

AgriCoach evaluation

Report 1st case study evaluation - season A 2020

Appreciation and use of AgriCoach by farmers and impact on practices and potato yield



This report describes the method and results of the 1st case study evaluation that is done over season A 2020, as part of evaluation of the AgriCoach app for the GAP4All project. It focusses on how farmers appreciate and use the AgriCoach app and how this information changes their behaviour, cultivation practices and the resulting yield for potatoes.

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Summary

The goal of the case study was to evaluate how farmers appreciate and use the AgriCoach app and how this information changes their behaviour, cultivation practices and the resulting yield for potatoes.

Over the short growing season A 2020, starting in September 2019 until January 2020, a case study was held to evaluate the pilot version AgriCoach (weather forecast and GAP for potato). A group of 16 farmers was split in a test using the AgriCoach and a control group.

Data was gathered with the following methods: 1) a weekly digital questionnaire via the chatbot Jeanne monitored field observations, management practices and farmer feedback on the AgriCoach, 2) farmers were interviewed on the use and appreciation of the AgriCoach, 3) field measurements at their potato plots were taken near the end of the season and 4) website statistics on app use were gathered.

The case study showed that all farmers appreciate the AgriCoach and they gave it a rating of 8 or higher (out of 10). The case study confirmed the need for agricultural information in Burundi, most farmers had very little access to it, and appreciated the AgriCoach information being close to them.

The weather forecast was discussed in their weekly meeting and in some cases shared mouth-to-mouth in between meetings. Farmer understood the forecast well and indicated that it was mainly accurate. The forecast is used by farmers to plan their activities for upcoming days, activities like planting, hiring labour, drying or visiting fields further away.

The movies showing the Good Agricultural Practices received only positive feedback. Farmers mentioned that they were easy to understand and learned new practices from them. Even previously trained farmers appreciated them, mentioning that it was easier for them to see something in a movie than being told how a practice should be done. Farmers were asking for movies for other crops as the pilot version only contained potato movies.

The farmers that used the AgriCoach had all changed their behaviour, using the recommended practices on their potato field. Some farmers used the exact practices, others adopted it to their own style or situations. Farmers tried the AgriCoach practices on one of their plots or a part of their land, as they considered it as a test if this way of agriculture works, learning and adopting the information.

Field measurements were taken eight weeks after emergence. The potato fields of AgriCoach farmers had taller potato plants than control group farmers (61 cm against 54 cm) and had 85% more biomass (5.3 kg against 2.9 kg for 10 potato plants).

Main issues described by farmers are unreliable internet connectivity and access to quality inputs, mainly seeds. The issue with internet connectivity was already known based on previous evaluations and is being anticipated by the development of version 1 as an offline app.

Part of the farmers in the evaluation group were also farmers that are trained according to the Plan Intégré du Paysan (PIP) approach as part of the PAPAB programme. In the PIP approach farmers are stimulated to become more empowered in their self development. They were included in the evaluation to find out how these farmers perceived and used the AgriCoach, as it is planned that the two approaches, AgriCoach and PIP, are to be implemented side by side in future agricultural development programmes. The evaluation shows that the PIP farmers appreciated the AgriCoach and it's recommendations similar to the non-PIP farmers. They recognized many of the recommended best practices from earlier trainings. However still they appreciated the AgriCoach as the movies are very clear and understandable and appreciated the information was always accessible and easy to share with the group. Some thought of the AgriCoach as an extra motivation to implement these best practices they know.



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Abbreviations

AgriCoach (AC)

Master Activator (MA)

Super Activators (SA)

Key Activators (KA)

Plan Intégré du Paysan (PIP)

Context

The AgriCoach is an application designed to support the pillar Work and Income of the CAP program of the AUXFIN G50 network. Agriculture is the main activity for most people in rural Burundi supporting their livelihood. The AgriCoach is there to assist the farmer to develop a cultivation plan (long term plan) and to plan his/her weekly activities (short term plan) for agriculture providing timely and relevant information to solve three basic decisions:

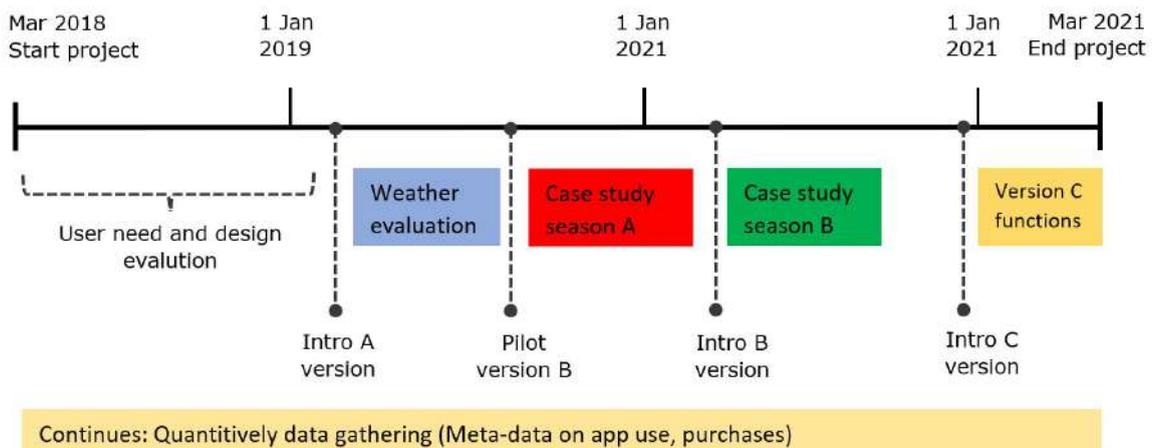
- What crops to grow? (CropSelector)
- When to perform my farm activities? (ActivityCalender and WeatherCenter)
- How to perform these activities? (BestPracticeMovies)

The Monitoring and Evaluation (M&E) of the AgriCoach aims to understand and determine usage, change in farm management and impact of the AgriCoach on the AUXFIN G50 groups and to make a projection of the potential impact on the food security in Burundi. The results will be used to strengthen and improve the AgriCoach in the remaining part of the project.

This report describes the results and insights from the case study evaluation that was executed over season A 2020. A group of 16 farmers were followed over season A for an in-depth understanding of how the AgriCoach (AC) is used and to study the added value and impact.

This is one of the M&E activities of the AgriCoach, alongside a user need and design evaluation, a second case study and quantitative data gathering (for the full evaluation plan, see the document: *AgriCoach M&E: AgriCoach evaluation plan*). The AgriCoach is developed and released versions A, B and C. The AgriCoach evaluation is synchronised to the development trajectory, evaluation results and insights are used in the development and each part of the evaluation focuses on new functions (see Figure 1).

Figure 1: a schematic presentation of the M&E activities for the AgriCoach. This document focuses on the monitoring in season A (red).



Objectives

The case study is explanatory, focussing on understanding and measuring the impact of the AgriCoach version A. The case study assesses:

(1) How is the AgriCoach used and valued by farmers

- How do the farmers use the AgriCoach and are they enthusiastic about the technology and design?
- Is the information presented correct and relevant for the farmers and do they see added value in application of the AgriCoach for their agricultural practices?

(2) What is the impact of the AgriCoach on their management practices and yield?

- Do the farmers apply recommended management practices? Are these practices influenced by the AgriCoach?
- Do the farmers time their practices better, using the AgriCoach?
- Can we measure a yield increase caused by the AgriCoach?

(3) Additionally it was assessed whether differences between the farmers using AgriCoach could be detected, to help understand the use and impact of the AgriCoach. It was assessed how PIP farmers appreciate the AgriCoach with the objective to study how AgriCoach and PIP complement each other, as these approaches are planned to be implemented side by side in future agricultural development programmes. An explanation of the different groups is given under the section farmer selection in Method.

Hypotheses

(1) It was expected that farmers value the AgriCoach information and are well able to understand it, as previous interviews showed that all farmers are in need of agricultural information and can work with the current design. However, it was also expected that the evaluation would bring to light that some parts of the information and design is less/more useful or understandable than expected.

(2) It was expected that all farmers using the AgriCoach would apply some of the information, but not all practices. It was expected that most farmers will time their practices better. It was not expected that necessarily a clear impact in yield can be measured, because there is a lot of variability in smallholder farmers yields (influenced by many other factors than the AgriCoach intervention) and the sample group is relatively small.

(3) It was expected that there would be differences in farmers using AgriCoach. It was expected that PIP farmers are more empowered, but that the AgriCoach has added value to them, providing relevant and accessible agricultural information.

Method

Set-up of case study

Auxfin field-staff network

The case study was set up and executed through the Auxfin-staff. Auxfin has an extended network of field-staff: there is one Master Activator (MA) per province, several Super Activators (SA) within that region and several Key Activators (KA) that live near G50 groups. Each G50 group contains of 50 households that live directly next to each other. Each G50 group has one tablet and has three Group Leaders (GL), that chair the weekly meetings in which the AgriCoach is discussed besides their regular topics (UMVA etc). The MA, SA and KA are Auxfin staff, the GL hold that position on a voluntary elected basis. In general, each of them is assisted and managed by the position above them.

This means that the GL are assisted by one KA, which are then assisted by one SA. For the case study, they had the following roles:

- GL: introduced and instructed on how to use the AgriCoach but no other monitoring activities.
- KA: responsible for farmer selection, filling in the questionnaires and yield measurements.
- SA: assist the KA with his/her activities, join several questionnaire meetings and the yield measurements.

Farmer selection

A number of farming families (16 in total) from different groups were selected. The KA were told to look for farmers in the G50 groups that were planning to cultivate potato in season A. These farmers should want to be part of evaluation voluntarily, and did not have to comply to any other criteria than that. Farmers did not receive inputs or compensation for the participation. The list of farmers is presented in Appendix II.

The farmers were selected and divided in three different groups:

- Group A: Champion AC evaluation
6 farmer families that started using AgriCoach WeatherCentre in March 2019 and were introduced to the AgriCoach pilot version in September 2019. These are part of the 66 G50 Champion-groups. These farmers already had some experience with the WeatherCentre.
- Group B: PIP + AC evaluation
4 farmer families that were introduced to the AgriCoach pilot version in September 2019 and are also PIP farmers. These farmers had no prior experience with the AgriCoach.
- Group C: Control group
6 farmer families that don't have experience with the AgriCoach. This group was not introduced to the AgriCoach (also not using the Weather Centre) and served as a control group.

These different groups were selected to study the changes between farmers that received the AgriCoach and farmers that don't use the AgriCoach, and to study to evaluate how PIP farmers evaluate the AgriCoach. The control group was used to compare the results from the groups that are using the AgriCoach with (objective 1 and 2). The PIP farmer group was included to study how PIP farmers appreciate and use the AgriCoach (objective 3). PIP farmers that are part of the PAPAB programme and trained in according to the Plan Intégré du Paysan (PIP) approach. In the PIP approach farmers are stimulated to become more empowered in their self development. The were included in the evaluation to find out how these farmers perceived and used the AgriCoach, as it is planned that the two approaches, AgriCoach and PIP, are to be implemented side by side in future agricultural development programmes.

Introduction and content of AgriCoach-app

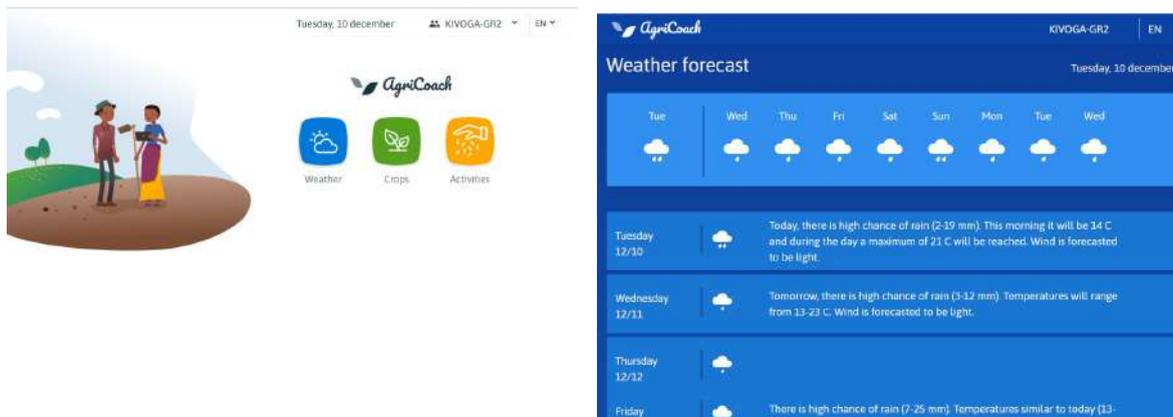
In September a workshop was held at the Auxfin Office in Bujumbura to train all the people involved in the case study of season A 2020 on the goal and upcoming activities (for report and the instructions to KA see: M&E P2-SR1 Report training day on AgriCoach introduction and farmer monitoring).

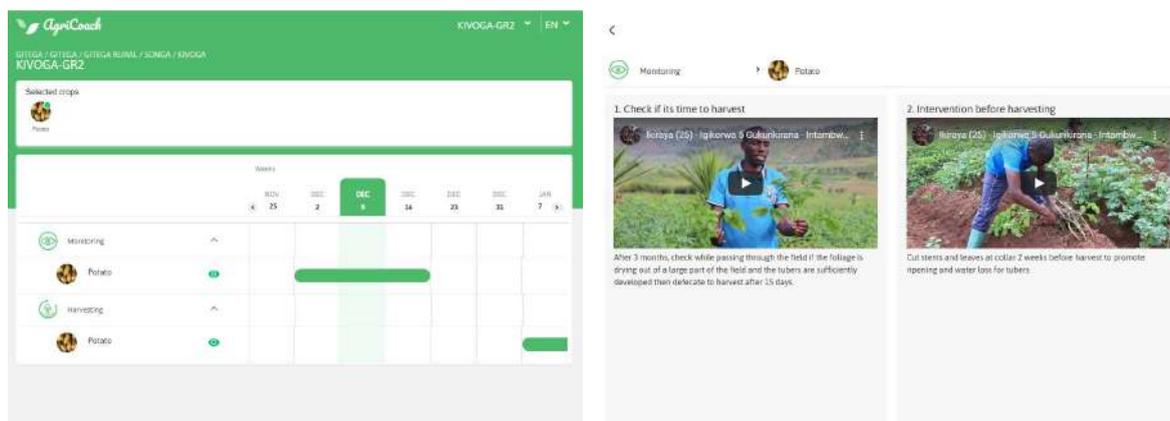
The week after this meeting the G50 groups of the Group A and Group B farmers were introduced to the pilot version of the AgriCoach app by their GL and KA. In July 2019 interviews to evaluate the design of the AgriCoach had emphasized the connectivity problems while using the AgriCoach. To solve this issue, the tablets of the GL and KA contained both the online version of the app (URL) and offline content (movies and print screens of the activity calendars throughout the season). All the online content is provided in English, French and Kirundi.

The piloted version of the AgriCoach app contained (see Figure 2):

- WeatherCentre information: page that shows the weather forecast for the coming week 10 days.
- ActivityCalendar for potato: showing the activities that are recommended for potato, and the time period in which it is recommended to do these. When clicking on the activity you are forwarded to the BestPractice movies.
- BestPractice movies for potato: per step the recommended practices are shown in movies in Kirundi. There are usually several movies per step, about 1 minute long. In this version the movies on harvest were missing.

Figure 2: Print screens of the pilot version 1 of the AgriCoach app. The homepage (top left), WeatherCentre (top right), the ActivityCalendar (bottom left) and the BestPractice movies per step in the ActivityCalendar (bottom right)





The evaluation focussed on weather information in general and the ActivityCalendar and BestPractice movies for potato, as that was the information that was presented in the AgriCoach.

When the KA and GL were trained about the evaluation and the introduction, they were told that the AgriCoach should be consulted in the weekly group meetings (group A and B). It was emphasised that the farmers are not steered or asked to follow up the recommendations, they are free to do with the information what they want.

Review and training December

In December meetings were held with all the KA, SA and Jori Langwerden (Waterwatch) and Yves-Patrick Iradukunda (Auxfin Burundi). The goal of this meeting was to evaluate the work of the KA and SA and receive their input on how the monitoring is going. The KA and SA were also trained on how to do yield measurements. Additionally, all the potato fields in Gitega were visited with the farmers, when the potatoes were about 8 to 10 weeks old.

Data gathering

Data was gathered in the following ways:

1. Questionnaires during growing season
2. Farmer interviews
3. Yield measurements
4. Website statistics

Regular questionnaires

During the growing season each KA visited their farmers every two weeks. During this visit the KA interviewed the farmer and visited their potato plot for observations or measurements. The KA filled in a list of questions with the use of the 'Jeanne' app on their tablet. The Jeanne app is a chatbot operated by Auxfin that uses an easy interface to chat with users (see Figure 3).

With the Jeanne technology it was possible to follow up on field activities and gather structured data on the farmer during the growing season. The questionnaires used a combination of open and multiple choice questions, and were adjusted to moment in the growing season. The questions mainly focused on the management practices used by the farmer, the situation at the potato plot and use of the AgriCoach.

Figure 3: A print screen of one of the Jeanne questionnaires in English (right) and the KA and farmer filling in a questionnaire on the tablet in Kirundi (left).



Farmer interviews

In December 2019 eight of the farmers were interviewed in person. The interviews were with the farmer alone and done by Jori Langwerden (interviewing) and Yves-Patrick Iradukunda (translations). The interviews usually took place at their house and took around 1,5 to 2 hours per interview. The main goal of these interviews was a qualitative evaluation of:

- How the AgriCoach is used by farmers (how often consulted, how is information shared, is it discussed between farmers)
- What their experience is with the AgriCoach (easy to understand, relevant/irrelevant information, what parts are most interesting)
- How AgriCoach has had impact on their behaviour and practices (what practices they have applied on their potato plot and whether this was influenced by the AgriCoach)

Field measurements

Field measurements were taken when the potato plants were 8 weeks old on average. At this stage the potato plants were at 60-80% of their growth cycle between emergence and the moment the plants were harvested (average of 75%). The reason for earlier yield measurement is that we were using farmer' plots, and needed to take measurements before they were going to perform topkill or decide to harvest early.

The measurements were done by the KA and SA. The data was gathered and sent with the use of a Jeanne questionnaire. 10 potato plants were randomly selected over the field and fully uprooted (all above and underground biomass). Any excess material like sand and dust was removed. The weight was measured with the use of a digital hanging scale and a bag. The following weights measurements were taken: weight of full plants, weight of consumable product (tubers) and weight of plant biomass. Additional measurements contained: plant density, plant height in centimetres (of average plant, lowest and highest plant), presence and severity of pests and diseases.

Website statistics

Statistics are derived from Google Analytics and Youtube Beta, indicating website statistics as number of visitors, views and clicks per page or video for the online content.



Results

(1) How is the AgriCoach used and valued by farmers

How do the farmers use the AgriCoach and are they enthusiastic about the technology and design?

- All farmers value the AgriCoach information and would recommend it to other farmers, they give a rating of 8 or higher out of 10. (AV: C3, C4, C13)
- In most cases farmers used the AgriCoach every week where they received information during the weekly group meetings (Figure 4 and 5). The group leader explains the AgriCoach information and when there are movies to be watched the AgriCoach is passed through the group. Some of the farmers are Group Leaders themselves and will consult the tablet during the week because they have direct access to it. Some farmers also indicated to discuss AgriCoach content outside the meetings with the Group Leader or Key Activator. (AV: C1, C2). One AgriCoach farmer had not really used the AgriCoach, he does not go to weekly meetings (AV: C1).
- The use is reflected in the online website statistics of the app. Website statistics show the app is used frequently throughout the season, receiving about several users per day (Figure 5).
- Internet connectivity is an issue for using the AgriCoach. Some groups had used the offline content (AV: C1, C7, F1).
- Farmers value the different AgriCoach information parts and can not mention information that is not relevant to them. All farmers have a different part of the app that is their favourite, although the WeatherCentre is mentioned most often to be most appreciated and influential. (AV: C6, C7, C10, C13, C14)
- Some farmers indicated it is not easy to take in all the information at once (AV: C11).
- Most farmers used the majority of information, but not all farmers. Some did not see all movies, others did not use the calendar (AV: E1).
- Farmers are asking for the same information for other crops (AIII).

Figure 4 (left): Percentage of farmers who used the AgriCoach during the weekly meetings, based on the Jeanne questionnaire feedback.

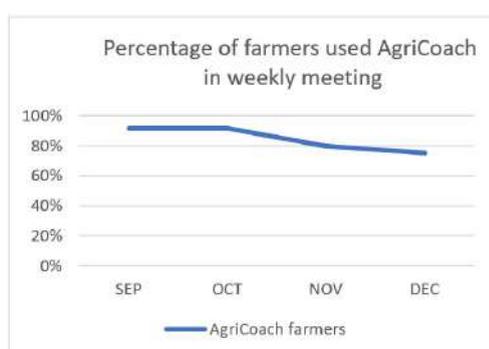


Figure 5: Number of users of the online AgriCoach app per day over the period 23 September 2019 – 13 January 2020 (derived from Google Analytics on 13 January). The statistics confirm the regular use of the AgriCoach by farmers over the season.



Is the information presented correct and relevant for the farmers and do they see added value in application of the AgriCoach for their agricultural practices?

WeatherCentre

- Weather information is usually consulted about once to two times a week. In some cases it is consulted more often where a farmer asks the group leader in person if weather information is requested for certain activities (AV: D1).
- Farmers appreciate the weather information because it enable them to plan their activities, mostly for planting, spraying and hiring labour (AV: D2, C6, C10, C14)
- According to the farmers observations the weather forecast mostly matches with the reality, but not always (AV: D3).
- From the interview with Zabron Kana: *'He did not think it was possible to have weather information in the tablet, so this was difficult for him to understand. But now he learned this is possible.'* (AV: C11)



ActivityCalendar

- What is mostly valued about the ActivityCalendar is that it helps farmers to plan and think ahead of the upcoming activities. Before they would just go into the field and do what they see needs to be done that day. Farmers appreciate having a guideline and overview of activities. Even if farmers are aware of what activities to do, the calendar is appreciated because it helps as reminder and encouragement to do them (AV: E2, E3)
- Some have used the ActivityCalendar to time their practices, others indicated to have used it more as a general guide and reminder of activities. (AV: E2, E3) As told by Rosalie and Zabron:
 - o Rosalie Habonimana about the ActivityCalendar: "Very useful, because now she know exactly what farmer activities to do and when [...] she thinks of the ActivityCalendar like a coach, it encourages her to do activities. Before they did not really have a plan" (AV: E2)
 - o Zabron Kana: "Yes now he knows better what to do when. Before he would just go into the field and do what he sees. Now he knows what to do in the field and at what time" (AV: E3)
- Two of the interviewed farmers had not used the ActivityCalendar. One farmer seemed to have limited interest as he was well trained on activities. The other indicated it is not interesting to have a cropping calendar for only one crop, as he has many crops and logistically cannot just focus on the one, but said it will be interesting to have a calendar that includes several crops. (AV: E1)

BestPractice Movies

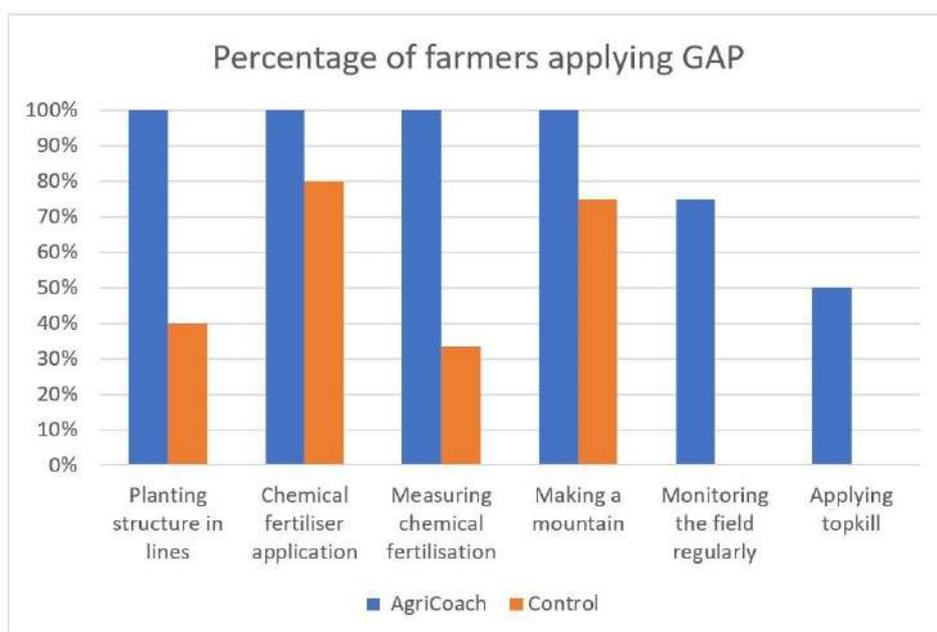
- Farmers indicate the movies are useful to them because the video format shows them clearly how to do the GAP. This is regardless of the amount of training a farmer has received. Even well trained farmers indicated:
 - o Habarugira Janvier: "He likes because the videos show exactly what needs to be done for the activities. He has received agricultural information and training before, but there it was always told and it really helps to see it." (AV: C3)
 - o Zachone Maruzaniye: "He has had training on practices, but for him the AgriCoach is a motivation. Especially the information in the movies add value, because with the movies he could see the activities." (AV: C10)
- Movies were consulted both offline and online (AV: F1). Some of the interviewed farmers had not seen much of the movies, and it did not become clear from follow-up questions what was the reason. (AV: F1)

(2) What is the impact of the AgriCoach on their management practices and yield?

Do the farmers apply recommended management practices? Are these practices influenced by the AgriCoach?

- The farmers that used the AgriCoach had all changed their behaviour, using the recommended practices on their potato field, where most of the recommended practices were implemented (Figure 6).
- The management practices are influenced by the AgriCoach:
 - The GAP are used to a much lesser extent in the control group
 - Interviewed farmers indicated that most of the practices were new to them and were learned from the AgriCoach movies (AV: K1, K2, K3, K4 and K5)
- Some farmers used the exact practices, others adopted it to their own style or situations (AV: K1, K2, K3, K4 and K5). Farmers tried the AgriCoach practices on one of their plots or a part of their land, as they considered it as a test if this way of agriculture works, learning and adopting the information. (AV: IV, B8)
- For some management practices there is not enough data to indicate whether these recommendations were followed up. These are planting method by separating seed and fertiliser, weeding and reapplication of chemical fertiliser after a few weeks.

Figure 6: Percentage of farmers applying Good Agricultural Practices, separated by farmers using the AgriCoach and farmers in the control group. Agricultural practices are generalised into a common practice and the GAP recommended by the AgriCoach.



Do the farmers time their practices better, using the AgriCoach?

- The case study farmers have used the WeatherCentre weekly and all indicate to have used it to time their activities. The main activities mention this to be used for is planting and spraying (AV: D1, D2). This is corresponding with previous evaluation results of the WeatherCentre.

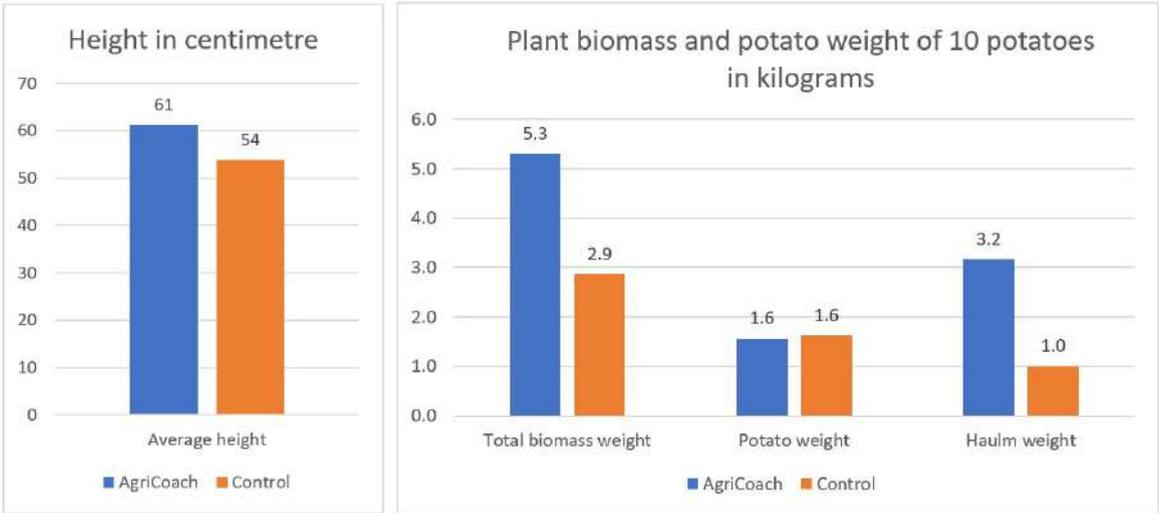
Can we measure a yield increase caused by the AgriCoach?

Field measurements were taken early when the potato plants were 8 weeks old when 60-80% of their growth cycle between the emergence and harvest was realized.

- The potato plants of AgriCoach farmers were higher than for the control group farmers (average 61 vs 54 cm plant height) (Figure 7).
- The total biomass weight of the potato plants (above and underground biomass) almost doubled for AgriCoach farmers (5.3 kg) vs control group farmers (2.9 kg) (Figure 8). The weight of the potato tubers was about equal between the groups at that moment in time.
- The measurements were taken when the plants were about 8 weeks old, when plants were not yet mature but in the stage of tuber growth. It can be expected that at the time of harvest the weight of the potatoes will have been more for AgriCoach farmers than for control group farmers. This is due to the difference in haulm weight: AgriCoach farmers have three times the haulm weight of control group farmers. A potato plant uses the haulm for tuber growth, transporting energy from the leaves to the potato tubers. The increased haulm weight translates into an increased energy storage and energy transmission for tuber growth.¹

Figure 7 (left): Average height of the potato plants (above ground in centimetres) of AgriCoach farmers and control group farmers measured 8 weeks after emergence.

Figure 8 (right): Average of total biomass weight (all above and underground biomass), potato weight (consumable product) and haulm weight (plant material except consumable product: leaves and stems) of 10 potato plants of AgriCoach farmers and control group farmers. The measurements were done early and it is to be expected that the tubers of the AgriCoach farmers will grow more in the remainder of the season, as the haulm is used for tuber growth.



¹ Beukema H.P. and van der Zaag D.E. (1990) Introduction to potato production, Pudoc, The Netherlands.

Farmers observations

Farmers mentioned that they noticed that the potato plants look better and yields improve. Some explanations:

- Nimpagaritse Anicet: “[..] they saw that others used AC for potato harvest was good, that is why they were convinced they wanted to use AgriCoach. [..] The plants are much bigger. Before they would just plant in disorder. Now with AC practices they separate the crops and now the plants have more space to grow bigger. Another difference is they have an exact timing for each activity. (AIII)
- Ningabiye Marguerite: “The biggest difference is that you use less seeds, but use more fertilisers. But that does not make you unhappy because when you see the yield it is much better. ” (AIII)
- Habarugira Janvier: “He also sees that his field is looking good so he is content with these decisions ” (AV)

Growing conditions in Season 2020 A

Season A 2020 was relatively wet, with a higher precipitation than usual. This caused good cultivation conditions, with a likelihood of less than 10% for water stress. In some regions the precipitation was so intense that it has caused flooding and waterlogging.² Several farmers indicated that in their experience their potato production was suffering from too much rainfall. In most cases they indicated they got black spots and stems which were caused by too much rainfall. This is in correspondence with the field observations, where phytophthora was observed often, a fungal disease that favours wet conditions.

² FAO GIEWS, 2020. Global Information and Early Warning System. Country Briefs, Burundi. Access online at 1st Februari though <http://www.fao.org/giews/countrybrief/country.jsp?code=BDI>



(3) Are differences between farmers using AgriCoach detectable?

There was a variety in the farmers. Some had received quite some training, while others did not receive any training at all. Also some already implemented some of the GAP before using AgriCoach based on either training or experience and local knowledge. Regardless of these differences, all farmers that used the AgriCoach valued the information and applied it on their land.

PIP programme farmers

Small differences were detected between the G50 farmers using AgriCoach (Group 1) and the G50 farmers using the AgriCoach that are also part of the PIP programme (Group 2). In general, the PIP farmers interviewed indicated to have had more agricultural training and were already used to some of the recommended practices. Nonetheless, these farmers indicated that the AgriCoach had important added value to them. For example, they did not have access to a weather forecast or a crop calendar and movies, and valued and used this information the same way as the other AgriCoach farmers did. (AV: C3, C10, C13, C14)



Another importance of the AgriCoach to PIP farmers was accessibility of the information and easy understandability of the movies:

- Ningabiye Marguerite "In her group there are many PIP farmers, when she got the AgriCoach they were very happy because what they learned and when they saw the videos it was easier. Because it was easier than what they learned in PIP. Now they don't need to run after somebody to show the information, they have the information with them on the tablet. In PIP they just discuss, talk and take notes. But now with AgriCoach they can discuss and look at the video." (AIV)
- Rosalie Habonimana: "The people have appreciated that the information of the AgriCoach is so close to them" (AV: CI)
- Zachone Maruzaniye: "He has had training on practices, but for him the AgriCoach is a motivation. Especially the information in the movies add value, because with the movies he could see the activities." (AV: C10)

Several PIP farmers were asking for information on more crops:

- Ningabiye Marguerite: "This farmer appreciates the information he had because when he sees the potatoes how they grew, he sees difference from when he used to do the crop without these information. He asks for more information on other crops" (AIII)
- Nduwimana Jeremie: "He appreciates the agricoach app and says it's the solution. He asks to have more information for other crops like beans and soja" (AIII)

General observations (not related to evaluation questions)

- There was variability in the planting date. All the farmers in Karusi planted about 4 weeks later because the rains were delayed. One farmer in Kayanza planted deliberately 4 weeks later to get a better market price.
- The rainfall in season A 2020 had been unusually high. All farmers indicated that there had been more rainfall than usual.
- Potato seeds are expensive. Farmers indicated that their financial resources are a limitation to cultivate potato, decreasing potato area or choosing for another crop. (AV: B8, I5, I6, I7, F4)
- All farmers stressed their issues to get quality seeds/plant material (without the interview having questions focussing on this). They would like the AgriCoach to provide a solution for this. (AV: B8, C5, C8, C12, H13, I4, I5)
- Two of the interviewed farmers mention that other farmers have noticed that their field looks good and are asking what they did. (AV: I4, C14)
- Control group farmers indicated they are in need of agricultural information and joined the evaluation so they would be involved in the programme in the future. (AV: I4, G1, G2, G3, G4)



Conclusions

Main conclusions

- All farmers that used the AgriCoach value the app and see added value to them. They would recommend it to other farmers, and gave it a rating of 8 or higher out of 10.
- In most cases farmers used the AgriCoach every week where they received information during the weekly G50 group meetings. In some cases the information is shared mouth to mouth in between meetings.
- All information is relevant to the farmers.
 - WeatherCentre: Is used about once to two times a week. Farmers use it to plan their activities, like planting, spraying, drying and hiring labour
 - ActivityCalendar: Helps farmers to plan and think ahead of the upcoming activities and is an encouragement of activities. Not everybody used it regularly
 - Movies: Are appreciated and easy to understand, easier to see how to do an activity than hearing it in training.
- Variety in farmers: every person seems to favour another element & use their own way. Most farmers used the majority of information, but not all farmers. Some farmers did not see all the movies or others did not use the calendar.
- Farmers applied most of the recommended practices on their field. This translated into higher and heavier potato plants of farmers using AgriCoach than the control group. The potato plants of farmers using AgriCoach had 85% more biomass. The weight of the potato tuber was equal at that stage, but is expected to have become heavier for AgriCoach farmers due to difference in total biomass. More growth and more reallocation of biomass is expected at the end stage of the potato growth cycle.
- Farmers mentioned they saw their field did better while using AgriCoach and some also received questions from others who passed their field.
- Farmers that are also part of the PIP programme value the AgriCoach the same way, even though they have received agricultural training before. They mention the AgriCoach important because the information is close to them as the tablet is always accessible and easy to understand.
- The group of farmers that was not using AgriCoach (control) confirmed the need for Burundian farmers for access to agricultural information by requesting information and to receive the AgriCoach.

Recommendations and outlook

Recommendations AgriCoach

Two major issues are internet connectivity and access to quality inputs

- Internet connectivity: This issue had already become clear in previous evaluations but has been confirmed by this case study. The Development of the AgriCoach as an offline app had already started in parallel with the evaluation. Since March 2020 all information (movies, calendar, crop information) is provided offline on the farmer tablets and only to update the weather forecast a brief internet connection is needed. New information can be provided using an online synchronization button for limited updates or by updating the app via the USB provided by the key activator for large updates, e.g. to get access to new movies.
- Access to quality inputs: it was mentioned very frequently by farmers that access to quality inputs is a major constraint for them to improve agricultural practices. Farmers specifically asked if we can help with access to quality seeds. It had already been a goal to address this issue with upcoming AgriCoach developments, now the importance has been emphasised by farmers.

Case study season B 2020

In the case study in season B 2020 the offline AgriCoach will be evaluated and the CropSelector will be included (see Figure 1). This means that the farmers will have access to information on a variety of crops. Otherwise the set up will be largely the same as the case study in season A 2020. The evaluation will focus on the impact on bean cultivation, and add the evaluation of the CropSelector. Besides weekly Jeanne questionnaires about the evaluation farmers, there will be an extension of weekly questions to the group-leaders as well, to get insight into the impact of the AgriCoach in the G50 groups. The evaluation group will slightly increase. Farmers that were part of the control group during the case study season A will become users of the AgriCoach in season B. A new control group will be created to verify the results.

Appendices

Appendix I: Photos

Training day on the evaluation in Bujumbura



One of the workshops on to update on evaluation and train on yield measurements in Gitega



Key Activator and Super Activator in Gitega explaining yield measurement to farmer and farmer interviews



Pictures of the potato fields in Gitega

AgriCoach farmers Gitega

Habarugira Janvier



Nibigira Rosette



Zachone Maruzaniye



Habonimana Rosarie



Control group farmers Gitega

Bazikwankana Jean



Nzeyimana Emmanuel



Appendix II: Team and evaluation farmers

Team of evaluation

Jori Langwerden (AUXFIN International), André Jellema (AUXFIN International), Yves-Patrick Iradukunda (AUXFIN Burundi), Aline-Karine Niyondiko (AUXFIN Burundi), Jaffar Rushigaje (AUXFIN Burundi), Yannick Chokola (AUXFIN Burundi) and the Key-Activators and Super-Activators of AUXFIN Burundi: Jimmy, Claude, Fabrice, Febronie, Charles, Eric, Anatole and Miriam.

Farmers of evaluation

The table below presents all the farmers that were part of the monitoring in season A 2020. The second control group farmer from Kayanza, Dominique, dropped out. He decided very late that he was not going to grow potatoes this season.

Farmer information					
Nr	Province	Sous-colline	Monitoring group	Case study code	Farmer name
1	Gitega	taba	Group A = Champion AC evaluation	GIT_GR1_F1	Habarugira Janvier
2	Gitega	taba	Group A = Champion AC evaluation	GIT_GR1_F2	Nibigira Rosette
3	Gitega	Buhunja	Group B = PIP +AC evaluation	GIT_GR2_F1	Zachone Maruzaniye
4	Gitega	Buhunja	Group B = PIP +AC evaluation	GIT_GR2_F2	Habonimana Rosarie
5	Gitega	Nyabikenke	Group C = Control group	GIT_GR3_F1	Bazikwankana Jean
6	Gitega	Nyabikenke	Group C = Control group	GIT_GR3_F2	Nzeyimana Emmanuel
7	Karusi	Masake	Group A = Champion AC evaluation	KAR_GR1_F1	Nimpagaritse Anciet
8	Karusi	Masake	Group A = Champion AC evaluation	KAR_GR1_F2	Ntahomvukiye Firmin
9	Karusi	Rutoke	Group B = PIP +AC evaluation	KAR_GR2_F1	Ningabiye Marguerite
10	Karusi	Rutoke	Group B = PIP +AC evaluation	KAR_GR2_F2	Nduwimana Jeremie
11	Karusi	Kanyereza	Group C = Control group	KAR_GR3_F1	Ngarukiyinka Dorothe
12	Karusi	Kanyereza	Group C = Control group	KAR_GR3_F2	Bucindika Clemence
13	Kayanza	Nyabikenke	Group A = Champion AC evaluation	KAY_GR1_F1	Benoît NDEREYIMANA
14	Kayanza	Nyabikenke	Group A = Champion AC evaluation	KAY_GR1_F2	zabron KANA
15	Kayanza	Nyabikenke	Group C = Control group	KAY_GR3_F1	NTUNZWENIMANA ATHANASE
16	Kayanza	Nyabikenke	Group C= Control group	KAY_GR3_F2	Dominique NIYONZIMA*

*dropped out

Appendix III: Questionnaire feedback

At the end of some of the weekly questionnaires an open question was asked whether there is anything else to share about this farmer in regard to the AgriCoach monitoring. Below the responses are presented with the farmer's name as filled in by the Key Activator, ordered by evaluation group.

Group 1: AgriCoach farmers

- He asks for assistance in good agriculture practices for other crops like maize and common beans (Nimpagaritse Anicet, 28 October,)
- He explains that Agricoach is an opportunity because he used to plant badly by using a lot of seeds but no yield. Now the yield will be good comparing to what he uses to have because he used agricoach recommendation in potatoes farming (Ntahomvukiye Firmin, 25 November)
- He is thankful (Habarugira Janvier, 6 January)
- Good, it shows true information (Nibigira Rosette, 6 January)
- He understood to do modern agriculture (Nimpagaritse Anicet, 6 January)
- He will keep doing modern agriculture (Ntahomvukiye Firmin, 6 January)

Group 2: PIP +AC evaluation

- This farmer appreciate the information he had because when he sees the potatoes how they grew, he sees difference from when he used to do the crop without these information. He asks for more information on other crops (Ningabiye Marguerite, 28 October)
- He appreciates the agricoach app and says it's the solution. He asks to have more information for other crops like beans and soja (Nduwimana Jeremie, 28 October)
- He understood well AgriCoach's recommendations and planted well his farm (Habonimana Rosarie, 25 November)
- He is thankful to have been among the first to be taught agricoach and then expects good yield. He asks for pesticides to prevent diseases, good seeds to increase again the production comparing to what they used to have before using agricoach, (Ningabiye Marguerite, 25 November)
- He is thankful for the AgriCoach's recommendations and asks for the good seeds and mineral fertilizers to ease his farming activities (Nduwimana Jeremie, 25 November)
- He is thankful to have learn modern agriculture (Ningabiye Marguerite, 6 January)

Group 3: Control group

- This farmer didn't use agricoach but would like to use it. (Bucindika Clemence, 28 October)
- This farmer ask that the following season, he be taught how to use agricoach and use it in his farms because if he looks at farmers that used agricoach (Ngarukiyinka Dorothe, 25 November)
- He doesn't know about it but would like to know about Agricoach (Ngarukiyinka Dorothe, 6 January)
- He would like to know how to use agricoach (Bucindika Clemence, 6 January)
- He would like also to use agricoach` (NTUNZWENIMANA ATHANASE, 6 January)

Appendix IV: March interviews

In March farmers were interviewed as part of the second case study in season B 2020. Three of these farmers had used the AgriCoach for potato as part of the case study of season A: Nimpagaritse Anicet (Group 1: AC farmers), Ningabiye Marguerite (Group 2: PIP+AC), Hakizimana Firmin (Group 1: AC farmers). The interviews were focused on evaluation of the CropSelector during Februari, but several references were made to their experience with AgriCoach season A, presented below.

What was the motivation for farmers that are part of the evaluation to join?

- In last season they saw that other used AC for potato harvest was good, that is why they were convinced they wanted to use AgriCoach. (Nimpagaritse Anicet)
- The motivation was based on the experience from last season. And because they saw they needed less inputs. (Ningabiye Marguerite)

Last season you yourself used the AgriCoach to cultivate potato. What is the biggest difference in your view?

- The plants are much bigger. Before they would just plant in disorder. Now with AC practices they separate the crops and now the plant have more space to grow bigger. Another difference they have an exact timing for each activity. (Nimpagaritse Anicet)
- The biggest difference is that you use less seeds, but use more fertilisers. But that does not make you unhappy because when you see the yield it is much better. " (Ningabiye Marguerite)

Do you think PIP farmers have the same need for AgriCoach as other farmers, or it is different?

- In her group there are many PIP farmers, when she got the AgriCoach they were very happy because what they learned and when they saw the videos it was easier. Because it was easier than what they learned in PIP. Now they don't need to run after somebody to show the information, they have the information with them in the tablet. In PIP they just discuss, talk and take notes. But now with AgriCoach they can discuss and look at the video. (Ningabiye Marguerite)

Why do you make time for AgriCoach during group meetings?

- AgriCoach is helping them how to organise how to manage their fields, which crops to plant and which crops are good for them, which fertilisers. It is like their own agronome in their group. It is like they have their own agronome that stays with them every day. (Nimpagaritse Anicet)
- AgriCoach came to me to help me. For example next I will plant 15 kg of seeds, I got some harvest, but now, with 10 kg I can get more than that previous harvest. Now I spend less money but a got a lot of harvest. Also she does not have a big field but with AgriCoach she learned how to subdivide and get space for every crop. Now she takes a small space. (Ningabiye Marguerite)
- This is most important for them. They want to see the good information for agriculture. In some meetings the request of the members is to discuss the calendar and activities even before saving, because it is so important to them. (Hakizimana Firmin)

Appendix V: December interview

[pdf to be attached]