%	93%
Ntchisi	89%	100%	100%	100%	100%	100%

The focus group discussions with clients emphasized that the most important determinants for likelihood of repayment were: (1) the desire of farmers to remain in Chithumba for future seasons, and (2) the proximity of clients to the repayment aggregation point, the ACE certified warehouse. The further the farmers were located, the more difficult it was for them to repay, which translated into lower repayment rates. Originally, in the 2016 and 2017 seasons, Chithumba farmers were located within a 5km radius from warehouse collection points. However, with the addition of new farmers in the 2017-2018 season, distances from warehouses were expanded. As a consequence, the overall repayment rate for the group located in Mchinji dropped from 100% in 2016 and 2017 to 90% in 2018.

Secondly, if a client did not intend to return to the model for the following season, the likelihood of a full repayment significantly decreased. Notably, full repayment does not guarantee future participation in the program since some clients decided later in the season that they do not wish to participate anymore even after their repayment.

Respondents highlighted significant demand for access to agricultural input loans among all farmer groups. Generally, it was agreed that despite the high repayment ratio associated with the model, clients still valued the model. 90% of respondents stated that they were convinced that yields have improved since they became Chithumba clients. Moreover, the high quality of inputs provided was unanimously cited as an important advantage of Chithumba, and a main driver of their willingness to remain as a client. Finally, clients appreciated the communication strategy implemented under Chithumba and highlighted the team's willingness to facilitate regular open dialogue with them.

However, the model was perceived as expensive and willingness to participate was often based on availability of alternative input supply options with lower repayment rates in the farmer areas. In this context, the model struggled to retain clients in the face of competition from other short-term input distribution projects. The survey also revealed that the respondents' perception of the high cost of Chithumba reflected a lack of understanding of the latter. Respondents



compared the Chithumba repayment ratio (1:5) with other alternative programs, concluding that it was more expensive; but they were unable to compare the repayment ratio with the production level and / or cost of inputs at the closest retail point.

Respondents also stated that the inputs offered on loan through Chithumba occasionally do not meet their demand. It was suggested that some producers have greater need for other types of inputs such as chemicals. In some cases, producers retained seed or sourced it elsewhere but struggled to access chemicals.

With regards to client retention, the study found a striking difference between repayment and

retention rates over three seasons. Chithumba has faced difficulties to retain clients over time as seen in Table 5 below. The retention rates observed among the three participating farmer groups over the past three seasons had substantial differences based on location. In 2017, retention rates in both Lilongwe and Ntchisi districts decreased, with an overall retention rate of only 9% over two seasons in Lilongwe. The significant drop in the retention rate in the Lilongwe and Ntchisi districts was a direct result of the perceived high repayment ratio of the model, i.e. the number of kilograms of grain required to pay off one kilogram of seed disbursed on loan. Groups with access to other input supply options, at a more attractive cost, clearly felt that the value offered by Chithumba

did not justify re-enrolling. However, often those alternative input supply options are not known by farmers at the time of repayment, thus some clients repaid their loans to ensure they would

have the opportunity to access inputs via Chithumba if no other options were available by the start of the next agricultural season.

Table 5: Chithumba retention rates

Retention Rates			
	From 2015 to 2016	From 2016 to 2017	From 2015 to 2017
Mchinji	98%	76%	74%
Lilongwe	96%	10%	9%
Ntchisi	65%	20%	12%

RECOMMENDATIONS FOR FUTURE RESEARCH/APPLICATION

As shown in the sections above, the demand for the provision of inputs on credit is correlated with the availability of alternative programs to access inputs in a given area. Where those programs were available, and the inputs were able to be accessed at a lower cost, clients prioritized such programs over Chithumba.

As the repayment ratio was calculated to cover the cost of inputs only, it was not possible to lower the repayment ratio without seriously compromising the model's sustainability and core values. In this context, several recommendations are provided below to maintain a sufficient demand for the Chithumba model. In addition, the limited offer of inputs available on credit via Chithumba limited the demand for the model.

1 Target geographic areas with little presence of development partners and / or inputs distribution programs in order to limit competition.

2 Explore options to diversify Chithumba's loan portfolio and to increase loan package customization to acquire an additional competitive advantage. Ensure the loan portfolio is diversified to offer inputs on credit that are more difficult to source by potential clients.

3 Increase the level of understanding of potential clients of the repayment ratio, how it is calculated and what proportion of their potential yield it represents. Assist potential client to put the repayment quantity in perspective with the model's broader benefits.

4 Develop and strengthen internal procedures and processes to ensure the quality of the services provided (quality of inputs, delivery time, etc.).

5 Focus on geographic areas with close proximity to aggregation centers to maximize client's ability to repay.

6 Develop a strategy to ensure model's continuity season after season. If clients feel that the project is ending, they are unlikely to pay back their loan.

Agricultural Extension Services

As the second core pillar of Chithumba, training on Good Agricultural Practices (GAP) was identified as key to ensure that farmers correctly utilized inputs offered on loan, increased their crop yields, repaid on time, and retained crops for consumption and future sales of soybean grain. Since there was no previous data about prior adoption of GAP by Chithumba farmers,

the insights here are not able to identify improvements beyond crop productivity increases. Table 6 shows the adoption rate of the full recommended GAP agricultural practices by farmer's gender and for the whole sample. Overall, 21% of the surveyed farmers adopted all recommendations.

Table 6: Adoption rate of the Good Agricultural Practices promoted by the Chithumba model

Adoption Rate of Full Recommended GAP Farming Techniques		
Women	Men	Total
15%	28%	21%

Despite low adoption (21%) of the full package of recommended farming practices, 99% of respondents claimed the GAP trainings were useful and 96% noted that recommendations were different from the traditional practices applied prior to Chithumba. Notably, women farmers appeared to have a much lower rate of adoption, compared to men. During the focus group discussions, women indicated they were less likely to follow the recommended planting practices because they have fewer hours available to work in the field due to competing household responsibilities. Women also noted that they were less likely to have the authority to use household income to pay for additional labor to assist them with work in their fields.

Moreover, there was no significant difference in adoption rates based on the size of the land planted with Chithumba inputs. However, since the analysis was based on adoption of the full set of practices, it is possible that observable differences in plot size for individual GAP recommendations are obscured by composite data. Since constraints are multi-faceted, further investigation is needed to identify which constraints are driving lack of adoption of GAP recommendations. Further investigation is needed for each specific GAP practice to understand where adjustments are needed.

Table 7 below provides a breakdown of the main reasons cited for not following the recommended GAP.

Table 7: Reasons cited for not implementing the recommended agricultural practices (s =167)

Reasons Cited for Not Implementing the Recommended Agricultural Practices	
The recommended agricultural practices are too labor intensive	64%
The client does not believe the recommended practices will result in a yield increase	6%
The client does not understand the recommended practices	3%
Clients land size is larger than the input package obtained, but they want to utilize all available land with the inputs received.	8%
The training was conducted too late in the season when the land was already prepared	2%
Manual weeding is too difficult if the recommended practices are adopted	4%
The work was performed by someone else / casual labor who did not follow the instructions	2%
Other	5%
The client followed recommendations provided by another partner and different from Chithumba recommendations	6%

Of the 167 clients (79% of sample) who did not follow the recommended practices, 64% indicated that this was because they were more labor intensive; with the cost of labor, additional time requirement and physical ability being the main constraints for the respondents. In particular, the activities of land preparation and weeding required additional labor when following the recommendations.

Central to the GAP was double planting per ridge and one seed per hole. This methodology

was designed to maximize plant count in a given area. Such practice was expected to reduce soil evaporation, reduce the chance of insect infestation and crowd out weeds. During the focus group discussions, farmers were asked to provide a more detailed explanation the specific hardships in applying GAP. The main differences between the traditional cultivation practices and the Chithumba recommended practices, as well as the cited constraints are indicated in Table 8 below.

Table 8: The Main Differences in Traditional and Recommended Cultivation Practices

Activity	Traditional Practice	Recommended Practice	Cited Constraints to Implementing Recommended Practice
Ridge Spacing	75-90 cm	75 cm	Farmers who rent land may not be allowed to alter existing ridge spacing.
Ridge Type	Standard triangular ridge	Flat topped ridge	Flat topped ridges require a relatively greater number of man hours to construct.
Row Type	Single row per ridge	Double row per ridge	Double the man-hours required to plant two rows per ridge.
Planting	2-5 seeds per hole, 15 cm apart	1 seed per hole, 5cm apart	Planting one seed per hole is difficult given the small size of soybean seed.
Weeding	Weeding by Hoe	Weeding by Hoe/Hand	Weeding between double rows on the ridge must be done by hand which is extremely tedious.
Pest and Disease Management	No use of chemicals or reactive treatment only	Preventive spraying	Lack of access to the inputs

With regards to yield increase, 90% of respondents stated that they were convinced their yields have improved since they became Chithumba clients. Unfortunately, Chithumba does not have reliable baseline data for yields to compare with post-pilot results.

Farmers' average yields and the average returns on inputs for the 2017-2018 season are presented in Table 9 below. The average yield per hectare

of 1,155kgs was higher than the estimated national average yield of 800 to 1000kgs/ha. There were no significant differences in yields found between men and women. The low adoption of recommended practices, specifically planting spacing, resulted in significant variation seed rates with values ranging from 13kgs/acre to 63kgs/acre (avg 26kgs per acre), compared to the expected seed rate of approximately 30kgs per acre.²⁷

Table 9: Chithumba Soybean Yield

	Average Yield <i>kgs / ha</i>	Average Return on Inputs <i>kgs of grain / kg of seed planted</i>
Men	1,183	19
Women	1,135	17
Total	1,155	18

The average return per kg of seed planted was critical to the clients' understanding of their ability to repay. As the average return per kg of seed planted was 18 kgs of grain, it places in context the relatively high repayment rate of (1:5) and proved that farmers were able to repay the loan and remain with a significant quantity of grain at the end of the season.

No significant difference was found in the data collected regarding the adoption of recommended practices for farmers that utilized hired labor and those who did not. Some possible explanations for this absent trend for the data are that hired laborers did not follow the full recommended GAP practice because: (1) they lack the knowledge about the practices,

(2) find the work cumbersome, (3) in the absence of oversight, they performed short cuts in application, (4) they required additional fees from farmers for what was perceived as additional labor which farmers were unwilling or unable to pay. Therefore, more in-depth investigation is needed to determine what the driving factors for the lack of observed difference between those who hired labor and those who did not. Since the data analysis was based on adoption of the full set of practices, it is also possible that further research that disaggregates individual GAP practices could show a more significant distance between farmers who hire laborers and those who do not.

²⁷ In some cases, seed rates were affected by dry spells early in the season which necessitated replanting on the same piece of land.

RECOMMENDATIONS FOR FUTURE RESEARCH/APPLICATION

This survey corroborates that respondents highly valued the knowledge received and had an interest in the training content delivered under Chithumba. However, both their ability and willingness to move away from their traditional cultivation practices remain a significant challenge to adopting GAP. As an important

consequence, it prevents Chithumba from conducting strong analysis of the potential yield increase resulting from the use of quality inputs and adoption of GAP. In this context, several recommendations address improving the uptake of GAP practices and unlocking clients' potential to increase yields.

1 Design the training methodology to only deliver relevant content to specific target groups and to limit training cost.

2 Investigate further existing differences among clients' profiles to clarify which recommendations are most attainable for specific client segments. Test the effectiveness of customized GAP trainings, especially for women that account for labor and cost constraints and show incremental changes farmers can make to achieve more significant results.



3 Diversify the loan portfolio to increase relevance of recommendations to a larger client profile. Consider including pest and disease management inputs under the loan offer.

4 Further analyze yield differences and yield increase for Chithumba clients and non-clients to assess yield increase resulting from i) use of certified inputs ii) adoption of recommended practices as this study does not demonstrate that the adoption of the recommended practices results in a yield increase.

5 Conduct further research during at least one entire agricultural season in order to capture data in real conditions rather than retrospectively. Field visual inspections and ongoing monitoring of agricultural practices would ensure accuracy of data collected, provide a greater level of details and allow for further discussion with the farmers.

Marketing Assistance

Access to formal markets through ACE is the third and final core pillar of the model. The study found farmers had a strong stated demand for marketing services and marketing assistance. They believed that this was key to achieve better market prices for their crops. Despite these stated

preferences, there was low adoption of ACE marketing services for surplus volumes beyond repayment amounts. Table 10 below shows the proportion of respondents who utilized ACE services to market their surplus soybean in the 2016-2017 season.

Table 10: Marketing channel used to market soybean in 2017

ACE Service Utilization	
ALL	21%
Mchinji	8%
Lilongwe	83%
Ntchisi	14%

As shown in Table 10, there were significant differences in adoption between the farmer groups, with higher rates of adoption by

Lilongwe farmer groups due to groups' proximity to Lilongwe and ACE offices. Proximity with urban centers reduces the transport cost associated

with the recourse to ACE services. In addition, farmer groups located closer to large urban centers tend to have more understanding of the functioning of the market, current market prices and, as such, are more confident to enter the formal market.

In the 2016-2017 marketing season, 21% of the respondents used ACE services, whilst 71% utilized local vendors to market their soybeans. According to the farmers' surveyed, the low uptake of ACE services was primarily because the services offered did not meet their needs. In addition to distance to warehouses, the other main bottlenecks preventing the adoption of ACE services was the farmers' need for immediate sale and cash in hand. Given that a significant proportion of farmers built up a number of debts over the course of the growing season, they were eager to obtain cash in hand soon after harvesting to pay it off. These debts were related to labor utilized but also included various household debts. The time to obtain cash when using ACE services was perceived as too slow, thus limiting clients' interest in the service. In many cases the financial pressure on farmers at the end of the season meant that they were generally not willing to hold onto their commodity and wait for better prices.

Additionally, a lack of understanding of how formal markets function impeded the clients' willingness to use ACE services.

Often the farmers felt that they were being "cheated" by vendors whilst a benevolent market exists in urban areas that they could profit from if they accessed it. This was usually not the case and the margins available in urban markets were often not significantly greater than the prices offered by vendors once aggregation and transportation costs were considered. Several respondents also complained about the fees associated with the use of ACE services, combined with perceived difficulties and other constraints, the potential margin was too small.

Despite these challenges there was still a strong demand for market information among the farmers. 63% of the surveyed clients said that receiving messages about market prices in urban areas was useful. When asked what information sent by message was most needed, 58% claimed that the most important information would relate to market prices and market opportunities, whilst 34% indicated that information relating agricultural extension was most needed. It is important to also note that the FGD revealed that the marketing decisions were usually made by the head of household and thus largely by the men. The decision on how to spend the money made from the sale was, in some cases, made jointly but the marketing process was overseen and managed by men most of the time.



RECOMMENDATIONS FOR FUTURE RESEARCH/APPLICATION

Despite high stated demand for marketing assistance, the adoption of the offered services remained very low. If Chithumba's marketing assistance was perceived as satisfactory by most clients, it would provide the model a significant competitive advantage compared to alternative inputs distribution programs that do not offer any marketing support. Based on the analysis, it is not

clear whether issues with adoption are related to problems of farmer misperceptions of marketing services benefits, a lack of understanding of the market principles driving prices and costs, and/or that ACE service delivery requires adjustment to better meet farmers' needs related to cash payments, payment timing and/or transport.

1 Investigate further client needs and behavior to understand how to strengthen the marketing assistance provided under Chithumba, i.e. define more specific client segments and articulate value proposition better for each of them. Potentially explore only offering services to farmer groups closer to the main urban centers.

2 Investigate further and/or test whether or not farmer perception or knowledge gaps about markets are driving lack of adoption. If it is the latter, then improving the training strategy to ensure Chithumba clients have a deeper understanding of the market functioning would allow better alignment of their expectations with market realities. However, if it is the former, this would suggest a different strategy entirely.

Conclusion

The Chithumba model offers an opportunity to improve the livelihoods of smallholder producers in Malawi by addressing various challenges in the agricultural sector. The model aims to increase clients' access to quality agricultural inputs, knowledge of Good Agricultural Practices and access to the formal markets. This study provides insights on farmers' demand and behavior within the Chithumba model. Despite Chithumba's repayment ratio being capped to ensure affordability of the services, the demand for inputs on credit is correlated with the availability of cheaper alternatives to access inputs. Limited offer of inputs available on credit restrains the demand as well. The study also reveals important differences between farmers stated or perceived demand versus actual behavior, specifically as it relates to agricultural training. Less than a third of the surveyed clients implemented the full set of GAP practices with the main bottleneck being the difficulty to afford or provide the additional labor associated with the recommendations.

Going forward, implementers should further investigate customized packages for agricultural trainings that consider the current level of expertise, constraints and investment possible by farmers. Farming modules should be tailored to specific farmers' situations. In addition, in-depth understanding of the impact of the certain GAP on yield improvement should be conducted. Lastly, while the demand for marketing assistance



is evident, the adoption of ACE services remains low. The lack of understanding, the need for immediate cash and small margins realized through the formal market were the main blockages to adoption. Further investigation and trials are needed to measure the impact of the offered services, particularly with regards to accessing the formal market. Finally, the case study reinforces that demand and satisfaction with the services offered are a prerequisite for financial sustainability in the long-term.

Bibliography

Adjognon, Serge G. and Liverpool-Tasie, Lenis Saweda O. and Reardon, Thomas A. “Agricultural input credit in Sub-Saharan Africa: Telling myth from facts”, *Food Policy*, Volume 67 (2017): Pages 93-105

Carr, Stephen. “The challenge of Africa’s nitrogen drought: Some indicators from Malawian experience”. *International Food Policy Research Institute (IFPRI) Policy Note* 19 (2014)

Chirwa, Ephraim & Mvula, Peter & Kadzandira, John. “Agricultural Marketing Liberalisation and the Plight of the Poor in Malawi.” (2005)

FAO, *Country Fact Sheet of Food and Agriculture Policy Trends* (2015)

FAO, *Review of Food and Agricultural Policies in Malawi* (2014)

Feder, Gershon & Just, Richard & Zilberman, David. “Adoption of Agricultural Innovations in Developing Countries: A Survey.” *Economic Development and Cultural Change*. Volume 33 (1985): pages 255-98.

FinMark Trust, “Status of Agricultural and Rural Finance in Malawi”. (2012)

Hong, David, and Stephanie Hanson. “Scaling up agricultural credit in Africa,” Frontier Issues Brief submitted to the Brookings Institution’s Ending Rural Hunger project (2016)

Knorr, Jochen & Gerster-Bentaya, Maria & Hoffmann, Volker. “The History of Agricultural Extension in Malawi.” (2002).

Mandiwa, Madalitso. “Access To Financial Services In Malawi: Policies And Challenges”, Expert Meeting On The Impact Of Access To Financial Services, United Nations Conference On Trade And Development. (2014)

National Statistical Office (NSO) of Malawi, “*2018 Malawi Population and Housing Census – Preliminary Report*” (2018)

National Statistical Office (NSO) of Malawi, “Malawi Second Integrated Household Survey (IHS3) 2010-2011” Basic Information Document, Malawi. (2012)

Nkhoma, Peter R. “The evolution of agricultural input subsidy programs: contextualizing policy debates in Malawi’s FISP”, *World Development Perspectives*, Volume 9 (2018): Pages 12-17.

Ragasa, Catherine & Mazunda, John & Kadzamira, Mariam. “The national extension policy of Malawi – lessons from implementation”. *International Food Policy Research Institute*, MASSP POLICY NOTE 23. (2015).

World Bank, Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS), Malawi Agricultural Commercialization Project (P158434), Report No: PIDISDSA20938 (2017).

Appendix

The Agricultural Commodity Exchange for Africa

ACE provides structured trade services to the actors of the industry of agriculture. ACE services' offer is organized around three pillars:

Market Information: ACE provides market information to a broad base of clients. Information is disseminated via a manifold of channels (SMS, radio program, newspaper, email, etc.) and includes information on rural market prices, market opportunities and best prices offered in the main trade hubs for key agricultural commodities.

Trade Facilitation: ACE facilitates trades through an online trade platform where direct trades, warehouse receipt trades, auctions and forward contracts are facilitated.

Warehouse Receipt System: The WRS allows ACE clients to access storage, finance and marketing services by using their stored commodity as collateral with commercial banks. ACE has certified a network of warehouses. The WRS allows producers and suppliers of commodity to deposit and safely store their stock at an ACE certified warehouse; upon deposit, the commodity is cleaned, graded, re-bagged and stacked. The warehouse operator issues a warehouse receipt to the client stating the commodity type, variety, volume, quality grade and moisture level. The WRS aggregates high quality commodity therefore it increases the likelihood of a supplier accessing a higher-value market. Furthermore, the depositor can access collateral finance for the duration of the deposit, providing a choice to the depositor; to sell when the market is potentially more favorable due to the seasonality of prices.

